WebSphere Business Integration
Server Express and Express Plus

IBM

Adapter for Oracle Applications User Guide

Adapter Version 2.6.x

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> **Note!**
>
> Before using this information and the product it supports, read the information in "Notices" on page 277.

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About this document

The IBM^(R) WebSphere^(R) Business Integration Server Express and IBM^(R) WebSphere^(R) Business Integration Server Express Plus are made up of the following components: InterChange Server Express, the associated Toolset Express, Collaboration-Foundation, and a set of software integration adapters. The tools in Toolset Express help you to create, modify, and manage business processes. You can choose from among the prepackaged adapters for your business processes that span applications. The standard processes template--CollaborationFoundation-- allows you to quickly create customized processes.

This document describes the installation, configuration, and business object development for the adapter for Oracle Applications.

Except where noted, all the information in this guide applies to both IBM WebSphere Business Integration Server Express and Express Plus. The term "WebSphere Business Integration Server Express" and its variants refer to both products.

Audience

This document is for consultants, developers, and system administrators who use the connector at customer sites.

Related documents

The complete set of documentation available with this product describes features and components common to all WebSphere adapter installations, and includes reference material on specific components.

You can download, install, and view the documentation from the following site: http://www.ibm.com/websphere/wbiserverexpress/infocenter

Typographic conventions

This document uses the following conventions:

courier font	Indicates a literal value, such as a command name, file name, information that you type, or information that the system prints on the screen.
bold	Indicates a new term the first time that it appears.
italic, italic	Indicates a variable name or a cross-reference.
blue outline	Blue outline, which is visible only when you view the manual online, indicates a cross-reference hyperlink. Click inside the outline to jump to the object of the reference.
/,\	In this document backslashes (\) are used as the convention for directory paths. for Linux and i5/OS installations substitute slashes (\) for backslashes. All WebSphere Business Integration Server Express product pathnames are relative to the directory where the product is installed on your system.

ProductDir	Represents the directory where the WebSphere Business Integration Server Express Adapters product is installed. The default product directory for each platform is as follows: Windows: IBM\WebSphereServer i5/OS: /QIBM/ProdData/WBIServer44/product Linux: /home/${username}/IBM/WebSphereServer
{ }	In a syntax line, curly braces surround a set of options from which you must choose one and only one.
|	In a syntax line, a pipe separates a set of options from which you must choose one and only one.
[ ]	In a syntax line, square brackets surround an optional parameter.
...	In a syntax line, ellipses indicate a repetition of the previous parameter. For example, option[,...] means that you can enter multiple, comma-separated options.
< >	Angle brackets surround individual elements of a name to distinguish them from each other, as in <server_name><connector_name>tmp.log.

New in this release

Version 2.6.x

The 2.6.x version of the adapter is supported on the following platforms:

- Windows 2003
- IBM i5/OS V5R3 and OS/400 V5R2

  Note:
  i5/OS refers to OS/400 and i5/OS unless explicitly stated.

- Linux:

  RedHat Enterprise Linux WS/AS/ES Update 2, Intel (IA32)
  SuSE Linux ES 8.1 SP3, Intel (IA32)
  SuSE Linux ES 9.0, Intel (IA32)

Chapter 1. Overview of the connector

Connectors consist of two parts: the **connector framework** and the **application-specific component**. The connector framework, whose code is common to all connectors, acts as an intermediary between the integration broker and the application-specific component. The application-specific component contains code tailored to a particular application or technology (in this case, Oracle applications). The connector framework provides the following services between the integration broker and the application-specific component:

* Receives and sends business objects
* Manages the exchange of startup and administrative messages

This chapter describes the connector component of the WebSphere Business Integration Server Express Adapter for Oracle Applications. It contains the following sections:

* "Connector components"
* "How the connector works" on page 2

Note that this document contains information about both the connector framework and the application-specific component. It refers to both of these as the connector. For more information about the relationship of the integration broker to the connector, see the *System Administration Guide.*

Connector components

The connector allows the integration broker to exchange business objects with an Oracle application using a JDBC driver for Oracle database that follows the JDBC 2.0 or above specification. This section presents a high-level description of the connector's architecture and use of different JDBC drivers for Oracle database.

For specifying the driver to be used by the connector to connect to the database, see "Enabling multi-driver support" on page 15.

The connector connects to the application database by using the JDBC Connect mechanism. One connector-specific configuration parameter ("DatabaseURL" on page 20) allows you to specify the name of the database server to which the connector should connect. For information on the configuration parameters, see "Configuring the connector" on page 16.

When the connector is started, it establishes a connection pool with the database. It uses connections from this pool for all transaction processing with the database. On termination of the connector, all connections in the pool are closed.

Connector architecture

Figure 1 shows the connector components and their relationships within the WebSphere Business Integration Server Express Adapter system.
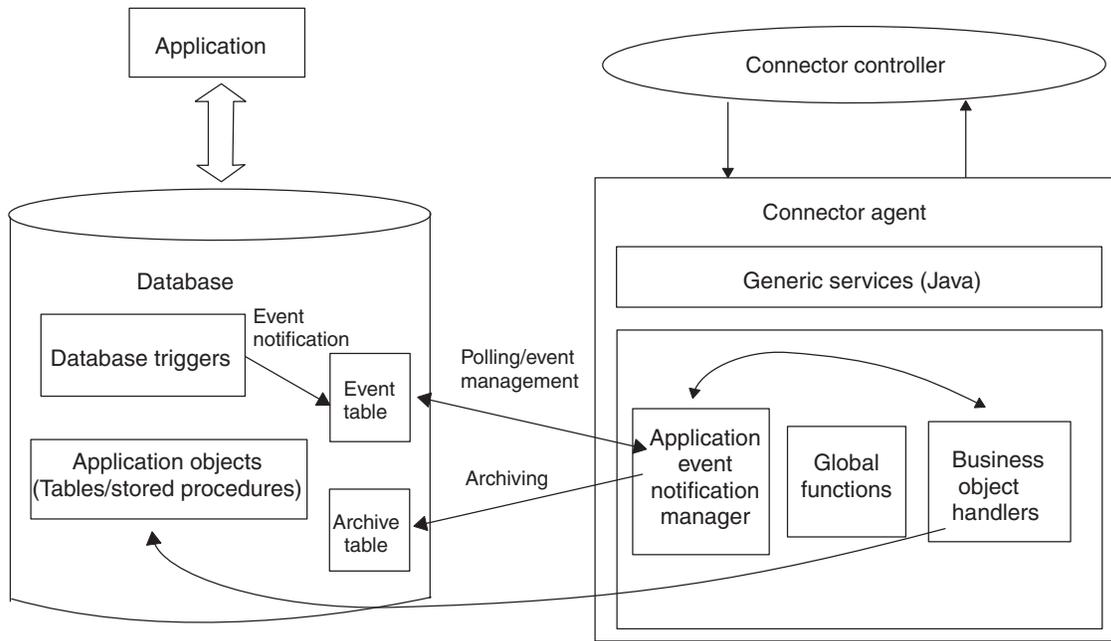
Figure 1. Business object request architecture in an InterChange Server Express environment

How the connector works

This section describes how meta-data enhances the connector's flexibility, and presents a high-level description of business object processing and event notification.

The connector and meta-data

The connector is meta-data-driven. Meta-data, in the adapter environment, is application-specific data that is stored in business objects and that assists the connector in its interaction with the application. A meta-data-driven connector handles each business object that it supports based on meta-data encoded in the business object definition rather than on instructions hard coded in the connector.

Business object meta-data includes the structure of a business object, the settings of its attribute properties, and the content of its application-specific information. Because the connector is meta-data driven, it can handle new or modified business objects without requiring modifications to the connector code.

The connector executes SQL statements or stored procedures to retrieve or change data in the database/application. To build dynamic SQL statements or stored procedures, the connector uses application-specific meta-data. These SQL statements and stored procedures perform the required retrieval from or changes to the database/application for the business object and for the verb that the connector is processing. For information using application-specific information, see Chapter 3, "Understanding business objects for the connector," on page 33.

Business object processing

This section provides an overview of how the connector processes business object requests and application events. For more detailed information, see "Business object verb processing" on page 38.

Processing business object requests

When the connector receives a request to perform an application operation, the connector processes hierarchical business objects recursively; that is, it performs the same steps for each child business object until it has processed all individual business objects. The order in which the connector processes child business objects and the top-level business object depends on whether the child business objects are contained with or without ownership and whether they are contained with single cardinality or multiple cardinality.

The connector supports the following four ways to process request business objects:

- Data can be passed to the application indirectly using the interface tables and stored procedures to invoke the concurrent program.
- Data can be passed indirectly using the interface tables and stored procedures to call public APIs.
- Data can be passed indirectly using customized tables and customized APIs.
- Data can be written directly to the Oracle application base tables using SQL or private APIs.

For more information, see Chapter 3, "Understanding business objects for the connector," on page 33. For examples of how to use the interface tables with stored procedures to process business objects, see Appendix C, "About sample business objects and stored procedures," on page 127.

Note: The term **hierarchical** business object refers to a complete business object, including all the child business objects that it contains at any level. The term **individual** business object refers to a single business object, independent of any child business objects it might contain or that contain it. The term **top-level** business object refers to the individual business object at the top of the hierarchy that does not itself have a parent business object.

Business object retrieval: When an integration broker asks the connector to retrieve a hierarchical business object from the Oracle application, the connector attempts to return a business object that exactly matches the current representation of that business object in the application database. In other words, all simple attributes of each individual business object returned to the integration broker match the value of the corresponding field in the database. Also, the number of individual business objects in each array contained by the returned business object match the number of children in the database for that array.

To perform such a retrieval, the connector uses the primary key values in the top-level business object received from the business process to recursively descend through the corresponding data in the database.

Business object RetrievalByContent: When an integration broker asks the connector to retrieve a hierarchical business object based on values in non-key attributes in the top-level business object, the connector uses the value of all non-null attributes as the criteria for retrieving the data.

Business Object Creation: When an integration broker asks the connector to create a hierarchical business object in the Oracle application, the connector performs the following steps:

1. Recursively creates each single-cardinality child business object contained with ownership.

2. Processes each single-cardinality child business object contained without ownership.
3. Creates the top-level business object.
4. Creates each single-cardinality child business object that stores the parent/child relationship in the child.
5. Creates each multiple-cardinality child business object.

Business object modification: When an integration broker asks the connector to update a hierarchical business object in the database, the connector performs the following steps:

1. Uses the primary key values of the source business object to retrieve the corresponding entity from the database.
2. Recursively updates all single-cardinality children of the top-level business object.
3. For single-cardinality child business objects that store the relationship in the parent, sets each foreign key value in the parent to the value of the primary key in the corresponding single-cardinality child business object.
4. Updates all simple attributes of the retrieved business object except those whose corresponding attribute in the source business object contain the value CxIgnore.
5. Sets all foreign key values in each child that stores the parent/child relationship in the child (both multiple-cardinality and single-cardinality) to the primary key value of its corresponding parent business object.
6. Processes all arrays of the retrieved business object.

Business object deletion: When an integration broker asks the connector to delete a hierarchical business object from the database, the connector performs the following steps:

1. Deletes the single-cardinality children
2. Deletes the multiple-cardinality children
3. Deletes the top-level business object.

Processing application events

The connector handles the Create, Update, and Delete events generated by the application in the manner described below.

Create notification: When the connector encounters a Create event in the event table, it creates a business object of the type specified by the event, sets the key values for the business object (using the keys specified in the event table), and retrieves the business object from the database. After it retrieves the business object, the connector sends it with the Create verb to the integration broker.

Update notification: When the connector encounters an Update event in the event table, it creates a business object of the type specified by the event, sets the key values for the business object (using the keys specified in the event table), and retrieves the business object from the database. After it retrieves the business object, the connector sends it with the Update verb to the integration broker.

Delete notification: When the connector encounters a Delete event in the event table, it creates a business object of the type specified by the event, sets the key values for the business object (using the keys specified in the event table), and sends it with the Delete verb to the integration broker. All values other than the

key values are set to CxIgnore. If any of the non-key fields are significant at your site, modify the value of the fields as needed.

The connector handles logical and physical Delete operations that are triggered by its application. In the case of physical deletes, the SmartFiltering mechanism removes all of the business object's unprocessed events (such as Create or Update) before inserting the Delete event into the event table. In the case of logical deletes, the connector inserts a Delete event in the event table without removing other events for the business object.

Setting the Object Event ID: The event ID is a unique ID that is used to avoid logging duplicate events from the application broker. For example, an event is in progress and is sent to the integration broker, and then the adapter fails. When the adapter is restarted, it reprocesses and resends the event. The integration broker then compares event IDs and discards any duplicate events, because each event ID is unique.

Retrieving Business Objects for Event Processing: A Retrieve can be done in two ways on a business object for event processing. The first is a Retrieve based on key attributes in a business object. The second is a Retrieve based on both key and non-key attributes. In this case, the business object needs to support the `RetrieveByContent` verb and must use `name_value` pair for the object keys.

Note: If the object key does not use `name_value` pair, the keys in the object key field should follow the same order as the keys in the business object.

Event notification

The connector's event detection mechanism uses an event table, an archive table, stored procedures, and database triggers. Because there are potential failure points associated with the processing of events, the event management process does not delete an event from the event table until it has been inserted into the archive table.

The database triggers populate an event table whenever an event of interest occurs in the database. The connector polls this table at a regular, configurable interval, retrieves the events, and processes the events first by priority and then sequentially. When the connector has processed an event, the event's status is updated.

Note: You must add the triggers to the database as part of the installation procedure.

The setting of its ArchiveProcessed property determines whether the connector archives an event into the archive table after updating its status. For more information on the ArchiveProcessed property, see "Configuring the connector" on page 16.

Table 1 illustrates the archiving behavior depending on the setting of the ArchiveProcessed property.

Table 1. Archiving behavior

Archive processed setting	Reason deleted from event table	Connector behavior
`true or no value`	Successfully processed	Archived with status of Sent to InterChange

Table 1. Archiving behavior (continued)

Archive processed setting	Reason deleted from event table	Connector behavior
	Unsuccessfully processed	Archived with status of Error
	No subscription for business object	Archived with status of Unsubscribed (for subscription information specific to your integration broker, see the broker's implementation guide)
false	Successfully processed	Not archived and deleted from event table
	Unsuccessfully processed	Remains in the event table with a status of Error
	No subscription for business object	Remains in event table with status of Unsubscribed (for subscription information specific to your integration broker, see the broker's implementation guide)

SmartFiltering, a mechanism within the database triggers that minimizes the amount of processing the integration broker and connector must perform. For example, if an application has updated the Contract business object 15 times since the connector last polled for events, the SmartFiltering stores those changes as a single Update event.

Handling lost database connections

There are numerous reasons for losing a database connection. If this occurs, the connector terminates. The JDBC specification does not provide a mechanism for detecting lost connections; however, the PingQuery property is provided to handle this detection. If a failure occurs during a service call request, the connector executes this PingQuery to confirm that the failure was not due to a lost connection to a database. If the PingQuery fails and the AutoCommit property is set to false, the connector will attempt to create a new connection to the database. If it succeeds in creating a new connection to the database it will continue processing, otherwise the connector returns an APPRESPONSETIMEOUT, which results in the termination of the connector.

The PingQuery is executed if a failure occurs when accessing a database for any type of transaction. For example:
- While accessing the event and archive tables
- While retrieving the business object that is related to the event

While creating or updating a record pertaining to a business object

Processing locale-dependent data

The connector has been internationalized so that it can support double-byte character sets, and deliver message text in the specified language. When the connector transfers data from a location that uses one character code set to a location that uses a different code set, it performs character conversion to preserve the meaning of the data.

The Java runtime environment within the Java Virtual Machine (JVM) represents data in the Unicode character code set. Unicode contains encodings for characters in most known character code sets (both single-byte and multibyte). Most

components in the WebSphere business integration system are written in Java. Therefore, when data is transferred between most Server Acces components, there is no need for character conversion.

To log error and informational messages in the appropriate language and for the appropriate country or territory, configure the Locale standard configuration property for your environment. For more information on these properties, see Appendix A, "Standard configuration properties for connectors," on page 89.

Chapter 2. Installing and configuring the adapter

This chapter describes how to install and configure the WebSphere Business Integration Server Express Adapter for Oracle Applications. It contains the following sections:

- "Prerequisites"
- "Installing the adapter and related files" on page 10
- "Installed file structure" on page 10
- "Enabling the application for the connector" on page 12
- "Enabling multi-driver support" on page 15
- "Enabling the custom business object handler class" on page 15
- "Configuring the connector" on page 16
- "Connector startup" on page 30

Adapter platforms

The adapter is supported on the following platforms:

- Windows 2003
- IBM i5/OS V5R3 and OS/400 V5R2

  Note:
  i5/OS refers to OS/400 and i5/OS unless explicitly stated.
- Linux:

  RedHat Enterprise Linux WS/AS/ES Update 2, Intel (IA32)
  SuSE Linux ES 8.1 SP3, Intel (IA32)
  SuSE Linux ES 9.0, Intel (IA32)

Adapter applications

The adapter for Oracle applications supports the following versions of Oracle Applications: 10.7, 11, 11i

Prerequisites

The adapter has the following software prerequisites and dependencies:

- Install the Adapter Development Kit only if you plan to extend or modify the adapter functionality.

  Before running the connector, if the connector runs on a different machine from the integration broker, install the Adapter Framework that is compatible with the integration broker version.
- You must install the JDBC driver for Oracle for all versions and configurations of the adapter for Oracle applications, unless you are on i5/OS platform. For i5/OS, use the native i5/OS driver that is part of the i5/OS Toolbox for Java licensed program 5722JC1.
- Verify that all required vendor-specific software, including JDBC driver requirements, has been installed.

  For example, if you are using the JDBC Type 2 driver for an Oracle database, you must install the OracleOCI libraries.

- Verify the existence of a user account in the application

  The connector processes data in an Oracle application using a driver for Oracle that follows the JDBC specification. For the connector to process data in the database, with which it talks directly, it must have access to a user account and password that is valid for the application. The user account must have the privileges to retrieve, insert, update, and delete data from the application's database. If you do not already have such an account, you must create one.

- Verify the character code set of the connected database.

  The Java runtime environment within the Java Virtual Machine (JVM) represents data in the Unicode character code set. Unicode contains encodings for characters in most known character sets (both single-byte and multibyte). Because the connector is written in Java, it understands Unicode.

Locale-dependent data

The connector has been internationalized so that it can support double-byte character sets, and deliver message text in the specified language. When the connector transfers data from a location that uses one character code to a location that uses a different code set, it performs character conversion to preserves the meaning of the data.

The Java runtime environment within the Java Virtual Machine (JVM) represents data in the Unicode character code set. Unicode contains encoding for characters in most known character code sets (both single-byte and multibyte). Most components in the WebSphere business integration system are written in Java. Therefore, when data is transferred between most integration components, there is no need for character conversion.

To log error and informational messages in the appropriate language and for the appropriate country or territory, configure the `Locale` standard configuration property for your environment. For more information on configuration properties, see Appendix A, "Standard configuration properties for connectors," on page 89.

Installing the adapter and related files

For information on installing WebSphere Business Integration Server Express adapter products, refer to the WebSphere Business Integration Server Express installation guide for Windows, for Linux, or for i5/OS. The guide is located in the WebSphere Business Integration Server Express Adapters Infocenter at the following site: http://www.ibm.com/websphere/wbiserverexpress/infocenter.

Installed file structure

The following subsections describe the installed file structure of the adapter on a Windows, Linux, and i5/OS system.

Note: Unless otherwise indicated, the remaining sections in this chapter apply to both Linux and Windows installations of the adapter.

Installed file structure on a Linux system

Table 2 describes the Linux file structure used by the adapter.

Table 2. Installed Linux file structure for the connector

Subdirectory of $*ProductDir*	Description
connectors/OracleApps	Contains the connector CWOracleApps.jar and the start_OracleApps.sh files.
	The start_Oracle Apps.sh file is a system startup script for the connector. It is called from the generic connector manager script. When you click Install from Connector Configurator Express or the Connector Configuration screen of System Manager with InterChange Server Express as the integration broker, the installer creates a customized wrapper for this connector manager script.
	When the connector works with InterChange Server Express, use this customized wrapper to start and stop the connector.
connectors/OracleApps/dependencies	Contains the SQL scripts that create the event, archive, and unique identifier tables.
connectors/messages	Contains the message file OracleAppsConnector.txt.
/lib	Contains the WBIA. jar file.
/bin	Contains the CWConnEnv.sh file.

After you have installed the connector, you must use the Connector Configuration Tool to generate the customized connector wrapper (`connector_manager_Oracle Applications`) required to start the connector. Refer to the *WebSphere Business Integration Server Express Installation for Linux* for more information.

For more information on installing the connector component, refer to *System Installation Guide for Linux*.

Installed file structure on a Windows system

Table 3 describes the Windows file structure used by the connector.

Table 3. Installed Windows file structure for the adapter

Subdirectory of %*ProductDir*%	Description
connectors\OracleApps	Contains the connector CWOracleApps.jar and the start_OracleApps.bat files.
connectors\OracleApps\ start_OracleApps_service.bat	The startup script for the connector service.
connectors\OracleApps\dependencies	Contains the SQL scripts that create the event, archive, and unique identifier tables.
connectors\messages	Contains the message file OracleAppsConnector.txt.
\lib	Contains the WBIA. jar file.
\bin	Contains the CWConnEnv.bat file.

Installer adds an icon for the connector file to the WebSphere Business Integration Server Express Adapters menu. For a fast way to start the connector, create a shortcut to this file on the desktop.

For more information on installing the connector component, refer to one of the following guides, depending on the integration broker you are using the WebSphere Business Integration Server Express installation guide for Windows, or for Linux, or for i5/OS

Installed file structure on an i5/OS system

Table 2 describes the i5/OS file structure used by the adapter.

Table 4. Installed i5/OS file structure for the connector

Subdirectory of $*ProductDir*	Description
connectors/OracleApps	Contains the connector CWOracleApps.jar and the start_OracleApps.sh files.
connectors/OracleApps/dependencies	Contains the SQL scripts that create the event, archive, and unique identifier tables.
connectors/messages	Contains the message file OracleAppsConnector.txt.
/lib	Contains the WBIA. jar file.
/bin	Contains the CWConnEnv.sh file.

After you have installed the connector, you must use the Connector Configuration Tool to generate the customized connector wrapper (`connector_manager_Oracle Applications`) required to start the connector. Refer to the *WebSphere Business Integration Server Express Installation for i5/OS.* for more information.

For more information on installing the connector component, refer to *System Installation Guide for Linux*.

Enabling the application for the connector

You must set up the event notification mechanism in the database before the connector can process event delivery. To do this, you must complete the following tasks:

- Create the event and archive tables in the database.
- Install database triggers on the application's tables to support the business objects needed by the business processes running at your site. It is assumed that you develop your own database triggers.
- Optionally, install an adapter counter table. Perform this step only if you require the connector to generate a unique ID when creating a business object. For more information on generating unique IDs, see the UID=CW.uidcolumnname[=UseIfMissing] parameter.

The sections that follow provide information on creating and configuring the event and archive tables.

Event and archive tables

The connector uses the event table to queue events for pickup. If you have set the ArchiveProcessed property to true or to no value, the connector uses the archive table to store events after updating their status in the event table.

For each event, the connector gets the business object's name, verb, and key from the event table. The connector uses this information to retrieve the entire entity from the application. If the entity was changed after the event was first logged, the connector gets the initial event and all subsequent changes. In other words, if an entity is created and updated before the connector gets it from the event table, the connector gets both data changes in the single retrieval.

The following three outcomes are possible for each event processed by a connector:

- Event was processed successfully
- Event was not processed successfully

- Event was not subscribed to (for subscription information specific to your integration broker, see the broker's implementation guide)

If events are not deleted from the event table after the connector picks them up, they occupy unnecessary space there. However, if they are deleted, all events that are not processed are lost and you cannot audit the event processing. Therefore, it is recommended that you also create an archive table and keep the ArchiveProcessed property set to true. Whenever an event is deleted from the event table, the connector inserts it into the archive table.

Note: If problems accessing the application database cause the connector to fail while deleting an event from the event table or inserting an event into the archive table, the connector returns APPRESPONSETIMEOUT.

Configuring event and archive processing

To configure event and archive processing, you must use configuration properties to specify the following information:
- The name of the event table (EventTableName). This format is not required if you use the connector only to process integration broker requests.
- The interval frequency (PollQuantity)
- The number of events for each polling interval (PollQuantity)
- The name of the archive table (ArchiveTableName)
- Whether the connector archives unsubscribed and unprocessed events (ArchiveProcessed)
- The unique ID of the connector, which is important when multiple connectors poll the same table (ConnectorID)

You can also specify a value for the EventOrderBy property to specify the order of events to be processed. For information on these and other configuration properties, see Appendix A, "Standard configuration properties for connectors," on page 89 and Table 7.

Note: Creation of the event and archive tables is optional. However, if you specify a value for EventTableName but do not use the connector to poll for events and do not create an event table, the connector times out. To prevent such time-out, leave the value of EventTableName as null (as a string).

By default, the name of the event queue table is xworlds_events, and the name of the archive queue table is xworlds_archive_events.

To use the connector only for request processing, use the -fno option when starting it and set the value of EventTableName to null (as a string).

If the driver being used does not support Java class DatabaseMetaData, and you want the connector to avoid the checking for the existence of event and archive tables, disable the CheckForEventTableInInit by setting its value to false. By default, it is true. It is recommended that the value not be set to false.

Note: If your site will not archive events into the archive table, set the value of ArchiveProcessed to false.

SQL scripts for installing the event and archive tables

The scripts to install the event, archive, and unique identifier tables for an Oracle database are:

- event_table_oracle.sql
- event_package_oracle.sql
- archive_table_oracle.sql
- uid_table_oracle.sql

These files are located in the following directories:

Linux:

connectors/OracleApps/dependencies/

Windows:

connectors\OracleApps\dependencies\

i5/OS:

connectors/OracleApps/dependencies/

It is recommended that the DBA or person implementing the connector modify these scripts to meet specific installation and query optimization requirements. For example, these scripts do not create indexes on the tables. It is the responsibility of the person implementing the connector to create indexes to enhance performance with the query optimizer.

Note: These scripts are provided only as a template to assist you in creating the required tables for the connector. For other databases, please create your scripts using these as guidelines. The order and data type in the table columns is very important. Please refer to Table 5 to view the correct order and type.

Event and archive table schema

Table 5 describes the columns in the event and archive tables.

Table 5. Event and archive table schema

Name	Description	Type	Constraint
event_id	Internal identifier of the event	INTEGER	Primary key
connector_id	Unique ID of the connector for which the event is destined. This value is important when multiple connectors poll the same table.	VARCHAR	
object_key	Primary key of the business object. The object key can be represented as a name_value pair, or as a set of keys delimited by a colon or other configurable delimiter (for example, 1000065:10056:2333). See the "EventKeyDel" on page 22 property for more information.	VARCHAR	Not null
object_name	Name of the business object	VARCHAR	Not null
object_verb	Verb associated with the event	VARCHAR	Not null
event_priority	Event priority (0 is highest, n is lowest), which the connector uses to get events on a priority basis. The connector does not use this value to lower or raise priorities.	INTEGER	Not null

Table 5. Event and archive table schema (continued)

Name	Description	Type	Constraint
event_time	Date and time the event occurred	DATETIME	Default current date/time (for archive table, actual event time)
archive_time	Date and time the event was archived (applies only to the archive table)	DATETIME	Archive date/time
event_status	-2 (Error sending event to the integration broker) -1 (Error processing event) 0 (Ready for poll) 1 (Sent to the integration broker) 2 (No Subscriptions for the business object) 3 (In Progress). This status is used only in the event table and not in the archive table.	INTEGER	Not null
event_comment	Description of the event or error string	VARCHAR	

Enabling multi-driver support

You can specify the driver by doing the following:

1. Install the driver on your machine.
2. Put all dynamic libraries that the connector requires at runtime in the connectors\OracleApps directory under the product directory.
3. Edit the connector's start file to include all relevant class pathnames (including license
   information if required) in the JDBCDRIVERPATH variable.

   On Linux, the start file is:

   $*ProductDir*/connectors/OracleApps/start_OracleApps.sh

   On Windows, the start file is:

   %*ProductDir*%\connectors\OracleApps\start_OracleApps.bat

   On i5/OS, the start file is:
   /QIBM/UserData/WBIServer44/QWBIDFT44/connectors/OracleApps
   /start_OracleApps.sh
4. Specify a value for the JDBCDriverClass configuration property.

   Note: For all features that it supports, the connector can operate with any driver that follows the JDBC 2.0 or above specification. If the driver does not support a particular feature, the connector does not function properly. For example, if the driver does not support all method calls used by OracleAppsODA, the OracleAppsODA log indicates the process that the driver does not support. In such a case, you must use a different driver.

Enabling the custom business object handler class

The connector supports the custom business object handler class, CustomBOH. It implements the JDBCBOhandlerInterface interface. The syntax of this interface is:

```
public interface JDBCBOhandlerInterface{
    public int doVerbForCustom(CWConnectorBusObj busObj) throws
    VerbProcessingFailedException, ConnectionFailureException;
}
```

When you implement the `doVerbForCustom` method, ensure that it throws but does not catch the two exceptions. Also set the status and message of each exception before throwing them.

- `VerbProcessingFailedException`—Thrown when the operation specified by the verb fails.
- `ConnectionFailureException`—Thrown when the connector can not establish a connection with the application.

To enable the connector to support this business object handler:

- Specify the `CustomBOH` class name in the verb application-specific information.

  The connector obtains the name of the custom business object handler class from the verb application-specific information. Use the following syntax:

  `CustomBOH=customBOhandlerClassName`

  For example, assume the verb application-specific information is specified as follows:

  `CustomBOH=JDBCBOhandlerForOverrideSQL`

  In this case, `JDBCBOhandlerForOverrideSQL` is the name of the custom business object handler class.

- Ensure that `CustomBOH` belongs to `com.crossworlds.connectors.JDBC`

If the connector finds "`CustomBOH=`" in the verb application-specific information and finds the class in the `com.crossworlds.connectors.JDBC` package, it executes the custom business object handler. If it does not find `CustomBOH`, it throws an error saying that it could not find the class.

Configuring the connector

You must set the connector's standard and connector-specific configuration properties before you can run it. Use Connector Configurator Express (becauseInterChange Server Express is the integration broker)--Access this tool from the System Manager.

Standard connector properties

Standard configuration properties provide information that all connectors use. See Appendix A, "Standard configuration properties for connectors," on page 89 for detailed information about these properties.

Important: Because the connector for Oracle Applications supports the InterChange Server Express broker and configuration properties.

In addition, see Table 6 for information about standard configuration properties specific to the WebSphere Business Integration Server Express Adapter for Oracle Applications. The information in this table supplements the information in the appendix.

Table 6. Property information specific to this connector

Property	Notes
CharacterEncoding	This connector does not use the CharacterEncoding property

Table 6. Property information specific to this connector (continued)

Property	Notes
Locale	Because this connector has been internationalized, you can change the value of the Locale property. **Note:** If you are using WebSphere MQ Integrator Broker as your broker, you must use the same locale for the adapter, the broker, and any applications.

Connector-specific properties

Connector-specific configuration properties provide information needed by the connector at runtime. Connector-specific properties also provide a way of changing static information or logic within the connector without having to recode and rebuild it.

Table 7 lists the connector-specific configuration properties for the connector. See the sections that follow for explanations of the properties.

Table 7. Connector-specific configuration properties

Name	Possible values	Default value	Required
ApplicationPassword	*Password for the connector user account*		Yes*
ApplicationUserName	*Name of the connector user account*		Yes*
ArchiveProcessed	`true` or `false`	`true`	No
ArchiveTableName	*Name of archive queue table*	`xworlds_archive_events`	Yes if Archive Processed is true
AutoCommit	`true` or `false`	`false`	No
CheckforEventTableInInit	`true` or `false`	`true`	No
ChildUpdatePhyDelete	`true` or `false`	`false`	No
CloseDBConnection	`true` or `false`	`false`	No
ConnectorID	*Unique ID for the connector*	`null`	No
DatabaseURL	*Name of the database server*		Yes
DateFormat	*A time pattern String*	`MM/dd/yyyy HH:mm:ss`	No
DriverConnectionProperties	*Additional JDBC driver connection properties*		No
DriverSupportForLong	`true` or `false`	`false`	No
EventKeyDel	*Delimiter character or characters for object key column of event table*	`semicolon (;)`	No
EventOrderBy	`none`, *ColumnName* `[`, *ColumnName*`, ...]`		No
EventQueryType	Fixed or Dynamic	`Fixed`	No
EventTableName	*Name of event queue table*	`xworlds_events`	Yes, if polling is required; null (as a string) if polling is not required.
JDBCDriverClass	driver classname		Yes
MaximumDatabaseConnections	*Number of simultaneous database connections*	5	Yes
PingQuery	`SELECT 1 FROM <tablename>`		No
PollQuantity	Values are 1 to 500	1	No
PreserveUIDSeq	`true` or `false`	`true`	No
QueryTimeOut	Integer value in seconds		No

Table 7. Connector-specific configuration properties (continued)

Name	Possible values	Default value	Required
RDBMS.initsession	*SQL statement that initializes every database session*		No
RDBMSVendor	Oracle	Oracle	Yes
ReplaceAllStr	true or false	false	No
ReplaceStrList	A set composed of a single character, a character delimiter, and the character's substitution string. Also, multiple such sets with a termination delimiter between them.	Q,DSQNote: In the connector configuration tool, these characters represent a single quotation mark, followed by a comma, followed by two single quotation marks.	No
RetryCountAndInterval	*count, interval in seconds*	3,20	No
ReturnDummyBOForSP	true or false	false	No
SchemaName	Schema on which the WebSphere Business Integration Server Express Adapter events reside		No
SelectiveCommitForPoll	true or false	false	No
SPBeforePollCall	Name of the stored procedure to be executed for each poll call		No
StrDelimiter	The character and termination delimiters used in the ReplaceStrList property	;:	No
TimingStats	0, 1, 2	0	No
UniqueIDTableName	*Name of table used for generation of IDs*	xworlds_uid	No
UseDefaults	true or false	false	Yes
UseDefaultsForCreatingChildBOs	true or false	false	No
UseDefaultsWhenPolling	true or false	true	No

*ApplicationPassword and ApplicationUserName are not required if you are using trusted authentication.

ApplicationPassword

Password for the connector's user account.

There is no default value.

ApplicationUserName

Name of the connector's user account.

There is no default value.

ArchiveProcessed

Specifies whether the connector archives events for which there are no current subscriptions.

Set this property to true to cause events to be inserted into the archive table before they are deleted from the event table.

Set this property to false to cause the connector not to perform archive processing. In this case, it does not check the value of the ArchiveTableName property. If ArchiveProcessed is set to false, the connector performs the following behavior:

- If the event is successfully processed, the connector deletes it from the event table and does not archive it.
- If the connector does not subscribe to the event's business object, the connector leaves the event in the event table and changes its event status to Unsubscribed. See your integration broker's implementation guide for specific information about subscriptions.
- If the business object encounters a problem while being processed, the connector leaves the event in the event table with event status of Error.

If this property is set to false and the poll quantity is low, the connector appears to be polling the event table, but it is simply picking up the same events repeatedly.

If this property has no value, the connector assumes the value to be true. If the ArchiveTableName property also has no value, the connector assumes the archive table's name is xworlds_archive_events.

The default value is true.

ArchiveTableName
Name of archive queue table.

If the ArchiveProcessed property is set to false, it is unnecessary to set a value for this property.

The default name is xworlds_archive_events.

AutoCommit
This property makes the AutoCommit setting configurable. When set to true, all transactions are automatically committed.

If the database connection is lost, the connector will attempt to create a new connection to restart the complete processing as long as AutoCommit is set to false. If the new connection is invalid, or if AutoCommit is set to true, the connector returns APPRESPONSETIMEOUT, which results in the termination of the connector.

The default value is false.

CheckforEventTableInInit
Setting this connector property to false prevents the connector from checking for the existence of the event and archive tables during connector initialization. It is recommended that you always set it to true unless the JDBC driver you are using does not support the JDBC class DatabaseMetaData.

When the property is set to false, although the connector does not check for the existence of EventTable and ArchiveTable, the event and archive tables should always exist because the connector uses them during the initialization process. To prevent the connector from using the event and archive tables during initialization, set the property EventTableName to null.

The default value is true.

ChildUpdatePhyDelete
During an update operation, specifies how the connector handles data represented by a child business object that is missing from the incoming business object but exists in the database.

Set this property to true to cause the connector to physically delete the data record from the database.

Set this property to false to cause the connector to logically delete the data record from the database by setting the status column to the appropriate value. The connector obtains the name of the status column and its value from the StatusColumnValue (SCN) parameter specified in its business-object level application-specific information. For more information, see "Application-specific information at the business-object level" on page 56.

Default value is false.

CloseDBConnection

This property makes the closing of the database connection configurable. When set to `true`, for every service call request and poll call, the database connection is closed. Setting this property to `true` impairs performance and is not advisable.

The default value is `false`.

ConnectorID

A unique ID for the connector. This ID is useful to retrieve events for a particular instance of the connector.

Default value is null.

DatabaseURL

Name of the database server to which the connector should connect.

If you use Oracle thin driver, the recommended URL is:

`jdbc:oracle:thin:@MachineName:PortNumber:DBname`

You must provide this value for the connector to process successfully.

DateFormat

Specifies the date format that the connector expects to receive and return. This property supports any format that is based on the syntax as contained in Table 8.

Table 8 Defines the DateFormat syntax using a time pattern string. In this pattern, all ASCII letters are reserved as pattern letters.

Table 8. DateFormat syntax

Symbol	Meaning	Presentation	Example
G	era designator	(Text)	AD
y	year	(Number)	1996
M	month in year	(Text & Number)	July & 07
d	day in month	(Number)	10
h	hour in am/pm(1-12)	(Number)	12
H	hour in day(0-23)	(Number)	0
m	minute in hour	(Number)	30
s	second in minute	(Number)	55
S	millisecond	(Number)	978
E	day in week	(Text)	Tuesday
D	day in year	(Number)	189
F	day of week in month	(Number)	2 (2nd Wed in July)
w	week in year	(Number)	27
W	week in month	(Number)	2
a	am/pm marker	(Text)	PM
k	hour in day(1-24)	(Number)	24
K	hour in am/pm(0-11)	(Number)	0
z	time zone	(Text)	Pacific Standard Time
'	escape for text	(Delimiter)	
''	single quote	(Literal)	'

Table 9. Examples using the US locale

Format pattern	Result
"yyyy.MM.dd G 'at' hh:mm:ss z"	1996.07.10 AD at 15:08:56 PDT
"EEE, MMM d, ''yy"	Wed, July 10, '96
"h:mm a"	12:08 PM
"hh 'o''clock' a, zzzz"	12 o'clock PM, Pacific Daylight Time
"K:mm a, z"	0:00 PM, PST
"yyyy.MMMMM.dd GGG hh:mm aaa"	1996.July.10 AD 12:08 PM

DriverConnectionProperties

Besides the user name and password, a JDBC driver might need additional properties or information. The `DriverConnectionProperties` connector property will take additional properties that a JDBC driver needs, as name-value pairs. The properties should be specified as follows:

```
property1=value1[;property2=value2...]
```

The properties must be given as name value pairs, separated by semi-colons. The property is separated from its value by an equals sign (with no extra spaces).

For example, assume the JDBC driver needs license information and port number. The property name it expects for license information is `MyLicense` and the value is `ab23jk5`. The property name it expects for port number is `PortNumber` and value is `1200`. The `DriverConnectionProperties` should be set to the value `MyLicense=ab23jk5;PortNumber=1200`.

DriverSupportForLong

Specifies how integer parameters are handled for PreparedStatements. When this property is true,

```
setLong
```

is used to set the integer parameter. When it is false,

`setInt`

is used to set the parameter.

The default value is true.

EventKeyDel

Specifies the delimiter when the object_key column of the event table contains multiple attribute values.

There are two ways to retrieve the business object that has been created, updated, or deleted in the triggering application.

- The first is to populate the `object_key` column with values for attributes that are keys in a business object. Set the `EventKeyDel` configuration property to a single character that is not part of the key field. For **example**, if the delimiter is specified as "**;**", then the `object_key` will be as follows: *xxx;123*
- The second is to populate the `object_key` column with values for any attribute in a business object. These values should be represented as `name_value` pair. The first delimiter will be for the `name_value` and the second is for the keys. For example, if the delimiter is specified as "**=;**", then the `object_key` will be as follows: *CustomerName=xxx;CustomerId=123*;

  If the delimiter is specified as "**=:**", then the `object_key` will be as follows: *CustomerName=xxx:CustomerId=123*:

Note: The order that the key values are defined should follow the same order as the key attributes in a business object.

Important: If you use Date attribute data, avoid using a colon (:) delimiter, because it may be included in the attribute's data.

The default value is a semicolon (;), which is based on keys, not `name_value` pairs.

EventOrderBy

Specifies whether to turn off the ordering of events, or specifies an order of event processing that is different from the default order.

By default, at each poll the connector pulls only the number of events specified in its PollQuantity property, and orders event processing by the values in the `event_time` and `event_priority` columns of the Event table.

To cause the connector not to order events, set the value of this property to `none`.

To cause the connector to order by different columns in the Event table, specify the names of those columns. Separate column names with a comma (**,**). Specifying a value for this property overwrites the default value.

There is no default value for this property.

EventQueryType

The `EventQueryType` property is used to indicate whether the connector should dynamically generate a query to retrieve events from the event table or use its built in query. For the dynamically generated query, the connector correlates its

event structure to the columns in the event table. The order of the data in the table columns is very important. Please refer to the "Event and archive table schema" on page 14 to view the correct order.

If the value in the EventQueryType is Fixed (as a string), the default query is executed. If set to Dynamic (as a string), a new query is built by getting the column names from the table that is specified in the "EventTableName" property.

The event table column names can change but the order and data type of the columns must remain the same as specified in the event table creation section. "EventOrderBy" on page 22 will be appended to either the default or the dynamically generated query.

If the EventQueryType property is not added or it contains no value, it is defaulted to Fixed.

Default value is Fixed (as a string).

EventTableName
Name of event queue table, which is used by the connector's polling mechanism.

The default name is xworlds_events.

Set this to null (as a string) when polling is turned off for the connector. This prevents validation of the existence of the event and archive tables.

For a user defined event table, ensure that the event_id maps to one of the following JDBC types: INTEGER, BIGINT, NUMERIC, VARCHAR.

JDBCDriverClass
Specifies the class name of a driver. To use a particular JDBC driver, specify the driver's class name in this configuration property. For example, to specify the Oracle thin driver, set the value of this property to: oracle.jdbc.driver.OracleDriver.

For more information, see "Enabling multi-driver support" on page 15.

No default value is provided.

MaximumDatabaseConnections
Specifies the maximum number of simultaneous database connections allowed. At runtime, the number of open database connections is the sum of this value plus 1.

If the "PreserveUIDSeq" on page 24 property is set to false, at runtime, the number of open database connections is the sum of this value plus 2.

The default value is 5.

PingQuery
Specifies the SQL statement or stored procedure that the connector executes to check database connectivity.

The following is an example of an SQL statement used as a ping query:
SELECT 1 FROM <tablename>

The following is an example of a stored procedure call (sampleSP) used as a ping query with an Oracle or DB2 database:

```
call sampleSP( )
```

Note that stored procedure calls cannot have output parameters. If an input parameter is required by the database, the input value must be specified as part of the ping query. For example:

```
Call checkproc(2)
```

There is no default value. For more information, see "Handling lost database connections" on page 6 and "Loss of connection to the application" on page 86.

PollQuantity

Number of rows in the database table that the connector retrieves per polling interval. Allowable values are 1 to 500.

The default is 1.

PreserveUIDSeq

Specifies whether or not the incoming unique ID sequence will be preserved in the unique identifier table.

If set to `true`, the unique ID is not committed until the business object is successfully processed in the destination application. All other processes attempting to access the unique identifier table must wait until the transaction is committed.

If set to `false`, the unique ID is committed when the business object requests it. The business object processing and the unique ID processing each have their own transaction block (internal to the connector). This is only possible if the transaction relating to the unique identifier table has its own connection.

Note: If this property is not added to the connector configuration, the default behavior is the same as if this property were added and set to `true`. Also, if "AutoCommit" on page 19 is set to `true`, the connector executes the same behavior as if `PreserveUIDSeq` is set to `false`.

If the "PreserveUIDSeq" property is set to false, at runtime, the number of open database connections is the sum of this value plus 2.

The default value is `true`.

QueryTimeOut

The value of this property is an integer in seconds that sets the QueryTimeOut for all Retrieves to the number of seconds specified. If the value is not specified, it implies that no timeout is set on the query. If the query takes longer than the number of seconds specified, the database produces an SQL Exception that is captured. The associated message is logged in the log file.

No default value is provided.

RDBMS.initsession

SQL statement that initializes every session with the database. The connector takes a query and executes it at startup. There should not be a return value for this query. The property name is required, but a value is not.

There is no default value.

RDBMSVendor

Specifies the RDBMS that the connector uses for special processing. A value is required for the connector to process successfully.

The default is `Oracle`.

ReplaceAllStr

Specifies whether the connector replaces all instances of each character identified in the ReplaceStrList property with the substitution string specified in that property. The connector evaluates ReplaceAllStr only if the ESC=[true|false] parameter of each attribute's AppSpecificInfo property does not contain a value. In other words, if the ESC parameter has been specified, its value takes precedence over the value set for the ReplaceAllStr property. To cause the connector to use the value of ReplaceAllStr, verify that the ESC parameter has not been specified.

The default value of ReplaceAllStr is `false`.

Note: The ESC parameter and the ReplaceAllStr and ReplaceStrList properties provide support for database escape character functionality (for example, escaping single quotes). Because the same functionality is also available from the Prepared Statements provided by the JDBC driver, these properties will be deprecated in future releases of the connector. The connector currently supports the use of the JDBC Prepared Statements.

ReplaceStrList

Specifies one or more substitution sets, each composed of an individual character to be replaced, a character delimiter, and a substitution string. The connector performs this substitution on an attribute's value only if a value has been specified for the ESC=[true|false] parameter of the attribute's AppSpecificInfo property or for the connector's ReplaceAllStr property.

Note: The ESC parameter and the ReplaceAllStr and ReplaceStrList properties provide support for database escape character functionality (for example, escaping single quotes). Because the same functionality is also available from the Prepared Statements provided by the JDBC driver, these properties will be deprecated in future releases of the connector. The connector currently supports the use of the JDBC Prepared Statements.

The syntax for this attribute is:

single_char1,substitution_str1[:single_char2,substitution_str2[:...]]

where:

single_char	A character to be replaced.
substitution_str	The substitution string that the connector uses to replace the character.
,	The character delimiter, which separates the character to be replaced from the string that replaces it. By default, the character delimiter is a comma (,). You can configure this delimiter by setting the first delimiter in the StrDelimiter property.
:	The termination delimiter, which separates substitution sets (each of which is composed of the character to be replaced, a character

delimiter, and the substitution string). By default, the termination delimiter is a colon (:). You can configure this delimiter by setting the second delimiter in the StrDelimiter property.

For example, assume you want to replace a single percent sign (%) with two percent signs (%%), and a caret (^) with a backslash and a caret (\^). By default, StrDelimiter specifies a comma (,) as the character delimiter, and a colon (:) as the termination delimiter. If you keep the default delimiters, use the following string as the value of ReplaceStrList:

`%,%%:^,\^`

Note: A restriction of the connector configuration tool prevents entering single quotation marks. Therefore, you must represent a single quotation with the character Q, and two single quotations with the characters DSQ. In the above example, if you also want to substitute a single quotation mark (') with two single quotation marks (''), use the following notation: Q,DSQ:%,%%:^,\^

RetryCountAndInterval

Specifies the number of attempts and the interval in seconds that the connector should use when it is unable to lock data while performing an update operation.

Before it performs an update, the connector locks rows related to the update and attempts to retrieve current data. If the connector cannot lock the rows, it tries again to get the lock for the count and interval specified in this configuration property. The connector eventually times out if the lock is not obtainable within the values specified here.

Specify the value in the format: count, interval in seconds. For example, a value of 3,20 specifies three retries with an interval of 20 seconds in between.

The default is 3,20.

ReturnDummyBOForSP

This property is used to return output parameters even when the result set is empty.

In the case of RetrieveSP, a result set is returned. If the result set is empty, no business objects are created, and the output parameters returned by the procedure call cannot be retrieved. However, if ReturnDummyBOForSP is true, a dummy business object with values from output and input/output parameters populated in the corresponding attributes will be returned.

The default value is false.

SelectiveCommitForPoll

Specifies when commits to the database will take place. If true, then only one commit will occur, after an event has been processed. If false, then the standard behavior occurs; commits to the database will take place at each stage of event processing.

The default value is false.

SchemaName

This property limits the search for the event and archive tables within that particular schema. If this property is not added or if it is left empty, the connector

will search all of the schemas that the user has access to. This SchemaName is also used when building the queries to access the event and archive tables.

The Oracle Database provides support for schema names.

No default value is provided.

SPBeforePollCall

This property names the stored procedure that is executed for every poll call. If the property SPBeforePollCall has a value (the name of a stored procedure), then at the start of each poll call, the connector calls the stored procedure, passing it the values of the connector properties ConnectorID and PollQuantity. The procedure will update PollQuantity number of rows, setting the connector-id column to ConnectorID where status=0 and connector-id is null. This enables load balancing in the connector.

Note: In the case where a poll call fails prematurely (the database is down, or the connection is lost), the connector-id remains set. This may result in records being skipped during polling. It is therefore recommended that periodically, the connector-id is reset back to null for all records in the event table with a status of 0.

StrDelimiter

Specifies the character and termination delimiters for use in the ReplaceStrList property.
- The character delimiter separates the character to be replaced from the string that replaces it. The character delimiter occupies the first (left-hand) position of this property's values and defaults to a comma (,).
- The termination delimiter separates substitution sets (each of which is composed of the character to be replaced, a character delimiter, and the substitution string). The termination delimiter occupies the second (right-hand) position of this property's values and defaults to a colon (:).

You can specify your own value for either or both of these delimiters. If you do so, do not specify a space or other character between them.

Default value is a comma followed immediately by a colon (,:)

TimingStats

Allows you to time each verb operation of the connector to look for problems. Available settings are:

0 (No timing statistics)

1 (Timing displayed at entry and exit of the verb operation for an entire hierarchical business object).

2 (Timing displayed at entry and exit of each verb operation for each individual business object in a hierarchical business object).

Timing messages are log messages rather than trace messages. They can be turned on and off, independent of trace levels.

The default value is 0.

UniqueIDTableName

Specifies the table that contains the latest value used for generation of a unique ID. By default, the table has one column (id). You can customize the table to add a column for each attribute that requires generation of a UID.

The default value is `xworlds_uid`.

UseDefaults

If UseDefaults is set to `true` or is not set, the connector checks whether a valid value or a default value is provided for each required business object attribute. If a value is provided, the Create succeeds; otherwise, it fails.

If UseDefaults is set to `false`, the connector checks only whether a valid value is provided for each required business object attribute; the Create operation fails if a valid value is not provided.

The default value is `false`.

UseDefaultsForCreatingChildBOs

If UseDefaultsForCreatingChildBOs is set to `true` or is not set, the connector checks whether a valid value or a default value is provided for each required business object attribute. If a value is provided, the Create succeeds; otherwise, it fails.

If UseDefaultsForCreatingChildBOs is set to `false`, the connector checks only whether a valid value is provided for each required business object attribute; the Create operation fails if a valid value is not provided.

UseDefaultsWhenPolling

If UseDefaultsWhenPolling is set to true, the default values will be set in the business object before it is retrieved from the database and dispatched to the server.

If UseDefaultsWhenPolling is set to false, the default values will not be set in the business object before it is retrieved from the database and dispatched to the server.

The default value is true.

Note: This connector-specific configuration property replaces UseDefaultsForRetrieve.

Creating multiple connector instances

Creating multiple instances of a connector is in many ways the same as creating a custom connector. You can set your system up to create and run multiple instances of a connector by following the steps below. You must:

- Create a new directory for the connector instance
- Make sure you have the requisite business object definitions
- Create a new connector definition file
- Create a new start-up script

Create a new directory

- **For Windows Platforms**:

    ProductDir\connectors\connectorInstance

If the connector has any connector-specific meta-objects, you must create a meta-object for the connector instance. If you save the meta-object as a file, create this directory and store the file here:

ProductDir\repository\connectorInstance

where *connectorInstance* uniquely identifies the connector instance.

You can specify the InterChange Server Express server name as a parameter of startup.bat; an example is: start_OracleApps.bat connName serverName.

- **For i5/OS Platforms:**

/QIBM/UserData/WBIServer44/WebShereICSName/connectors/connectorInstance

where connectorInstance uniquely identifies the connector instance and where WebSphereICSName is the name of the Interchange Server Express instance with which the connector runs.

If the connector has any connector-specific meta-objects, you must create a meta-object for the connector instance. If you save the meta-object as a file, create this directory and store the file here:

/QIBM/UserData/WBIServer44/WebSphereICSName /repository/connectorInstance where WebSphereICSName is the name of the Interchange Server Express instance with which the connector runs.

- **For Linux Platforms**:
ProductDir/connectors/connectorInstance where connectorInstance uniquely identifies the connector instance. If the connector has any connector-specific meta-objects, you must create a meta-object for the connector instance. if you save the meta-object as a file, create this directory and store the file here: ProductDir/repository/connectorInstance.You can specify the InterChange Server Express servername as a parameter of connector_manager; an example is connector_manager -start connName WebSphereICSName [-cConfigFile].

Create business object definitions

If the business object definitions for each connector instance do not already exist within the project, you must create them.

1. If you need to modify business object definitions that are associated with the initial connector, copy the appropriate files and use Business Object Designer Express to import them. You can copy any of the files for the initial connector. Just rename them if you make changes to them.

2. Files for the initial connector should reside in the following directory:

   ProductDir\repository\initialConnectorInstance

   Any additional files you create should be in the appropriate connectorInstance subdirectory of ProductDir\repository.

Create a connector definition

You create a configuration file (connector definition) for the connector instance in Connector Configurator Express. To do so:

1. Copy the initial connector's configuration file (connector definition) and rename it.

2. Make sure each connector instance correctly lists its supported business objects (and any associated meta-objects).

3. Customize any connector properties as appropriate.

Create a start-up script

To create a startup script:

1. Copy the initial connector's startup script and name it to include the name of the connector directory:

   dirname

2. Put this startup script in the connector directory you created in "Create business object definitions" on page 29.

3. (For Windows only.) Create a startup script shortcut.

4. (For Windows only.) Copy the initial connector's shortcut text and change the name of the initial connector (in the command line) to match the name of the new connector instance.

5. (For i5/OS only.) Create a job description for the connector using the information below:
   CRTDUPOBJ(QWBIOCLC) FROMLIB(QWBISVR44)OBJTYPE(*JOBD)TOLIB (QWBISVR44) NEWOBJ(newoclname) where newoclname is a 10-character name that you use for the job description for your new connector.

6. (For i5/OS only.) Add the new connector to the WebSphere Business Integration Server Express Console. For information about the WebSphere Business Integration Server Express Console, refer to the online help provided with the Console.

Connector startup

Use the following instructions to start and stop the connector,

Starting the connector

A connector must be explicitly started using its **connector start-up script**. On Windows systems the startup script should reside in the connector's runtime directory:*ProductDir*\connectors*connName*where *connName* identifies the connector.

On Linux systems the startup script should reside in the *ProductDir*/bin directory.

On i5/OS systems the startup script should reside in the /QIBM/UserData/WBIServer44/<instance>/connectors/<ConnInstance>/ with which the connector runs.

The name of the startup script depends on the operating-system platform, as Table 10 shows.

Table 10. Startup scripts for a connector

Operating system	Startup script
Linux	connector_manager
i5/OS	start_connName.sh
Windows	start_*connName*.bat

When the startup script runs, it expects by default to find the configuration file in the *Productdir* (see the commands below). This is where you place your configuration file.

Note: You need a local configuration file if the adapter is using JMS transport.

- **Starting the connector on a Windows system:**
  - From the **Start** menu, select **Programs>IBM WebSphere Business Integration Server Express>Adapters>Connectors**. By default, the program name is "IBM

WebSphere Business Integration Server Express". However, it can be customized. Alternatively, you can create a desktop shortcut to your connector.

– From the Windows command line: start_connName connName brokerName {-cconfigFile}.

– On Windows systems, you can configure the connector to start as a Windows service. In this case, the connector starts when the Windows system boots (for an Auto service) or when you start the service through the Windows Services window (for a Manual service).

- **Starting the connector on a Linux system**:
  – From the command line type:

  ```
  connector_manager -start connName brokerName [-cconfigFile ]
  ```

  where *connName* is the name of the connector and *brokerName* identifies your integration broker.

  – For InterChange Server Express, specify for *brokerName* the name of the InterChange Server Express instance.

- **Starting the connector on an i5/OS system**:
  – From the Windows system where the WebSphere Business Integrations Server Express Console is installed, select **IBM WebSphere Business Integration Server Express>Toolset Express> Administrative>Console**. Then specify the OS/400 or i5/OS system name or IP address and a user profile and password that has *JOBCTL special authority. Select the connector from the list of connectors, and click Start

  – To automatically start the adapter using the Console, use the submit_adapter.sh script. This is the only way the adapter will start using the subsystem within the autostart job entry for the server.

  – In Batch mode, from the i5/OS command line, you need to run the CL command QSH and from the QSHELL environment. Run /QIBM/ProdData/WBIServer44/bin/submit_adapter.sh *connName WebSphereICSName pathToConnNameStartScript jobDescriptionName*, where *connName* is the connector name, *WebSphereICSName* is the Interchange Server Express server name (default is QWBIDFT44), *pathToConnNameStartScript* is the full path to the connector start script, *jobDescriptionName* is the name of the job description to use in the QWBISVR44 library.

  – In interactive mode, you need to run the CL command QSH and from the QSHELL environment. Run /QIBM/UserData/WBIServer44/WebSphereICSName/connectors/connName/ start_connName.sh connNameWebsphereICSName [-cConfigFile] where *connName* is the name of your connector and *WebSphereICSName* is the name of the InterChange Server Express instance.

For more information on how to start a connector, including the command-line startup options, refer to the *System Administration Guide*.

Stopping the connector

The way to stop a connector depends on the way that the connector was started.

- **Windows**:
  – You can invoke the startup script which creates a separate "console" window for the connector. In this window, type "q" and press Enter to stop the connector.

- You can configure the connector to start as a Windows service. In this case, the connector stops when the Windows system shuts down.

- **Linux**:

  Connectors run in the background so they have no separate window. Instead, run the following command to stop the connector:

  ```
  connector_manager -stop connName
  ```

  where *connName* is the name of the connector.

- **i5/OS**:

  – If you started the connector using the Console, or using the "submit_adapter.sh" script in QSHELL, then you can use one of two methods to stop the connector:

  – From the Windows system where the WebSphere Business Integration Server Express Console is installed, select IBM **WebSphere Business Integration Express> Toolset Express>Administrative>Console**. Then specify the OS/400 or i5/OS system name or IP address and a user profile and password that has *JOBCTL special authority. Select the Oracle adapter from the list and select the Stop button. Use the CL Command WRKACTJOB SBS (QWBISVR44) to display the jobs to the Server Express Product. Scroll the list to find the job with the jobname that matches the job description for the connector. For example, for the JMS connector the jobname is QWBIOCLC. Select Option 4 on this job, and press F4 to get the prompt for the ENDJOB command. Then specify *IMMED for the Option parameter and press enter.

     Note: The connector will end when the QWBISVR44 subsystem has ended.

  – If you used the start_connName.sh script to start the adapter from QSHELL, press F3 to end the connector. You can also stop the agent, by using a script named *stop_adapter.sh* located in the /QIBM/ProdData/WBIServer44/bin directory.

Chapter 3. Understanding business objects for the connector

This chapter describes how the WebSphere Business Integration Server Express Adapter for Oracle Applications processes business objects and describes the assumptions the connector makes when retrieving and modifying data. It contains the following sections:

- "Business object and attribute naming conventions"
- "Business object structure"
- "Business object verb processing" on page 38
- "Business object attribute properties" on page 53
- "Business object application-specific information" on page 55

You can use this information as a guide to modifying existing business objects or as suggestions for implementing new ones. For information on the utility that automates the creation of business object definition files from database tables, see Chapter 4, "Generating business object definitions using OracleAppsODA," on page 67.

The connector makes assumptions about the structure of its supported business objects, the relationships between parent and child business objects, the format of the application-specific information, and the database representation of the business object. Therefore, when you create or modify a business object that will be processed by the connector, your modifications must conform to the rules the connector is designed to follow. If they do not, the connector cannot process new or modified business objects correctly.

Business object and attribute naming conventions

The name of a business object used by the connector can consist only of alphanumeric characters or the underscore character. Business object attribute names also can consist only of alphanumeric characters or the underscore character

Business object structure

In most cases, the connector assumes that every individual business object is represented by one database table or view, and that each **simple attribute** (that is, an attribute that represents a single value, such as a `String` or `Integer` or `Date`) within the object is represented by a column in that table or view. Thus, attributes within the same individual business object cannot be stored in different database tables. However, the following situations are possible:

- The database table might have more columns than the corresponding individual business object has simple attributes (that is, some columns in the database are not represented in the business object). Include in your design only those columns needed for the business object processing.
- The individual business object might have more simple attributes than the corresponding database table has columns (that is, some attributes in the business object are not represented in the database). The attributes that do not have a representation in the database either have no application-specific information or are set with a default value or specify stored procedures.
- The individual business object can represent a view that spans multiple database tables. The connector can use such a business object when processing Create,

Retrieve, Update, and Delete events triggered in the application. However, when processing integration broker requests, the connector can use such a business object only for Retrieve requests.

- The individual business object can represent a wrapper object that is used as a container for unrelated business objects. The wrapper object is not represented by a database table or view. Wrapper objects may not be used as children of other objects.

Note: If a business object is based on a stored procedure, each simple attribute (other than the special SP attributes) may or may not have application-specific information. For more information, see "Stored procedures" on page 46.

Business objects can be flat or hierarchical. All the attributes of a **flat** business object are simple and represent a single value.

A **hierarchical** business object has attributes that represent a child business object, an array of child business objects, or a combination of both. In turn, each child business object can contain a child business object or an array of business objects, and so on. A **single-cardinality relationship** occurs when an attribute in a parent business object represents a single child business object. In this case, the attribute is of the same type as the child business object.

A **multiple-cardinality relationship** occurs when an attribute in the parent business object represents an array of child business objects. In this case, the attribute is an array of the same type as the child business objects.

Note: The term **hierarchical** business object refers to a complete business object, including all the child business objects that it contains at any level. The term **individual** business object refers to a single business object, independent of any child business objects it might contain or that contain it. The term **top-level** business object refers to the individual business object at the top of the hierarchy that does not itself have a parent business object.

The connector supports the following relationships among business objects:
- "Single-cardinality relationships"
- "Single-cardinality relationships and data without ownership" on page 35
- "Multiple-cardinality relationships" on page 36
- "Single-cardinality relationships that store the relationship in the child" on page 37

In each type of cardinality, the relationship between the parent and child business objects is described by the application-specific information of the key attribute of the business object storing the relationship.

Single-cardinality relationships

Typically, a business object that contains a single-cardinality child business object has at least two attributes that represent the relationship. The type of one attribute is the same as the child's type. The other attribute is a simple attribute that contains the child's primary key as a foreign key in the parent. The parent has as many foreign-key attributes as the child has primary-key attributes.

Because the foreign keys that establish the relationship are stored in the parent, each parent can contain only one single-cardinality child of a given type.

Figure 2 illustrates a typical single-cardinality relationship. In the example, fk1 is the simple attribute that contains the child's primary key, and child[1] is the attribute that represents the child business object.
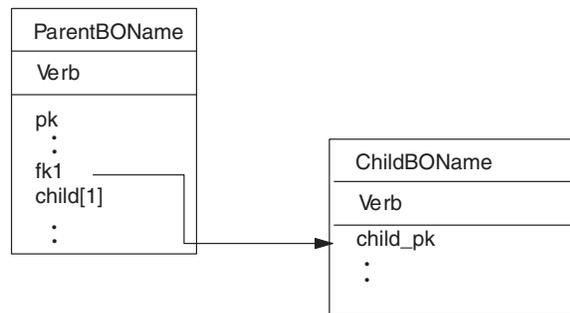
Figure 2. Typical single-cardinality relationship

Single-cardinality relationships and data without ownership

Typically, each parent business object owns the data within the child business object that it contains. For example, if each Customer business object contains a single Address business object, when a new customer is created, a new row is inserted into both the customer and the address tables. The new address is unique to the new customer. Likewise, when deleting a customer from the customer table, the customer's address is also deleted from the address table.

However, there are situations where multiple hierarchical business objects contain the same data, which none of them owns. For example, assume that an Address business object has a StateProvince[1] attribute that represents the StateProvince lookup table with single cardinality. Because the lookup table is rarely updated and is maintained independently of the address data, creation or modification of address data does not affect the data in the lookup table. The connector either finds an existing state or province name or fails. It does not add or change values in the lookup table.

When multiple business objects contain the same single-cardinality child business object, the foreign-key attribute in each parent business object must specify the relationship as NO_OWNERSHIP. When a business process sends the connector a hierarchical business object with a Create, Delete, or Update request, the connector ignores single-cardinality children contained without ownership. The connector performs only retrieves on these business objects. If the connector fails to retrieve such a single-cardinality business object, it returns an error and stops processing.

For information on how to specify the relationship without ownership, see "Attributes that represent a single-cardinality child business object" on page 63. For more information on specifying foreign key relationships, see "Specifying an Attribute's Foreign Key" on page 60.

Denormalized data and data without ownership

In addition to facilitating use of static lookup tables, containment without ownership provides another capability: synchronizing normalized and denormalized data.

Synchronizing from normalized to denormalized data: Specifying a relationship as NO_OWNERSHIP allows you to create or change data when you synchronize from a normalized application to a denormalized one. For example, assume that your

normalized source application stores data in two tables, A and B. Assume further that your denormalized destination application stores all the data in a single table such that each entity A redundantly stores B data.

In this example, to synchronize a change in table B data from your source application to your destination application, you must trigger a table A event whenever table B data changes. Moreover, because table B data is stored redundantly in table A, you must send a business object for each row in table A that contains the changed data from table B.

Synchronizing from denormalized to normalized data: When synchronizing data from a denormalized source application to a normalized destination application, the connector does not create, delete, or update data contained without ownership in the normalized application.

When synchronizing data to a normalized application, the connector ignores all single-cardinality children contained without ownership. In order to create, remove, or modify such child data, you must process the data manually.

Multiple-cardinality relationships

Typically, a business object that contains an array of child business objects has only one attribute that represents the relationship. The type of the attribute is an array of the same type as the child business objects. In order for a parent to contain more than one child, the foreign keys that establish the relationship are stored in each child.

Therefore, each child has at least one simple attribute that contains the parent's primary key as a foreign key. The child has as many foreign-key attributes as the parent has primary key attributes.

Because the foreign keys that establish the relationship are stored in the child, each parent can have zero or more children.

Figure 3 illustrates a multiple-cardinality relationship. In the example, parentId is the simple attribute that contains the parent's primary key, and child[n] is the attribute that represents the array of child business objects.
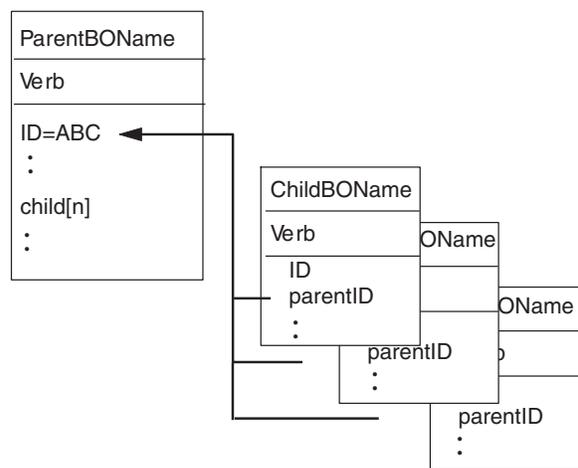
Figure 3. Multiple-cardinality business object relationship

Single-cardinality relationships that store the relationship in the child

Some applications store a single child entity so that the relationship is stored in the child rather than in the parent. In other words, the child contains a foreign key whose value is identical to the value stored in the parent's primary key.

Figure 4 illustrates this special type of single-cardinality relationship.
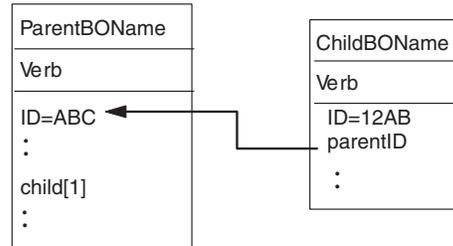
Figure 4. Single-cardinality business object with relationship stored in the child

Applications use this type of single-cardinality relationship when child data does not exist independently of its parent and can be accessed only through its parent. Such child data is never owned by more than one parent, and requires that the parent and its primary-key value exist before the child and its foreign-key value can be created.

To accommodate such applications, the connector also supports hierarchical business objects that contain a child with single cardinality but store the relationship in the child rather than in the parent.

To specify that a parent business object contains a single-cardinality child in this special way, when you specify the application-specific information of the attribute that contains the child, do not include the CONTAINMENT parameter. For more information, see "Attributes that represent a single-cardinality child business object" on page 63.

Wrapper objects

The wrapper object is a top-level business object that does not correspond to any database table or view. The wrapper object is denoted by the top-level business object property of WRAPPER with a value of true. The wrapper object is a dummy parent that is used as a container for unrelated children. In processing the wrapper object, the connector ignores the top-level business object and processes only the children. The wrapper object may contain N cardinality or N-1 cardinality entities or both.

A N cardinality entity should have at least one unique attribute marked as a primary key and at least one attribute marked as a foreign key. This foreign key will then be added as a primary key in the wrapper object. The entity's foreign key will reference the wrapper object's primary key that was just added.

In the case of a N-1 cardinality entity, the primary key should be marked as both a primary key and a foreign key, referencing the primary key in the wrapper, which is the same as the primary key in the N-1 entity.

Business object verb processing

This section describes the following aspects of processing a business object's verbs:

- "Verb determination," which explains how the connector determines the verb to use for each individual, source business object
- "After-images and deltas," which defines the terms and explains how the connector works with afterimages
- "Verb processing" on page 40, which explains the steps the connector takes when creating, retrieving, updating, or deleting a business object
- "Stored procedures" on page 46, which explains how the connector uses stored procedures
- "Transaction commit and rollback" on page 52, which briefly explains how the connector uses transaction blocks

Verb determination

A top-level business object and each of its individual child business objects can contain their own verbs. Therefore, a business process can pass a business object that has different verbs for parent and child business objects to the connector. When this occurs, the connector uses the verb of the top-level parent business object to determine how to process the entire business object. For more information, see "Verb processing" on page 40.

After-images and deltas

An after-image is the state of a business object after all changes have been made to it. A delta is a business object used in an update operation that contains only key values and the data to be changed. Because the connector supports only after-images, when it receives a business object for update from a business process, the connector assumes that the business object represents the desired state of the data after update.

Therefore, when a business process sends a business object with the Update verb to the connector, the connector changes the current representation of the business object in the database so that it exactly matches the source business object. To do this, the connector changes simple attribute values and adds or removes child business objects.

For example, assume the current state of Contract 2345 in the database is as follows:
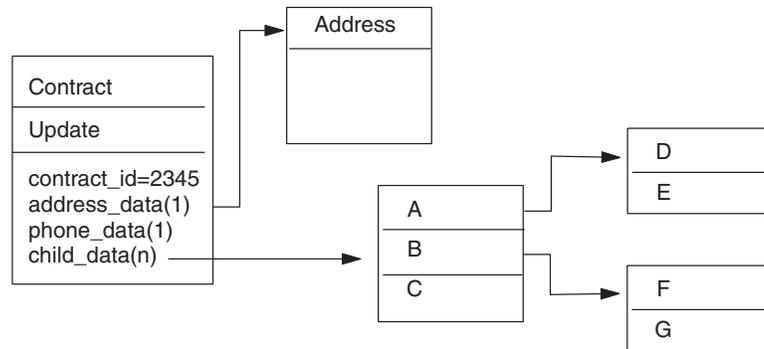
Assume further that the business process passes the following business object to the connector:
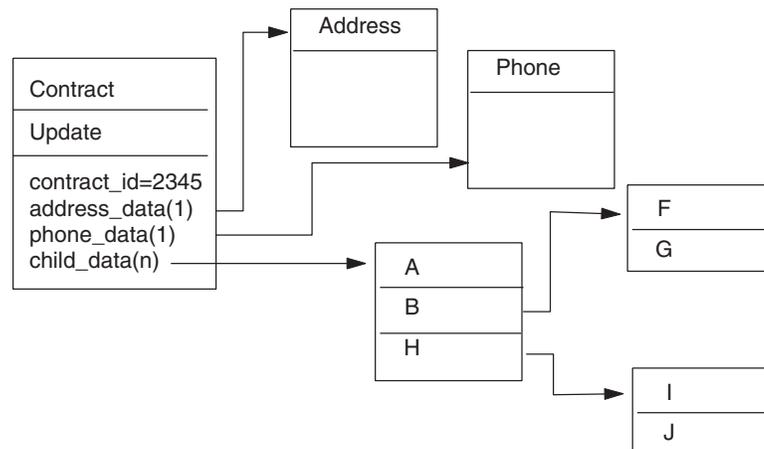
To process the update, the connector applies the following changes to the database:
- Update the simple attributes in the top-level Contract and Address business objects
- Create the Phone business object
- Update the simple attributes in the child business objects A, B, F and G
- Delete the child business objects C, D and E
- Create the child business objects H, I and J

Because the connector assumes that each business object it receives from a business process represents an afterimage, it is important to ensure that each business object sent to the connector for updating contains valid existing child business objects. Even if none of a child business object's simple attributes have changed, the child business object must be included in the source business object.

There is a way, however, that you can prevent the connector from deleting missing child business objects during an update operation. You can use the application-specific information for the attribute that represents the child or array of children to instruct the connector to keep child business objects that are not included in the source business object. To do so, set KEEP_RELATIONSHIP to true. For more information, see "Specifying an Attribute's Foreign Key" on page 60.

Verb processing

This section outlines the steps the connector takes when creating, retrieving, updating, or deleting a business object that it receives from a business process. The connector processes hierarchical business objects recursively; that is, it performs the same steps for each child business object until it has processed all individual business objects.

Note: A top-level business object that is a wrapper supports the create, retrieve, update and delete verbs. The only difference in processing a wrapper object is that the wrapper object is not processed, only the objects that it contains are processed.

Business object comparison

At various points in the processing outlined below, the connector compares two business objects to see if they are the same. For example, during an update operation, the connector determines whether a particular business object exists in an array of business objects. To perform the check, the connector compares the business object to each business object within the array. For two business objects to be identical, the following two conditions must be satisfied:

- The type of the business objects being compared must be the same. For example, a Customer business object is never considered identical to a Contact business object even if all of their attributes are exactly the same.

- All corresponding key attributes in the two business objects must contain identical values. If a key attribute is set to CxIgnore in both business objects, the connector considers them identical. However, if a key attribute is set to CxIgnore in one business object but not in the other, the business objects are not identical.

Create operations

When creating a business object, the connector returns a status either of VALCHANGE if the operation was successful (regardless of whether the operation caused changes to the business object), or FAIL if the operation failed.

The connector performs the following steps when creating a hierarchical business object:

1. Recursively inserts each single-cardinality child business object contained with ownership into the database. In other words, the connector creates the child and all child business objects that the child and its children contain.

   If the business object definition specifies that an attribute represents a child business object with single cardinality and that attribute is empty, the connector ignores the attribute. However, if the business object definition requires that attribute to represent a child and it does not, the connector returns an error and stops processing.

2. Processes each single-cardinality child business object contained without ownership as follows:

   a. Recursively attempts to retrieve the child from the database using the key values passed in by the business process.

b. If the retrieve is unsuccessful, indicating that the child does not currently exist in the database, the connector returns an error and stops processing. If the retrieve is successful, the connector recursively updates the child business object.

Note: For this approach to work correctly when the child business object already exists in the application database, you must ensure that primary key attributes in child business objects are cross-referenced correctly on create operations. If the child business object does not already exist in the application database, set the primary key attributes to CxBlank.

3. Inserts the top-level business object in the database as follows:
   a. Sets each of its foreign-key values to the primary-key values of the corresponding child business object represented with single cardinality. Because values in child business objects can be set by database sequences or counters or by the database itself during the creation of the child, this step ensures that the foreign-key values in the parent are correct before the connector inserts the parent in the database.
   b. Generates a new unique ID value for each attribute that is set automatically by the database. The name of the database sequence or counter is stored in the attribute's application-specific information. If an attribute has an associated database sequence or counter, the value generated by the connector overwrites any value passed in by the business process. For more information on specifying a database sequence or counter, see "Application-specific information for simple attributes" on page 57.
   c. Copies the value of an attribute to the value of another attribute as specified by the CA (CopyAttribute) parameter of the attribute's application-specific information. For more information on using the CA parameter, see "Application-specific information for simple attributes" on page 57.
   d. Inserts the top-level business object into the database.

   Note: A top-level business object that is a wrapper will not be inserted into the database.

4. Processes each of its single-cardinality child business objects that stores the parent/child relationship in the child, as follows:
   a. Sets the foreign-key values in the child to reference the value in the corresponding primary-key attributes in the parent. Because the parent's primary-key values may have been generated during the creation of the parent, this ensures that the foreign-key values in each child are correct before the connector inserts the child into the database.
   b. Inserts the child into the database.

5. Processes each of its multiple-cardinality child business objects, as follows:
   a. Sets the foreign-key values in each child to reference the value in the corresponding primary-key attributes in the parent. Because the parent's primary-key values may have been generated during the creation of the parent, this ensures that the foreign-key values in each child are correct before the connector inserts the child into the database.
   b. Inserts each of its multiple-cardinality child business objects into the database.

Retrieve operations

The connector performs the following steps when retrieving a hierarchical business object:

1. Removes all child business objects from the top-level business object that it received from the business process.
2. Retrieves the top-level business object from the database.
   - If the retrieval returns 1 row, the connector continues processing.
   - If the retrieval returns no rows, indicating that the top-level business object does not exist in the database, the connector returns BO_DOES_NOT_EXIST.
   - If the retrieval returns more than one row, the connector returns FAIL.

     Note: A business object can have attributes that do not correspond to any database column, such as placeholder attributes. During retrieval, the connector does not change such attributes in the top-level business object; they remain set to the values received from the business process. In child business objects, the connector sets such attributes to their default values during retrieval.

     Note: A top-level business object that is a wrapper must contain any attribute values from the objects at the level immediately below the wrapper object, which would be necessary to retrieve the objects, including keys and placeholder attributes. The wrapper object must have all keys and placeholder attributes populated. Simple attributes in the wrapper object that will be used as foreign keys in the objects one level below the wrapper should be marked as keys in the wrapper object.
3. Recursively retrieves all multiple-cardinality child business objects.

   Note: The connector does not enforce uniqueness when populating an array of business objects. It is the database's responsibility to ensure uniqueness. If the database returns duplicate child business objects, the connector returns duplicate children to the business process.
4. Recursively retrieves each of the single-cardinality children regardless of whether the child business object is contained with or without ownership.

Note: All single cardinality child business objects are processed based on occurrence in the business object and before the parent business object is processed. Child object ownership and non-ownership do not determine the processing sequence, but do determine the type of processing.

RetrieveByContent operations

A RetrieveByContent verb is applicable only for the top-level business object, because the connector performs a retrieval based on attributes only in the top-level business object.

If a top-level business object uses the RetrieveByContent verb, all of the attributes (including non-key attributes) that are not null are used as retrieval criteria.

If more than one row is returned, the connector uses the first row as the result row and returns MULTIPLE_HITS.

Note: A RetrieveByContent verb is not applicable for a top-level business object that is a wrapper.

Update operations

When updating a business object, the connector returns a status either of VALCHANGE if the operation was successful (regardless of whether the operation caused

changes to the business object), or FAIL if the operation failed. When working with an Oracle database, the connector locks data while retrieving it to ensure data integrity.

The connector performs the following steps when updating a hierarchical business object:

1. Uses the primary-key values of the source business object to retrieve the corresponding entity from the database. The retrieved business object is an accurate representation of the current state of the data in the database.

   - If the retrieval fails, indicating that the top-level business object does not exist in the database, the connector returns BO_DOES_NOT_EXIST and the update fails.

     Note: A top-level business object that is a wrapper does not have to exist in the database. However, it must contain any attribute values from the objects at the level immediately below the wrapper object, which would be necessary to retrieve the objects including keys and placeholder attributes. The wrapper object must have all keys and placeholder attributes populated. Simple attributes in the wrapper object that will be used as foreign keys in the objects one level below the wrapper should be marked as keys in the wrapper object.

   - If the retrieval succeeds, the connector compares the retrieved business object to the source business object to determine which child business objects require changes in the database. The connector does not, however, compare values in the source business object's simple attributes to those in the retrieved business object. The connector updates the value of all non-key simple attributes.

     If all the simple attributes in the top-level business object represent keys, the connector cannot generate an update query for the top-level business object. In this case, the connector logs a warning and continues to step 2.

2. Recursively updates all single-cardinality children of the top-level business object.

   If the business object definition requires that an attribute represent a child business object, the child must exist in both the source business object and the retrieved business object. If it does not, the update fails, and the connector returns an error.

   The connector handles single-cardinality children contained with ownership in one of the following ways:

   - If the child is present in both the source and the retrieved business objects, instead of updating the already existing child in the database, the connector deletes the existing child and creates the new child.

   - If the child is present in the source business object but not in the retrieved business object, the connector recursively creates it in the database.

   - If the child is present in the retrieved business object but not in the source business object, the connector recursively deletes it from the database. The type of delete, physical or logical, depends on the value of its ChildUpdatePhyDelete property.

   For single-cardinality children contained without ownership, the connector attempts to retrieve every child from the database that is present in the source business object. If it successfully retrieves the child, the connector populates the child business object but does not update it, as single cardinality children contained without ownership are never modified by the connector.

3. For single-cardinality child business objects that store the relationship in the parent, sets each foreign-key value in the parent to the value of the primary key in the corresponding single-cardinality child business object. This step is necessary because single-cardinality children may have been added to the database during previous steps, resulting in the generation of new unique IDs.

4. Updates all simple attributes of the retrieved business object except those whose corresponding attribute in the source business object contain the value `CxIgnore`.

   Because the business object being updated must be unique, the connector verifies that only one row is processed as a result. It returns an error if more than one row is returned.

5. Sets all foreign-key values in each child that stores the parent/child relationship in the child (both multiple-cardinality and single-cardinality) to the primary-key value of its corresponding parent business object. (When InterChange Server Express is used as the integration broker, these values have typically been cross-referenced during data mapping.) However, this step is important to ensure that the foreign-key values of new children that store the relationship in the child are correct before the connector updates those children.

6. Processes each multiple-cardinality child of the retrieved business object in one of the following ways:

   - If the child exists in both the source and the retrieved business objects' arrays, the connector recursively updates it in the database.

   - If the child exists in the source array but not in the retrieved business object's array, the connector recursively creates it in the database.

   - If the child exists in the retrieved business object's array but not in the source array, the connector recursively deletes it from the database unless the application-specific information for the attribute that represents the child in the parent has `KEEP_RELATIONSHIP` set to `true`. In this case, the connector does not delete the child from the database. For more information, see "Specifying an Attribute's Foreign Key" on page 60. The type of delete, physical or logical, depends on the value of its ChildUpdatePhyDelete property.

Note: The business process must ensure that business objects contained with multiple cardinality in the source business object are unique (that is, that an array does not contain two or more copies of the same business object). If the connector receives duplicates of a business object in a source array, it processes the business object twice, with possibly unpredictable results.

DeltaUpdate operations

DeltaUpdate verb processing is different from update verb processing as follows:

1. On a DeltaUpdate no retrieve is done before updating, as is done in update verb processing.

2. No comparisons are made between the incoming business object and the business object in the database.

3. All children will be processed based on the verb set in each child object. If a child doesn't have a verb set in it, the connector will return an error.

When delta updating a business object, the connector returns a status of either `VALCHANGE` if the operation was successful (regardless of whether the operation caused changes to the business object) or `FAIL` if the operation failed.

The connector performs the following steps when delta updating a hierarchical business object:

1. Recursively processes all single-cardinality children of the parent object. If a child is marked as IsRequired in the business object specification, it must be present in the inbound object. If not, the delta update will fail and the connector will return an error.

2. Sets all foreign key values in the parent that reference attributes in single-cardinality children to their corresponding child values. This is necessary because single-cardinality children may have been added to the database during the previous steps, resulting in the generation of new sequence values.

3. Updates the current object being processed via an SQL UPDATE statement or a stored procedure. All simple attributes of the individual business object are updated, except those attributes set to IsIgnore in the inbound business object. The connector does not compare the inbound object to the current object on an attribute level to determine which attributes need to be added to the update statement; they are all updated. Since the object being updated should be unique, the connector checks to make sure that only one row is processed as a result. An error is returned if more than one row is processed.

4. Sets all foreign key values in all cardinality N children of the current object that reference parent attributes to the corresponding parent values. Usually these values will already be cross-referenced during data mapping; however, this may not be the case for new children in cardinality N containers. This ensures that the foreign key values in all cardinality N children are correct before those children are updated.

5. Updates all cardinality N containers of the current object.

When the child objects are processed, each child's verb is taken and the appropriate operation is done. The allowed verbs on a child in DeltaUpdate are Create, Delete and DeltaUpdate.

- If a Create verb is found in the child, the child gets created in the database if it is an ownership child. Non-ownership children are retrieved to validate their existence in the database.
- If a Delete verb is found in the child, that child gets deleted.
- If a DeltaUpdate verb is found in the child, the child gets updated in the database.

Delete operations

When deleting a business object, the connector returns a status of SUCCESS if the operation was successful or FAIL if the operation failed. The parent business object is first retrieved and then the adapter recursively deletes all single-cardinality children that have an ownership relationship to the parent, then the parent business object itself, and finally all cardinality N children. Single-cardinality no-ownership children are never deleted.If the business object does not exist, the connector returns a FAIL.

The connector supports logical and physical deletes, depending on the Status Column Name (SCN) value in the object's application-specific information. If the SCN value is defined, the connector performs a logical delete. If the SCN value is not defined, the connector performs a physical delete.

Physical deletes: The connector performs the following steps when physically deleting a hierarchical business object:

1. Recursively deletes all single-cardinality child business objects contained with ownership.
2. Deletes the top-level business object.
3. Recursively deletes all multiple-cardinality child business objects.

Note: A top-level business object that is a wrapper does not have a corresponding database table, hence it will not be deleted from the database. Any simple attribute values for a wrapper will be ignored.

Logical deletes: When logically deleting a business object, the connector performs the following steps:

1. Issues an UPDATE that sets the business object's status attribute to the value specified by the business object's application-specific information. The connector ensures that only one database row is updated as a result, and it returns an error if this is not the case.

2. Recursively logically deletes all single-cardinality children contained with ownership and all multiple-cardinality children. The connector does not delete single-cardinality children contained without ownership.

SQL statements

The connector can use simple SQL statements for select, update, retrieve or delete operations. The column names for SQL statements are derived from an attribute's AppSpecificInfo property. Each query spans one table only, unless posted to a view.

Stored procedures

A stored procedure is a group of SQL statements that form a logical unit and perform a particular task. A stored procedure encapsulates a set of operations or queries for the connector to execute on an object in a database server.

The connector calls stored procedures in the following circumstances:
- Before processing a business object, to perform preparatory operational processes
- After processing a business object, to perform post-operational processes
- To perform a set of operations on a business object, instead of using a simple INSERT, RETRIEVE, UPDATE, or DELETE statement

When it processes a hierarchical business object, the connector can use a stored procedure to process the top-level business object or any of its child business objects. However, each business object or array of business objects must have its own stored procedure.

Specifying a stored procedure

This section describes the steps you must perform to cause the connector to use a stored procedure for a business object. It contains the following sections:
- "Adding attributes to the business object"
- "Syntax of a stored procedure" on page 47
- "Examples of stored procedures" on page 48
- "Specifying the stored procedure" on page 48

Adding attributes to the business object: You must add a special kind of attribute to the business object for each type of stored procedure that the connector processes. These attributes represent only the stored procedure's type and the application-specific information that defines it. These attributes do not use the application-specific information parameters available for a standard simple attribute.

Name the attribute according to the type of stored procedure to be used. For example, to cause the connector to use AfterUpdate and BeforeRetrieve stored procedures, add the `AfterUpdateSP` and `BeforeRetrieveSP` attributes.

The connector recognizes the following business object attribute names:

```
BeforeCreateSP
AfterCreateSP
CreateSP
BeforeUpdateSP
AfterUpdateSP
UpdateSP
BeforeDeleteSP
AfterDeleteSP
DeleteSP
BeforeRetrieveSP
AfterRetrieveSP
RetrieveSP
BeforeRetrieveByContentSP
AfterRetrieveByContentSP
RetrieveByContentSP
BeforeRetrieveUpdateSP
AfterRetrieveUpdateSP
RetrieveUpdateSP
BeforeDeltaUpdateSP
AfterDeltaUpdateSP
DeltaUpdateSP
```

Note: Create an attribute only for those stored procedures that you want the connector to execute. Use the application-specific information or mapping (available only when InterChange Server Express is used as the integration broker) to specify values for these attributes before the business object is sent to the connector. The connector must be restarted to recognize changes to these values for subsequent calls on a business object.

Syntax of a stored procedure: The syntax for specifying a stored procedure is:

```
SPN=StoredProcedureName;RS=true|false[;IP=Attribute_Name1
[:Attribute_Name2[:...]]][;OP=Attribute_Name1 | RS[:Attribute_Name2 | RS[:...]]]
[;IO=Attribute_Name1[:Attribute_Name2[:...]]]
```

where:

StoredProcedureName	The name of the stored procedure.
RS	Is `true` if the stored procedure returns a result set or `false` if it does not. By default, `false`. If the value is `true`, the `ColumnName` property in an attribute's application-specific information points to the appropriate column in the result set. If RS is part of the output parameter list, then that particular parameter returns a result set. Only one result set `OUTparameter` is supported. If there are more than one result sets returned as `OUTparameters`, only the first result set is returned and all others are ignored. Currently, this feature is supported for Oracle 8i and above, stored procedures that use the Oracle JDBC Driver. For the stored procedure in the database, the corresponding parameter should return a `REFCURSORtype`.
IP	Input Parameters: The list of business object

attributes whose values the connector should use as input values when executing the stored procedure.

OP   Output Parameters: The list of business object attributes to which the connector should return values after executing the stored procedure. See RS for a description of the result set.

IO   InputOutput Parameters: The list of business object attributes whose values the connector should use as input values and to which the connector should return values after executing the stored procedure.

Note: The order of StoredProcedureName, RS, and parameters is important; the order of parameters among themselves is not important. In other words, it makes no difference to the connector if the stored procedure groups all parameters of each type or intersperses the types of parameters.

When multiple parameters of the same type are grouped together, separate the values with a colon delimiter; you need not repeat the parameter's name for each value. Separate parameters of different types with a semicolon delimiter. When specifying parameter values, do not put a blank space on either side of the equal sign (=).

Examples of stored procedures: The following examples use stored procedures named CustomerInsert and VendorInsert that get values from two input attributes, and return values to four output attributes. The examples illustrate different structures for stored procedures.

- Parameters of the same type are grouped together (IP, IP, OP, OP, OP, IO):

  ```
  SPN=CustomerInsert;RS=false;IP=LastName:FirstName;OP=CustomerName:
  CustomerID: ErrorStatus:ErrorMessage;IO=VendorID
  ```

- Parameters of the same type are interspersed (IP, OP, OP, OP, IP, IO, OP):

  ```
  SPN=VendorInsert;RS=false;IP=LastName;OP=CustomerName:CustomerID:
  ErrorStatus; IP=FirstName;IO=VendorID;OP=ErrorMessage
  ```

The connector supports only the simple data types supported by the JDBC driver.

Specifying the stored procedure: There are two ways to specify the stored procedure name and its parameter values:

- Attribute's AppSpecificInfo property

  If the length of the text that specifies the stored procedure is less than or equal to 4 KiloBytes, you can specify the value in the attribute's AppSpecificInfo property. You can use this property to specify the stored procedure regardless of whether the connector has polled for the business object (that is, the business object represents an application event) or has received the business object as an integration broker request.

  The following example illustrates specification of the stored procedure in application-specific information. In this case, the value specified for the MaxLength property is not important to the stored procedure.

  ```
   [Attribute]
  Name = BeforeCreateSP
  Type = String
  MaxLength = 15
  IsKey = false
  ```

```
IsRequired = false
AppSpecificInfo =SPN=ContactInsert;IP=LastName:FirstName;OP=CustomerName:
CustomerID:ErrorStatus: ErrorMessage
[End]
```

- Attribute's value (relevant only when InterChange Server Express is used as the integration broker)

  If the length of the text that specifies the stored procedure is more than 4 KiloBytes, you must use mapping to specify the stored procedure. You can use mapping to specify the stored procedure only if the business object represents an integration broker request. In other words, you cannot use an attribute's value to specify a stored procedure when the connector is polling for events.

  If the text of the stored procedure is longer than 4 KiloBytes and you use mapping to specify it, remember to expand the value of the MaxLength property to accommodate the full text.

Note: If a stored procedure that handles a create, update, or delete operation is executed on a hierarchical business object containing an array of child business objects, the connector processes each child business object individually. For example, if the connector executes a BeforeCreate stored procedure, it does not process the array as a unit but processes each member in the array. When it processes a BeforeRetrieve stored procedure, the connector operates on a single business object. When it processes an AfterRetrieve stored procedure, the connector operates on all business objects returned by the retrieval.

Processing business objects using stored procedures or simple SQL statements

The following sections explain how the connector processes the stored procedures:

- "Business object create operations"
- "Business object update operations" on page 50
- "Business object delete operations" on page 50
- "Business object retrieve operations" on page 51
- "Business object RetrieveByContent operations" on page 51
- "Business object Retrieve-for-Update operations" on page 52

Business object create operations: A Create stored procedure usually returns values that the connector uses to populate the simple attributes in the top-level business object. The connector performs the following steps when processing the Create stored procedures (BeforeCreate, Create, AfterCreate):

1. Checks whether the business object contains a BeforeCreateSP attribute. If it does, calls the BeforeCreate stored procedure.
2. If the stored procedure returns values through output parameters, uses the values to set the value of simple attributes in the business object.
3. Creates the single-cardinality child business objects.
4. Sets each of the top-level business object's foreign key values to the primary-key value of each single-cardinality child business object.
5. Checks whether the business object contains a CreateSP attribute. If it does, calls the Create stored procedure to create the top-level business object. If it does not, builds and executes an INSERT statement to create the top-level business object.
6. If the Create stored procedure returns values through output parameters, uses the values to set the value of simple attributes in the business object.

7. Sets the foreign-key value in each multiple-cardinality child to the value of its parent's primary-key attribute.
8. Creates the multiple-cardinality child business objects.
9. Checks whether the business object contains an `AfterCreateSP` attribute. If it does, calls the `AfterCreate` stored procedure.
10. If the stored procedure returns values through output parameters, uses the values to set the values of simple attributes in the business object.

The connector can use values returned in step 10 to change the values of a business object that it created in steps 3 or 5.

Business object update operations: An Update stored procedure usually returns values that the connector uses to populate the simple attributes in the top-level business object. The connector performs the following steps when processing the Update stored procedures (`BeforeUpdate`, `Update`, `AfterUpdate`):

1. Checks whether the business object contains a `BeforeUpdateSP` attribute. If it does, calls the `BeforeUpdate` stored procedure.
2. If the `BeforeUpdate` stored procedure returns values through output parameters, uses the values to set the value of simple attributes in the business object.
3. Updates the single-cardinality child business objects.
4. Sets each of the top-level business object's foreign-key values to the primary-key value of each child business object contained with single cardinality.
5. Checks whether the business object contains an `UpdateSP` attribute. If it does, calls the `Update` stored procedure to update the top-level business object. If it does not, builds and executes an `UPDATE` statement to update the top-level business object.
6. If the `Update` stored procedure returns values through output parameters, uses the values to set the value of simple attributes in the business object.
7. Sets foreign-key values in the multiple-cardinality children to reference the value in the corresponding primary-key attributes in the parent.
8. Updates the multiple-cardinality child business objects.
9. Checks whether the business object contains an `AfterUpdateSP` attribute. If it does, calls the `AfterUpdate` stored procedure.
10. If the stored procedure returns values through output parameters, uses the values to set the value of simple attributes in the business object.

Business object delete operations: A Delete stored procedure does not return values to the connector. The connector performs the following steps when processing the Delete stored procedures (`BeforeDelete`, `Delete`, `AfterDelete`):

1. Checks whether the business object contains a `BeforeDeleteSP` attribute. If it does, calls the BeforeDelete stored procedure.
2. Deletes the single-cardinality child business objects.
3. Deletes the multiple-cardinality child business objects.
4. Checks whether the business object contains a `DeleteSP` attribute. If it does, calls the Delete stored procedure to delete the top-level business object. If it does not, builds and executes a `DELETE` statement.
5. Checks whether the business object contains an `AfterDeleteSP` attribute. If it does, calls the `AfterDelete` stored procedure.

Business object retrieve operations: For simple RETRIEVE operations, stored procedures can be used for top-level business object, single cardinality children, as well as multiple cardinality children. The order of the procedures is as follows:

- BeforeRetrieve
- Retrieve
- AfterRetrieve

The connector creates a temporary object to retrieve a single cardinality child business object or a multiple cardinality child business object. The connector applies the BeforeRetrieve stored procedure to the temporary business object. The AfterRetrieve stored procedure is applied to each of the child objects retrieved for the container.

The connector executes the AfterRetrieve stored procedure after it executes a Retrieve query generated dynamically from the business object meta-data or stored procedure on the business object.

According to the JDBC specification there are three types of StoredProcedure calls as follows:

- {call <spName>(?,?,?)}
- {call <spName>}
- {?= call <spName>(?,?,?)}

The connector supports the first two types. It will process the ResultSet that is returned from StoredProcedure.

In the stored procedure syntax, if RS=true, the result set from the stored procedure is processed. If RS=false, the result set is not processed. By default the value of RS is false. After the result set values are processed, the stored procedure output variables are processed. If RS=true, multiple cardinality children cannot specify the output variables in the related stored procedure.

Note: Result set processing is supported only for Retrieve verb operations and for RetrieveSP only.

Processing result set returned from retrieve stored procedure (RetrieveSP): ResultSetMetaData is obtained for the result set returned from the stored procedure. Values of all the columns in the result set are obtained and set on the corresponding attribute of the business object. The ColumnName property of an attribute's application-specific information should contain the ResultSet column name to match the attribute to the column.

For single cardinality objects, the corresponding result set should consist of only one row. If multiple rows are returned in the result set, an error is reported.

For multiple cardinality children, multiple rows can be returned through the result set. For each row returned, a new object is created and added to the container. The container is then added to the parent object at the required attribute index.

Business object RetrieveByContent operations: For simple RetrieveByContent operations, stored procedures can be used only for the top-level business object and its single-cardinality children; that is, they cannot be used to return a result set or multiple rows. The order of the procedures is as follows:

- BeforeRetrieveByContent

- RetrieveByContent
- AfterRetrieveByContent

The connector creates a temporary object to retrieve a single cardinality child business object or a multiple cardinality child business object. For multiple cardinality business objects, the connector applies the BeforeRetrieveByContent stored procedure to the temporary business object. The AfterRetrieveByContent stored procedure is applied to each of the child objects retrieved for the container.

The connector executes the AfterRetrieveByContent stored procedure after it executes a RetrieveByContent query generated dynamically from the business object meta-data or stored procedure on the business object. In this case, even though the retrieval of a hierarchical business object also retrieves its child business objects, the connector executes the AfterRetrieveByContent stored procedure on every business object present in the array.

Business object Retrieve-for-Update operations: The following stored procedures are called on the top-level business object and retrieve all child business objects in the same way as the simple Retrieve.

The order of the procedures is as follows:
- BeforeRetrieveUpdate
- RetrieveUpdate
- AfterRetrieveUpdate

These stored procedures perform the same operations as BeforeRetrieve and AfterRetrieve. They have distinguishing names so that you can create separate attributes to cause the connector to perform both BeforeRetrieve and BeforeRetrieveUpdate operations, as well as AfterRetrieve and AfterRetrieveUpdate operations.

The connector creates a temporary object to retrieve a single cardinality child business object or a multiple cardinality child business object. For multiple cardinality business objects, the connector applies the BeforeRetrieveUpdate stored procedure to the temporary business object. The AfterRetrieveUpdate stored procedure is applied to each of the child objects retrieved for the container.

The connector executes the AfterRetrieveUpdate stored procedure after it executes a RETRIEVE query generated dynamically from the business object meta-data or stored procedure on the business object. In this case, even though the retrieval of a hierarchical business object also retrieves its child business objects, the connector executes the AfterRetrieveUpdate stored procedure on every business object present in the array.

Transaction commit and rollback

Whenever the connector receives a business object for processing, it begins a transaction block. All SQL statements that the connector executes while processing that business object are encapsulated within the transaction block. When the connector finishes processing the business object, it commits the transaction block if the processing was successful, or rolls back the transaction if it encountered an error.

Business object attribute properties

Business object architecture defines various properties that apply to attributes. This section describes how the connector interprets several of these properties and describes how to set them when modifying a business object.

Name property

Each business object attribute must have a unique name.

Type property

Each business object attribute must have a type, such as `Integer`, `String`, or the type of a child business object. When the connector encounters an attribute of type `Date`, `Long Text`, or `String`, the connector wraps the value in quotation marks and handles the value as character data.

Cardinality property

Each business object attribute that represents a child or array of child business objects has the value of 1 or n, respectively, in this attribute. All attributes that represent child business objects also have a `ContainedObjectVersion` property (which specifies the child's version number) and a `Relationship` property (which specifies the value `Containment`).

Max length property

If the attribute is of type `String`, this property specifies the maximum length allowed for the attribute's value.

Key property

At least one simple attribute in each business object must be specified as the key. To define an attribute as a key, set this property to `Yes`. If the business object attribute is of type `String`, it is recommended that the data type in the database is of type `Varchar` instead of `char`.

Note: The connector does not support specifying an attribute that represents a child business object or an array of child business objects as a key attribute.

If the key property is set to `true` for a simple attribute, the connector adds that attribute to the `WHERE` clause of `SELECT`, `UPDATE`, `RETRIEVE,` and `DELETE` SQL statements that it generates while processing the business object.

If the key property is set to `true` for an attribute in a child that stores the parent/child relationship in the child (both multiple-cardinality and single-cardinality), the connector uses the parent's primary keys in the `WHERE` clause of the `SELECT` statement, and it does not use the `Key` property. For information on specifying the name of business object attributes whose values are used to set the child's foreign-key attributes, see "Application-specific information at the attribute level" on page 57.

Foreign key property

The connector uses this property to determine whether an attribute is a foreign key.

Required property

The Required property specifies whether an attribute must contain a value.

If this property is specified for an attribute that represents a single-cardinality child business object, the connector requires the parent business object to contain a child business object for this attribute.

When the connector receives a business object with a Create request, the connector causes the Create operation to fail if both of the following conditions are true:

- The business object does not have a valid value or a default value for a required attribute.
- application-specific information does not specify that the connector generate the unique ID.

When the connector receives a business object with a Retrieve request and the business object does not have a valid value or a default value for a required attribute, the connector causes the retrieval operation to fail.

The connector does not use this property for attributes that contain an array of child business objects.

Note: If the key attribute uses a sequence or counter or is populated by the database, it should not be marked as Required.

AppSpecificInfo

For information on this property, see "Application-specific information at the attribute level" on page 57.

Default value property

This property specifies a default value that the connector uses to populate a simple attribute if it is not populated with a value from the database table. The connector does not evaluate this property for attributes that represent a child business object or an array of child business objects.

The connector evaluates this property only if the UseDefaults configuration property is set to true. For more information, see Table 7.

Special attribute value

Simple attributes in business object can have the special value, CxIgnore. When it receives a business object from a business process, the connector ignores all attributes with a value of CxIgnore. It is as if those attributes were invisible to the connector.

When the connector retrieves data from the database and the SELECT statement returns a null value for an attribute, the connector sets the value of that attribute to CxIgnore by default. If a value has been specified for the UNVL parameter of the attribute's application-specific information, the connector uses that value to represent the null.

Because the connector requires every business object to have at least one primary-key attribute, ensure that business objects passed to the connector have at least one primary key that is not set to CxIgnore. The only exception to this

requirement is a business object whose primary key is to be generated by the connector using a counter or sequence, or is generated by the database.

When the connector inserts data into the database and a business object attribute has no value specified, it uses the value specified by the attribute's `UseNullValue` property.

Business object application-specific information

Application-specific information in business object definitions provides the connector with application-dependent instructions on how to process business objects. The connector parses the application-specific information from the attributes or verb of a business object or from the business object itself to generate queries for create, update, retrieve, and delete operations.

The connector stores some of the business object's application-specific information in cache and uses this information to build queries for all the verbs.

If you extend or modify an application-specific business object, you must make sure that the application-specific information in the business object definition matches the syntax that the connector expects.

Note: For best performance with the InterChange Server Express, the application-specific business objects should be smaller than 1 MB when possible, and should never exceed 5 MB. Larger business objects cause performance problems due to limitations to the Java Virtual Machine upon which the InterChange Server Express runs.

This section provides information on the object-level, attribute, and verb application-specific information format for business objects supported by the connector.

Table 11 provides an overview of the functionality available in business object application-specific information.

Table 11. Overview of application-specific information in supported business objects

Scope of application-specific information	Functionality
Entire business object	Specifies:
	• The name of the corresponding database table.
	• Defines the column whose value the connector uses in the `WHERE` clause to perform a logical (or soft) delete.
	• That the top-level business object is a wrapper.

Table 11. Overview of application-specific information in supported business objects (continued)

Scope of application-specific information	Functionality
Simple attributes	Specifies: • The database column name for an attribute. • The foreign key relationship between an attribute in the current business object and a parent or child business object. • Automatic generation of unique identifier values. • The name of another attribute within the same business object whose value the connector must use to set the value of the current attribute. • Whether to use the current attribute when sorting a retrieval. • The value to use when the value of the current attribute is null. • String substitution behavior. • Whether to use the `LIKE operator` or `= operator` when comparing strings. • The value to use as the wildcard position when the `LIKE operator` is used.
Attributes that contain a child or an array of child business objects	Specifies whether a single-cardinality child is owned by the parent. Specifies whether the connector deletes child data during an update operation if the data is not represented in the source business object.
Business object verb	Used only for the Retrieve verb, this text specifies the attributes to be included in the `WHERE` clause for a retrieval. You can also specify operators and attribute values.

The following sections discuss this functionality in more detail.

Application-specific information at the business-object level

Application-specific information at the business-object level allows you to:
• Specify the name of the corresponding database table.
• Provide the information necessary to perform a physical or logical delete.
• Specify that the top-level business object is a wrapper object.

At the business-object level, application-specific information format consists of parameters separated by colon (:) or semicolon (;) delimiters:

```
TN=TableName; SCN=StatusColumnName:StatusValue; WRAPPER=true|false
```

where TableName identifies the database table, StatusColumnName is the name of the database column used to perform logical deletes, and StatusValue is the value that signifies that a business object is inactive or deleted, and *true|false* indicates whether the top-level business object is a wrapper object.

For example, assume that a Customer business object has the following value specified for its business object application-specific information:

```
TN=CUSTOMER; SCN=CUSTSTATUS:DELETED
```

Assume also that the connector receives a request to delete the customer. Such a value causes the connector to issue the following SQL statement:

```
UPDATE CUSTOMER SET CUSTSTATUS = 'DELETED' WHERE CUSTOMER_ID = 2345
```

If the SCN parameter is not included or no value is specified for it, the connector physically deletes the business object from the database. In other words, if the business object with the Delete verb includes the SCN parameter in its application-specific information, the connector performs a logical delete. If the business object with the Delete verb does not include the SCN parameter in its application-specific information, the connector performs a physical delete.

Both update and delete operations may use the value of the SCN property:

- When performing an update, the connector uses the value of its ChildUpdatePhyDelete property to determine whether to physically or logically delete missing child data. If logically deleting the child data, it uses the value of its SCN parameter to obtain the name of the status column and the text of the status value. For more information, see "Update operations" on page 42.
- When performing a delete, the connector uses the value of its SCN parameter to determine whether to physically or logically delete the entire business object. If the SCN parameter contains a value, the connector performs a logical delete. If the SCN parameter does not contain a value, the connector performs a physical delete. For more information, see "Delete operations" on page 45.

At the business-object level, application-specific information may be used to specify a wrapper:

```
WRAPPER=true|false
```

If the wrapper parameter is set to true, the top-level business object is a wrapper object. The wrapper object is not represented by a database table or view. A wrapper is used as a container for unrelated business objects. The connector ignores the top-level object and processes only the children. The wrapper object may contain N cardinality or N-1 cardinality entities or both.

Application-specific information at the attribute level

The application-specific information for attributes differs depending on whether the attribute is a simple attribute or an attribute that represents a child or an array of child business objects. The application-specific information for an attribute that represents a child also differs depending on whether the parent/child relationship is stored in the child or in the parent. For information on application-specific information for attributes that represent a child or array of child business objects, see "Specifying an Attribute's Foreign Key" on page 60.

Application-specific information for simple attributes

For simple attributes, application-specific information format consists of a number of name-value parameters, each of which includes the parameter name and its value. Each parameter set is separated from the next by a colon (:) delimiter.

The format of attribute application-specific information is shown below. Square brackets ([ ]) surround an optional parameter. A vertical bar (|) separates the members of a set of options. Reserve the colon as a delimiter.

```
CN=col_name:[FK=[fk_object_name.]fk_attribute_name]:
[UID=[AUTO|uid_name|CW.schema_name.uid_name
[=UseIfMissing]|CW.uidcolumnname [=UseIfMissing]]]:
[PH=true|false]:[CA=set_attr_name | ..set_attr_name]:[OB=[ASC|DESC]]:[UNVL=value]:
[ESC =true|false]:[FIXEDCHAR=true|false]:
```

```
[BYTEARRAY=true|false]:[USE_LIKE=true|false:
[WILDCARD_POSITION=non-negative number|NONE|BEGIN|END|BOTH]]:
[CLOB]=true
[TS=true|false]]
```

The only required parameter for a simple attribute that you want the connector to process is the column name. For example, to specify only the column name, use the following format:

```
CN=customer_id
```

Table 12 describes each name-value parameter.

Table 12. Name-value parameters in attribute application-specific information

Parameter	Description
`CN=col_name`	The name of the database column for this attribute.
`FK=[fk_object_name.] fk_attribute_name`	The value of this property depends on whether the parent/child relationship is stored in the parent business object or the child
	If an attribute is not a foreign key, do not include this parameter in the application-specific information.
	For more information, see "Specifying an Attribute's Foreign Key" on page 60.
`UID=uid_name |schema_name.uid_name [=UseIfMissing] UID=CW.uidcolumnname [=UseIfMissing]`	The connector uses this parameter to generate the unique ID for the business object.
	If an attribute does not require generation of a unique ID, do not include this parameter in the application-specific information.
	See the "PreserveUIDSeq" on page 24 property description for details on preserving the unique ID during business object processing.
	For more information, see "Generating a business object's unique identifier" on page 62.
`PH=true|false`	If `PH=true`, then the corresponding simple attribute is a placeholder attribute. A simple attribute is also a placeholder if its ASI is blank or null.
`CA=set_attr_name	..set_attr_name`	If `set_attr_name` is set to the name of another attribute within the current individual business object, the connector uses the value of the specified attribute to set the value of this attribute before it adds the business object to the database during a Create operation. The value of `set_attr_name` cannot reference an attribute in a child business object, but it can reference an attribute in the parent business object if there if `set_attr_name`is preceded by the two periods.
	If you do not include this parameter in the application-specific information, the connector uses the value of the current attribute without copying the attribute's value (CA) from another attribute.
`OB=[ASC|DESC]`	If a value is specified for this parameter and the attribute is in a child business object, the connector uses the value of the attribute in the `ORDER BY` clause of retrieval queries.
	The connector can retrieve child business objects in ascending order or descending order.
	• Use `ASC` to specify retrieval in ascending order.
	• Use `DESC` to specify retrieval in descending order.
	If you do not include this parameter in the application-specific information, the connector does not use this attribute when specifying retrieval order.

Table 12. Name-value parameters in attribute application-specific information (continued)

Parameter	Description
UNVL=value	Specifies the value the connector uses to represent a null when it retrieves a business object with null-valued attributes. If you do not include this parameter in the application-specific information, the connector inserts a CxIgnore for the attribute's value.
ESC=[true|false]	Determines whether the connector replaces all instances of each character identified in the ReplaceAllStr property with the substitution strings also specified in the ReplaceStrList property. If this parameter does not contain a value, the connector uses the value of the ReplaceStrList property to make this determination. **Note:** The ESC parameter and the ReplaceAllStr and ReplaceStrList properties provide support for database escape character functionality (for example, escaping single quotes). Because the same functionality is also available from the Prepared Statements provided by the JDBC driver, these properties will be deprecated in future releases of the connector. The connector currently supports the use of the JDBC Prepared Statements.
FIXEDCHAR=true|false	Specifies whether the attribute is of fixed length when the columns in the table are of type CHAR, not VARCHAR. For example, if a particular attribute is linked to a column that is of type CHAR, the connector expects FIXEDCHAR in length; for the application specific information of that attribute specify FIXEDCHAR=true. Ensure that the MaxLength property of the attribute is of the CHAR length, which is specified in the database. By default, FIXEDCHAR=false.
BYTEARRAY=true|false	If BYTEARRAY=true, the connector will read and write binary data to the database and will send that data as a string to InterChange Server Express. BYTEARRAY=false is the default. For more information, see "Working with binary data" on page 64.
USE_LIKE=true|false	Specifies whether the connector compares strings using the = operator or the LIKE operator. If USE_LIKE is set to true, wildcard queries can be performed by setting WILDCARD_POSITION. If USE_LIKE is set to false, the =operator will be used.
WILDCARD_POSITION=non-negative number|NONE|BEGIN|END|BOTH	If USE_LIKE is true, the WILDCARD_POSITION is used to specify the position that is the wildcard. This value can be any non-negative number, NONE, BEGIN, END, or BOTH. For example, using BEGIN will place the wildcard character in the first position of the string (%string). Using END will place the wildcard character in the last position of the string (string%). Using BOTH will place wildcard characters in both the first and last position in the string (%string%).
CLOB=true	Only applicable for String Attribute Type. Specifies that the database column that corresponds to this attribute is a CLOBdatatype. **Note:** A CLOB datatype is defined as follows:. • The CLOB attribute has a String Type whose length is used to define the length of the CLOB • The CLOB attribute has ASI=CN=xyz; CLOB=true • Any other attribute type with reference to CLOB in the ASI would result in an error • CLOB=false would result in an error A regular String Type would be the same and with no reference to CLOB in the ASI. CLOB datatypes of 4k and larger can be inserted or updated. But they can be used only with Oracle and require the latest thin driver with CLOB support. Using any other driver may cause errors.

Parameter	Description
TS=true|false	For attributes of type DATE, when TS=false is specified in the application-specific information for the attribute, the attribute is treated as a DATE type. When TS=true, the attribute is treated as a TIMESTAMP type. The default value of TS is true.

Note: If none of the application-specific information in any of a business object's attributes cause the connector to build or execute a query, the connector logs a warning and continues operating. It does not throw an exception or return a failure.

Specifying an Attribute's Foreign Key: The value of this property depends on whether the parent/child relationship is stored in the parent business object or the child:

- Stored in the parent—set the value to include both the type of the child business object and the name of the attribute in the child to be used as the foreign key.
- In the child—set the value to include only the name of the attribute in the parent to be used as the foreign key.

If the value of fk_object_name does not match the type of the child business object, and the value of *fk_attribute_name* does not match the name of the attribute in the parent or child (as applicable), the connector cannot process this attribute as a foreign key. The case of the business object's name and the attribute's name is significant.

For example, assume that the Customer business object contains the Addr[1] attribute, which represents the Address child business object, and the AID attribute, which stores the primary key of the child business object as a foreign key. In this case, the application-specific information of the parent's foreign key attribute must contain the type of the child business object (Address) as well as the name of its primary key attribute (ID). In this example, the application-specific information of the AID attribute would include FK=Address.ID.

Naming a foreign key attribute: Multiple parent business objects can contain the same child business object, regardless of whether the child is stored with single cardinality or multiple cardinality, and regardless of whether the parent/child relationship is stored on the parent or on the child. However, all parent business objects that store the parent/child relationship must use identically named attributes to contain the child's primary key. Moreover, all child business objects that store the parent/child relationship must use identically named attributes to contain the parent's primary key. Figure 5 illustrates these relationships.
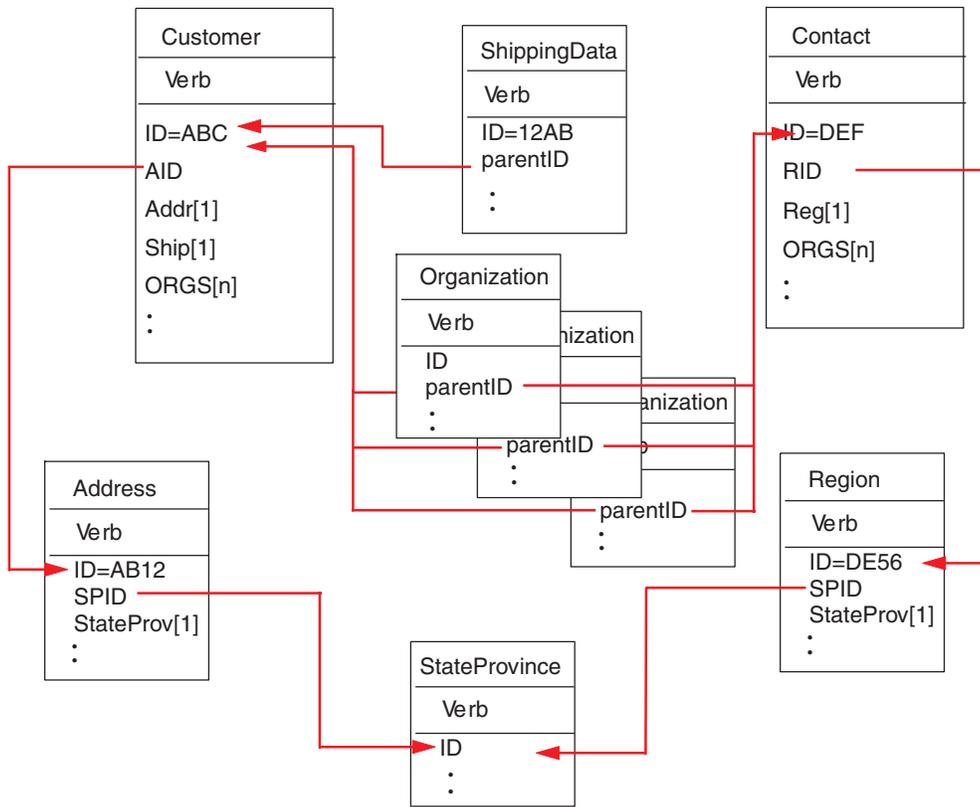
Figure 5. Example of relationships among business objects

Figure 5 illustrates the following relationships:

- The ORGS[n] attribute of Customer ABC and Contact DEF represents an array of Organization business objects. The foreign key value for each business object in the array of Organizations corresponds to the primary key value in the ID attribute in the Customer and Contact business objects. In this case, each business object in the array is contained by multiple parents.

  The application-specific information for the ORGS attribute might be:

  ```
  KEEP_RELATIONSHIP=true
  ```

  For more information on the KEEP_RELATIONSHIP parameter, see "Application-specific information for attributes that represent children" on page 63.

  The application-specific information for the parentID attribute of each child in the array of Organizations contains the name of the column in the database that corresponds to the current attribute, and specifies the current attribute's foreign key by containing the name of the parent's primary key attribute; for example:

  ```
  CN=ORG_ID:FK=ID
  ```

  Note: For multiple business objects to contain the same child (where the parent/child relationship is stored in the child), all parent business objects must use an identically named attribute to contain the foreign key for the child. The foreign key parameter of that child's application-specific information identifies only the attribute's name and not the type of the parent business object. The connector assumes that the direct parent is the owner of each child.

- The Addr[1] attribute of Customer represents the Address business object with ownership. The AID attribute of Customer identifies the primary key of the

Address business object as a foreign key in the parent. In this case, the parent's foreign key attribute must contain the type of the child business object as well as the name of its primary key attribute. The single-cardinality child, Address, is contained by only one parent.

The application-specific information for the `Addr` attribute is:

```
CONTAINMENT=OWNERSHIP
```

The application-specific information for the `AID` attribute contains the name of the column in the database that corresponds to the current attribute, and specifies the current attribute's foreign key by containing the type of the child business object and the name of its primary key attribute; for example:

```
CN=FK_AD:FK=Address.ID
```

The application-specific information for the child's primary-key attribute is

```
CN=pk
```

- The `StateProv[1]` attributes of the Address and Region business objects represent the StateProvince business object without ownership. The `SPID` attributes of the Address and Region business objects contain the type of the child business object (StateProvince) and the name of its primary key attribute, which serve as the parent's foreign key. The same single-cardinality child, StateProvince, is contained by multiple parents.

The application-specific information for the `SPID` attribute is:

```
CONTAINMENT=NOOWNERSHIP
```

For more information on the CONTAINMENT parameter, see "Application-specific information for attributes that represent children" on page 63.

The application-specific information for the Address `SPID` attribute contains the name of the column in the database that corresponds to the current attribute, and specifies the current attribute's foreign key by containing the type of the child business object and the name of its primary key attribute; for example:

```
CN=FK_SP:FK=StateProvince.ID
```

The application-specific information for the child's primary key attribute is:

```
CN=SP_ID
```

Note: For multiple business objects (that store the parent/child relationship in the parent) to contain the same child, all child business objects must use an identically named attribute to contain the foreign key for the parent.

- The `Ship[1]` attribute of Customer represents a ShippingData business object that contains the customer's shipping information. The `ID` attribute of Customer functions as the foreign key for the shipping data. In this case, because ShippingData cannot exist independently of its parent and is created only after its parent is created, the parent/child relationship is stored in the child.

The application-specific information for the child's `parentID` attribute contains the name of the column in the database that corresponds to the current attribute, and specifies the current attribute's foreign key by containing the name of its parent's primary key attribute; for example:

```
CN=SD_ID:FK=ID
```

Generating a business object's unique identifier: The connector uses the `UID` parameter to generate the unique ID for the business object. The connector generates unique IDs by using sequences (as Oracle does), or counters (which are structured as tables), and then issues the `INSERT` statement.

- If `UID = uid_name`, the value of uid_name provides the name of the Oracle sequence that the connector uses to generate a unique ID for the attribute. After

the connector fetches the sequence value, it populates the key attribute and issues the `INSERT` statement. This syntax is currently used only for Oracle databases.

- If UID = *uid_name*`=UseIfMissing` and if the value of the attribute is not `CxIgnore`, the connector uses the attribute's value rather than generating a unique ID. The `=UseIfMissing` parameter cannot contain blanks and is case-insensitive.
- If `UID=CW.`*uidcolumnname*, the connector uses a counter table to generate a unique ID for the attribute. The table, whose name is configurable, is created with a single column named id. You can customize the table to add a column for each attribute that requires generation of a UID. Use the `uidcolumnname` parameter to specify the name of the column for the connector to use when generating the unique ID. Note that the connector supports only the numeric data type for columns that require generation of a UID.

  For information on configuring the table's name, see UniqueIDTableName. The script for installing this table is:

  `\connectors\OracleApps\dependencies\uid_table_oracle.sql`

- If `UID=CW.uidcolumnname=UseIfMissing` and if the value of the attribute is not `CxIgnore`, the connector uses the attribute's value rather than generating a unique ID. The `=UseIfMissing` parameter cannot contain blanks and is case-insensitive.

See the "PreserveUIDSeq" on page 24 property for information on preserving the unique ID sequence during processing.

Application-specific information for attributes that represent children

Attributes that represent a single-cardinality child business object can specify whether the child is owned by the parent or shared among multiple parents.

Attributes that represent a single-cardinality child or an array of child business objects can specify the connector's behavior when updating the parent and a subset of the children.

Attributes that represent a single-cardinality child business object: The format of the application-specific information for attributes that represent a single-cardinality child business object is:

`CONTAINMENT= [OWNERSHIP|NO_OWNERSHIP]`

Set `CONTAINMENT` to `OWNERSHIP` to represent a single-cardinality relationship where the parent owns the child business object. Set `CONTAINMENT` to `NO_OWNERSHIP` to represent a single-cardinality relationship where the parent shares the child business object. Do not include the `CONTAINMENT` parameter when you represent a single-cardinality relationship that stores the relationship in the child rather than in the parent.

For more information, see "Single-cardinality relationships and data without ownership" on page 35 and "Single-cardinality relationships that store the relationship in the child" on page 37.

Attributes that represent a child that stores the parent's key: For Update operations on an array of business objects that store the parent/child relationship in the child, there is a special value for the attribute that represents the child: you can set `KEEP_RELATIONSHIP` to `true` to prevent the connector from deleting existing child data that is not represented in the source business object.

For example, assume an existing contract is associated with an existing site, such as New York. Assume further that the connector receives a request to update a Contract business object that contains a single child business object that associates San Francisco as the site. If KEEP_RELATIONSHIP evaluates to true for the attribute that represents the site data, the connector updates the contract to add its association with San Francisco and does not delete its association with New York.

However, if KEEP_RELATIONSHIP evaluates to false, the connector deletes all existing child data that is not contained in the source business object. In such a case, the contract is associated only with San Francisco.

The format for this application-specific information is:
KEEP_RELATIONSHIP=[true|false]

Case is ignored in checking for this application-specific information.

Working with binary data: If BYTEARRAY=true, the connector will read and write binary data to the database. Since there is no support for binary data in the current version of the WebSphere business integration system framework, the binary data is converted to a String and then sent to the integration broker. The format of this string is a hexadecimal number with 2 characters per byte. For example, if the binary data in the database is 3 bytes with the (decimal) values (1, 65, 255), the string will be ″0141ff″.

Application-specific information format for verbs

The connector uses verb application-specific information only for the Retrieve and RetrieveByContent verbs. This text allows you to specify the attributes to be included in the WHERE clause for a retrieval. You can also specify operators and attribute values.

The syntax for application-specific information for the Retrieve and RetrieveByContent verbs is shown below:
[*condition_variable conditional_operator* @ [...]:[..]*attribute_name* [, ...]]

where:

condition_variable	The name of the database column.
conditonal_operator	The operator supported by the database, for example =, >, OR, AND, and IN (value1, value2).
@	A variable that is substituted with the value retrieved by getAttrValue(attribute_name). The substitution is positional; that is, the connector substitutes the first @ with the value of the first attribute_name variable specified after the : delimiter.
..	The attribute specified in the attribute_name variable belongs to the immediate parent business object; if this value is missing, the attribute belongs in the current business object.
attribute_name	The name of the attribute whose value the connector substitutes for @.

To understand the syntax of this property, assume that an Item business object has an item_id attribute whose value is XY45 and a Color attribute whose value is RED. Assume further that you specify the Retrieve verb's AppSpecificInfo property as:

```
Color='RED'
```

The above application-specific information value causes the connector to build the following WHERE clause for a retrieval:

```
where item_id=XY45 and Color = 'RED'
```

For a more complicated example, assume that the Customer business object has a customer_id attribute whose value is 1234 and a creation_date attribute whose value is 01/01/90. Assume also that this business object's parent has a quantity attribute whose value is 20.

Assume further that you specify the Retrieve verb's AppSpecificInfo property as:

```
creation_date > @ OR quantity = @ AND customer_status IN
('GOLD', 'PLATINUM') : creation_date, ..quantity
```

The above application-specific information value causes the connector to build the following WHERE clause for a retrieval:

```
where customer_id=1234 and creation_date > '01/01/90' OR quantity = 20
AND customer_status IN ('GOLD', 'PLATINUM')
```

The connector gets the date value ('01/01/90') from the creation_date attribute in the current business object. It gets the quantity value (20) from the quantity attribute in the parent business object (as indicated by ..quantity in the application-specific information.

After the connector parses the application-specific information for the Retrieve verb, it adds the text to the WHERE clause of the RETRIEVE statement that it constructs from the business object's primary or foreign keys. The connector adds the leading AND to the WHERE clause. The value of the application-specific information must be valid SQL syntax. In the case of RetrieveByContent, the application-specific information is added to the WHERE clause of the RETRIEVE statement that it constructs from the business object's attributes that have their values populated.

The WHERE clause can also refer to placeholder attributes instead of the actual attributes in the parent business object. These placeholders do not have any application-specific information. An attribute can be a placeholder if it satisfies one of the following conditions for its ASI:

1. Simple attribute with ASI=null or ''
2. Simple attribute with ASI=PH=TRUE

For example: An Order business object contains a multiple cardinality line item business object, and retrieval of only specific line items is needed. This retrieval can be handled through a placeholder attribute in the Order business object. This placeholder is required in the parent object because the child objects are all pruned. The placeholder attribute can be populated at runtime by the integration broker with a list of the specific line items, separated by a comma (,).

For this example, you would add the following information to the WHERE clause for the retrieve verb on the child line item business object:

```
line_item_id in(@):..placeholder
```

Where `line_item_id` in is the ID in the child business object, `placeholder` is the attribute in the parent. If `placeholder` contains the values `12,13,14` the query would select the following from the WHERE clause:

`line_item_id in(12,13,14)`

Where `SELECT:..FROM:..WHERE` *x* `in (1,2,3)` is a standard database SQL syntax.

In the RetrieveByContent verb, if the length of the WHERE clause is 0, the connector will use the application-specific information in the WHERE clause of the RETRIEVE statement. With this feature, the user can send a business object with no attribute values populated and specify verb application-specific information for RetrieveByContent, and the connector will build the WHERE clause based on what was specified in the verb application-specific information alone.

Chapter 4. Generating business object definitions using OracleAppsODA

This chapter describes OracleAppsODA, an object discovery agent (ODA), which generates business object definitions for the IBM WebSphere Business Integration Server Adapter for Oracle Applications. Because the connector works with objects that are table-based or view-based, OracleAppsODA uses database tables and views to discover business object requirements specific to its JDBC data source.

Note: Familiarity with database concepts and JDBC drivers (for configuration purposes) can aid in understanding how OracleAppsODA operates.

This chapter contains the following sections:
- "Installation and usage"
- "Using OracleAppsODA in Business Object Designer Express" on page 71
- "Contents of the generated definition" on page 77
- "Sample business object definition file" on page 80
- "Inserting attributes that contain child business objects" on page 81
- "Adding information to the business object definition" on page 81

Installation and usage

This section discusses the following:
- "Installing OracleAppsODA"
- "Before using OracleAppsODA" on page 68
- "Launching OracleAppsODA" on page 69
- "Running multiple instances of OracleAppsODA" on page 70
- "Working with error and trace message files" on page 70

Installing OracleAppsODA

To install OracleAppsODA, use the Installer. Follow the instructions in the WebSphere Business Integration Server Express installation guide for Windows, for Linux, or i5/OS. When the installation is complete, the following files are installed in the directory on your system where you have installed the product:
- `ODA\OracleApps\OracleAppsODA.jar`
- `ODA\messages\OracleAppsODAAgent.txt`
- `ODA\messages\OracleAppsODAAgent_ll_TT.txt` (message files specific to a language (*ll*) and a country or territory (*TT*).
- `ODA\OracleApps\start_OracleAppsODA.bat` (Windows only)
- `ODA/OracleApps/start_OracleAppsODA.sh` (Linux and i5/OS)

  Note: For i5/OS the ProductDir path is /QIBM/ProdData/WBIServer44/AdapterCapcityPack.
- `bin\CWODAEnv.bat` (Windows only)
- `bin/CWODAEnv.sh` (Linux and i5/OS)

Note: Except as otherwise noted, this document uses backslashes (\) as the convention for directory paths. For Linux and i5/OS installations, substitute slashes (/) for backslashes. All product pathnames are relative to the directory where the adapter is installed on your system.

Before using OracleAppsODA

Before you can run OracleAppsODA, you must:

- Install the appropriate JDBC driver, except when using the i5/OS platform. i5/OS has the JDBC driver loaded and configured in the startup script.

   Note: OracleAppsODA can connect to any database using a JDBC driver that supports JDBC 2.0 or above.

- Because OracleAppsODA generates business object names and attribute names from the names of corresponding database tables and columns, and because business object names and attribute names must be in ISO Latin-1, verify that the appropriate database components have Latin-1 names. If they do not, you have the following choices:

   – Create the business object definition manually in Business Object Designer.
   – Edit the definition generated by OracleAppsODA so that all business object names and attribute names are in Latin-1.

- Open for editing the shell or batch file and configure the values described in Table 13. For i5/OS this is not necessary because the shell file values are already configured.

Table 13. Shell and batch file configuration variables

Variable	Explanation	Example
AGENTNAME	Name of the ODA	**Linux:** AGENTNAME=OracleAppsODA **Windows:** set AGENTNAME=OracleAppsODA
AGENT	Name of the ODA's jar file	**Linux:** AGENT=$CROSSWORLDS/ODA/OracleApps/ OracleAppsODA.jar **Windows:** set AGENT=%CROSSWORLDS%\ODA\OracleApps\ OracleAppsODA.jar
DRIVERPATH	Path of JDBC driver library; OracleAppsODA uses the driver classes to establish a connection to a specified database. Add the path to the driver of the Oracle database.	**Linux:** DRIVERPATH=$CROSSWORLDS/lib/ xwutil.jar:$CROSSWORLDS/lib/ xwbase.jar:$CROSSWORLDS/lib/ xwsqlserver.jar:$CROSSWORLDS/lib/ spy/lib/spy.jar **Windows:** set DRIVERPATH=%CROSSWORLDS%\lib\ xwutil.jar;%CROSSWORLDS%\lib\ xwbase.jar;%CROSSWORLDS%\lib\ xwsqlserver.jar;%CROSSWORLDS%\lib\ spy\lib\spy.jar
DRIVVERLIB	Path of the native libraries used by the JDBC driver	**Linux:** DRIVERLIB=$CROSSWORLDS/bin/libdb2jdbc.dll **Windows:** DRIVERLIB=%CROSSWORLDS%\bin\db2jdbc.dll

After installing the JDBC driver and setting configuration values in the shell or batch file, you must do the following to generate business objects:

1. Launch the ODA.
2. Launch Business Object Designer.
3. Follow a six-step process in Business Object Designer to configure and run the ODA.

The following sections describe these steps in detail.

Launching OracleAppsODA

You can launch the OracleAppsODA with the startup script appropriate for your operating system.

Linux:

`start_OracleAppsODA.sh`

i5/OS: The preferred methods to start the ODA are to

1. Use the Console function that runs on the Windws client. See the instructions below.
2. Run the script from the i5/OS QShell environment:
   /QIBM/ProdDataWBIServer44/bin/submit_oda.sh
   pathToODAStartScript jobDescriptionName
   where pathToODAStartScript is the path and name of the job description to used in the QWBISVR44 library (the shipped description for OracleAppsODA is QWBIOCLODA).
3. Run the startup script: start_OracleAppsODA.sh from the i5/OS QShell environment.

   To use the Console function to start the ODA on i5/OS, perform the following steps. On the Windows machine where the WebSphere Business Integration Server Express Console is installed:

   a. Select Programs > IBM WebSphere Business Integration Console > console.
   b. Type the i5/OS system name or IP address. Also type a user profile and password that has *JOBCTL special authority.
   c. Select the connName ODA from the list of ODAs and click Start ODA.

   You configure and run OracleAppsODA using Business Object Designer Express. Business Object Designer Express locates each ODA by the name specified in the AGENTNAME variable of each script or batch file. The default for ODA name for tis connector is OracleAppsODA.

Stopping OracleAppsODA: For i5/OS, the method you use to stop the ODA depends upon how you started it.

- If you used the startup script to start the ODA, then to stop the ODA press the F3 key from the same screen where you ran the start_OracleAppsODA.sh script.
- If you used one of the other two methods to start the ODA, do the following steps to stop the ODA:
  1. At the i5/OS command entry, run CL Command WRKACTJOB SBS (QWBISVR44).
  2. The screen displays all of the jobs running the subsystem. Scroll through the list to the job with a jobname that matches the job description for the ODA. For OracleAppsODA, the job description is QWBIOCLODA.
  3. Select option 4 of this job, and press F4 to prompt for the ENDJOB command.
  4. Type *IMMED for the OTION parameter and press Enter.

Windows:

```
start_OracleApps.bat
```

You configure and run OracleAppsODA using Business Object Designer Express. Business Object Designer Express locates each ODA by the name specified in the `AGENTNAME` variable of each script or batch file. The default ODA name for this connector is `OracleAppsODA`.

Running multiple instances of OracleAppsODA

It is recommended that you change the name of the ODA when you run multiple instances of it. To create additional uniquely named instances of OracleAppsODA:

- Create a separate script or batch file for each instance.
- Specify a unique name in the `AGENTNAME` variable of each script or batch file.

It is recommended that you prefix each name with the name of the host machine when you run ODA instances on different machines.If you registered the ODA with an Object Activation Daemon, you can use an ORB finder (`osfind`) to locate existing CORBA object names on your network.

Working with error and trace message files

Error and trace message files (the default is `OracleAppsODAAgent.txt`) are located in `\ODA\messages\`, which is under the product directory. These files use the following naming convention:

```
AgentNameAgent.txt
```

If you create multiple instances of the ODA script or batch file and provide a unique name for each represented ODA, you can have a message file for each ODA instance. Alternatively, you can have differently named ODAs use the same message file. There are two ways to specify a valid message file:

- If you change the name of an ODA and do not create a message file for it, you must change the name of the message file in Business Object Designer Express as part of ODA configuration. Business Object Designer Express provides a name for the message file but does not actually create the file. If the file displayed as part of ODA configuration does not exist, change the value to point to an existing file.
- You can copy the existing message file for a specific ODA, and modify it as required. Business Object Designer Express assumes you name each file according to the naming convention. For example, if the AGENTNAME variable specifies `OracleAppsODA1`, the tool assumes that the name of the associated message file is `OracleAppsODA1Agent.txt`. Therefore, when Business Object Designer Express provides the filename for verification as part of ODA configuration, the filename is based on the ODA name. Verify that the default message file is named correctly, and correct it as necessary.

> **Important**
> Failing to correctly specify the message file's name when you configure the ODA causes it to run without messages. For more information on specifying the message file name, see "Configure initialization properties" on page 72.

During the configuration process, you specify:

- The name of the file into which OracleAppsODA writes error and trace information
- The level of tracing, which ranges from 0 to 5.

Table 14 describes these values.

Table 14. Tracing levels

Trace Level	Description
0	Logs all errors
1	Traces all entering and exiting messages for method
2	Traces the ODA's properties and their values
3	Traces the names of all business objects
4	Traces details of all spawned threads
5	- Indicates the ODA initialization values for all of its properties - Traces a detailed status of each thread that OracleAppsODA spawned - Traces the business object definition dump

For information on where you configure these values, see "Configure initialization properties" on page 72.

Using OracleAppsODA in Business Object Designer Express

This section describes how to use OracleAppsODA in Business Object Designer Express to generate business object definitions. For information on launching Business Object Designer Express, see the *Business Object Development Guide*.

After you launch an ODA, you must launch Business Object Designer Express to configure and run it. There are six steps in Business Object Designer Express to generate a business object definition using an ODA. Business Object Designer Express provides a wizard that guides you through each of these steps.

After starting the ODA, do the following to start the wizard:

1. Open Business Object Designer Express.
2. From the File menu, select the New Using ODA... submenu.

   Business Object Designer Express displays the first window in the wizard, named Select Agent.

To select, configure, and run the ODA, follow these steps:

1. "Select the ODA" on page 72
2. "Configure initialization properties" on page 72
3. "Expanding nodes and selecting tables, views, stored procedures, and synonyms/nicknames" on page 73
4. "Confirm selection of database objects" on page 74
5. "Generate the definition" on page 75 and, optionally, "Provide additional information" on page 75
6. "Saving the definition" on page 77

Select the ODA

Business Object Designer Express provides a six-step wizard. Open the wizard and select the ODA to run.

To select the ODA:

1. Click the Find Agents button to display all registered or currently running ODAs in the Located agents field.

   Note: If Business Object Designer Express does not locate your desired ODA, check the setup of the ODA.

2. Select the desired ODA from the displayed list.

   Business Object Designer Express displays your selection in the Agent's name field.

Configure initialization properties

The first time Business Object Designer Espress communicates with OracleAppsODA, it prompts you to enter a set of initialization properties as shown in Figure 6. You can save these properties in a named profile so that you do not need to re-enter them each time you use OracleAppsODA. For information on specifying an ODA profile, see the *Business Object Development Guide*.
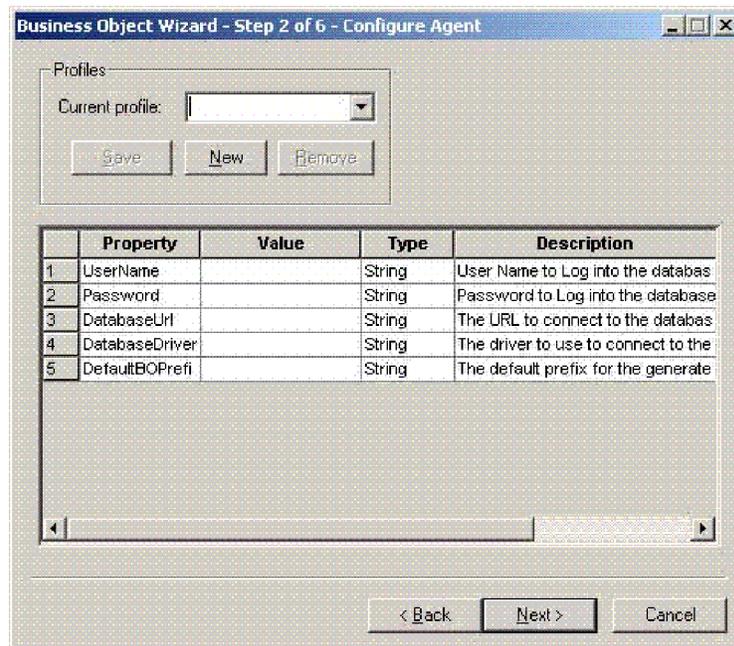
Figure 6. Configuring agent initialization properties

Configure the OracleAppsODA properties described in Table 15.

Table 15. OracleAppsODA properties

Row number	Property name	Property type	Description
1	UserName	String	Name of the user with authorization to connect to the database
2	Password	String	Password of the user with authorization to connect to the database
3	DatabaseUrl	String	URL that enables a connection to the database. For example: `jdbc:oracle:thin:@MACHINENAME:1521:SIDNAME`

Table 15. OracleAppsODA properties (continued)

Row number	Property name	Property type	Description
4	DatabaseDriver	String	Name of the driver used to establish the connection. For example: `oracle.jdbc.driver.OracleDriver`
5	DefaultBOPrefix	String	Text that is prepended to the name of the business object to make it unique. You can change this later, if required, when Business Object Designer Express prompts you for business object properties. For more information, see "Provide additional information" on page 75.

> **Important**
>
> Correct the name of the message file if the default value displayed in Business Object Designer Express represents a non-existent file. If the name is not correct when you move forward from this dialog box, Business Object Designer Express displays an error message in the window from which the ODA was launched. This message does not popup in Business Object Designer Express. Failing to specify a valid message file causes the ODA to run without messages.

Expanding nodes and selecting tables, views, stored procedures, and synonyms/nicknames

After you configure all initialization properties for OracleAppsODA, Business Object Designer Express connects to the specified database and displays a tree with all the schema names in the database. These names, which are presented as nodes in the tree, are expandable. Click on them to display all the tables, views and stored procedures in each schema. Figure 7 illustrates this dialog box with some schema expanded.
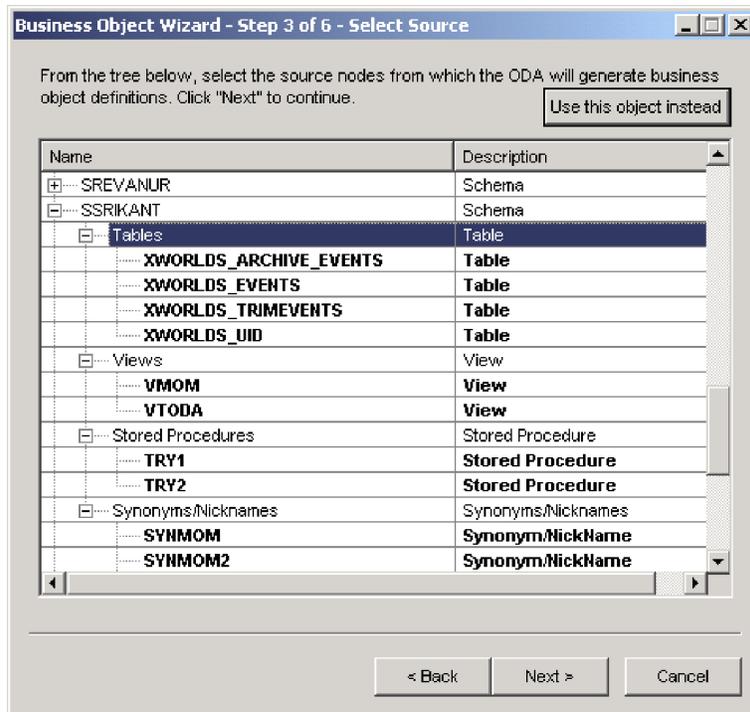
Figure 7. Tree of schema with expanded nodes

To identify all the database objects that store data for the generated business object definition, select all the required tables and views, stored procedures, and synonyms/nicknames and click Next. For information on how to filter the objects returned, see the *Business Object Development Guide.*

The schema name ALL SCHEMAS is used to facilitate the retrieval of objects such as tables and views from databases that don't have schemas associated with the objects. When you expand ALL SCHEMAS, a tree is shown with tables, views, stored procedures, and synonyms/nicknames. When each of these nodes is expanded, all the relevant objects from the database appear, regardless of the schema to which the object belongs.

Confirm selection of database objects

After you identify all the database objects to be associated with the generated business object definition, Business Object Designer Express displays the dialog box with only the selected tables, views, stored procedures, and synonyms/nicknames. Figure 8 illustrates this dialog box.
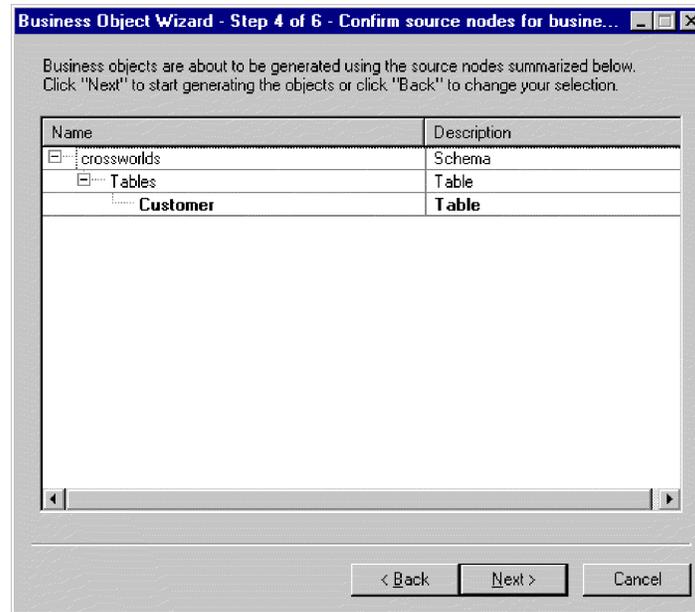
Figure 8. Confirming selection of database objects

This window provides the following options:
- To confirm the selection, click Next.
- If the selection is not correct, click Back to return to the previous window and make the necessary changes. When the selection is correct, click Next.

Generate the definition

After you confirm the database objects, the next dialog box informs you that Business Object Designer Express is generating the definitions.

Provide additional information

If the OracleAppsODA needs additional information, Business Object Designer Express displays the BO Properties window, which prompts you for the information.

In the BO Properties window, enter or change the following information:
- *Prefix*—The text that is prepended to the name of the business object to make it unique. If you are satisfied with the value you entered for the *DefaultBOPrefix* property in the Configure Agent window (Figure 6), you do not need to change the value here.
- *Verbs*— Click in the *Value* field and select one or more verbs from the pop-up menu. These are the verbs supported by the business object.
- *Add Stored Procedure*—Click Yes or No in the Value field:
  - If you select Yes and click OK, OracleAppsODA displays a window that provides a list of all stored procedure attributes. Select the stored procedure attributes that you want added to the business object.
  - Select No to ensure that no stored procedure attributes are added to the generated business object definition.

  The default is Yes.

Note: If a field in the BO Properties dialog box has multiple values, the field appears to be empty when the dialog box first displays. Click in the field to display a drop-down list of its values.
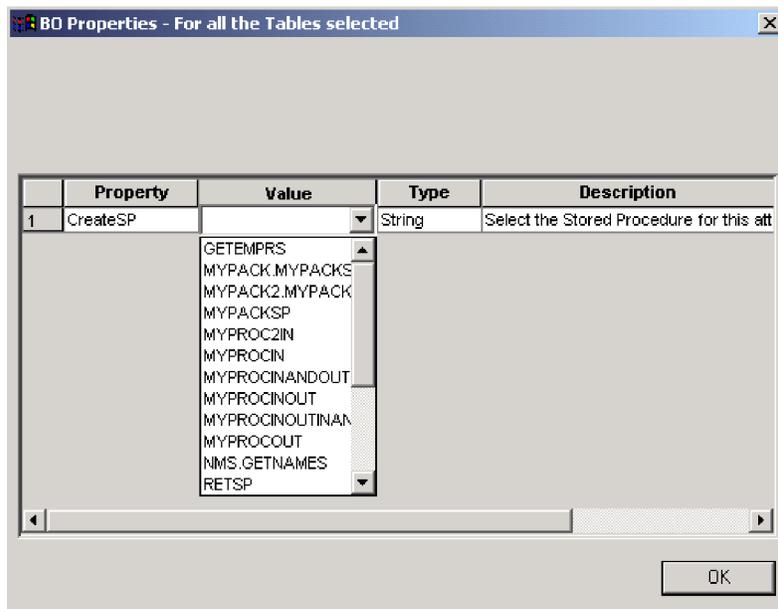
Figure 9. Associating Stored Procedures with Stored Procedure Attributes

The stored procedure attributes to be added to the business object can be associated with one of the stored procedures in the database in that schema. You can choose a stored procedure from a drop down list of all stored procedures in the database in that schema, against each stored procedure attribute. This information will generate the necessary ASI information for that attribute.

The ASI (application-specific information) for the object level will look like `TN=tableName`

And for the attribute level, the ASI will look like `CN=ColumnName`

If a business object is being generated from a stored procedure, and if Oracle Applications Adapter stored procedure attributes, such as SPForCreate, are associated with it, then the ODA provides a list of all stored procedure names in that schema against the stored procedure attributes and enables you to associate the required stored procedure with the business object. This will generate the ASI for the Oracle Applications Adapter stored procedure attribute as follows:

`SPN=stored procedure Name; IN=a1:a2; OUT=b1:b2; IO=c1:c2`

Where IN means the parameter of the stored procedure is INPUT type, OUT means the parameter is OUTPUT type, and IO means it is INPUT/OUTPUT type. The ODA will not set RS to true or false on the ASI, so you need to set it manually.

The verbs added to the business object are the standard verbs, essentially Retrieve, RetrieveByContent, Create, Update and Delete.

If the return parameter of the stored procedure is of ResultSet Type, the ODA will analyst the result set and create a business object, making the columns of the result set attributes of the business object. The ASI for the stored procedure columns will

be set as `CN=StoredProcedureColumnName`. The ODA sets the key attributes based on the JDBC metadata information returned by the driver. If none is returned, the ODA does not mark any attributes by default as keys. All other attributes, such as length and type, are set as for the attributes generated from tables.

Saving the definition

After you provide all required information in the BO Properties dialog box and click OK, Business Object Designer Express displays the final dialog box in the wizard. Here, you can save the definition to the server or to a file, or you can open the definition for editing in Business Object Designer Express. For more information, and to make further modifications, see the *Business Object Development Guide*.

Contents of the generated definition

The business object definition that OracleAppsODA generates contains:
- An attribute for each column in the specified database tables, views, stored procedures, and synonyms/nicknames
- The verbs specified in the BO Properties window
- Application-specific Information:
  – At the business-object level
  – For each attribute
  – For each verb

This section describes:
- "Business-object-level properties"
- "Attribute properties" on page 78
- "Verbs" on page 80

Business-object-level properties

OracleAppsODA generates the following information at the business-object level:
- Name of the business object
- Version—defaults to `1.0.0`
- Application-specific information

Application-specific information at the business-object level allows you to:
- Specify the name of the corresponding database table
- Provide the information necessary to perform a physical or logical delete

At the business-object level, application-specific information format consists of parameters separated by semicolon (;) delimiters. The name of the parameter and its value are separated by a colon (:) delimiter. The syntax is:

`TN=TableName; SCN=StatusColumnName:StatusValue`

where TableName identifies the database table, StatusColumnName is the name of the database column used to perform logical deletes, and StatusValue is the value that signifies that a business object is inactive or deleted.

The AppSpecificInfo that OracleAppsODA generates at this level contains a value only for the name of the database table, view, stored procedure, or

synonym/nickname. For information on specifying a value for the status column, see "Application-specific information at the business-object level" on page 56.

Attribute properties

This section describes the properties that OracleAppsODA generates for each attribute. For more information about the attributes, see "Business object attribute properties" on page 53.

Name property

OracleAppsODA obtains the value of the attribute's name from the column name in the database table, view, stored procedure, or synonym/nickname.

Data type property

When setting the type of an attribute, OracleAppsODA converts the data type of a column in the table or view to a corresponding Business Object type. This conversion is done in two steps. First, the data type in the database is converted to a JDBC type. Then, the JDBC type is converted to Business Object type. The first conversion is done by the JDBC driver that you are using. Please refer to the JDBC specification (2.0 and above) for details on individual database type mapping to a JDBC type. Table 14 shows the conversion from the JDBC Type to the corresponding Business Object type.

Table 16. Correspondence of data types

JDBC type	Business Object Type
BIT	BOOLEAN
CHAR	STRING
VARCHAR	STRING
LONGVARCHAR	STRING
INTEGER	INTEGER
NUMERIC	INTEGER
SMALLINT	INTEGER
TINYINT	INTEGER
BIGINT	INTEGER
DATE	DATE
TIME	DATE
TIMESTAMP	DATE
DECIMAL	STRING
DOUBLE	DOUBLE
FLOAT	DOUBLE
REAL	FLOAT
BINARY	STRING, add BYTEARRAY=TRUE to AppSpecificInfo

Table 16. Correspondence of data types (continued)

JDBC type	Business Object Type
VARBINARY	STRING, add BYTEARRAY=TRUE to AppSpecificInfo

Note: If a column's data type is not one of those shown in Table 16 on page 78, OracleAppsODA skips the column and displays a message stating that the column cannot be processed.

Cardinality property

OracleAppsODA sets the cardinality of all simple attributes to 1.

MaxLength property

OracleAppsODA obtains the length of a string from the length specified for the varchar, char, or text data type.

IsKey property

If the column is a primary key in the table, OracleAppsODA marks it as a key attribute. However, if a view, stored procedure, or synonym/nickname, instead of a table, is selected as the source node to generate Business Objects, OracleAppsODA does not mark the column as a key attribute. In this case, the key attribute needs to be set manually.

IsForeignKey property

OracleAppsODA does not set the IsForeignKey property. You can set it in Business Object Designer Express.

IsRequired property

If a field is designated not null in the table, view, stored procedure, or synonym/nickname, OracleAppsODA marks it as a required attribute. However, OracleAppsODA does not mark the key field as required because there may be a sequence associated with it, or it may be an identity column.

AppSpecificInfo Property

OracleAppsODA includes two parameters for the AppSpecificInfo property at the attribute level. The syntax of the specified parameters are:

CN=*ColumnName*

where ColumnName is the name of the column in the database table, view, stored procedure, or synonym/nickname associated with the specific attribute.

BYTEARRAY=*true|false*

OracleAppsODA recognizes columns with binary data and creates an attribute of type String with an AppSpecificInfo property of BYTEARRAY=true.

Note: You can set additional AppSpecificInfo parameters in Business Object Designer Express. For information about these parameters, see "Application-specific information format for verbs" on page 64.

Verbs

OracleAppsODA generates the verbs specified in the BO Properties window. It creates an AppSpecificInfo property for each verb but does not populate it. For more information, see "Application-specific information format for verbs" on page 64.

Sample business object definition file

A sample business object definition follows:

```
[BusinessObjectDefinition]
Name = CUSTOMER
Version = 1.0.0
AppSpecificInfo = TN=ra_customers;SCN=

        [Attribute]
        Name = customer_id
        Type = Integer
        Cardinality = 1
        MaxLength = 0
        IsKey = true
        IsForeignKey = false
        IsRequired = false
        AppSpecificInfo = CN=customer_id
        DefaultValue =
        [End]

        *******Other attributes *********

[Attribute]
        Name = ObjectEventId
        Type = String
        Cardinality = 1
        MaxLength = 0
        IsKey = false
        IsForeignKey = false
        IsRequired = false
        AppSpecificInfo =
        DefaultValue =
        [End]

        [Verb]
        Name = Delete
        AppSpecificInfo =
        [End]

        [Verb]
        Name = Update
        AppSpecificInfo =
        [End]

        [Verb]
        Name = Create
        AppSpecificInfo =
        [End]

        [Verb]
        Name = Retrieve
        AppSpecificInfo =
        [End]
[End]
```

Inserting attributes that contain child business objects

Use Business Object Designer Express to insert attributes that represent single-cardinality or multiple-cardinality child business objects. For more information, see the *Business Object Development Guide*.

Adding information to the business object definition

Because the database tables, views, stored procedures, and synonym/nicknames may not have all the information that a business object definition requires, it may be necessary to add information to the business object definition that OracleAppsODA creates. For more information, see Chapter 3, "Understanding business objects for the connector," on page 33.

To examine the business object definition or add information, you can use Business Object Designer Express or a text editor. To reload a revised definition into the WebSphere Business Integration Server Express Adapter repository, you can use Business Object Designer Express and InterChange Server Express, the repos_copy command.

Chapter 5. Troubleshooting and error handling

The chapter describes problems that you may encounter when starting up or running the IBM WebSphere Business Integration Server Express Adapter for Oracle Applications. It contains the following sections:

- "Startup problems"
- "Event processing"
- "Mapping (InterChange Server Express Integration broker)"
- "Error handling and logging" on page 84
- "Loss of connection to the application" on page 86
- "Resource-busy error" on page 86

Startup problems

If you encounter difficulties when trying to start the connector, check to make sure that the integration broker is up and running.

Event processing

If there are events in the event table, and they are not being processed while the connector is running, ensure that:

- The relevant business process is running.
- The name of the business object in the event table matches the name of the business object specified for the business process port.

Mapping (InterChange Server Express Integration broker)

This section discusses the following:

- "Mapping problems"
- "Date conversion"

Mapping problems

If the business objects are not being mapped or mapping is not being invoked, check to make sure the maps have been installed in the correct directory.

Date conversion

Note: This date conversion procedure applies only to versions of the connector prior to version 1.5.0.

Use adapter maps to convert data stored in `Date` format in the database to the `String` format used by a business object.

For example, assume that you want to convert the following date, which is stored in an Oracle database:

```
Sun Jan 01 00:00:00 CEST 1999
```

to the following string, which is processed in a business object:

```
Jan 01 1999 00:00:00
```

To perform this conversion, use the `DtpDate()` and `DtpSplitString()` constructors defined for data transformation in mapping. For the syntax and a description of these constructors and the classes whose objects they construct, see the *Map Development Guide*.

To use a map to convert the `Date` value to a `String`, follow these steps:

1. Use `DtpSplitString()` with a space delimiter to split the string into its six pieces and rearrange it into an order that `DtpDate` can use. To convert the example date, use:

```
DtpSplitString OurSplitString = new DtpSplitString
    ("Sun Jan 01 00:00:00 CEST 1999"," ");
```

   In the above statement, `OurSplitString` is a user-defined variable of type `DtpSplitString`, and a space is specified as the delimiter.

2. Use the `nextElement()` method of the `DtpSplitString` class to loop through the newly created `OurSplitString` variable, putting each of the variable's six elements into an array whose elements are of type `String`. The following example specifies `OurStringPieces` as the output array:

```
String[] OurStringPieces = new String[6];
for (i=0;i<=5;i=i+1){
    OurStringPieces[i]=OurSplitString.nextElement();
}
```

   This looping produces the following array elements:

```
OurStringPieces[0] = Sun
OurStringPieces[1] = Jan
OurStringPieces[2] = 01
OurStringPieces[3] = 00:00:00
OurStringPieces[4] = CEST
OurStringPieces[5] = 1999
```

3. Concatenate the pieces of the string needed for `DtpDate` input. The example conversion uses "M D Y h:m:s" as the input format for `DtpDate`, which requires the converted string to look like "Jan 01 1999 00:00:00". This example `String` uses elements 1, 2, 5, and 3 of the `OurStringPieces` array:

```
OurConcatenatedString =
OurStringPieces[1]+OurStringPieces[2]+OurStringPieces[5]+OurStringPieces[3];
```

4. Use your new concatenated string as input into `DtpDate`:

```
DtpDate OurDtpDate = new DtpDate(OurConcatenatedString,"M D Y h:m:s");
```

After you have put the `Date` value into `DtpDate` format, you are ready to work with the date in your map.

Error handling and logging

The connector logs an error message whenever it encounters a condition that causes its current processing of a business object and verb to fail. When such an error occurs, the connector also prints a textual representation of the failed business object as it was received from the business process. It writes the text to the connector log file or the standard output stream, depending on its configuration. You can use the text as an aid in determining the source of the error.

Error types

Table 17 describes the types of tracing messages that the connector outputs at each trace level. These messages are in addition to any tracing messages output by the adapter architecture, such as the Java connector execution wrapper.

Table 17. Connector tracing messages

Tracing level	Tracing messages
Level 0	Message that identifies the connector version. No other tracing is done at this level. This is the default value.
Level 1	• Status messages • Messages that provide identifying (key) information for each business object processed • Messages delivered each time the pollForEvents method is executed
Level 2	• Business object handler messages that contain information such as the arrays and child business objects that the connector encounters or retrieves during the processing of a business object • Messages logged each time a business object is posted to the integration broker, either from gotApplEvent() or executeCollaboration() • Messages that indicate that a business object has been received as an integration broker request
Level 3	• Foreign key processing messages that contain such information as when the connector has found or has set a foreign key in a business object • Messages that provide information about business object processing. For example, these messages are delivered when the connector finds a match between business objects, or finds a business object in an array of child business objects
Level 4	• Application-specific information messages, for example, messages showing the values returned by the functions that parse the business object's application-specific information fields • Messages that identify when the connector enters or exits a function, which helps trace the process flow of the connector • All thread-specific messages. If the connector spawns multiple threads, a message appears for the creation of each new thread.
Level 5	• Messages that indicate connector initialization, for example, messages showing the value of each configuration property retrieved from the integration broker. • Messages that include statements executed in the application. At this trace level, the connector log file contains all statements executed in the destination application and the value of any variables that are substituted. • Messages that comprise a representation of a business object before the connector begins processing it (displaying its state as the connector receives it from the business process) and after the connector has completed its processing (displaying its state as the connector returns it to the business process) • Messages that comprise a business object dump • Messages that indicate the status of each thread the connector spawns while it is running

Error messages

Connector message file

All the error messages that the connector generates are stored in a message file named OracleAppsConnector.txt or OracleAppsConnector_*ll_TT*.txt (where *ll*

specifies a language, and *TT* specifies a country or territory). Each error has an error number followed by the error message. For example:

```
20017
Connector Infrastructure version does not match.

20018
Connection from {1} to the Application is lost! Please enter 'q'
to stop the connector, then restart it after the problem is fixed.

20019
Error: ev_id is NULL in pollForEvent().
```

Problem with dates in business objects (InterChange Server Express) Integration broker

If the date is wrong in business objects, check the date style specified in the connector's RDBMS.initsession configuration property. The date format must correspond to the date format used in maps for the business objects.

WebSphere Business Integration Adapter Server Express native maps assume that the NT short date style is MM/dd/yyyy. If the short date style is any other format, change the map rules to reflect the new date format and recompile the maps. Use the RDBMS.initsession configuration property to issue SQL statements that set the date format in the database.

Loss of connection to the application

If the connector fails to establish connection, it sends FAIL to the integration broker and terminates.

When AutoCommit is set to false and the PingQuery fails, the connector will attempt to create a new connection to the database. If it succeeds in creating a new connection to the database it will continue processing, otherwise the connector returns an APPRESPONSETIMEOUT, which results in the termination of the connector.

Fetch out-of-sequence error

The AutoCommit property must be set to false when using Oracle database version 8.0 and 8.1 with Linux and i5/OS or Oracle 8.1 with Windows 2003. Otherwise, you will experience ORA-01002 (fetch out of sequence) error messages. In prior versions of Oracle databases this error will not occur. Setting AutoCommit to false will improve performance.

Resource-busy error

Note: This connector only encounters this error when it is running on an Oracle database.

The connector sometimes encounters an error when retrieving or changing data in an application. This error occurs when the connector tries to update a record that is currently locked. The connector must lock the record before it can update it. The record may be locked by another process, or because the connector is multi-threaded, it may be locked by the connector itself.

An error message like the following displays:

```
[Time: 2001/05/29 16:30:07.356] [System: ConnectorAgent] [SS: SOVTConnector]
[Type: Trace] [Mesg: Select CLIENT,COUNTRY,STRT_CODE,CITY_CODE,
CITYP_CODE,STRTYPEAB,COMMU_CODE,REGIOGROUP,TAXJURCODE from ADRSTREET
where CLIENT='100' and COUNTRY='DE' and STRT_CODE='000001114136'
FOR UPDATE NOWAIT]
[Time: 2001/05/29 16:30:07.526] [System: ConnectorAgent] [SS: SOVTConnector]
[Type: Trace ] [Mesg: :logMsg]
[Time: 2001/05/29 16:30:07.536] [System: ConnectorAgent] [SS: SOVTConnector]
[Type: Error ] [MsgID: 37002]
[Mesg: Execution of Retrieve statement failed : java.
sql.SQLException: ORA-00054: Versuch, mit NOWAIT eine bereits
belegte Ressourceanzufordern.]
```

To resolve this problem, you can stop the process that is preventing the connector
from obtaining a lock on the record, or you can adjust the RetryCountInterval
configuration property for the connector.

Appendix A. Standard configuration properties for connectors

This appendix describes the standard configuration properties for the connector component of WebSphere Business Integration Server Express adapters. The information covers InterChange Server Express.

For information about properties specific to this connector, see the relevant section in this guide.

New properties

These standard properties have been added in this release:
- AdapterHelpName
- BiDi.Application
- BiDi.Broker
- BiDi.Metadata
- BiDi.Transformation
- ControllerEventSequencing
- jms.ListenerConcurrency
- jms.TransportOptimized
- TivoliTransactionMonitorPerformance

Standard connector properties overview

Connectors have two types of configuration properties:
- Standard configuration properties, which are used by the framework
- Application, or connector-specific, configuration properties, which are used by the agent

These properties determine the adapter framework and the agent run-time behavior.

This section describes how to start Connector Configurator Express and describes characteristics common to all properties. For information on configuration properties specific to a connector, see its adapter user guide.

Starting Connector Configurator Express

You configure connector properties from Connector Configurator Express, which you access from System Manager. For more information on using Connector Configurator Express, refer to the sections on Connector Configurator Express in this guide.

Connector Configurator Express and System Manager run only on the Windows system. If you are running the connector on a Linux system, you must have a Windows machine with these tools installed.

To set connector properties for a connector that runs on Linux, you must start up System Manager on the Windows machine, connect to the Linux integration broker, and bring up Connector Configurator Express for the connector.

Configuration property values overview

The connector uses the following order to determine a property's value:

1. Default
2. Repository for InterChange Server Express integration broker.
3. Local configuration file
4. Command line

The default length of a property field is 255 characters. There is no limit on the length of a STRING property type. The length of an INTEGER type is determined by the server on which the adapter is running.

A connector obtains its configuration values at startup. If you change the value of one or more connector properties during a run-time session, the property's update method determines how the change takes effect.

The update characteristics of a property, that is, how and when a change to the connector properties takes effect, depend on the nature of the property.

There are four update methods for standard connector properties:

- **Dynamic**
  The new value takes effect immediately after the change is saved in System Manager. However, if the connector is in stand-alone mode (independently of System Manager).

- **Agent restart (InterChange Server Express only)**
  The new value takes effect only after you stop and restart the connector agent.

- **Component restart**
  The new value takes effect only after the connector is stopped and then restarted in System Manager. You do not need to stop and restart the agent or the server process.

- **System restart**
  The new value takes effect only after you stop and restart the connector agent and the server.

To determine how a specific property is updated, refer to the **Update Method** column in the Connector Configurator Express window, or see the Update Method column in Table 18 on page 91.

There are three locations in which a standard property can reside. Some properties can reside in more than one location.

- **ReposController**
  The property resides in the connector controller and is effective only there. If you change the value on the agent side, it does not affect the controller.

- **ReposAgent**
  The property resides in the agent and is effective only there. A local configuration can override this value, depending on the property.

- **LocalConfig**
  The property resides in the configuration file for the connector and can act only through the configuration file. The controller cannot change the value of the property, and is not aware of changes made to the configuration file unless the system is redeployed to update the controller explicitly.

Standard properties quick-reference

Table 18 provides a quick-reference to the standard connector configuration properties. Not all connectors require all of these properties, and property settings may differ. .

See the section following the table for a description of each property.

Note: In the Notes column in Table 18, the phrase "RepositoryDirectory is set to <REMOTE>" indicates that the broker is InterChange Server Express.

Table 18. Summary of standard configuration properties

Property name	Possible values	Default value	Update method	Notes
AdapterHelpName	One of the valid subdirectories in <ProductDir>\bin\Data\ App\Help that has a valid <Regional Setting> directory	Template name, if valid, or blank field	Component restart	Supported regional settings. Include `chs_chn`, `cht_twn`, `deu_deu`, `esn_esp`, `fra_fra`, `ita_ita`, `jpn_jpn`, `kor_kor`, `ptb_bra`, and `enu_usa` (default).
AdminInQueue	Valid JMS queue name	`<CONNECTORNAME>` `/ADMININQUEUE`	Component restart	This property is valid only when the value of DeliveryTransport is JMS
AdminOutQueue	Valid JMS queue name	`<CONNECTORNAME>` `/ADMINOUTQUEUE`	Component restart	This property is valid only when the value of DeliveryTransport is JMS
AgentConnections	1 through 4	1	Component restart	This property is valid only when the value of DeliveryTransport is MQ or IDL, the value of Repository Directory is set to <REMOTE> and the value of BrokerType is ICS.
AgentTraceLevel	0 through 5	0	Dynamic for ICS; otherwise Component restart	
ApplicationName	Application name	The value specified for the connector application name	Component restart	
BiDi.Application	Any valid combination of these bidirectional attributes: 1st letter: `I,V` 2nd letter: `L,R` 3rd letter: `Y, N` 4th letter: `S, N` 5th letter: `H, C, N`	`ILYNN` (five letters)	Component restart	This property is valid only if the value of BiDi.Transforma tion is `true`

Table 18. Summary of standard configuration properties (continued)

Property name	Possible values	Default value	Update method	Notes
BiDi.Broker	Any valid combination of these bidirectional attributes: 1st letter: I,V 2nd letter: L,R 3rd letter: Y, N 4th letter: S, N 5th letter: H, C, N	ILYNN (five letters)	Component restart	This property is valid only if the value of BiDi.Transformation is true. If the value of BrokerType is ICS, the property is read-only.
BiDi.Metadata	Any valid combination of these bidirectional attributes: 1st letter: I,V 2nd letter: L,R 3rd letter: Y, N 4th letter: S, N 5th letter: H, C, N	ILYNN (five letters)	Component restart	This property is valid only if the value of BiDi.Transformation is true.
BiDi.Transformation	true or false	false	Component restart	This property is valid only if the value of BrokerType is not WAS
BrokerType	ICS	ICS	Component restart	
CharacterEncoding	Any supported code. The list shows this subset: ascii7, ascii8, SJIS, Cp949, GBK, Big5, Cp297, Cp273, Cp280, Cp284, Cp037, Cp437 .	ascii7	Component restart	This property is valid only for C++ connectors.
CommonEventInfrastructure	true or false	false	Component restart	
CommonEventInfrastructureURL	A URL string, for example, corbaloc:iiop: host:2809.	No default value.	Component restart	This property is valid only if the value of CommonEvent Infrastructure is true.
ConcurrentEventTriggeredFlows	1 through 32,767	1	Component restart	This property is valid only if the value of RepositoryDirectory is set to <REMOTE> and the value of BrokerType is ICS.
ContainerManagedEvents	Blank or JMS	Blank	Component restart	This property is valid only when the value of Delivery Transport is JMS.
ControllerEventSequencing	true or false	true	Dynamic	This property is valid only if the value of Repository Directory is set to <REMOTE> and the value of BrokerType is ICS.
ControllerStoreAndForwardMode	true or false	true	Dynamic	This property is valid only if the value of Repository Directory is set to <REMOTE> and the value of BrokerType is ICS.

Table 18. Summary of standard configuration properties (continued)

Property name	Possible values	Default value	Update method	Notes
ControllerTraceLevel	0 through 5	`0`	Dynamic	This property is valid only if the value of RepositoryDirectory is set to <REMOTE> and the value of BrokerType is ICS.
DeliveryQueue	Any valid JMS queue name	`<CONNECTORNAME>` `/DELIVERYQUEUE`	Component restart	This property is valid only when the value of Delivery Transport is JMS.
DeliveryTransport	IDL or JMS	IDL when the value of RepositoryDirectory is <REMOTE>, otherwise JMS	Component restart	If the value of RepositoryDirectory is not <REMOTE>, the only valid value for this property is JMS.
DuplicateEventElimination	true or false	`false`	Component restart	This property is valid only if the value of DeliveryTransport is JMS.
EnableOidForFlowMonitoring	true or false	`false`	Component restart	This property is valid only if the value of BrokerType is ICS.
FaultQueue	Any valid queue name.	`<CONNECTORNAME>` `/FAULTQUEUE`	Component restart	This property is valid only if the value of DeliveryTransport is JMS.

jms.FactoryClassName	`CxCommon.Messaging.jms`
	`.IBMMQSeriesFactory,`
	`CxCommon.Messaging`
	`.jms.SonicMQFactory,`
	or any Java class name
		`CxCommon.Messaging.`
		`jms.IBMMQSeriesFactory`
			Component restart	This property is valid only if the value of DeliveryTransport is JMS.

jms.ListenerConcurrency	1 through 32767	`1`	Component restart	This property is valid only if the value of jms.TransportOptimized is true.
jms.MessageBrokerName	If the value of jms.FactoryClassName is IBM, use `crossworlds.queue.` `manager.`	`crossworlds.queue.` `manager`	Component restart	This property is valid only if the value of DeliveryTransport is JMS .
jms.NumConcurrent Requests	Positive integer	`10`	Component restart	This property is valid only if the value of DeliveryTransport is JMS .
jms.Password	Any valid password		Component restart	This property is valid only if the value of DeliveryTransport is JMS .
jms.TransportOptimized	true or false	`false`	Component restart	This property is valid only if the value of DeliveryTransport is JMS and the value of BrokerType is ICS.
jms.UserName	Any valid name		Component restart	This property is valid only if the value of Delivery Transport is JMS.

Table 18. Summary of standard configuration properties (continued)

Property name	Possible values	Default value	Update method	Notes
JvmMaxHeapSize	Heap size in megabytes	128m	Component restart	This property is valid only if the value of Repository Directory is set to <REMOTE> and the value of BrokerType is ICS.
JvmMaxNativeStackSize	Size of stack in kilobytes	128k	Component restart	This property is valid only if the value of Repository Directory is set to <REMOTE> and the value of BrokerType is ICS.
JvmMinHeapSize	Heap size in megabytes	1m	Component restart	This property is valid only if the value of Repository Directory is set to <REMOTE> and the value of BrokerType is ICS.
ListenerConcurrency	1 through 100	1	Component restart	This property is valid only if the value of DeliveryTransport is MQ.
Locale	This is a subset of the supported locales: en_US, ja_JP, ko_KR, zh_CN, zh_TW, fr_FR, de_DE, it_IT, es_ES, pt_BR	en_US	Component restart	
LogAtInterchangeEnd	true or false	false	Component restart	This property is valid only if the value of Repository Directory is set to <REMOTE> and the value of BrokerType is ICS.
MaxEventCapacity	1 through 2147483647	2147483647	Dynamic	This property is valid only if the value of Repository Directory is set to <REMOTE> and the value of BrokerType is ICS.
MessageFileName	Valid file name	InterchangeSystem.txt	Component restart	
MonitorQueue	Any valid queue name	<CONNECTORNAME> /MONITORQUEUE	Component restart	This property is valid only if the value of DuplicateEventElimination is true and ContainerManagedEvents has no value.
OADAutoRestartAgent	true or false	false	Dynamic	This property is valid only if the value of Repository Directory is set to <REMOTE> and the value of BrokerType is ICS.
OADMaxNumRetry	A positive integer	1000	Dynamic	This property is valid only if the value of Repository Directory is set to <REMOTE> and the value of BrokerType is ICS.

Table 18. Summary of standard configuration properties (continued)

Property name	Possible values	Default value	Update method	Notes
OADRetryTimeInterval	A positive integer in minutes	10	Dynamic	This property is valid only if the value of Repository Directory is set to <REMOTE> and the value of BrokerType is ICS.
PollEndTime	HH = 0 through 23 MM = 0 through 59	`HH:MM`	Component restart	
PollFrequency	A positive integer (in milliseconds)	10000	Dynamic if broker is ICS; otherwise Component restart	
PollQuantity	1 through 500	1	Agent restart	This property is valid only if the value of ContainerManagedEvents is JMS.
PollStartTime	HH = 0 through 23 MM = 0 through 59	`HH:MM`	Component restart	
RepositoryDirectory	<REMOTE> if the broker is ICS; otherwise any valid local directory.	For ICS, the value is set to <REMOTE>	Agent restart	
RequestQueue	Valid JMS queue name	`<CONNECTORNAME> /REQUESTQUEUE`	Component restart	This property is valid only if the value of DeliveryTransport is JMS
ResponseQueue	Valid JMS queue name	`<CONNECTORNAME> /RESPONSEQUEUE`	Component restart	This property is valid only if the value of DeliveryTransport is JMS.
RestartRetryCount	0 through 99	3	Dynamic if ICS; otherwise Component restart	
RestartRetryInterval	A value in minutes from 1 through 2147483647	1	Dynamic if ICS; otherwise Component restart	
RHF2MessageDomain	`mrm` or `xml`	`mrm`	Component restart	This property is valid only if the value of DeliveryTransport is JMS and the value of WireFormat is CwXML.
SourceQueue	Any valid WebSphere MQ queue name	`<CONNECTORNAME> /SOURCEQUEUE`	Agent restart	This property is valid only if the value of ContainerManagedEvents is JMS.
SynchronousRequest Queue	Any valid queue name.	`<CONNECTORNAME> /SYNCHRONOUSREQUEST QUEUE`	Component restart	This property is valid only if the value of DeliveryTransport is JMS.
SynchronousRequest Timeout	0 to any number (milliseconds)	0	Component restart	This property is valid only if the value of DeliveryTransport is JMS.

Table 18. Summary of standard configuration properties (continued)

Property name	Possible values	Default value	Update method	Notes
SynchronousResponse Queue	Any valid queue name	`<CONNECTORNAME>` `/SYNCHRONOUSRESPONSE` `QUEUE`	Component restart	This property is valid only if the value of DeliveryTransport is JMS.
TivoliMonitorTransaction Performance	`true or false`	`false`	Component restart	
WireFormat	`CwXML or CwBO`	`CwXML`	Agent restart	The value of this property must be CwXML if the value of RepositoryDirectory is not set to <REMOTE>. The value must be CwBO if the value of RepositoryDirectory is set to <REMOTE>.
WsifSynchronousRequest Timeout	0 to any number (milliseconds)	0	Component restart	This property is not valid if the value of BrokerType is ICS..
XMLNameSpaceFormat	`short or long`	`short`	Agent restart	This property is not valid if the value of BrokerType is ICS.

Standard properties

This section describes the standard connector configuration properties.

AdapterHelpName

The AdapterHelpName property is the name of a directory in which connector-specific extended help files are located. The directory must be located in *<ProductDir>*\bin\Data\App\Help and must contain at least the language directory enu_usa. It may contain other directories according to locale.

The default value is the template name if it is valid, or it is blank.

AdminInQueue

The AdminInQueue property specifies the queue that is used by the integration broker to send administrative messages to the connector.

The default value is `<CONNECTORNAME>/ADMININQUEUE`

AdminOutQueue

The AdminOutQueue property specifies the queue that is used by the connector to send administrative messages to the integration broker.

The default value is `<CONNECTORNAME>/ADMINOUTQUEUE`

AgentConnections

The AgentConnections property controls the number of ORB (Object Request Broker) connections opened when the ORB initializes.

The default value of this property is 1.

AgentTraceLevel

The AgentTraceLevel property sets the level of trace messages for the application-specific component. The connector delivers all trace messages applicable at the tracing level set and lower.

The default value is 0.

ApplicationName

The ApplicationName property uniquely identifies the name of the connector application. This name is used by the system administrator to monitor the integration environment. This property must have a value before you can run the connector.

The default is the name of the connector.

BiDi.Application

The BiDi.Application property specifies the bidirectional format for data coming from an external application into the adapter in the form of any business object supported by this adapter. The property defines the bidirectional attributes of the application data. These attributes are:

- Type of text: implicit or visual (I or V)
- Text direction: left-to-right or right-to-left (L or R)
- Symmetric swapping: on or off (Y or N)
- Shaping (Arabic): on or off (S or N)
- Numerical shaping (Arabic): Hindi, contextual, or nominal (H, C, or N)

This property is valid only if the BiDi.Transformation property value is set to true.

The default value is ILYNN (implicit, left-to-right, on, off, nominal).

BiDi.Broker

The BiDi.Broker property specifies the bidirectional format for data sent from the adapter to the integration broker in the form of any supported business object. It defines the bidirectional attributes of the data, which are as listed under BiDi.Application above.

This property is valid only if the BiDi.Transformation property value is set to true. If the BrokerType property is ICS, the property value is read-only.

The default value is ILYNN (implicit, left-to-right, on, off, nominal).

BiDi.Metadata

The BiDi.Metadata property defines the bidirectional format or attributes for the metadata, which is used by the connector to establish and maintain a link to the external application. The attribute settings are specific to each adapter using the bidirectional capabilities. If your adapter supports bidirectional processing, refer to section on adapter-specific properties for more information.

This property is valid only if the BiDi.Transformation property value is set to true.

The default value is ILYNN (implicit, left-to-right, on, off, nominal).

BiDi.Transformation

The BiDi.Transformation property defines whether the system performs a bidirectional transformation at run time.

If the property value is set to `true`, the BiDi.Application, BiDi.Broker, and BiDi.Metadata properties are available. If the property value is set to `false`, they are hidden.

The default value is `false`.

BrokerType

The BrokerType property identifies the integration broker type that you are using. The value is `ICS`.

CharacterEncoding

The CharacterEncoding property specifies the character code set used to map from a character (such as a letter of the alphabet, a numeric representation, or a punctuation mark) to a numeric value.

Note: Java-based connectors do not use this property. C++ connectors use the value `ascii7` for this property.

By default, only a subset of supported character encodings is displayed. To add other supported values to the list, you must manually modify the \Data\Std\stdConnProps.xml file in the product directory (<*ProductDir*>). For more information, see the Connector Configurator Express appendix in this guide.

ConcurrentEventTriggeredFlows

The ConcurrentEventTriggeredFlows property determines how many business objects can be concurrently processed by the connector for event delivery. You set the value of this attribute to the number of business objects that are mapped and delivered concurrently. For example, if you set the value of this property to 5, five business objects are processed concurrently.

Setting this property to a value greater than 1 allows a connector for a source application to map multiple event business objects at the same time and deliver them to multiple collaboration instances simultaneously. This speeds delivery of business objects to the integration broker, particularly if the business objects use complex maps. Increasing the arrival rate of business objects to collaborations can improve overall performance in the system.

To implement concurrent processing for an entire flow (from a source application to a destination application), the following properties must configured:
- The collaboration must be configured to use multiple threads by setting its `Maximum number of concurrent events` property high enough to use multiple threads.
- The destination application's application-specific component must be configured to process requests concurrently.

The ConcurrentEventTriggeredFlows property has no effect on connector polling, which is single-threaded and is performed serially.

This property is valid only if the value of the RepositoryDirectory property is set to <REMOTE>.

The default value is 1.

ContainerManagedEvents

The ContainerManagedEvents property allows a JMS-enabled connector with a JMS event store to provide guaranteed event delivery, in which an event is removed from the source queue and placed on the destination queue as one JMS transaction.

When this property is set to JMS, the following properties must also be set to enable guaranteed event delivery:
- PollQuantity = 1 to 500
- SourceQueue = /SOURCEQUEUE

You must also configure a data handler with the MimeType and DHClass (data handler class) properties. You can also add DataHandlerConfigMOName (the meta-object name, which is optional). To set those values, use the **Data Handler** tab in Connector Configurator Express.

Although these properties are adapter-specific, here are some example values:
- MimeType = text\xml
- DHClass = com.crossworlds.DataHandlers.text.xml
- DataHandlerConfigMOName = MO_DataHandler_Default

The fields for these values in the **Data Handler** tab are displayed only if you have set the ContainerManagedEvents property to the value JMS.

Note: When ContainerManagedEvents is set to JMS, the connector does not call its pollForEvents() method, thereby disabling that method's functionality.

The ContainerManagedEvents property is valid only if the value of the DeliveryTransport property is set to JMS.

There is no default value.

ControllerEventSequencing

The ControllerEventSequencing property enables event sequencing in the connector controller.

This property is valid only if the value of the RepositoryDirectory property is set to set to <REMOTE> (BrokerType is ICS).

The default value is true.

ControllerStoreAndForwardMode

The ControllerStoreAndForwardMode property sets the behavior of the connector controller after it detects that the destination application-specific component is unavailable.

If this property is set to true and the destination application-specific component is unavailable when an event reaches InterChange Server Express (ICS), the connector

controller blocks the request to the application-specific component. When the application-specific component becomes operational, the controller forwards the request to it.

However, if the destination application's application-specific component becomes unavailable after the connector controller forwards a service call request to it, the connector controller fails the request.

If this property is set to `false`, the connector controller begins failing all service call requests as soon as it detects that the destination application-specific component is unavailable.

This property is valid only if the value of the RepositoryDirectory property is set to <REMOTE> (the value of the BrokerType property is ICS).

The default value is `true`.

ControllerTraceLevel

The ControllerTraceLevel property sets the level of trace messages for the connector controller.

This property is valid only if the value of the RepositoryDirectory property is set to set to <REMOTE>.

The default value is `0`.

DeliveryQueue

The DeliveryQueue property defines the queue that is used by the connector to send business objects to the integration broker.

This property is valid only if the value of the DeliveryTransport property is set to JMS.

The default value is `<CONNECTORNAME>/DELIVERYQUEUE`.

DeliveryTransport

The DeliveryTransport property specifies the transport mechanism for the delivery of events. For Java Messaging Service, the value is JMS.
- If the value of the RepositoryDirectory property is set to <REMOTE>, the value of the DeliveryTransport property can be `IDL` or `JMS`, and the default is `IDL`.
- If the value of the RepositoryDirectory property is a local directory, the value can be only `JMS`.

The connector sends service-call requests and administrative messages over CORBA IIOP if the value of the RepositoryDirectory property is `IDL`.

The default value is JMS.

JMS

The JMS transport mechanism enables communication between the connector and client connector framework using Java Messaging Service (JMS).

If you select JMS as the delivery transport, additional JMS properties such as `jms.MessageBrokerName,` `jms.FactoryClassName,` `jms.Password,` and `jms.UserName`

are listed in Connector Configurator Express. The properties
`jms.MessageBrokerName` and `jms.FactoryClassName` are required for this transport.

There may be a memory limitation if you use the JMS transport mechanism for a connector in the following environment when InterChange Server Espress (ICS) is the integration broker.

In this environment, you may experience difficulty starting both the connector controller (on the server side) and the connector (on the client side) due to memory use within the WebSphere MQ client. If your installation uses less than 768MB of process heap size, set the following variable and property:

- Set the LDR_CNTRL environment variable in the CWSharedEnv.sh script.

  This script is located in the \bin directory below the product directory (*<ProductDir>*). Using a text editor, add the following line as the first line in the CWSharedEnv.sh script:

  `export LDR_CNTRL=MAXDATA=0x30000000`

  This line restricts heap memory usage to a maximum of 768 MB (3 segments * 256 MB). If the process memory grows larger than this limit, page swapping can occur, which can adversely affect the performance of your system.

- Set the value of the IPCCBaseAddress property to 11 or 12. For more information on this property, see the *WebSphere Business Integration Server Express Installation Guide for Windows, for Linux, or for i5/OS*.

DuplicateEventElimination

When the value of this property is `true`, a JMS-enabled connector can ensure that duplicate events are not delivered to the delivery queue. To use this feature, during connector development, the connector must have a unique event identifier set as the business object ObjectEventId attribute in the application-specific code.

Note: When the value of this property is `true`, the MonitorQueue property must be enabled to provide guaranteed event delivery.

The default value is `false`.

EnableOidForFlowMonitoring

When the value of this property is `true`, the adapter runtime will mark the incoming ObjectEventID as a foreign key for flow monitoring.

This property is only valid if the BrokerType property is set to ICS.

The default value is `false`.

FaultQueue

If the connector experiences an error while processing a message, it moves the message (and a status indicator and description of the problem) to the queue specified in the FaultQueue property.

The default value is `<CONNECTORNAME>/FAULTQUEUE`.

jms.FactoryClassName

The jms.FactoryClassName property specifies the class name to instantiate for a JMS provider. This property must be set if the value of the DeliveryTransport property is JMS.

The default is `CxCommon.Messaging.jms.IBMMQSeriesFactory`.

jms.ListenerConcurrency

The jms.ListenerConcurrency property specifies the number of concurrent listeners for the JMS controller. It specifies the number of threads that fetch and process messages concurrently within a controller.

This property is valid only if the value of the jms.OptimizedTransport property is `true`.

The default value is 1.

jms.MessageBrokerName

The jms.MessageBrokerName specifies the broker name to use for the JMS provider. You must set this connector property if you specify JMS as the delivery transport mechanism (in the DeliveryTransport property).

When you connect to a remote message broker, this property requires the following values:
`QueueMgrName:Channel:HostName:PortNumber`
where:
`QueueMgrName` is the name of the queue manager.
`Channel` is the channel used by the client.
`HostName` is the name of the machine where the queue manager is to reside.
`PortNumber`is the port number used by the queue manager for listening

For example:
`jms.MessageBrokerName = WBIMB.Queue.Manager:CHANNEL1:RemoteMachine:1456`

The default value is `crossworlds.queue.manager`. Use the default when connecting to a local message broker.

jms.NumConcurrentRequests

The jms.NumConcurrentRequests property specifies the maximum number of concurrent service call requests that can be sent to a connector at the same time. Once that maximum is reached, new service calls are blocked and must wait for another request to complete before proceeding.

The default value is 10.

jms.Password

The jms.Password property specifies the password for the JMS provider. A value for this property is optional.

There is no default value.

jms.TransportOptimized

The jms.TransportOptimized property determines if the WIP (work in progress) is optimized. You must have a WebSphere MQ provider to optimize the WIP. For optimized WIP to operate, the messaging provider must be able to:
1. Read a message without taking it off the queue
2. Delete a message with a specific ID without transferring the entire message to the receiver's memory space

3. Read a message by using a specific ID (needed for recovery purposes)
4. Track the point at which events that have not been read appear.

The JMS APIs cannot be used for optimized WIP because they do not meet conditions 2 and 4 above, but the MQ Java APIs meet all four conditions, and hence are required for optimized WIP.

This property is valid only if the value of DeliveryTransport is JMS and the value of BrokerType is ICS.

The default value is false.

jms.UserName

the jms.UserName property specifies the user name for the JMS provider. A value for this property is optional.

There is no default value.

JvmMaxHeapSize

The JvmMaxHeapSize property specifies the maximum heap size for the agent (in megabytes).

This property is valid only if the value for the RepositoryDirectory property is set to <REMOTE>.

The default value is 128m.

JvmMaxNativeStackSize

The JvmMaxNativeStackSize property specifies the maximum native stack size for the agent (in kilobytes).

This property is valid only if the value for the RepositoryDirectory property is set to <REMOTE>.

The default value is 128k.

JvmMinHeapSize

The JvmMinHeapSize property specifies the minimum heap size for the agent (in megabytes).

This property is valid only if the value for the RepositoryDirectory property is set to <REMOTE>.

The default value is 1m.

ListenerConcurrency

The ListenerConcurrency property supports multithreading in WebSphere MQ Listener when ICS is the integration broker. It enables batch writing of multiple events to the database, thereby improving system performance.

This property valid only with connectors that use MQ transport. The value of the DeliveryTransport property must be MQ.

The default value is 1.

Locale

The Locale property specifies the language code, country or territory, and, optionally, the associated character code set. The value of this property determines cultural conventions such as collation and sort order of data, date and time formats, and the symbols used in monetary specifications.

A locale name has the following format:

`ll_TT.codeset`

where:
ll is a two-character language code (in lowercase letters)
TT is a two-letter country or territory code (in uppercase letters)
codeset is the name of the associated character code set (may be optional).

By default, only a subset of supported locales are listed. To add other supported values to the list, you modify the \Data\Std\stdConnProps.xml file in the *<ProductDir>*\bin directory. For more information, refer to the Connector Configurator Express appendix in this guide.

If the connector has not been internationalized, the only valid value for this property is en_US. To determine whether a specific connector has been globalized, refer to the user guide for that adapter.

The default value is en_US.

LogAtInterchangeEnd

The LogAtInterchangeEnd property specifies whether to log errors to the log destination of the integration broker.

Logging to the log destination also turns on e-mail notification, which generates e-mail messages for the recipient specified as the value of MESSAGE_RECIPIENT in the InterchangeSystem.cfg file when errors or fatal errors occur. For example, when a connector loses its connection to the application, if the value of LogAtInterChangeEnd is true, an e-mail message is sent to the specified message recipient.

This property is valid only if the value of the RespositoryDirectory property is set to <REMOTE> (the value of BrokerType is ICS).

The default value is false.

MaxEventCapacity

The MaxEventCapacity property specifies maximum number of events in the controller buffer. This property is used by the flow control feature.

This property is valid only if the value of the RespositoryDirectory property is set to <REMOTE> (the value of BrokerType is ICS).

The value can be a positive integer between 1 and 2147483647.

The default value is 2147483647.

MessageFileName

The MessageFileName property specifies the name of the connector message file. The standard location for the message file is \connectors\messages in the product directory. Specify the message file name in an absolute path if the message file is not located in the standard location.

If a connector message file does not exist, the connector uses InterchangeSystem.txt as the message file. This file is located in the product directory.

Note: To determine whether a connector has its own message file, see the individual adapter user guide.

The default value is InterchangeSystem.txt.

MonitorQueue

The MonitorQueue property specifies the logical queue that the connector uses to monitor duplicate events.

It is valid only if the value of the DeliveryTransport property is JMS and the value of the DuplicateEventElimination is true.

The default value is <CONNECTORNAME>/MONITORQUEUE

OADAutoRestartAgent

the OADAutoRestartAgent property specifies whether the connector uses the automatic and remote restart feature. This feature uses the WebSphere MQ-triggered Object Activation Daemon (OAD) to restart the connector after an abnormal shutdown, or to start a remote connector from System Monitor.

This property must be set to true to enable the automatic and remote restart feature. For information on how to configure the WebSphere MQ-triggered OAD feature. see the *WebSphere Business Integration Server Express Installation Guide for Windows, for Linux* or *for i5/OS*.

This property is valid only if the value of the RepositoryDirectory property is set to <REMOTE> (the value of BrokerType is ICS).

The default value is false.

OADMaxNumRetry

The OADMaxNumRetry property specifies the maximum number of times that the WebSphere MQ-triggered Object Activation Daemon (OAD) automatically attempts to restart the connector after an abnormal shutdown. The OADAutoRestartAgent property must be set to true for this property to take effect.

This property is valid only if the value of the RepositoryDirectory property is set to <REMOTE> (the value of BrokerType is ICS).

The default value is 1000.

OADRetryTimeInterval

The OADRetryTimeInterval property specifies the number of minutes in the retry-time interval for the WebSphere MQ-triggered Object Activation Daemon (OAD). If the connector agent does not restart within this retry-time interval, the connector controller asks the OAD to restart the connector agent again. The OAD repeats this retry process as many times as specified by the OADMaxNumRetry property. The OADAutoRestartAgent property must be set to `true` for this property to take effect.

This property is valid only if the value of the RespositoryDirectory property is set to <REMOTE> (the value of BrokerType is ICS).

The default value is `10`.

PollEndTime

The PollEndTime property specifies the time to stop polling the event queue. The format is *HH:MM*, where *HH* is 0 through 23 hours, and *MM* represents 0 through 59 minutes.

You must provide a valid value for this property. The default value is `HH:MM` without a value, and it must be changed.

If the adapter runtime detects:
- PollStartTime set and PollEndTime not set, or
- PollEndTime set and PollStartTime not set

it will poll using the value configured for the PollFrequency property.

PollFrequency

The PollFrequency property specifies the amount of time (in milliseconds) between the end of one polling action and the start of the next polling action. This is not the interval between polling actions. Rather, the logic is as follows:
- Poll to obtain the number of objects specified by the value of the PollQuantity property.
- Process these objects. For some connectors, this may be partly done on separate threads, which execute asynchronously to the next polling action.
- Delay for the interval specified by the PollFrequency property.
- Repeat the cycle.

The following values are valid for this property:
- The number of milliseconds between polling actions (a positive integer).
- The word `no`, which causes the connector not to poll. Enter the word in lowercase.
- The word `key`, which causes the connector to poll only when you type the letter `p` in the connector Command Prompt window. Enter the word in lowercase.

The default is `10000`.

Important: Some connectors have restrictions on the use of this property. Where they exist, these restrictions are documented in the chapter on installing and configuring the adapter.

PollQuantity

The PollQuantity property designates the number of items from the application that the connector polls for. If the adapter has a connector-specific property for setting the poll quantity, the value set in the connector-specific property overrides the standard property value.

This property is valid only if the value of the `DeliveryTransport` property is JMS, and the `ContainerManagedEvents` property has a value.

An e-mail message is also considered an event. The connector actions are as follows when it is polled for e-mail.

- When it is polled once, the connector detects the body of the message, which it reads as an attachment. Since no data handler was specified for this mime type, it will then ignore the message.
- The connector processes the first BO attachment. The data handler is available for this MIME type, so it sends the business object to Visual Test Connector.
- When it is polled for the second time, the connector processes the second BO attachment. The data handler is available for this MIME type, so it sends the business object to Visual Test Connector.
- Once it is accepted, the third BO attachment should be transmitted.

PollStartTime

The PollStartTime property specifies the time to start polling the event queue. The format is *HH:MM*, where *HH* is 0 through 23 hours, and *MM* represents 0 through 59 minutes.

You must provide a valid value for this property. The default value is `HH:MM` without a value, and it must be changed.

If the adapter runtime detects:

- PollStartTime set and PollEndTime not set, or
- PollEndTime set and PollStartTime not set

it will poll using the value configured for the PollFrequency property.

RepositoryDirectory

The RepositoryDirectory property is the location of the repository from which the connector reads the XML schema documents that store the metadata for business object definitions.

If the integration broker is ICS, this value must be set to set to <REMOTE> because the connector obtains this information from the InterChange Server Express repository.

When the integration broker is a WebSphere message broker or WAS, this value is set to *<ProductDir>*\repository by default. However, it may be set to any valid directory name.

RequestQueue

The RequestQueue property specifies the queue that is used by the integration broker to send business objects to the connector.

This property is valid only if the value of the DeliveryTransport property is JMS.

The default value is *<CONNECTORNAME>*/REQUESTQUEUE.

ResponseQueue

The ResponseQueue property specifies the JMS response queue, which delivers a response message from the connector framework to the integration broker. When the integration broker is InterChange Server Express (ICS), the server sends the request and waits for a response message in the JMS response queue.

This property is valid only if the value of the DeliveryTransport property is JMS.

The default value is *<CONNECTORNAME>*/RESPONSEQUEUE.

RestartRetryCount

The RestartRetryCount property specifies the number of times the connector attempts to restart itself. When this property is used for a connector that is connected in parallel, it specifies the number of times the master connector application-specific component attempts to restart the client connector application-specific component.

The default value is 3.

RestartRetryInterval

The RestartRetryInterval property specifies the interval in minutes at which the connector attempts to restart itself. When this property is used for a connector that is linked in parallel, it specifies the interval at which the master connector application-specific component attempts to restart the client connector application-specific component.

Possible values for the property range from 1 through 2147483647.

The default value is 1.

RHF2MessageDomain

The RHF2MessageDomain property allows you to configure the value of the field domain name in the JMS header. When data is sent to a WebSphere message broker over JMS transport, the adapter framework writes JMS header information, with a domain name and a fixed value of mrm. A configurable domain name lets you track how the WebSphere message broker processes the message data.

This is an example header:

```
<mcd><Msd>mrm</Msd><Set>3</Set><Type>
Retek_POPhyDesc</Type><Fmt>CwXML</Fmt></mcd>
```

This property is not valid if the value of BrokerType is ICS. Also, it is valid only if the value of the DeliveryTransport property is JMS, and the value of the WireFormat property is CwXML.

Possible values are mrm and xml. The default value is mrm.

SourceQueue

The SourceQueue property designates the JMS source queue for the connector framework in support of guaranteed event delivery for JMS-enabled connectors that use a JMS event store. For further information, see "ContainerManagedEvents" on page 99.

This property is valid only if the value of DeliveryTransport is JMS, and a value for ContainerManagedEvents is specified.

The default value is `<CONNECTORNAME>`/SOURCEQUEUE.

SynchronousRequestQueue

The SynchronousRequestQueue property delivers request messages that require a synchronous response from the connector framework to the broker. This queue is necessary only if the connector uses synchronous execution. With synchronous execution, the connector framework sends a message to the synchronous request queue and waits for a response from the broker on the synchronous response queue. The response message sent to the connector has a correlation ID that matches the ID of the original message.

This property is valid only if the value of DeliveryTransport is JMS.

The default value is `<CONNECTORNAME>`/SYNCHRONOUSREQUESTQUEUE

SynchronousRequestTimeout

The SynchronousRequestTimeout property specifies the time in milliseconds that the connector waits for a response to a synchronous request. If the response is not received within the specified time, the connector moves the original synchronous request message (and error message) to the fault queue.

This property is valid only if the value of DeliveryTransport is JMS.

The default value is `0`.

SynchronousResponseQueue

The SynchronousResponseQueue property delivers response messages in reply to a synchronous request from the broker to the connector framework. This queue is necessary only if the connector uses synchronous execution.

This property is valid only if the value of DeliveryTransport is JMS.

The default is `<CONNECTORNAME>`/SYNCHRONOUSRESPONSEQUEUE

TivoliMonitorTransactionPerformance

The TivoliMonitorTransactionPerformance property specifies whether IBM Tivoli Monitoring for Transaction Performance (ITMTP) is invoked at run time.

The default value is `false`.

WireFormat

The WireFormat property specifies the message format on the transport:
- If the value of the RepositoryDirectory property is a local directory, the value is `CwXML`.

- If the value of the RepositoryDirectory property is a remote directory, the value is `CwBO`.

Appendix B. Connector Configurator Express

This appendix describes how to use Connector Configurator Express to set configuration property values for your adapter.

You use Connector Configurator Express to:
* Create a connector-specific property template for configuring your connector
* Create a configuration file
* Set properties in a configuration file

The topics covered in this appendix are:
* "Overview of Connector Configurator Express"
* "Creating a connector-specific property template" on page 113
* "Creating a new configuration file" on page 115
* "Setting the configuration file properties" on page 118

Overview of Connector Configurator Express

Connector Configurator Express allows you to configure the connector component of your adapter for use with the InterChange Server Express integration broker.

You use Connector Configurator Express to:
* Create a **connector-specific property template** for configuring your connector.
* Create a **connector configuration file**; you must create one configuration file for each connector you install.
* Set properties in a configuration file.
  You may need to modify the default values that are set for properties in the connector templates. You must also designate supported business object definitions and, with InterChange Server Express, maps for use with collaborations as well as specify messaging, logging and tracing, and data handler parameters, as required.

Connector configuration properties include both standard configuration properties (the properties that all connectors have) and connector-specific properties (properties that are needed by the connector for a specific application or technology).

Because **standard properties** are used by all connectors, you do not need to define those properties from scratch; Connector Configurator Express incorporates them into your configuration file as soon as you create the file. However, you do need to set the value of each standard property in Connector Configurator Express.

The range of standard properties may not be the same for all brokers and all configurations. Some properties are available only if other properties are given a specific value. The Standard Properties window in Connector Configurator Express will show the properties available for your particular configuration.

For **connector-specific properties**, however, you need first to define the properties and then set their values. You do this by creating a connector-specific property template for your particular adapter. There may already be a template set up in

your system, in which case, you simply use that. If not, follow the steps in "Creating a new template" on page 113 to set up a new one.

Running connectors on Linux

Connector Configurator Express runs only in a Windows environment. If you are running the connector in a Linux environment, use Connector Configurator Express in Windows to modify the configuration file and then copy the file to your Linux environment.

Some properties in the Connector Configurator Express use directory paths, which default to the Windows convention for directory paths. If you use the configuration file in a Linux environment, revise the directory paths to match the Linux convention for these paths. Select the target operating system in the toolbar drop-list so that the correct operating system rules are used for extended validation.

Starting Connector Configurator Express

You can start and run Connector Configurator Express in either of two modes:
- Independently, in stand-alone mode
- From System Manager

Running Configurator in stand-alone mode

You can run Connector Configurator Express without running System Manager and work with connector configuration files, irrespective of your broker.

To do so:
- **Start>All Programs,** click **IBM WebSphere Business Integration Express>Toolset Express>Development>Connector Configurator Express.**
- Select **File>New>Connector Configuration**.

You may choose to run Connector Configurator Express independently to generate the file, and then connect to System Manager to save it in a System Manager project (see "Completing a configuration file" on page 118.)

Running Configurator from System Manager

You can run Connector Configurator Express from System Manager.

To run Connector Configurator Express:
1. Open the System Manager.
2. In the System Manager window, expand the **Integration Component Libraries** icon and highlight **Connectors**.
3. From the System Manager menu bar, click **Tools>Connector Configurator Express**. The Connector Configurator Express window opens and displays a **New Connector** dialog box.
4. When you click the pull-down menu next to **System Connectivity Integration Broker**, you can select ICS.

To edit an existing configuration file:

- In the System Manager window, select any of the configuration files listed in the Connector folder and right-click on it. Connector Configurator Express opens and displays the configuration file with the integration broker type and file name at the top.
- From Connector Configurator Express, select **File>Open**. Select the name of the connector configuration file from a project or from the directory in which it is stored.
- Click the Standard Properties tab to see which properties are included in this configuration file.

Creating a connector-specific property template

To create a configuration file for your connector, you need a connector-specific property template as well as the system-supplied standard properties.

You can create a brand-new template for the connector-specific properties of your connector, or you can use an existing connector definition as the template.
- To create a new template, see "Creating a new template" on page 113.
- To use an existing file, simply modify an existing template and save it under the new name. You can find existing templates in your \ProductDir\bin\Data\App directory.

Creating a new template

This section describes how you create properties in the template, define general characteristics and values for those properties, and specify any dependencies between the properties. Then you save the template and use it as the base for creating a new connector configuration file.

To create a template in Connector Configurator Express:
1. Click **File>New>Connector-Specific Property Template**.
2. The **Connector-Specific Property Template** dialog box appears.
   - Enter a name for the new template in the **Name** field below **Input a New Template Name.** You will see this name again when you open the dialog box for creating a new configuration file from a template.
   - To see the connector-specific property definitions in any template, select that template's name in the **Template Name** display. A list of the property definitions contained in that template appears in the **Template Preview** display.
3. You can use an existing template whose property definitions are similar to those required by your connector as a starting point for your template. If you do not see any template that displays the connector-specific properties used by your connector, you will need to create one.
   - If you are planning to modify an existing template, select the name of the template from the list in the **Template Name** table below **Select the Existing Template to Modify: Find Template.**
   - This table displays the names of all currently available templates. You can also search for a template.

Specifying general characteristics

When you click **Next** to select a template, the **Properties - Connector-Specific Property Template** dialog box appears. The dialog box has tabs for General characteristics of the defined properties and for Value restrictions. The General display has the following fields:

- **General:**
  Property Type
  Property Subtype
  Updated Method
  Description
- **Flags**
  Standard flags
- **Custom Flag**
  Flag

The **Property Subtype** can be selected when **Property Type** is a String. It is an optional value which provides syntax checking when you save the configuration file. The default is a blank space, and means that the property has not been subtyped.

After you have made selections for the general characteristics of the property, click the **Value** tab.

Specifying values

The **Value** tab enables you to set the maximum length, the maximum multiple values, a default value, or a value range for the property. It also allows editable values. To do so:

1. Click the **Value** tab. The display panel for Value replaces the display panel for General.
2. Select the name of the property in the **Edit properties** display.
3. In the fields for **Max Length** and **Max Multiple Values**, enter your values.

To create a new property value:

1. Right-click on the square to the left of the Value column heading.
2. From the pop-up menu, select **Add** to display the Property Value dialog box. Depending on the property type, the dialog box allows you to enter either a value, or both a value and a range.
3. Enter the new property value and click OK. The value appears in the **Value** panel on the right.

The **Value** panel displays a table with three columns:

The **Value** column shows the value that you entered in the **Property Value** dialog box, and any previous values that you created.

The **Default Value** column allows you to designate any of the values as the default.

The **Value Range** shows the range that you entered in the **Property Value** dialog box.

After a value has been created and appears in the grid, it can be edited from within the table display.

To make a change in an existing value in the table, select an entire row by clicking on the row number. Then right-click in the **Value** field and click **Edit Value**.

Setting dependencies

When you have made your changes to the **General** and **Value** tabs, click **Next**. The **Dependencies - Connector-Specific Property Template** dialog box appears.

A dependent property is a property that is included in the template and used in the configuration file *only if* the value of another property meets a specific condition. For example, `PollQuantity` appears in the template only if JMS is the transport mechanism and `DuplicateEventElimination` is set to `True`.
To designate a property as dependent and to set the condition upon which it depends, do this:

1. In the **Available Properties** display, select the property that will be made dependent.
2. In the **Select Property** field, use the drop-down menu to select the property that will hold the conditional value.
3. In the **Condition Operator** field, select one of the following:

   == (equal to)

   != (not equal to)

   > (greater than)

   < (less than)

   >= (greater than or equal to)

   <=(less than or equal to)
4. In the **Conditional Value** field, enter the value that is required in order for the dependent property to be included in the template.
5. With the dependent property highlighted in the **Available Properties** display, click an arrow to move it to the **Dependent Property** display.
6. Click **Finish**. Connector Configurator Express stores the information you have entered as an XML document, under `\data\app` in the `\bin` directory where you have installed Connector Configurator Express.

Setting pathnames

Some general rules for setting pathnames are:

- The maximum length of a filename in Windows and Linux is 255 characters.
- In Windows, the absolute pathname must follow the format [Drive:][Directory]\filename: for example, C:\WebSphereAdapters\bin\Data\Std\StdConnProps.xml
  In Linux the first character should be /.
- Queue names may not have leading or embedded spaces.

Creating a new configuration file

When you create a new configuration file, you must name it and select an integration broker.

You also select an operating system for extended validation on the file. The toolbar has a droplist called **Target System** that allows you to select the target operating system for extended validation of the properties. The available options are: Windows, Linux, and i5/OS, Other (if not Windows or Linux), and None-no extended validation (switches off extended validation). The default on startup is Windows.

To start Connector Configurator Express:

- In the System Manager window, select **Connector Configurator Express** from the **Tools** menu. Connector Configurator Express opens.
- In stand-alone mode, launch Connector Configurator Express.

To set the operating system for extended validation of the configuration file:
- Pull down the **Target System:** droplist on the menu bar.
- Select the operating system you are running on.

Then select **File>New>Connector Configuration**. In the New Connector window, enter the name of the new connector.

You also need to select an integration broker. The broker you select determines the properties that will appear in the configuration file. To select a broker:
- In the **Integration Broker** field, select ICS.
- Complete the remaining fields in the **New Connector** window, as described later in this chapter.

Creating a configuration file from a connector-specific template

Once a connector-specific template has been created, you can use it to create a configuration file:

1. Set the operating system for extended validation of the configuration file using the **Target System:** droplist on the menu bar (see "Creating a new configuration file" above).
2. Click **File>New>Connector Configuration**.
3. The **New Connector** dialog box appears, with the following fields:
   - **Name**

     Enter the name of the connector. Names are case-sensitive. The name you enter must be unique, and must be consistent with the file name for a connector that is installed on the system.

     Important: Connector Configurator Express does not check the spelling of the name that you enter. You must ensure that the name is correct.
   - **System Connectivity**

     Click ICS.
   - **Select Connector-Specific Property Template**

     Type the name of the template that has been designed for your connector. The available templates are shown in the **Template Name** display. When you select a name in the Template Name display, the **Property Template Preview** display shows the connector-specific properties that have been defined in that template.

     Select the template you want to use and click **OK**.
4. A configuration screen appears for the connector that you are configuring. The title bar shows the integration broker and connector name. You can fill in all the field values to complete the definition now, or you can save the file and complete the fields later.
5. To save the file, click **File>Save>To File** or **File>Save>To Project**. To save to a project, System Manager must be running. If you save as a file, the **Save File Connector** dialog box appears. Choose *.cfg as the file type, verify in the File Name field that the name is spelled correctly and has the correct case, navigate

to the directory where you want to locate the file, and click **Save**. The status display in the message panel of Connector Configurator Express indicates that the configuration file was successfully created.

> **Important:** The directory path and name that you establish here must match the connector configuration file path and name that you supply in the startup file for the connector.

6. To complete the connector definition, enter values in the fields for each of the tabs of the Connector Configurator Express window, as described later in this chapter.

Using an existing file

You may have an existing file available in one or more of the following formats:

- A connector definition file.This is a text file that lists properties and applicable default values for a specific connector. Some connectors include such a file in a \repository directory in their delivery package (the file typically has the extension .txt; for example, CN_JMS.txt for the JMS connector).
- An ICS repository file. Definitions used in a previous ICS implementation of the connector may be available to you in a repository file that was used in the configuration of that connector. Such a file typically has the extension .in or .out.
- A previous configuration file for the connector.
  Such a file typically has the extension *.cfg.

Although any of these file sources may contain most or all of the connector-specific properties for your connector, the connector configuration file will not be complete until you have opened the file and set properties, as described later in this chapter.

To use an existing file to configure a connector, you must open the file in Connector Configurator Express, revise the configuration, and then resave the file.

Follow these steps to open a *.txt, *.cfg, or *.in file from a directory:

1. In Connector Configurator Express, click **File>Open>From File**.
2. In the **Open File Connector** dialog box, select one of the following file types to see the available files:
   - Configuration (*.cfg)
   - ICS Repository (*.in, *.out)

     Choose this option if a repository file was used to configure the connector in an ICS environment. A repository file may include multiple connector definitions, all of which will appear when you open the file.
   - All files (*.*)

     Choose this option if a *.txt file was delivered in the adapter package for the connector, or if a definition file is available under another extension.
3. In the directory display, navigate to the appropriate connector definition file, select it, and click **Open**.

Follow these steps to open a connector configuration from a System Manager project:

1. Start System Manager. A configuration can be opened from or saved to System Manager only if System Manager has been started.
2. Start Connector Configurator Express.

3. Click **File>Open>From Project**.

Completing a configuration file

When you open a configuration file or a connector from a project, the Connector Configurator Express window displays the configuration screen, with the current attributes and values.

The title of the configuration screen displays the integration broker and connector name as specified in the file. Make sure you have the correct broker. If not, change the broker value before you configure the connector. To do so:

1. Under the **Standard Properties** tab, select the value field for the BrokerType property. In the drop-down menu, select the value ICS.

2. The Standard Properties tab will display the connector properties associated with the selected broker. The table shows **Property name**, **Value**, **Type**, **Subtype** (if the Type is a string), **Description**, and **Update Method**.

3. You can save the file now or complete the remaining configuration fields, as described in "Specifying supported business object definitions" on page 121..

4. When you have finished your configuration, click **File>Save>To Project** or **File>Save>To File**.

   If you are saving to file, select *.cfg as the extension, select the correct location for the file and click **Save**.

   If multiple connector configurations are open, click **Save All to File** to save all of the configurations to file, or click **Save All to Project** to save all connector configurations to a System Manager project.

   Before you created the configuration file, you used the **Target System** droplist that allows you to select the target operating system for extended validation of the properties.

   Before it saves the file, Connector Configurator Express checks that values have been set for all required standard properties. If a required standard property is missing a value, Connector Configurator Express displays a message that the validation failed. You must supply a value for the property in order to save the configuration file.

   If you have elected to use the extended validation feature by selecting a value of Windows, Linux, and i5/OS, or Other from the **Target System** droplist, the system will validate the property subtype s well as the type, and it displays a warning message if the validation fails.

Setting the configuration file properties

When you create and name a new connector configuration file, or when you open an existing connector configuration file, Connector Configurator Express displays a configuration screen with tabs for the categories of required configuration values.

Connector Configurator Express requires values for properties in these categories for connectors running on all brokers:
- Standard Properties
- Connector-specific Properties
- Supported Business Objects
- Trace/Log File values
- Data Handler (applicable for connectors that use JMS messaging with guaranteed event delivery)

Note: For connectors that use JMS messaging, an additional category may display, for configuration of data handlers that convert the data to business objects.

For connectors running on InterChange Server Express, values for these properties are also required:

- Associated Maps
- Security

Important: Connector Configurator Express accepts property values in either English or non-English character sets. However, the names of both standard and connector-specific properties, and the names of supported business objects, must use the English character set only.

Standard properties differ from connector-specific properties as follows:

- Standard properties of a connector are shared by both the application-specific component of a connector and its broker component. All connectors have the same set of standard properties. These properties are described in Appendix A of each adapter guide. You can change some but not all of these values.
- Application-specific properties apply only to the application-specific component of a connector, that is, the component that interacts directly with the application. Each connector has application-specific properties that are unique to its application. Some of these properties provide default values and some do not; you can modify some of the default values. The installation and configuration chapters of each adapter guide describe the application-specific properties and the recommended values.

The fields for **Standard Properties** and **Connector-Specific Properties** are color-coded to show which are configurable:

- A field with a grey background indicates a standard property. You can change the value but cannot change the name or remove the property.
- A field with a white background indicates an application-specific property. These properties vary according to the specific needs of the application or connector. You can change the value and delete these properties.
- Value fields are configurable.
- The **Update Method** field is displayed for each property. It indicates whether a component or agent restart is necessary to activate changed values. You cannot configure this setting.

Setting standard connector properties

To change the value of a standard property:

1. Click in the field whose value you want to set.
2. Either enter a value, or select one from the drop-down menu if it appears.

   Note: If the property has a Type of String, it may have a subtype value in the Subtype column. This subtype is used for extended validation of the property.

3. After entering all the values for the standard properties, you can do one of the following:
   - To discard the changes, preserve the original values, and exit Connector Configurator Express, click **File>Exit** (or close the window), and click **No** when prompted to save changes.

- To enter values for other categories in Connector Configurator Express, select the tab for the category. The values you enter for **Standard Properties** (or any other category) are retained when you move to the next category. When you close the window, you are prompted to either save or discard the values that you entered in all the categories as a whole.

- To save the revised values, click **File>Exit** (or close the window) and click **Yes** when prompted to save changes. Alternatively, click **Save>To File** from either the File menu or the toolbar.

To get more information on a particular standard property, left-click the entry in the Description column for that property in the Standard Properties tabbed sheet. If you have Extended Help installed, an arrow button will appear on the right. When you click on the button, a Help window will open and display details of the standard property.

Note: If the hot button does not appear, no Extended Help was found for that property.

If installed, the Extended Help files are located in *<ProductDir>*\bin\Data\Std\Help*<RegionalSetting>*\.

Setting connector-specific configuration properties

For connector-specific configuration properties, you can add or change property names, configure values, delete a property, and encrypt a property. The default property length is 255 characters.

1. Right-click in the top left portion of the grid. A pop-up menu bar will appear. Click **Add** to add a property. To add a child property, right-click on the parent row number and click **Add child**.

2. Enter a value for the property or child property.

   Note: If the property has a Type of String, you can select a subtype from the Subtype droplist. This subtype is used for extended validation of the property.

3. To encrypt a property, select the **Encrypt** box.

4. To get more information on a particular property, left-click the entry in the Description column for that property. If you have Extended Help installed, a hot button will appear. When you click on the hot button, a Help window will open and display details of the standard property.

   Note: If the hot button does not appear, no Extended Help was found for that property.

5. Choose to save or discard changes, as described for "Setting standard connector properties" on page 119.

If the Extended Help files are installed and the AdapterHelpName property is blank, Connector Configurator Express will point to the adapter-specific Extended Help files located in *<ProductDir>*\bin\Data\App\Help*<RegionalSetting>*\. Otherwise, Connector Configurator Express will point to the adapter-specific Extended Help files located in *<ProductDir>*\bin\Data\App\Help*<AdapterHelpName>**<RegionalSetting>*\. See the AdapterHelpName property described in the Standard Properties appendix.

The Update Method displayed for each property indicates whether a component or agent restart is necessary to activate changed values.

Important: Changing a preset application-specific connector property name may cause a connector to fail. Certain property names may be needed by the connector to connect to an application or to run properly.

Encryption for connector properties

Application-specific properties can be encrypted by selecting the **Encrypt** check box in the Connector-specific Properties window. To decrypt a value, click to clear the **Encrypt** check box, enter the correct value in the **Verification** dialog box, and click **OK**. If the entered value is correct, the value is decrypted and displays.

The adapter user guide for each connector contains a list and description of each property and its default value.

If a property has multiple values, the **Encrypt** check box will appear for the first value of the property. When you select **Encrypt**, all values of the property will be encrypted. To decrypt multiple values of a property, click to clear the **Encrypt** check box for the first value of the property, and then enter the new value in the **Verification** dialog box. If the input value is a match, all multiple values will decrypt.

Update method

Refer to the descriptions of update methods found in the Standard Properties appendix, under "Standard connector properties overview"Appendix A, "Standard configuration properties for connectors," on page 89.

Specifying supported business object definitions

Use the **Supported Business Objects** tab in Connector Configurator Express to specify the business objects that the connector will use. You must specify both generic business objects and application-specific business objects, and you must specify associations for the maps between the business objects.

Note: Some connectors require that certain business objects be specified as supported in order to perform event notification or additional configuration (using meta-objects) with their applications.

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To specify that a business object definition is supported by the connector, or to change the support settings for an existing business object definition, click the **Supported Business Objects** tab and use the following fields.

Business object name: To designate that a business object definition is supported by the connector, with System Manager running:

1. Click an empty field in the **Business Object Name** list. A drop list displays, showing all the business object definitions that exist in the System Manager project.
2. Click on a business object to add it.
3. Set the **Agent Support** (described below) for the business object.
4. In the File menu of the Connector Configurator Express window, click **Save to Project**. The revised connector definition, including designated support for the added business object definition, is saved to an ICL (Integration Component Library) project in System Manager.

To delete a business object from the supported list:

1. To select a business object field, click the number to the left of the business object.

2. From the **Edit** menu of the Connector Configurator Express window, click **Delete Row**. The business object is removed from the list display.
3. From the **File** menu, click **Save to Project**.

Deleting a business object from the supported list changes the connector definition and makes the deleted business object unavailable for use in this implementation of this connector. It does not affect the connector code, nor does it remove the business object definition itself from System Manager.

Agent support: If a business object has Agent Support, the system will attempt to use that business object for delivering data to an application via the connector agent.

Typically, application-specific business objects for a connector are supported by that connector's agent, but generic business objects are not.

To indicate that the business object is supported by the connector agent, check the **Agent Support** box. The Connector Configurator Express window does not validate your Agent Support selections.

Maximum transaction level: The maximum transaction level for a connector is the highest transaction level that the connector supports.

For most connectors, Best Effort is the only possible choice.

You must restart the server for changes in transaction level to take effect.

Associated maps

Each connector supports a list of business object definitions and their associated maps that are currently active in InterChange Server Express. This list appears when you select the **Associated Maps** tab.

The list of business objects contains the application-specific business object which the agent supports and the corresponding generic object that the controller sends to the subscribing collaboration. The association of a map determines which map will be used to transform the application-specific business object to the generic business object or the generic business object to the application-specific business object.

If you are using maps that are uniquely defined for specific source and destination business objects, the maps will already be associated with their appropriate business objects when you open the display, and you will not need (or be able) to change them.

If more than one map is available for use by a supported business object, you will need to explicitly bind the business object with the map that it should use.

The **Associated Maps** tab displays the following fields:

- **Business Object Name**

  These are the business objects supported by this connector, as designated in the **Supported Business Objects** tab. If you designate additional business objects under the Supported Business Objects tab, they will be reflected in this list after you save the changes by choosing **Save to Project** from the **File** menu of the Connector Configurator Express window.

- **Associated Maps**

The display shows all the maps that have been installed to the system for use with the supported business objects of the connector. The source business object for each map is shown to the left of the map name, in the **Business Object Name** display.

- **Explicit Binding**

  In some cases, you may need to explicitly bind an associated map.

  Explicit binding is required only when more than one map exists for a particular supported business object. When InterChange Server Express boots, it tries to automatically bind a map to each supported business object for each connector. If more than one map takes as its input the same business object, the server attempts to locate and bind one map that is the superset of the others.

  If there is no map that is the superset of the others, the server will not be able to bind the business object to a single map, and you will need to set the binding explicitly.

  To explicitly bind a map:

  1. In the **Explicit** column, place a check in the check box for the map you want to bind.
  2. Select the map that you intend to associate with the business object.
  3. In the **File** menu of the Connector Configurator Express window, click **Save to Project**.
  4. Deploy the project to InterChange Server Express.
  5. Reboot the server for the changes to take effect.

Security

You can use the **Security** tab in Connector Configurator Express to set various privacy levels for a message. You can only use this feature when the DeliveryTransport property is set to JMS.

By default, Privacy is turned off. Check the **Privacy** box to enable it.

The **Keystore Target System Absolute Pathname** is:
- For Windows:
  `<ProductDir>\connectors\security\<connectorname>.jks`
- For Linux and i5/OS:
  `/ProductDir/connectors/security/<connectorname>.jks`

This path and file should be on the system where you plan to start the connector, that is, the target system.

You can use the Browse button at the right only if the target system is the one currently running. It is greyed out unless **Privacy** is enabled and the **Target System** in the menu bar is set to Windows.

The **Message Privacy Level** may be set as follows for the three messages categories (All Messages, All Administrative Messages, and All Business Object Messages):
- "": is the default; used when no privacy levels for a message category have been set.
- none: Not the same as the default: use this to deliberately set a privacy level of none for a message category.
- integrity
- privacy

- integrity_plus_privacy

The **Key Maintenance** feature lets you generate, import and export public keys for the server and adapter.

- When you select **Generate Keys**, the Generate Keys dialog box appears with the defaults for the keytool that will generate the keys.
- The keystore value defaults to the value you entered in **Keystore Target System Absolute Pathname** on the Security tab.
- When you select OK, the entries are validated, the key certificate is generated and the output is sent to the Connector Configurator Express log window.

Before you can import a certificate into the adapter keystore, you must export it from the server keystore. When you select **Export Adapter Public Key**, the Export Adapter Public Key dialog box appears.

- The export certificate defaults to the same value as the keystore, except that the file extension is <filename>.cer.

When you select **Import Server Public Key**, the Import Server Public Key dialog box appears.

- The import certificate defaults to *<ProductDir>*\bin\ics.cer (if the file exists on the system).
- The import Certificate Association should be the server name. If a server is registered, you can select it from the droplist.

The **Adapter Access Control** feature is enabled only when the value of DeliveryTransport is IDL. By default, the adapter logs in with the guest identity. If the **Use guest identity** box is not checked, the **Adapter Identity** and **Adapter Password** fields are enabled.

Setting trace/log file values

When you open a connector configuration file or a connector definition file, Connector Configurator Express uses the logging and tracing values of that file as default values. You can change those values in Connector Configurator Express.

To change the logging and tracing values:
1. Click the **Trace/Log Files** tab.
2. For either logging or tracing, you can choose to write messages to one or both of the following:
   - To console (STDOUT): Writes logging or tracing messages to the STDOUT display.

     Note: You can only use the STDOUT option from the **Trace/Log Files** tab for connectors running on the Windows platform.
   - To File: Writes logging or tracing messages to a file that you specify. To specify the file, click the directory button (ellipsis), navigate to the preferred location, provide a file name, and click **Save**. Logging or tracing message are written to the file and location that you specify.

     Note: Both logging and tracing files are simple text files. You can use the file extension that you prefer when you set their file names. For tracing files, however, it is advisable to use the extension .trace rather than .trc, to avoid confusion with other files that might reside on the system. For logging files, .log and .txt are typical file extensions.

Data handlers

The data handlers section is available for configuration only if you have designated a value of JMS for DeliveryTransport and a value of JMS for ContainerManagedEvents. Not all adapters make use of data handlers.

See the descriptions under `ContainerManagedEvents` in Appendix A, Standard Properties, for values to use for these properties.

Saving your configuration file

When you have finished configuring your connector, save the connector configuration file. Connector Configurator Express saves the file in the broker mode that you selected during configuration. The title bar of Connector Configurator Express always displays the broker mode that InterChange Server Express is currently using.

The file is saved as an XML document. You can save the XML document in three ways:
- From System Manager, as a file with a `*.con` extension in an Integration Component Library, or
- In a directory that you specify.
- In stand-alone mode, as a file with a `*.cfg` extension in a directory folder. By default, the file is saved to `\WebSphereAdapters\bin\Data\App`.

For details about using projects in System Manager, and for further information about deployment, see the System Implementation Guide.

Changing a configuration file

You can change the integration broker setting for an existing configuration file. This enables you to use the file as a template for creating a new configuration file, which can be used with a different broker.

Note: You will need to change other configuration properties as well as the broker mode property if you switch integration brokers.

To change your broker selection within an existing configuration file (optional):
- Open the existing configuration file in Connector Configurator Express.
- Select the **Standard Properties** tab.
- In the **BrokerType** field of the Standard Properties tab, select the value that is appropriate for your broker. When you change the current value, the available tabs and field selections in the properties window will immediately change, to show only those tabs and fields that pertain to the new broker you have selected.

Completing the configuration

After you have created a configuration file for a connector and modified it, make sure that the connector can locate the configuration file when the connector starts up.

To do so, open the startup file used for the connector, and verify that the location and file name used for the connector configuration file match exactly the name you have given the file and the directory or path where you have placed it.

Using Connector Configurator Express in a globalized environment

Connector Configurator Express is globalized and can handle character conversion between the configuration file and the integration broker. Connector Configurator Express uses native encoding. When it writes to the configuration file, it uses UTF-8 encoding.

Connector Configurator Express supports non-English characters in:
- All value fields
- Log file and trace file path (specified in the **Trace/Log files** tab)

The drop list for the CharacterEncoding and Locale standard configuration properties displays only a subset of supported values. To add other values to the drop list, you must manually modify the \Data\Std\stdConnProps.xml file in the product directory.

For example, to add the locale en_GB to the list of values for the Locale property, open the stdConnProps.xml file and add the line in boldface type below:

```
<Property name="Locale"
isRequired="true"
updateMethod="component restart">
                <ValidType>String</ValidType>
          <ValidValues>
                                <Value>ja_JP</Value>
                                <Value>ko_KR</Value>
                                <Value>zh_CN</Value>
                                <Value>zh_TW</Value>
                                <Value>fr_FR</Value>
                                <Value>de_DE</Value>
                                <Value>it_IT</Value>
                                <Value>es_ES</Value>
                                <Value>pt_BR</Value>
                                <Value>en_US</Value>
                                <Value>en_GB</Value>

                <DefaultValue>en_US</DefaultValue>
          </ValidValues>
      </Property>
```

Appendix C. About sample business objects and stored procedures

This chapter describes the sample business objects and stored procedures included with the WebSphere Business Integration Server Express Adapter for Oracle Applications. Use the samples as models for developing custom business objects for Oracle applications. The samples are based on the standard schema for Oracle 11i Applications.

Overview of stored procedures

When processing business object requests, the connector uses stored procedures to invoke APIs that operate on the data present in the interface tables to perform the required operations on the application base tables. These required operations are insert, update, and delete. A stored procedure is a schema object that encapsulates a set of operations that the connector performs on an object in the Oracle application database.

The connector calls stored procedures under the following circumstances:
* Before processing a business object, to perform preparatory operational processes
* After processing a business object, to perform post-operational processes
* To perform a set of operations on a business object instead of using a simple INSERT, UPDATE, RETRIEVE, or DELETE statement

Note: For event notification, the connector uses triggers on the application base tables to generate event business objects. Stored procedures are not used for event notification.

Included with the connector are sample business objects and wrapper stored procedures that demonstrate how to invoke concurrent programs and APIs using the connector's stored procedure functionality. Table 19 lists the sample business objects and their corresponding wrapper stored procedures.

Table 19. Sample business objects and wrapper stored procedures

Sample business objects	Wrapper stored procedure
BO_ORACLEAPPS_CUSTINTERFACE	CW_CUSTOMER_INTERFACE
BO_ORACLEAPPS_CUSTRETRIEVE	Not applicable. This object is based on views.
BO_ORACLEAPPS_ITEMINTERFACE	CW_ITEM_INTERFACE
BO_ORACLEAPPS_ITEMRETRIEVE	Not applicable. This object is based on views.
BO_ORACLEAPPS_ORDER	CW_PUBLIC_API_PROCESS_ORDER
BO_ORACLEAPPS_ORDERRETRIEVE	Not applicable. This object is based on views.

The sample wrapper stored procedures CW_CUSTOMER_INTERFACE and CW_ITEM_INTERFACE contain logic to call the concurrent program. The parameters required to run the concurrent program can be taken from the business object or can be found in the wrapper stored procedures. The sample stored procedures take their parameters from attributes in the business objects.

The sample business objects and wrapper stored procedures are located in Appendix D, "Business object and stored procedure samples," on page 131

Customer business object

In Oracle, some of the Receivables objects have been modified, and a new schema, `HZ`, has been added. Customer data is now stored in the `HZ` tables. Views such as `RA_CUSTOMERS` and `RA_ADDRESSES` are built on these `HZ` tables.

Customer and related business objects such as Address, Contacts, Sites, and Site_Usage can be maintained by using either the `HZ` tables or the Customer Interface. The sample business object `BO_ORACLEAPPS_CUSTINTERFACE` for Oracle uses the Customer Interface to maintain data in the application.

The Customer Interface includes the following five tables:

```
RA_CUSTOMER-INTERFACE

RA_CUSTOMER_PROFILES_INTERFACE
RA_CONTACT_PHONES_INTERFACE
RA_CUSTOMER_BANKS_INTERFACE
RA_CUST_PAY_METHOD_INTERFACE
```

The Customer business object is hierarchical. Customer details, addresses, and sites details are inserted into the `RA_CUSTOMER_INTERFACE` table. The details of profile, contact details, bank details, and payment methods are inserted into the `RA_CUSTOMER_PROFILES_INTERFACE`, `RA_CONTACT_PHONES_INTERFACE`, `RA_CUSTOMER_BANKS_INTERFACE`, and `RA_CUST_PAY_METHOD_INTERFACE` tables.

Once data has been inserted into the Customer Interface tables, the Customer Interface concurrent program must be run to import the customer data into the `HZ` tables. Three options are available for running the Customer Interface concurrent program:

- The application administrator can run the program manually.
- The application administrator can schedule the program to run at set intervals using the scheduling feature in Oracle.
- A wrapper stored procedure can be written to invoke the concurrent program each time data is inserted into the Customer Interface tables. The sample wrapper stored procedure `CW_CUSTOMER_INTERFACE` provides an example of this.

The Customer Interface concurrent program generates log and out files that detail the customers imported into the Oracle application. The log and out files also contain error messages generated in the event that the interface table data conflicts with the Receivables setup. Check your specific Oracle installation to determine the directory where the log and out files are written.

Note: Because the concurrent program is used to import data into the HZ tables, key values are not returned.

The Customer Interface allows only Create and Update operations. Create and Update operations are both performed using the Create verb. Delete is not supported through the Customer Interface. However, a logical delete can be performed by updating the customer status to "Inactive". Retrieve operations must use either the base tables or a view defined on the base tables. The sample business object `BO_ORACLEAPPS_CUSTRETRIEVE` supports Retrieve operations based on the interface tables.

Inventory item business object

The sample Item business object for the connector populates data directly into the `MTL_SYSTEM_ITEM` base table. The sample Item business object, which is hierarchical, uses the Item Interface tables. The following three tables must be populated in the Item Interface:

- `MTL_SYSTEM_ITEMS_INTERFACE`—holds information about Item
- `MTL_ITEM_REVISIONS_INTERFACE`—holds information required for revision control
- `MTL_ITEM_CATEGORIES_INTERFACE`—holds all the details of item categories

After data has been inserted into the Item Interface tables, the Item Interface concurrent program must be run to import the data into the application tables. Three options are available for running the Item Interface concurrent program:

- The application administrator can run the program manually.
- The application administrator can schedule the program to run at set intervals using the scheduling feature in Oracle.
- A wrapper stored procedure can be written to invoke the concurrent program each time data is inserted into the Item Interface tables. The sample wrapper stored procedure `CW_ITEM_INTERFACE` provides an example of this.

The interface table `MTL_INTERFACE_ERRORS` stores any error messages that are generated when the Item concurrent program runs. When an error occurs, the application administrator must correct the error and remove the error record from the `MTL_INTERFACE_ERRORS` table before restarting the concurrent program.

Note: Because the concurrent program is used to import data in to the HZ tables, key values are not returned.

The Item Interface tables support Create and Update operations only. Create and Update operations both use the Create verb. Retrieve operations must use either the base tables or a view defined on the base tables. The sample business object `Item_BO` supports Retrieve and Delete operations based on the interface tables. An Item can be deleted only if it is not used in any transactions. Otherwise, you must perform a logical delete by setting the status of the item to "Inactive".

Order business object

In the sample Order business object for the connector, data is populated into the following SO interface tables

- `so_headers_interface_all`
- `so_lines_interface_all`
- `so_line_details_interface`
- `so_price_adjustments_interface`
- `so_sales_credits_interface`.

The user runs the Import Order concurrent program to import the orders into the application.

In Oracle, Sales orders can be imported using interface tables and Order APIs. Oracle provides the following interface tables for order:

- `OE_ACTIONS_IFACE_ALL`
- `OE_CREDITS_IFACE_ALL`

- OE_HEADERS_IFACE_ALL
- OE_LINES_IFACE_ALL
- OE_PRICE_ADJS_IFACE_ALL
- OE_PRICE_ATTS_IFACE_ALL

The sample Order business object is designed to use the Oracle API. Oracle provides an API for each order record in the OE_Order_Pub package. These APIs cannot be accessed directly because they take parameters of type PL/SQL or RECORD. Therefore, a wrapper API is required to provide access. When data is inserted into the interface table, the wrapper API is called to take data from these tables and put it into the base tables. The sample stored procedure CW_PUBLIC_API_PROCESS_ORDER provides an example of using a wrapper API.

The Order business object for Oracle uses the same interface tables as Sales except Order does not use OE_ACTIONS_IFACE_ALL.

Additionally, the table CW_OE_API_ERRORS stores error messages that are generated during the API call. When an error occurs, the application administrator must correct the error and remove the error record from the CW_OE_API_ERRORS table before restarting the concurrent program. Here is the script for creating this error table:

```
DROP TABLE CW_Oe_Api_Errors ;

CREATE TABLE CW_Oe_Api_Errors (
  ERROR_MESSAGE  VARCHAR2 (4000))
```

Procedure CW_PUBLIC_API_PROCESS_ORDER contains the logic for order processing and calls to the API routines. Calls to this procedure migrate data from the interface tables to the Oracle application base tables. When an error occurs, the application administrator must correct the error and remove the error record from the CW_OE_API_ERRORS table before restarting the concurrent program. The procedure takes the Orig_Sys_Document_Ref attribute value as its order number parameter. This attribute is present in all objects related to order. You must ensure that the Orig_Sys_Document_Ref attribute is populated with the same value across all objects in an order. This can be enforced through foreign key specifications or can be defined in the map (relevant only when using InterChange Server Express as the integration broker).

The Order business object for Oracle, supports Create, Update, and Delete operations. Retrieve operations must use either the base tables or a view defined on the base tables. The sample business object BO_ORACLEAPPS_ORDERRETRIEVE supports Retrieve operations based on the interface tables.

Appendix D. Business object and stored procedure samples

This appendix details some sample business objects for the Oracle Applications connector, as follows:

- BO_ORACLEAPPS_CUSTINTERFACE
- BO_ORACLEAPPS_CUSTRETRIEVE
- BO_ORACLEAPPS_ITEMINTERFACE
- BO_ORACLEAPPS_ITEMRETRIEVE
- BO_ORACLEAPPS_ORDER
- BO_ORACLEAPPS_ORDERRETRIEVE

This appendix also contains sample stored procedures, as follows:

- CW_CUSTOMER_INTERFACE
- CW_ITEM_INTERFACE
- CW_PUBLIC_API_PROCESS_ORDER

BO_ORACLEAPPS_CUST INTERFACE

Business object used for testing:

```
[ReposCopy]
Version = 3.1.0
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Customer_Profile_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=ra_customer_profiles_interface

    [Attribute]
    Name = customer_profile_class_name
    Type = String
    Cardinality = 1
    MaxLength = 255
    IsKey = true
    IsForeignKey = false
    IsRequired = false
    AppSpecificInfo = CN=customer_profile_class_name:::::
    IsRequiredServerBound = false
    [End]
    [Attribute]
    Name = orig_system_customer_ref
    Type = String
    Cardinality = 1
    MaxLength = 255
    IsKey = false
    IsForeignKey = false
    IsRequired = true
    AppSpecificInfo = CN=orig_system_customer_ref:FK=ra_customers_interface.orig_system_customer_ref::::
    IsRequiredServerBound = false
    [End]
    [Attribute]
    Name = last_updated_by
    Type = Integer
    Cardinality = 1
    MaxLength = 1
    IsKey = false
    IsForeignKey = false
    IsRequired = true
    AppSpecificInfo = CN=last_updated_by:::::
    IsRequiredServerBound = false
    [End]
    [Attribute]
    Name = last_update_date
    Type = Date
    Cardinality = 1
    MaxLength = 1
    IsKey = false
    IsForeignKey = false
    IsRequired = true
```

```
                                AppSpecificInfo = CN=last_update_date:::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = created_by
                                Type = Integer
                                Cardinality = 1
                                MaxLength = 1
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = true
                                AppSpecificInfo = CN=created_by:::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = creation_date
                                Type = Date
                                Cardinality = 1
                                MaxLength = 1
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = true
                                AppSpecificInfo = CN=creation_date:::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = orig_system_address_ref
                                Type = String
                                Cardinality = 1
                                MaxLength = 255
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=orig_system_address_ref:::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = status
                                Type = String
                                Cardinality = 1
                                MaxLength = 255
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=status:::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = collector_name
                                Type = String
                                Cardinality = 1
                                MaxLength = 255
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=colletctor_name
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = credit_checking
                                Type = String
                                Cardinality = 1
                                MaxLength = 255
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=credit_checking
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = tolerance
                                Type = String
                                Cardinality = 1
                                MaxLength = 255
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=tolerance:::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = discount_terms
                                Type = String
                                Cardinality = 1
                                MaxLength = 255
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
```

```
AppSpecificInfo = CN=discount_terms:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = dunning_letters
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=dunning_letters:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = interest_charges
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=interest_charges:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = statements
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=statements:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = credit_balance_statements
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = Cn=credit_balance_statements:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = credit_hold
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=credit_hold:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = auto_rec_incl_disputed_flag
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=auto_rec_incl_disputed_flag:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = cons_inv_flag
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=cons_inv_flag:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = cons_inv_type
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
```

```
                         AppSpecificInfo = CN=cons_inv_type:::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = standard_term_name
                         Type = String
                         Cardinality = 1
                         MaxLength = 255
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=standard_term_name:::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = override_terms
                         Type = String
                         Cardinality = 1
                         MaxLength = 255
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=override_terms:::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = tax_printing_option
                         Type = String
                         Cardinality = 1
                         MaxLength = 255
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=tax_printing_option:::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = charge_on_finance_charge_flag
                         Type = String
                         Cardinality = 1
                         MaxLength = 255
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=charge_on_finance_charge_flag:::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = grouping_rule_name
                         Type = String
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=grouping_rule_name:::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = statement_cycle_name
                         Type = String
                         Cardinality = 1
                         MaxLength = 255
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=statement_cycle_name:::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = payment_grace_days
                         Type = String
                         Cardinality = 1
                         MaxLength = 255
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=payment_grace_days:::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = credit_rating
                         Type = String
                         Cardinality = 1
                         MaxLength = 255
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
```

```
                    AppSpecificInfo = CN=credit_rating:::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = risk_code
                    Type = String
                    Cardinality = 1
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=risk_code::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = account_status
                    Type = String
                    Cardinality = 1
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=account_status:::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = percent_collectable
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=percent_collectable:::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = insert_update_flag
                    Type = String
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = true
                    AppSpecificInfo = CN=insert_update_flag:::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = ObjectEventId
                    Type = String
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
                    [End]

                    [Verb]
                    Name = Create
                    [End]

                    [Verb]
                    Name = Delete
                    [End]

                    [Verb]
                    Name = Retrieve
                    [End]

                    [Verb]
                    Name = Update
                    [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Customer_Bank_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=ra_customer_banks_interface

                    [Attribute]
                    Name = orig_system_customer_ref
                    Type = String
                    Cardinality = 1
                    MaxLength = 255
                    IsKey = true
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=orig_system_customer_ref:FK=ra_customers_interface.orig_system_customer_ref
                    IsRequiredServerBound = false
```

```
[End]
[Attribute]
Name = bank_account_name
Type = String
Cardinality = 1
MaxLength = 80
IsKey = true
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=bank_account_name:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = primary_flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=primary_flag:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = orig_system_address_ref
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=orig_system_address_ref:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = start_date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=start_date:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = end_date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=end_date:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = attribute_category
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=attribute_category:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = attribute1
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=attribute1:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = last_update_date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=last_update_date:::::
IsRequiredServerBound = false
```

```
        [End]
        [Attribute]
        Name = last_updated_by
        Type = Integer
        Cardinality = 1
        MaxLength = 1
        IsKey = false
        IsForeignKey = false
        IsRequired = true
        AppSpecificInfo = CN=last_updated_by:::::
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = created_by
        Type = Integer
        Cardinality = 1
        MaxLength = 1
        IsKey = false
        IsForeignKey = false
        IsRequired = true
        AppSpecificInfo = CN=created_by:::::
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = creation_date
        Type = Date
        Cardinality = 1
        MaxLength = 1
        IsKey = false
        IsForeignKey = false
        IsRequired = true
        AppSpecificInfo = CN=creation_date
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = last_update_login
        Type = Integer
        Cardinality = 1
        MaxLength = 1
        IsKey = false
        IsForeignKey = false
        IsRequired = false
        AppSpecificInfo = CN=last_update_login:::::
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = org_id
        Type = Integer
        Cardinality = 1
        MaxLength = 1
        IsKey = false
        IsForeignKey = false
        IsRequired = false
        AppSpecificInfo = CN=org_id:::::
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = ObjectEventId
        Type = String
        MaxLength = 255
        IsKey = false
        IsForeignKey = false
        IsRequired = false
        IsRequiredServerBound = false
        [End]

        [Verb]
        Name = Create
        [End]

        [Verb]
        Name = Delete
        [End]

        [Verb]
        Name = Retrieve
        [End]

        [Verb]
        Name = Update
        [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Customer_Payment_Method_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=ra_cust_pay_method_interface

        [Attribute]
```

```
Name = orig_system_customer_ref
Type = String
Cardinality = 1
MaxLength = 255
IsKey = true
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=orig_system_customer_ref:FK=ra_customers_interface.orig_system_customer_ref
IsRequiredServerBound = false
[End]
[Attribute]
Name = payment_method_name
Type = String
Cardinality = 1
MaxLength = 30
IsKey = true
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=payment_method_name:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = primary_flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=primary_flag:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = orig_system_address_ref
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=orig_system_address_ref:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = start_date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=start_date:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = end_date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=end_date:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = attribute_category
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=attribute_category:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = attribute1
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=attribute1:::::
IsRequiredServerBound = false
[End]
[Attribute]
```

```
Name = last_update_date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=last_update_date:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = last_updated_by
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=last_updated_by:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = created_by
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=created_by:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = creation_date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=creation_date
IsRequiredServerBound = false
[End]
[Attribute]
Name = last_update_login
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=last_update_login:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = org_id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=org_id:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = ObjectEventId
Type = String
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
IsRequiredServerBound = false
[End]

[Verb]
Name = Create
[End]

[Verb]
Name = Delete
[End]

[Verb]
Name = Retrieve
[End]

[Verb]
```

```
            Name = Update
            [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Customer_Contact_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=RA_CONTACT_PHONES_INTERFACE

        [Attribute]
        Name = orig_system_customer_ref
        Type = String
        Cardinality = 1
        MaxLength = 255
        IsKey = true
        IsForeignKey = false
        IsRequired = false
        AppSpecificInfo = CN=orig_system_customer_ref::::
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = orig_system_address_ref
        Type = String
        Cardinality = 1
        MaxLength = 255
        IsKey = false
        IsForeignKey = false
        IsRequired = false
        AppSpecificInfo = CN=orig_system_address_ref:::::
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = orig_system_contact_ref
        Type = String
        Cardinality = 1
        MaxLength = 255
        IsKey = false
        IsForeignKey = false
        IsRequired = false
        AppSpecificInfo = CN=orig_system_contact_ref:::::
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = orig_system_telephone_ref
        Type = String
        Cardinality = 1
        MaxLength = 255
        IsKey = false
        IsForeignKey = false
        IsRequired = false
        AppSpecificInfo = CN=orig_system_telephone_ref:::::
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = contact_first_name
        Type = String
        Cardinality = 1
        MaxLength = 255
        IsKey = false
        IsForeignKey = false
        IsRequired = false
        AppSpecificInfo = CN=contact_first_name:::::
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = contact_last_name
        Type = String
        Cardinality = 1
        MaxLength = 255
        IsKey = false
        IsForeignKey = false
        IsRequired = false
        AppSpecificInfo = CN=contact_last_name:::::
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = contact_title
        Type = String
        Cardinality = 1
        MaxLength = 255
        IsKey = false
        IsForeignKey = false
        IsRequired = false
        AppSpecificInfo = CN=contact_title:::::
        IsRequiredServerBound = false
        [End]
        [Attribute]
        Name = salutation
        Type = String
```

```
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=salutation:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = contact_job_title
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=contact_job_title:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = contact_attribute_category
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=contact_attribute_category:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = contact_attribute1
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=contact_attribute1:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = email_address
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=email_address:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = last_update_date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=last_update_date:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = last_updated_by
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=last_updated_by:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = creation_date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=creation_date:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = created_by
Type = Integer
```

```
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = true
                    AppSpecificInfo = CN=created_by:::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = telephone
                    Type = String
                    Cardinality = 1
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=telephone:::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = telephone_type
                    Type = String
                    Cardinality = 1
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=telephone_type
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = telephone_extension
                    Type = String
                    Cardinality = 1
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=telephone_extension
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = telephone_area_code
                    Type = String
                    Cardinality = 1
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = telephone_area_code
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = ObjectEventId
                    Type = String
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
                    [End]

                    [Verb]
                    Name = Create
                    [End]

                    [Verb]
                    Name = Delete
                    [End]

                    [Verb]
                    Name = Retrieve
                    [End]

                    [Verb]
                    Name = Update
                    [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Customer_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=ra_customers_interface

                    [Attribute]
                    Name = AfterCreateSP
                    Type = String
                    Cardinality = 1
                    MaxLength = 0
```

```
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = SPN=CW_Customer_Interface;IP=Userid:Responsibility_Id:Application_Id
IsRequiredServerBound = false
[End]
[Attribute]
Name = Userid
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
IsRequiredServerBound = false
[End]
[Attribute]
Name = Responsibility_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
IsRequiredServerBound = false
[End]
[Attribute]
Name = Application_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
IsRequiredServerBound = false
[End]
[Attribute]
Name = AfterUpdateSP
Type = String
Cardinality = 1
MaxLength = 0
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = SPN=CW_Customer_Interface;IP=Userid:Responsibility_Id:Application_Id
IsRequiredServerBound = false
[End]
[Attribute]
Name = customer_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
IsRequiredServerBound = false
[End]
[Attribute]
Name = customer_name
Type = String
Cardinality = 1
MaxLength = 50
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=customer_name:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = customer_class_code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=customer_class_code
IsRequiredServerBound = false
[End]
[Attribute]
Name = customer_number
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=customer_number:::::
```

```
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = orig_system_customer_ref
                            Type = String
                            Cardinality = 1
                            MaxLength = 240
                            IsKey = true
                            IsForeignKey = false
                            IsRequired = true
                            AppSpecificInfo = CN=orig_system_customer_ref:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = customer_status
                            Type = String
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = true
                            AppSpecificInfo = CN=customer_status:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = customer_type
                            Type = String
                            Cardinality = 1
                            MaxLength = 25
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=customer_type:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = customer_category_code
                            Type = String
                            Cardinality = 1
                            MaxLength = 30
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=customer_category_code
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = statement_site_use_id
                            Type = Integer
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=statement_site_use_id:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = last_update_date
                            Type = Date
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = true
                            AppSpecificInfo = CN=last_update_date:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = last_updated_by
                            Type = Integer
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = true
                            AppSpecificInfo = CN=last_updated_by:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = creation_date
                            Type = Date
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = true
                            AppSpecificInfo = CN=creation_date
```

```
IsRequiredServerBound = false
[End]
[Attribute]
Name = created_by
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=created_by
IsRequiredServerBound = false
[End]
[Attribute]
Name = customer_prospect_code
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=customer_prospect_code:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = freight_term
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=freight_term:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = cust_tax_code
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=cust_tax_code:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Cust_tax_reference
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=cust_tax_reference:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = insert_update_flag
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=insert_update_flag:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = orig_system_address_ref
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=orig_system_address_ref:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = site_use_code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=site_use_code:::::
```

```
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = orig_system_parent_ref
                            Type = String
                            Cardinality = 1
                            MaxLength = 255
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=orig_system_parent_ref:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = primary_site_use_flag
                            Type = String
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=primary_site_use_flag:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = location
                            Type = String
                            Cardinality = 1
                            MaxLength = 255
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=location:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = address1
                            Type = String
                            Cardinality = 1
                            MaxLength = 255
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=address1::::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = address2
                            Type = String
                            Cardinality = 1
                            MaxLength = 255
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=address2::::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = address3
                            Type = String
                            Cardinality = 1
                            MaxLength = 255
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=address3
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = address4
                            Type = String
                            Cardinality = 1
                            MaxLength = 255
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=address4
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = city
                            Type = String
                            Cardinality = 1
                            MaxLength = 255
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=city:::::
```

```
IsRequiredServerBound = false
[End]
[Attribute]
Name = state
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=state:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = province
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=province
IsRequiredServerBound = false
[End]
[Attribute]
Name = county
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=county:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = postal_code
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=postal_code
IsRequiredServerBound = false
[End]
[Attribute]
Name = country
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=country
IsRequiredServerBound = false
[End]
[Attribute]
Name = bill_to_orig_address_ref
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=bill_to_orig_address_ref:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = address_lines_phonetic
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=address_lines_phonetic:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = person_first_name
Type = String
Cardinality = 1
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=person_first_name:::::
```

```
                             IsRequiredServerBound = false
                             [End]
                             [Attribute]
                             Name = person_last_name
                             Type = String
                             Cardinality = 1
                             MaxLength = 255
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = false
                             AppSpecificInfo = CN=person_last_name::::::
                             IsRequiredServerBound = false
                             [End]
                             [Attribute]
                             Name = ORACLEAPPS_Customer_Profile_Interface
                             Type = ORACLEAPPS_Customer_Profile_Interface_BO
                             ContainedObjectVersion = 1.0.0
                             Relationship = Containment
                             Cardinality = n
                             MaxLength = 1
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = false
                             IsRequiredServerBound = false
                             [End]
                             [Attribute]
                             Name = ORACLEAPPS_Customer_Bank_Interface
                             Type = ORACLEAPPS_Customer_Bank_Interface_BO
                             ContainedObjectVersion = 1.0.0
                             Relationship = Containment
                             Cardinality = n
                             MaxLength = 1
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = false
                             IsRequiredServerBound = false
                             [End]
                             [Attribute]
                             Name = ORACLEAPPS_Customer_Payment_Method_Interface
                             Type = ORACLEAPPS_Customer_Payment_Method_Interface_BO
                             ContainedObjectVersion = 1.0.0
                             Relationship = Containment
                             Cardinality = n
                             MaxLength = 1
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = false
                             IsRequiredServerBound = false
                             [End]
                             [Attribute]
                             Name = ORACLEAPPS_Customer_Contact_Interface
                             Type = ORACLEAPPS_Customer_Contact_Interface_BO
                             ContainedObjectVersion = 1.0.0
                             Relationship = Containment
                             Cardinality = n
                             MaxLength = 1
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = false
                             IsRequiredServerBound = false
                             [End]
                             [Attribute]
                             Name = ObjectEventId
                             Type = String
                             MaxLength = 255
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = false
                             IsRequiredServerBound = false
                             [End]

                             [Verb]
                             Name = Create
                             [End]

                             [Verb]
                             Name = Delete
                             [End]

                             [Verb]
                             Name = Retrieve
                             [End]

                             [Verb]
                             Name = Update
                             [End]
                    [End]
```

BO_ORACLEAPPS_CUSTRETRIEVE

Business object used for testing:

```
[ReposCopy]
Version = 3.1.0
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Customer_Retrieve
Version = 1.0.0
AppSpecificInfo = TN=hz_parties

    [Attribute]
    Name = party_id
    Type = Integer
    Cardinality = 1
    MaxLength = 1
    IsKey = true
    IsForeignKey = false
    IsRequired = false
    AppSpecificInfo = CN=party_id:::::
    IsRequiredServerBound = false
    [End]
    [Attribute]
    Name = party_name
    Type = String
    Cardinality = 1
    MaxLength = 1
    IsKey = false
    IsForeignKey = false
    IsRequired = false
    AppSpecificInfo = CN=party_name:::::
    IsRequiredServerBound = false
    [End]
    [Attribute]
    Name = party_number
    Type = Integer
    Cardinality = 1
    MaxLength = 1
    IsKey = false
    IsForeignKey = false
    IsRequired = false
    AppSpecificInfo = CN=party_number:::::
    IsRequiredServerBound = false
    [End]
    [Attribute]
    Name = ObjectEventId
    Type = String
    MaxLength = 255
    IsKey = false
    IsForeignKey = false
    IsRequired = false
    IsRequiredServerBound = false
    [End]

    [Verb]
    Name = Create
    [End]

    [Verb]
    Name = Delete
    [End]

    [Verb]
    Name = Retrieve
    [End]

    [Verb]
    Name = Update
    [End]
[End]
```

BO_ORACLEAPPS_ITEMINTERFACE

Business object used for testing:

```
[ReposCopy]
Version = 3.1.0
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Item_Revision_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=MTL_ITEM_REVISIONS_INTERFACE

        [Attribute]
```

```
                            Name = Inventory_Item_ID
                            Type = Integer
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=Inventory_Item_ID::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Organization_Id
                            Type = Integer
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = true
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=Organization_Id::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Revision
                            Type = String
                            Cardinality = 1
                            MaxLength = 3
                            IsKey = true
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=Revision::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Last_Updated_date
                            Type = Date
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = true
                            AppSpecificInfo = CN=Last_Updated_date::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Last_Updated_By
                            Type = Integer
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = true
                            AppSpecificInfo = CN=Last_Updated_By::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Creation_Date
                            Type = Date
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = true
                            AppSpecificInfo = CN=Creation_Date::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Created_by
                            Type = Integer
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = true
                            AppSpecificInfo = CN=Created_by::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Last_Update_Login
                            Type = Integer
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=Last_Update_Login::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
```

```
Name = Change_Notice
Type = String
Cardinality = 1
MaxLength = 10
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Change_Notice
IsRequiredServerBound = false
[End]
[Attribute]
Name = ECN_Initiation_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=ECN_Initiation_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Implementation_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Implementation_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Effectivity_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Effectivity_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute_Category
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute_Category::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Arribute1
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Arribute1::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Arribute2
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Arribute2::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Arribute3
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Arribute3::::
IsRequiredServerBound = false
[End]
[Attribute]
```

```
Name = Arribute4
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Arribute4::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Arribute5
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Arribute5::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Request_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Request_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Program_application_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Program_application_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Program_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Program_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Program_Update_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Program_Update_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Revised_Item_Sequence_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Revised_Item_Sequence_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Process_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Process_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
```

```
                    Name = Transaction_Type
                    Type = String
                    Cardinality = 1
                    MaxLength = 10
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = true
                    AppSpecificInfo = CN=Transaction_Type::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Set_Process_Id
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Set_Process_Id::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Item_Number
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = true
                    AppSpecificInfo = CN=Item_Number::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Organization_Code
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Organization_Code::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = ObjectEventId
                    Type = String
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
                    [End]

                    [Verb]
                    Name = Create
                    [End]

                    [Verb]
                    Name = Delete
                    [End]

                    [Verb]
                    Name = Retrieve
                    [End]

                    [Verb]
                    Name = Update
                    [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Item_Category_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=MTL_ITEM_CATEGORIES_INTERFACE

                    [Attribute]
                    Name = Inventory_Item_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Inventory_Item_ID::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Category_Set_Id
                    Type = Integer
```

```
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Category_Set_Id::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Category_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = true
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Category_ID::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Last_Updated_date
                    Type = Date
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = true
                    AppSpecificInfo = CN=Last_Updated_date::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Last_Updated_By
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = true
                    AppSpecificInfo = CN=Last_Updated_By::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Creation_Date
                    Type = Date
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = true
                    AppSpecificInfo = CN=Creation_Date::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Created_by
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = true
                    AppSpecificInfo = CN=Created_by::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Last_Update_Login
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Last_Update_Login::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Organization_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = true
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Organization_ID::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Category_Set_Name
                    Type = String
```

```
Cardinality = 1
MaxLength = 10
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Category_Set_Name::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Category_Name
Type = String
Cardinality = 1
MaxLength = 81
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Category_Name::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Request_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Request_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Program_application_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Program_application_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Program_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Program_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Program_Update_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Program_Update_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Process_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Process_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Transaction_Type
Type = String
Cardinality = 1
MaxLength = 10
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Transaction_Type::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Set_Process_Id
Type = Integer
```

```
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Set_Process_Id::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Item_Number
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = true
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Item_Number::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Organization_Code
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Organization_Code::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = ObjectEventId
                        Type = String
                        MaxLength = 255
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        IsRequiredServerBound = false
                        [End]

                        [Verb]
                        Name = Create
                        [End]

                        [Verb]
                        Name = Delete
                        [End]

                        [Verb]
                        Name = Retrieve
                        [End]

                        [Verb]
                        Name = Update
                        [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Item_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=mtl_system_items_interface

                        [Attribute]
                        Name = AfterCreateSP
                        Type = String
                        Cardinality = 1
                        MaxLength = 0
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = SPN=CW_Item_Interface;
                                IP=Userid:Responsibility_Id:Application_Id:Organization_Id:All_Organization:
                                        Transaction_Type:Set_Process_Id
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Userid
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Responsibility_Id
                        Type = Integer
                        Cardinality = 1
```

```
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
IsRequiredServerBound = false
[End]
[Attribute]
Name = Application_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
IsRequiredServerBound = false
[End]
[Attribute]
Name = Organization_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = true
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Organization_Id:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = All_Organization
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
IsRequiredServerBound = false
[End]
[Attribute]
Name = Transaction_Type
Type = String
Cardinality = 1
MaxLength = 10
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Transaction_Type:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Set_Process_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Set_Process_Id:::::
DefaultValue = 0
IsRequiredServerBound = false
[End]
[Attribute]
Name = AfterUpdateSP
Type = String
Cardinality = 1
MaxLength = 0
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = SPN=CW_Item_Interface;
        IP=Userid:Responsibility_Id:Application_Id:Organization_Id:
                All_Organization:Transaction_Type:Set_Process_Id
IsRequiredServerBound = false
[End]
[Attribute]
Name = Item_Number
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Item_Number:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Process_Flag
Type = Integer
Cardinality = 1
```

```
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = true
                            AppSpecificInfo = CN=Process_Flag
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Description
                            Type = String
                            Cardinality = 1
                            MaxLength = 50
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=Description:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Segment1
                            Type = String
                            Cardinality = 1
                            MaxLength = 240
                            IsKey = true
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=Segment1:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Segment2
                            Type = String
                            Cardinality = 1
                            MaxLength = 240
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=Segment2
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Segment3
                            Type = String
                            Cardinality = 1
                            MaxLength = 240
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=Segment3:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Inventory_Item_Status_Code
                            Type = String
                            Cardinality = 1
                            MaxLength = 10
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=INVENTORY_ITEM_STATUS_CODE:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Item_Type
                            Type = String
                            Cardinality = 1
                            MaxLength = 30
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=ITEM_TYPE
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Item_Catalog_Group_Id
                            Type = Integer
                            Cardinality = 1
                            MaxLength = 1
                            IsKey = false
                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=Item_Catalog_Group_Id:::::
                            IsRequiredServerBound = false
                            [End]
                            [Attribute]
                            Name = Customer_Order_Flag
                            Type = String
                            Cardinality = 1
```

```
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Customer_Order_Flag::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Serviceable_Product_Flag
                    Type = String
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Serviceable_Product_Flag:::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Returnable_Flag
                    Type = String
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Returnable_Flag::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Primary_Uom_Code
                    Type = String
                    Cardinality = 1
                    MaxLength = 3
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Primary_Uom_Code
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = List_price_per_unit
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=List_price_per_unit::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Unit_weight
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Unit_weight::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Weight_Uom_Code
                    Type = String
                    Cardinality = 1
                    MaxLength = 3
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Weight_Uom_Code:::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Unit_Volumn
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Unit_Volumn::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Volumn_Uom_Code
                    Type = String
                    Cardinality = 1
```

```
                                MaxLength = 3
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Volumn_Uom_Code::::
                                IsRequiredServerBound = false
                                [End]
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                                AppSpecificInfo = CN=Creation_date::::
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                                AppSpecificInfo = CN=Last_update_date::::
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                                IsRequired = false
                                AppSpecificInfo = CN=Enabled_Flag::::
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                                [Attribute]
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                                IsRequired = false
                                AppSpecificInfo = CN=Purchasing_Item_Flag::::
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                                Name = Shippable_Item_Flag
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                                Cardinality = 1
```

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                      MaxLength = 1
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                        IsRequired = false
                        AppSpecificInfo = CN=Revision_Qty_Control_Code::::
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                        IsForeignKey = false
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                        AppSpecificInfo = CN=Taxable_Flag::::
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                        Type = String
                        Cardinality = 1
```

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                            AppSpecificInfo = CN=Allow_Item_Desc_Update_Flag::::
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                            IsRequired = false
                            AppSpecificInfo = CN=Receipt_Required_Flag::::
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                            AppSpecificInfo = CN=RFQ_Required_Flag::::
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                            AppSpecificInfo = CN=Price_Tolerance_percent::::
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                            [Attribute]
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                            IsForeignKey = false
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                            Type = Integer
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                            IsForeignKey = false
                            IsRequired = false
                            AppSpecificInfo = CN=Shelf_Life_Days::::
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                            [Attribute]
                            Name = Serial_Number_Control_Code
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                            Cardinality = 1
```

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                     AppSpecificInfo = CN=Serial_Number_Control_Code::::
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                     [Attribute]
                     Name = Acceptable_rate_decrease
                     Type = Integer
                     Cardinality = 1
```

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MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Acceptable_rate_decrease::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Panning_Time_Fence_Days
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Panning_Time_Fence_Days::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = End_Assembly_Pegging_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=End_Assembly_Pegging_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Repetitive_Planning_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Repetitive_Planning_Flag::::
IsRequiredServerBound = false
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[Attribute]
Name = Bom_Item_type
Type = Integer
Cardinality = 1
MaxLength = 1
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IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Bom_Item_type
IsRequiredServerBound = false
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[Attribute]
Name = Pick_Components_Flag
Type = String
Cardinality = 1
MaxLength = 1
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IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN+Pick_Components_Flag::::
IsRequiredServerBound = false
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Name = Replenish_to_Order_Flag
Type = String
Cardinality = 1
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IsForeignKey = false
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IsRequiredServerBound = false
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[Attribute]
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IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=ATP_Components_Flag::::
IsRequiredServerBound = false
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[Attribute]
Name = ATP_Flag
Type = String
Cardinality = 1
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                       [Attribute]
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                       AppSpecificInfo = CN=Wip_Supply_Type::::
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                                        AppSpecificInfo = CN=Invoice_Enabled_Flag::::
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                                        AppSpecificInfo = CN=Auto_created_Config_Flag::::
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                                        Cardinality = 1
```

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                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=MRP_Planning_code::::
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                    [Attribute]
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                    IsForeignKey = false
                    IsRequired = false
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                    Cardinality = 1
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                    IsRequired = false
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                    IsRequired = false
                    AppSpecificInfo = CN=Template_Name
                    IsRequiredServerBound = false
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                    [Attribute]
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                    Type = ORACLEAPPS_Item_Revision_Interface_BO
                    ContainedObjectVersion = 1.0.0
                    Relationship = Containment
                    Cardinality = n
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
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                    [Attribute]
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                    Type = ORACLEAPPS_Item_Category_Interface_BO
                    ContainedObjectVersion = 1.0.0
                    Relationship = Containment
                    Cardinality = n
                    MaxLength = 1
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                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
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                    [Attribute]
                    Name = ObjectEventId
                    Type = String
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
                    [End]

                    [Verb]
                    Name = Create
                    [End]

                    [Verb]
                    Name = Delete
                    [End]

                    [Verb]
                    Name = Retrieve
                    [End]

                    [Verb]
                    Name = Update
                    [End]
           [End]
```

BO_ORACLEAPPS_ITEMRETRIEVE

Business object used for testing:P

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[ReposCopy]
Version = 3.1.0
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Item_Category_BO
Version = 1.0.0
AppSpecificInfo = TN=MTL_ITEM_CATEGORIES_V

            [Attribute]
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            Type = Integer
            Cardinality = 1
            MaxLength = 1
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IsKey = true
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Category_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Category_Set_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Category_Set_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Inventory_Item_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Inventory_Item_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Organiozation_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Organiozation_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Last_Update_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Last_Update_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Last_Updated_By
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Last_Updated_By::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Last_Update_Login
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Last_Update_Login::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Created_By
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Created_By::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Creation_Date
Type = Date
Cardinality = 1
MaxLength = 1
```

```
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Creation_Date::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Category_Set_Name
                    Type = String
                    Cardinality = 1
                    MaxLength = 30
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Category_Set_Name::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Validate_Flag
                    Type = String
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Validate_Flag::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Segment1
                    Type = String
                    Cardinality = 1
                    MaxLength = 30
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Segment1::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Segment2
                    Type = String
                    Cardinality = 1
                    MaxLength = 40
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Segment2::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Segment3
                    Type = String
                    Cardinality = 1
                    MaxLength = 40
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Segment3::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Control_Level
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Control_Level::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Control_Level_Disp
                    Type = String
                    Cardinality = 1
                    MaxLength = 80
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Control_Level_Disp::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Category_Concat_Segs
                    Type = String
                    Cardinality = 1
                    MaxLength = 122
```

```
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Category_Concat_Segs::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = ObjectEventId
                    Type = String
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
                    [End]

                    [Verb]
                    Name = Create
                    [End]

                    [Verb]
                    Name = Delete
                    [End]

                    [Verb]
                    Name = Retrieve
                    [End]

                    [Verb]
                    Name = Update
                    [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Item_Revision_BO
Version = 1.0.0
AppSpecificInfo = TN=MTL_ITEM_REVISIONS_ALL_V

                    [Attribute]
                    Name = Inventory_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = true
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Inventory_ID::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Organization_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Organization_ID::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Revision
                    Type = String
                    Cardinality = 1
                    MaxLength = 3
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Revision::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Last_Update_Date
                    Type = Date
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Last_Update_Date::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Last_Updated_By
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
```

```
                              IsRequired = false
                              AppSpecificInfo = CN=Last_Updated_By::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Last_Update_Login
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Last_Update_Login::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Created_By
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Created_By::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Creation_Date
                              Type = Date
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Creation_Date::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Change_Notice
                              Type = String
                              Cardinality = 1
                              MaxLength = 10
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Change_Notice::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = ECN_Initiation_Date
                              Type = Date
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=ECN_Initiation_Date::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Implementation_date
                              Type = Date
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Implementation_date::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Implementation_Serial_Number
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Implementation_Serial_Number::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Attribute_Category
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
```

```
IsRequired = false
AppSpecificInfo = CN=Attribute_Category::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute1
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute1::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute2
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute2::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute3
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute3::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute4
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute4::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute5
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute5::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Description
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Description::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = ObjectEventId
Type = String
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
IsRequiredServerBound = false
[End]

[Verb]
Name = Create
[End]

[Verb]
Name = Delete
[End]
```

```
                    [Verb]
                    Name = Retrieve
                    [End]

                    [Verb]
                    Name = Update
                    [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Item_Retrieve
Version = 1.0.0
AppSpecificInfo = TN=MTL_SYSTEM_ITEMS_FVL

                    [Attribute]
                    Name = Inventory_Item_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = true
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Inventory_Item_ID::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Organization_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Organization_ID:::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Primary_UOM_Code
                    Type = String
                    Cardinality = 1
                    MaxLength = 3
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Primary_UOM_Code::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Primary_Unit_Of_Measure
                    Type = String
                    Cardinality = 1
                    MaxLength = 25
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Primary_Unit_Of_Measure::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Item_Type
                    Type = String
                    Cardinality = 1
                    MaxLength = 30
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Item_Type::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Inventory_Item_Status_Code
                    Type = String
                    Cardinality = 1
                    MaxLength = 10
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Inventory_Item_Status_Code::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Item_Catalog_Group_Id
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Item_Catalog_Group_Id::::
```

```
IsRequiredServerBound = false
[End]
[Attribute]
Name = Catalog_Status_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Catalog_Status_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Inventory_Item_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Inventory_Item_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Stock_Enabled_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Stock_Enabled_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Mtl_Transaction_Enabled_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Mtl_Transaction_Enabled_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Check_Shortage_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Check_Shortage_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Revision_Qty_Control_code
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Revision_Qty_Control_code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Reservable_Type
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Reservable_Type::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Shelf_Life_Code
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Shelf_Life_Code::::
```

```
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Cycle_Count_Enabled_Flag
                          Type = String
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Cycle_Count_Enabled_Flag::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Lot_Control_Code
                          Type = Integer
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Lot_Control_Code::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Serial_number_Control_Code
                          Type = Integer
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Serial_number_Control_Code::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Location_control_Code
                          Type = Integer
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Location_control_Code::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Bom_Enabled_Flag
                          Type = String
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Bom_Enabled_Flag::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Bom_Item_Type
                          Type = Integer
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Bom_Item_Type::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Eng_Item_Flag
                          Type = String
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Eng_Item_Flag::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Engineering_ECN_Code
                          Type = String
                          Cardinality = 1
                          MaxLength = 50
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Engineering_ECN_Code::::
```

```
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Costing_Enabled_Flag
                        Type = String
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Costing_Enabled_Flag::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Inventory_Adder_Flag
                        Type = String
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Inventory_Adder_Flag::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Cost_Of_Sales_Account
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Cost_Of_Sales_Account::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Purchasing_Item_Flag
                        Type = String
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Purchasing_Item_Flag::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Purchasing_Tax_Code
                        Type = String
                        Cardinality = 1
                        MaxLength = 50
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Purchasing_Tax_Code::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = List_Price_Per_Unit
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=List_Price_Per_Unit::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Market_Price
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Market_Price::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Encumbrance_Account
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Encumbrance_Account::::
```

```
                                 IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Expense_Account
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Expense_Account::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Weight_UOM_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 3
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Weight_UOM_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Unit_Weight
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Unit_Weight::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Volume_UOM_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 3
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Volume_UOM_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Unit_Volume
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Unit_Volume::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Planner_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 10
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Planner_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Sales_Account
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Sales_Account::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Segment1
                              Type = String
                              Cardinality = 1
                              MaxLength = 40
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Segment1::::
```

```
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Segment2
                         Type = String
                         Cardinality = 1
                         MaxLength = 40
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Segment2::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Segment3
                         Type = String
                         Cardinality = 1
                         MaxLength = 40
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Segment3::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Created_By
                         Type = Integer
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Created_By::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Creation_Date
                         Type = Date
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Creation_Date::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Last_Update_Date
                         Type = Date
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Last_Update_Date::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Last_Updated_By
                         Type = Integer
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Last_Updated_By::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Last_Update_Login
                         Type = Integer
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Last_Update_Login::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Description
                         Type = String
                         Cardinality = 1
                         MaxLength = 240
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Description::::
```

```
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = ORACLEAPPS_Item_Category_BO
                    Type = ORACLEAPPS_Item_Category_BO
                    ContainedObjectVersion = 1.0.0
                    Relationship = Containment
                    Cardinality = n
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = ORACLEAPPS_Item_Revision_BO
                    Type = ORACLEAPPS_Item_Revision_BO
                    ContainedObjectVersion = 1.0.0
                    Relationship = Containment
                    Cardinality = n
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = ObjectEventId
                    Type = String
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
                    [End]

                    [Verb]
                    Name = Create
                    [End]

                    [Verb]
                    Name = Delete
                    [End]

                    [Verb]
                    Name = Retrieve
                    [End]

                    [Verb]
                    Name = Update
                    [End]
          [End]
```

BO_ORACLEAPPS_ORDER

Business object used for testing:

```
[ReposCopy]
Version = 3.1.0
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Order_SalesCredits_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=OE_CREDITS_IFACE_ALL

            [Attribute]
            Name = Order_Source_ID
            Type = Integer
            Cardinality = 1
            MaxLength = 1
            IsKey = false
            IsForeignKey = false
            IsRequired = false
            AppSpecificInfo = CN=Order_Source_ID::::
            IsRequiredServerBound = false
            [End]
            [Attribute]
            Name = Context
            Type = String
            Cardinality = 1
            MaxLength = 30
            IsKey = false
            IsForeignKey = false
            IsRequired = false
            AppSpecificInfo = CN=Context::::
            IsRequiredServerBound = false
```

```
[End]
[Attribute]
Name = Attribute1
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute1::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute2
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute2::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute3
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute3
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute4
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute4::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute5
Type = String
Cardinality = 1
MaxLength = 150
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute5::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Created_By
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Created_By::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Creation_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Creation_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Last_Update_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Last_Update_Date::::
IsRequiredServerBound = false
```

```
[End]
[Attribute]
Name = Last_Update_login
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Last_Update_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Last_Updated_By
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Last_Updated_By::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Operation_Code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Operation_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Orig_Sys_Credit_Ref
Type = String
Cardinality = 1
MaxLength = 50
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Orig_Sys_Credit_Ref::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Orig_Sys_Document_Ref
Type = String
Cardinality = 1
MaxLength = 50
IsKey = true
IsForeignKey = true
IsRequired = false
AppSpecificInfo = CN=Orig_Sys_Document_Ref:FK=Orig_Sys_Document_Ref:::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Orig_Sys_Line_Ref
Type = String
Cardinality = 1
MaxLength = 50
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Orig_Sys_Line_Ref:FK=Orig_Sys_Line_Ref:::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Orig_Sys_Shipment_Ref
Type = String
Cardinality = 1
MaxLength = 50
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Orig_Sys_Shipment_Ref::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Percent
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Percent::::
IsRequiredServerBound = false
```

```
                    [End]
                    [Attribute]
                    Name = Sales_Credit_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Sales_Credit_ID::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Sales_Credit_Type_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Sales_Credit_Type_ID::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = SalesRep_Id
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=SalesRep_Id::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = ObjectEventId
                    Type = String
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
                    [End]

                    [Verb]
                    Name = Create
                    [End]

                    [Verb]
                    Name = Delete
                    [End]

                    [Verb]
                    Name = Retrieve
                    [End]

                    [Verb]
                    Name = Update
                    [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Order_PriceAdj_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=OE_PRICE_ADJS_IFACE_ALL

                    [Attribute]
                    Name = Order_Source_Id
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Order_Source_Id::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Orig_Sys_Document_Ref
                    Type = String
                    Cardinality = 1
                    MaxLength = 50
                    IsKey = true
                    IsForeignKey = true
                    IsRequired = false
                    AppSpecificInfo = CN=Orig_Sys_Document_Ref:FK=Orig_Sys_Document_Ref:::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
```

```
                         Name = Orig_Sys_Line_Ref
                         Type = String
                         Cardinality = 1
                         MaxLength = 50
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Orig_Sys_Line_Ref:FK=Orig_Sys_Line_Ref:::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Orig_Sys_Shipment_Ref
                         Type = String
                         Cardinality = 1
                         MaxLength = 50
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Orig_Sys_Shipment_Ref::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Orig_Sys_Discount_Ref
                         Type = String
                         Cardinality = 1
                         MaxLength = 50
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Orig_Sys_Discount_Ref::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Creation_Date
                         Type = Date
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = true
                         AppSpecificInfo = CN=Creation_Date::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Created_By
                         Type = Integer
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = true
                         AppSpecificInfo = CN=Created_By::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Last_Update_Date
                         Type = Date
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = true
                         AppSpecificInfo = CN=Last_Update_Date::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Last_Update_Login
                         Type = Integer
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Last_Update_Login::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Last_Updated_By
                         Type = Integer
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = true
                         AppSpecificInfo = CN=Last_Updated_By::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
```

```
Name = Automatic_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Automatic_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Context
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Context::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute1
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute1::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute2
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute2::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute3
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute3::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute4
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute4::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute5
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute5::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = List_Header_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=List_Header_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
```

```
                              Name = List_Name
                              Type = String
                              Cardinality = 1
                              MaxLength = 240
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=List_Name::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = List_Line_Id
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=List_Line_Id::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Change_Reason_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Change_Reason_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Change_Reason_Text
                              Type = String
                              Cardinality = 1
                              MaxLength = 2000
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Change_Reason_Text::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Discount_Id
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Discount_Id::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Discount_Line_Id
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Discount_Line_Id::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Discount_Name
                              Type = String
                              Cardinality = 1
                              MaxLength = 240
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Discount_Name::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Operation_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = true
                              AppSpecificInfo = CN=Operation_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
```

```
                Name = Operand
                Type = Integer
                Cardinality = 1
                MaxLength = 1
                IsKey = false
                IsForeignKey = false
                IsRequired = false
                AppSpecificInfo = CN=Operand::::
                IsRequiredServerBound = false
                [End]
                [Attribute]
                Name = Pricing_Phase_ID
                Type = Integer
                Cardinality = 1
                MaxLength = 1
                IsKey = false
                IsForeignKey = false
                IsRequired = false
                AppSpecificInfo = CN=Pricing_Phase_ID::::
                IsRequiredServerBound = false
                [End]
                [Attribute]
                Name = Adjustment_Amount
                Type = Integer
                Cardinality = 1
                MaxLength = 1
                IsKey = false
                IsForeignKey = false
                IsRequired = true
                AppSpecificInfo = CN=Adjusted_Amount
                IsRequiredServerBound = false
                [End]
                [Attribute]
                Name = ObjectEventId
                Type = String
                MaxLength = 255
                IsKey = false
                IsForeignKey = false
                IsRequired = false
                IsRequiredServerBound = false
                [End]

                [Verb]
                Name = Create
                [End]

                [Verb]
                Name = Delete
                [End]

                [Verb]
                Name = Retrieve
                [End]

                [Verb]
                Name = Update
                [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Order_PriceAtts_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=OE_PRICE_ATTS_IFACE_ALL

                [Attribute]
                Name = Order_Source_ID
                Type = Integer
                Cardinality = 1
                MaxLength = 1
                IsKey = false
                IsForeignKey = false
                IsRequired = false
                AppSpecificInfo = CN=Order_Source_ID::::
                IsRequiredServerBound = false
                [End]
                [Attribute]
                Name = Orig_Sys_Document_Ref
                Type = String
                Cardinality = 1
                MaxLength = 50
                IsKey = true
                IsForeignKey = true
                IsRequired = false
                AppSpecificInfo = CN=Orig_Sys_Document_Ref:FK=Orig_Sys_Document_Ref:::
                IsRequiredServerBound = false
                [End]
                [Attribute]
                Name = Orig_Sys_Line_Ref
                Type = String
```

```
                                      Cardinality = 1
                                      MaxLength = 50
                                      IsKey = false
                                      IsForeignKey = false
                                      IsRequired = false
                                      AppSpecificInfo = CN=Orig_Sys_Line_Ref::::
                                      IsRequiredServerBound = false
                                      [End]
                                      [Attribute]
                                      Name = Orig_Sys_Shipment_Ref
                                      Type = String
                                      Cardinality = 1
                                      MaxLength = 50
                                      IsKey = false
                                      IsForeignKey = false
                                      IsRequired = false
                                      AppSpecificInfo = CN=Orig_Sys_Shipment_Ref::::
                                      IsRequiredServerBound = false
                                      [End]
                                      [Attribute]
                                      Name = Creation_Date
                                      Type = Date
                                      Cardinality = 1
                                      MaxLength = 1
                                      IsKey = false
                                      IsForeignKey = false
                                      IsRequired = true
                                      AppSpecificInfo = CN=Creation_Date::::
                                      IsRequiredServerBound = false
                                      [End]
                                      [Attribute]
                                      Name = Created_By
                                      Type = Integer
                                      Cardinality = 1
                                      MaxLength = 1
                                      IsKey = false
                                      IsForeignKey = false
                                      IsRequired = true
                                      AppSpecificInfo = CN=Created_By::::
                                      IsRequiredServerBound = false
                                      [End]
                                      [Attribute]
                                      Name = Last_Update_Date
                                      Type = Date
                                      Cardinality = 1
                                      MaxLength = 1
                                      IsKey = false
                                      IsForeignKey = false
                                      IsRequired = true
                                      AppSpecificInfo = CN=Last_Update_Date::::
                                      IsRequiredServerBound = false
                                      [End]
                                      [Attribute]
                                      Name = Last_Updated_By
                                      Type = Integer
                                      Cardinality = 1
                                      MaxLength = 1
                                      IsKey = false
                                      IsForeignKey = false
                                      IsRequired = true
                                      AppSpecificInfo = CN=Last_Updated_By::::
                                      IsRequiredServerBound = false
                                      [End]
                                      [Attribute]
                                      Name = Last_Update_Login
                                      Type = Integer
                                      Cardinality = 1
                                      MaxLength = 1
                                      IsKey = false
                                      IsForeignKey = false
                                      IsRequired = false
                                      AppSpecificInfo = CN=Last_Update_Login::::
                                      IsRequiredServerBound = false
                                      [End]
                                      [Attribute]
                                      Name = Pricing_Context
                                      Type = String
                                      Cardinality = 1
                                      MaxLength = 30
                                      IsKey = false
                                      IsForeignKey = false
                                      IsRequired = false
                                      AppSpecificInfo = CN=Pricing_Context::::
                                      IsRequiredServerBound = false
                                      [End]
                                      [Attribute]
                                      Name = Pricing_Attribute1
                                      Type = String
```

```
                         Cardinality = 1
                         MaxLength = 240
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Pricing_Attribute1::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Pricing_Attribute2
                         Type = String
                         Cardinality = 1
                         MaxLength = 240
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Pricing_Attribute2::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Pricing_Attribute3
                         Type = String
                         Cardinality = 1
                         MaxLength = 240
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Pricing_Attribute3::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Pricing_Attribute4
                         Type = String
                         Cardinality = 1
                         MaxLength = 240
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Pricing_Attribute4::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Pricing_Attribute5
                         Type = String
                         Cardinality = 1
                         MaxLength = 240
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Pricing_Attribute5::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Context
                         Type = String
                         Cardinality = 1
                         MaxLength = 30
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Context
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Attribute1
                         Type = String
                         Cardinality = 1
                         MaxLength = 240
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Attribute1::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Attribute2
                         Type = String
                         Cardinality = 1
                         MaxLength = 240
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Attribute2::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Attribute3
                         Type = String
```

```
                             Cardinality = 1
                             MaxLength = 240
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = false
                             AppSpecificInfo = CN=Attribute3::::
                             IsRequiredServerBound = false
                             [End]
                             [Attribute]
                             Name = Attribute4
                             Type = String
                             Cardinality = 1
                             MaxLength = 240
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = false
                             AppSpecificInfo = CN=Attribute4::::
                             IsRequiredServerBound = false
                             [End]
                             [Attribute]
                             Name = Attribute5
                             Type = String
                             Cardinality = 1
                             MaxLength = 240
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = false
                             AppSpecificInfo = CN=Attribute5::::
                             IsRequiredServerBound = false
                             [End]
                             [Attribute]
                             Name = Operation_Code
                             Type = String
                             Cardinality = 1
                             MaxLength = 30
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = true
                             AppSpecificInfo = CN=Operation_Code::::
                             IsRequiredServerBound = false
                             [End]
                             [Attribute]
                             Name = Flex_Title
                             Type = String
                             Cardinality = 1
                             MaxLength = 60
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = true
                             AppSpecificInfo = CN=Flex_Title::::
                             IsRequiredServerBound = false
                             [End]
                             [Attribute]
                             Name = ObjectEventId
                             Type = String
                             MaxLength = 255
                             IsKey = false
                             IsForeignKey = false
                             IsRequired = false
                             IsRequiredServerBound = false
                             [End]

                             [Verb]
                             Name = Create
                             [End]

                             [Verb]
                             Name = Delete
                             [End]

                             [Verb]
                             Name = Retrieve
                             [End]

                             [Verb]
                             Name = Update
                             [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Order_LotSerial_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=OE_LOTSERIALS_IFACE_ALL

                             [Attribute]
                             Name = Order_Source_ID
                             Type = Integer
                             Cardinality = 1
                             MaxLength = 1
```

```
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Order_Source_ID::::
                        IsRequiredServerBound = false
                    [End]
                    [Attribute]
                        Name = Orig_Sys_Document_Ref
                        Type = String
                        Cardinality = 1
                        MaxLength = 50
                        IsKey = true
                        IsForeignKey = true
                        IsRequired = false
                        AppSpecificInfo = CN=Orig_Sys_Document_Ref:FK=Orig_Sys_Document_Ref:::
                        IsRequiredServerBound = false
                    [End]
                    [Attribute]
                        Name = Orig_Sys_Line_Ref
                        Type = String
                        Cardinality = 1
                        MaxLength = 50
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = true
                        AppSpecificInfo = CN=Orig_Sys_Line_Ref::::
                        IsRequiredServerBound = false
                    [End]
                    [Attribute]
                        Name = Orig_Sys_Shipment_Ref
                        Type = String
                        Cardinality = 1
                        MaxLength = 50
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Orig_Sys_Shipment_Ref::::
                        IsRequiredServerBound = false
                    [End]
                    [Attribute]
                        Name = Orig_Sys_LotSerial_Ref
                        Type = String
                        Cardinality = 1
                        MaxLength = 50
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = true
                        AppSpecificInfo = CN=Orig_Sys_LotSerial_Ref::::
                        IsRequiredServerBound = false
                    [End]
                    [Attribute]
                        Name = Lot_Number
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Lot_Number::::
                        IsRequiredServerBound = false
                    [End]
                    [Attribute]
                        Name = From_Serial_Number
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=From_Serial_Number::::
                        IsRequiredServerBound = false
                    [End]
                    [Attribute]
                        Name = To_Serial_Number
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=To_Serial_Number::::
                        IsRequiredServerBound = false
                    [End]
                    [Attribute]
                        Name = Quantity
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
```

```
                                   IsKey = false
                                   IsForeignKey = false
                                   IsRequired = true
                                   AppSpecificInfo = CN=Quantity::::
                                   IsRequiredServerBound = false
                                   [End]
                                   [Attribute]
                                   Name = Context
                                   Type = String
                                   Cardinality = 1
                                   MaxLength = 30
                                   IsKey = false
                                   IsForeignKey = false
                                   IsRequired = false
                                   AppSpecificInfo = CN=Context::::
                                   IsRequiredServerBound = false
                                   [End]
                                   [Attribute]
                                   Name = Attribute1
                                   Type = String
                                   Cardinality = 1
                                   MaxLength = 240
                                   IsKey = false
                                   IsForeignKey = false
                                   IsRequired = false
                                   AppSpecificInfo = CN=Attribute1::::
                                   IsRequiredServerBound = false
                                   [End]
                                   [Attribute]
                                   Name = Attribute2
                                   Type = String
                                   Cardinality = 1
                                   MaxLength = 240
                                   IsKey = false
                                   IsForeignKey = false
                                   IsRequired = false
                                   AppSpecificInfo = CN=Attribute2::::
                                   IsRequiredServerBound = false
                                   [End]
                                   [Attribute]
                                   Name = Attribute3
                                   Type = String
                                   Cardinality = 1
                                   MaxLength = 240
                                   IsKey = false
                                   IsForeignKey = false
                                   IsRequired = false
                                   AppSpecificInfo = CN=Attribute3::::
                                   IsRequiredServerBound = false
                                   [End]
                                   [Attribute]
                                   Name = Attribute4
                                   Type = String
                                   Cardinality = 1
                                   MaxLength = 240
                                   IsKey = false
                                   IsForeignKey = false
                                   IsRequired = false
                                   AppSpecificInfo = CN=Attribute4::::
                                   IsRequiredServerBound = false
                                   [End]
                                   [Attribute]
                                   Name = Attribute5
                                   Type = String
                                   Cardinality = 1
                                   MaxLength = 240
                                   IsKey = false
                                   IsForeignKey = false
                                   IsRequired = false
                                   AppSpecificInfo = CN=Attribute5::::
                                   IsRequiredServerBound = false
                                   [End]
                                   [Attribute]
                                   Name = Creation_Date
                                   Type = Date
                                   Cardinality = 1
                                   MaxLength = 1
                                   IsKey = false
                                   IsForeignKey = false
                                   IsRequired = true
                                   AppSpecificInfo = CN=Creation_Date::::
                                   IsRequiredServerBound = false
                                   [End]
                                   [Attribute]
                                   Name = Created_By
                                   Type = Integer
                                   Cardinality = 1
                                   MaxLength = 1
```

```
                  IsKey = false
                  IsForeignKey = false
                  IsRequired = true
                  AppSpecificInfo = CN=Created_By::::
                  IsRequiredServerBound = false
                  [End]
                  [Attribute]
                  Name = Last_Update_Date
                  Type = Date
                  Cardinality = 1
                  MaxLength = 1
                  IsKey = false
                  IsForeignKey = false
                  IsRequired = true
                  AppSpecificInfo = CN=Last_Update_Date::::
                  IsRequiredServerBound = false
                  [End]
                  [Attribute]
                  Name = Last_Updated_By
                  Type = Integer
                  Cardinality = 1
                  MaxLength = 1
                  IsKey = false
                  IsForeignKey = false
                  IsRequired = true
                  AppSpecificInfo = CN=Last_Updated_By::::
                  IsRequiredServerBound = false
                  [End]
                  [Attribute]
                  Name = Last_Update_Login
                  Type = Integer
                  Cardinality = 1
                  MaxLength = 1
                  IsKey = false
                  IsForeignKey = false
                  IsRequired = false
                  AppSpecificInfo = CN=Last_Update_Login::::
                  IsRequiredServerBound = false
                  [End]
                  [Attribute]
                  Name = Operation_Code
                  Type = String
                  Cardinality = 1
                  MaxLength = 30
                  IsKey = false
                  IsForeignKey = false
                  IsRequired = true
                  AppSpecificInfo = CN=Operation_Code::::
                  IsRequiredServerBound = false
                  [End]
                  [Attribute]
                  Name = ObjectEventId
                  Type = String
                  MaxLength = 255
                  IsKey = false
                  IsForeignKey = false
                  IsRequired = false
                  IsRequiredServerBound = false
                  [End]

                  [Verb]
                  Name = Create
                  [End]

                  [Verb]
                  Name = Delete
                  [End]

                  [Verb]
                  Name = Retrieve
                  [End]

                  [Verb]
                  Name = Update
                  [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Order_Line_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=OE_LINES_IFACE_ALL

                  [Attribute]
                  Name = Accounting_Rule_Id
                  Type = Integer
                  Cardinality = 1
                  MaxLength = 1
                  IsKey = false
                  IsForeignKey = false
```

```
                              IsRequired = false
                              AppSpecificInfo = CN=Accounting_Rule_Id::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Agreement_ID
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Agreement_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Line_PO_Context
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Line_PO_Context::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Arribute1
                              Type = String
                              Cardinality = 1
                              MaxLength = 150
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Attribute1::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Arribute2
                              Type = String
                              Cardinality = 1
                              MaxLength = 150
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Attribute2::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Arribute3
                              Type = String
                              Cardinality = 1
                              MaxLength = 150
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Attribute3::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Arribute4
                              Type = String
                              Cardinality = 1
                              MaxLength = 150
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Attribute4::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Arribute5
                              Type = String
                              Cardinality = 1
                              MaxLength = 150
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Attribute5::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Authorised_To_Ship_Flag
                              Type = String
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
```

```
IsRequired = false
AppSpecificInfo = CN=Authorised_To_Ship_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Calculate_Price_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Calculate_Price_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Change_Sequence
Type = String
Cardinality = 1
MaxLength = 50
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Change_Sequence::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Component_Code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Component_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Created_By
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Created_By::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Creation_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Creation_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Customer_PO_Number
Type = String
Cardinality = 1
MaxLength = 50
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Customer_PO_Number::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Credit_Invoice_Line_Id
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Credit_Invoice_Line_Id:::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Customer_Dock_Code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
```

```
                              IsRequired = false
                              AppSpecificInfo = CN=Customer_Dock_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Customer_Item_Net_Price
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Customer_Item_Net_Price::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Customer_Job
                              Type = String
                              Cardinality = 1
                              MaxLength = 50
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Customer_Job::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Customer_Line_Number
                              Type = String
                              Cardinality = 1
                              MaxLength = 50
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Customer_Line_Number::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Customer_Payment_Term_Id
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Customer_Payment_Term_Id::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Customer_Production_Line
                              Type = String
                              Cardinality = 1
                              MaxLength = 50
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Customer_Production_Line::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Customer_Shipment_Number
                              Type = String
                              Cardinality = 1
                              MaxLength = 50
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Customer_Shipment_Number::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Delivery_To_Contact_Id
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Deliver_To_Contact_Id::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Delivery_To_Org_Id
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
```

```
                              IsRequired = false
                              AppSpecificInfo = CN=Deliver_To_Org_Id::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Delivery_Lead_Time
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Delivery_Lead_Time::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Demand_Bucket_Type_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Demand_Bucket_Type_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Demand_Class_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Demand_Class_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = FOB_Point_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=FOB_Point_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Freight_Term_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Freight_Terms_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Industry_Context
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Industry_Context::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Industry_Attribute1
                              Type = String
                              Cardinality = 1
                              MaxLength = 150
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Industry_Attribute1::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Industry_Attribute2
                              Type = String
                              Cardinality = 1
                              MaxLength = 150
                              IsKey = false
                              IsForeignKey = false
```

```
                                     IsRequired = false
                                     AppSpecificInfo = CN=Industry_Attribute2::::
                                     IsRequiredServerBound = false
                                     [End]
                                     [Attribute]
                                     Name = Industry_Attribute3
                                     Type = String
                                     Cardinality = 1
                                     MaxLength = 150
                                     IsKey = false
                                     IsForeignKey = false
                                     IsRequired = false
                                     AppSpecificInfo = CN=Industry_Attribute3::::
                                     IsRequiredServerBound = false
                                     [End]
                                     [Attribute]
                                     Name = Industry_Attribute4
                                     Type = String
                                     Cardinality = 1
                                     MaxLength = 150
                                     IsKey = false
                                     IsForeignKey = false
                                     IsRequired = false
                                     AppSpecificInfo = CN=Industry_Attribute4::::
                                     IsRequiredServerBound = false
                                     [End]
                                     [Attribute]
                                     Name = Industry_Attribute5
                                     Type = String
                                     Cardinality = 1
                                     MaxLength = 150
                                     IsKey = false
                                     IsForeignKey = false
                                     IsRequired = false
                                     AppSpecificInfo = CN=Industry_Attribute5::::
                                     IsRequiredServerBound = false
                                     [End]
                                     [Attribute]
                                     Name = Inventory_Item_ID
                                     Type = Integer
                                     Cardinality = 1
                                     MaxLength = 1
                                     IsKey = false
                                     IsForeignKey = false
                                     IsRequired = true
                                     AppSpecificInfo = CN=Inventory_Item_ID::::
                                     IsRequiredServerBound = false
                                     [End]
                                     [Attribute]
                                     Name = Invoice_To_contact_Id
                                     Type = Integer
                                     Cardinality = 1
                                     MaxLength = 1
                                     IsKey = false
                                     IsForeignKey = false
                                     IsRequired = false
                                     AppSpecificInfo = CN=Invoice_To_contact_Id::::
                                     IsRequiredServerBound = false
                                     [End]
                                     [Attribute]
                                     Name = Invoice_To_Org_Id
                                     Type = Integer
                                     Cardinality = 1
                                     MaxLength = 1
                                     IsKey = false
                                     IsForeignKey = false
                                     IsRequired = false
                                     AppSpecificInfo = CN=Invoice_To_Org_Id::::
                                     IsRequiredServerBound = false
                                     [End]
                                     [Attribute]
                                     Name = Invoicing_Rule_Id
                                     Type = Integer
                                     Cardinality = 1
                                     MaxLength = 1
                                     IsKey = false
                                     IsForeignKey = false
                                     IsRequired = false
                                     AppSpecificInfo = CN=Invoicing_Rule_Id::::
                                     IsRequiredServerBound = false
                                     [End]
                                     [Attribute]
                                     Name = Item_Revision
                                     Type = String
                                     Cardinality = 1
                                     MaxLength = 3
                                     IsKey = false
                                     IsForeignKey = false
```

```
IsRequired = false
AppSpecificInfo = CN=Item_Revision::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Last_Update_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Last_Update_Date
IsRequiredServerBound = false
[End]
[Attribute]
Name = Last_Update_Login
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Last_Update_Login::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Last_Updated_By
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Last_Updated_By::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Line_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Line_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Line_Number
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Line_Number::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Line_Type_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Line_Type_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Operation_Code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = true
AppSpecificInfo = CN=Operation_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Ordered_Quantity_Uom
Type = String
Cardinality = 1
MaxLength = 3
IsKey = false
IsForeignKey = false
```

```
                                        IsRequired = false
                                        AppSpecificInfo = CN=Ordered_Quantity_Uom2::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Order_Source_ID
                                        Type = Integer
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Order_Source_ID::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Ordered_Quantity
                                        Type = Integer
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Ordered_Quantity::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Ordered_Quantity2
                                        Type = Integer
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Ordered_Quantity2::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Orig_Sys_Document_Ref
                                        Type = String
                                        Cardinality = 1
                                        MaxLength = 50
                                        IsKey = true
                                        IsForeignKey = true
                                        IsRequired = false
                                        AppSpecificInfo = CN=Orig_Sys_Document_Ref:FK=Orig_Sys_Document_Ref:::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Orig_Sys_Line_Ref
                                        Type = String
                                        Cardinality = 1
                                        MaxLength = 50
                                        IsKey = true
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Orig_Sys_Line_Ref:::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Orig_Sys_Shipment_Ref
                                        Type = String
                                        Cardinality = 1
                                        MaxLength = 50
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Orig_Sys_Shipment_Ref::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Over_Ship_Resolved_Flag
                                        Type = String
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Over_Ship_Resolved_Flag::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Packing_Instructions
                                        Type = String
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
```

```
IsRequired = false
AppSpecificInfo = CN=Packing_Instructions::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Payment_Term_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Payment_Term_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Preferred_Grade
Type = String
Cardinality = 1
MaxLength = 4
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Preferred_Grade::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Price_List_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Price_List_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Project_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Project_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Promise_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Promise_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Return_Attribute1
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Return_Attribute1::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Return_Attribute2
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Return_Attribute2::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Return_Attribute3
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
```

```
                                  IsRequired = false
                                  AppSpecificInfo = CN=Return_Attribute3::::
                                  IsRequiredServerBound = false
                                  [End]
                                  [Attribute]
                                  Name = Return_Attribute4
                                  Type = String
                                  Cardinality = 1
                                  MaxLength = 240
                                  IsKey = false
                                  IsForeignKey = false
                                  IsRequired = false
                                  AppSpecificInfo = CN=Return_Attribute4::::
                                  IsRequiredServerBound = false
                                  [End]
                                  [Attribute]
                                  Name = Return_Attribute5
                                  Type = String
                                  Cardinality = 1
                                  MaxLength = 240
                                  IsKey = false
                                  IsForeignKey = false
                                  IsRequired = false
                                  AppSpecificInfo = CN=Return_Attribute5::::
                                  IsRequiredServerBound = false
                                  [End]
                                  [Attribute]
                                  Name = Return_Reason_Code
                                  Type = String
                                  Cardinality = 1
                                  MaxLength = 30
                                  IsKey = false
                                  IsForeignKey = false
                                  IsRequired = false
                                  AppSpecificInfo = CN=Return_Reason_Code::::
                                  IsRequiredServerBound = false
                                  [End]
                                  [Attribute]
                                  Name = SalesRep_Id
                                  Type = Integer
                                  Cardinality = 1
                                  MaxLength = 1
                                  IsKey = false
                                  IsForeignKey = false
                                  IsRequired = false
                                  AppSpecificInfo = CN=SalesRep_Id::::
                                  IsRequiredServerBound = false
                                  [End]
                                  [Attribute]
                                  Name = Schedule_Arrival_Date
                                  Type = Date
                                  Cardinality = 1
                                  MaxLength = 1
                                  IsKey = false
                                  IsForeignKey = false
                                  IsRequired = false
                                  AppSpecificInfo = CN=Schedule_Arrival_Date::::
                                  IsRequiredServerBound = false
                                  [End]
                                  [Attribute]
                                  Name = Schedule_Ship_Date
                                  Type = Date
                                  Cardinality = 1
                                  MaxLength = 1
                                  IsKey = false
                                  IsForeignKey = false
                                  IsRequired = false
                                  AppSpecificInfo = CN=Schedule_Ship_Date::::
                                  IsRequiredServerBound = false
                                  [End]
                                  [Attribute]
                                  Name = Service_Conterminate_Flag
                                  Type = String
                                  Cardinality = 1
                                  MaxLength = 1
                                  IsKey = false
                                  IsForeignKey = false
                                  IsRequired = false
                                  AppSpecificInfo = CN=Service_Coterminate_Flag::::
                                  IsRequiredServerBound = false
                                  [End]
                                  [Attribute]
                                  Name = Service_Duration
                                  Type = Integer
                                  Cardinality = 1
                                  MaxLength = 1
                                  IsKey = false
                                  IsForeignKey = false
```

```
IsRequired = false
AppSpecificInfo = CN=Service_Duration::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Service_End_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Service_End_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Service_Period
Type = String
Cardinality = 1
MaxLength = 3
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Service_Period::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Service_Reference_Line_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Service_Reference_Line::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Service_Reference_System_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Service_Reference_System::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Service_Reference_Type_Code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Service_Reference_Type_Code:::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Service_Start_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Service_Start_Date:::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Service_Txn_Comments
Type = String
Cardinality = 1
MaxLength = 2000
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Service_Txn_Comments::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Service_Txn_Reason_Code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
```

```
                        IsRequired = false
                        AppSpecificInfo = CN=Service_Txn_Reason_Code::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Ship_from_Org_ID
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Ship_from_Org_ID::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Ship_Set_Id
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Ship_Set_Id::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Ship_To_Contact_Id
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Ship_To_Contact_Id::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Ship_To_Org_Id
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Ship_To_Org_Id:::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Ship_Tolerance_Above
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Ship_Tolerance_Above::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Ship_Tolerance_Below
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Ship_Tolerance_Below::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Shipment_Priority_Code
                        Type = String
                        Cardinality = 1
                        MaxLength = 30
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Shipment_Priority_Code:::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Shipping_Instructions
                        Type = String
                        Cardinality = 1
                        MaxLength = 2000
                        IsKey = false
                        IsForeignKey = false
```

```
                              IsRequired = false
                              AppSpecificInfo = CN=Shipping_Instructions::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Shipping_Method_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Shipping_Method_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Sold_From_Org_ID
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Sold_From_Org_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Sold_To_Org_Id
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Sold_To_Org_Id::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Split_From_Line_Id
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Split_From_Line_Id::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Task_Id
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Task_Id::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Tax_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 50
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Tax_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Tax_Date
                              Type = Date
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Tax_Date::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Tax_Exempt_Flag
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
```

```
                              IsRequired = false
                              AppSpecificInfo = CN=Tax_Exempt_Flag::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Tax_Exempt_Number
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Tax_Exempt_Number::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Tax_Exempt_Reason_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Tax_Exempt_Reason_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Tax_Point_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Tax_Point_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Top_model_line_Id
                              Type = String
                              Cardinality = 1
                              MaxLength = 50
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Top_model_line_Ref::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Unit_List_Percent
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Unit_List_Percent::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Unit_List_Price
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Unit_List_Price::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Unit_Selling_Percent
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Unit_Selling_Percent::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Unit_Selling_Price
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
```

```
                           IsRequired = false
                           AppSpecificInfo = CN=Unit_Selling_Price::::
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = ORACLEAPPS_Order_SalesCredit_Interface_BO
                           Type = ORACLEAPPS_Order_SalesCredits_Interface_BO
                           ContainedObjectVersion = 1.0.0
                           Relationship = Containment
                           Cardinality = n
                           MaxLength = 1
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = ORACLEAPPS_Order_PriceAdj_Interface_BO
                           Type = ORACLEAPPS_Order_PriceAdj_Interface_BO
                           ContainedObjectVersion = 1.0.0
                           Relationship = Containment
                           Cardinality = n
                           MaxLength = 1
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = ORACLEAPPS_Order_PriceAtts_Interface_BO
                           Type = ORACLEAPPS_Order_PriceAtts_Interface_BO
                           ContainedObjectVersion = 1.0.0
                           Relationship = Containment
                           Cardinality = n
                           MaxLength = 1
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = ORACLEAPPS_Order_LotSerial_Interface_BO
                           Type = ORACLEAPPS_Order_LotSerial_Interface_BO
                           ContainedObjectVersion = 1.0.0
                           Relationship = Containment
                           Cardinality = n
                           MaxLength = 1
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = ObjectEventId
                           Type = String
                           MaxLength = 255
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           IsRequiredServerBound = false
                           [End]

                           [Verb]
                           Name = Create
                           [End]

                           [Verb]
                           Name = Delete
                           [End]

                           [Verb]
                           Name = Retrieve
                           [End]

                           [Verb]
                           Name = Update
                           [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Order_Interface_BO
Version = 1.0.0
AppSpecificInfo = TN=OE_HEADERS_IFACE_ALL

                           [Attribute]
                           Name = Orig_Sys_Document_Ref
                           Type = String
                           Cardinality = 1
                           MaxLength = 50
```

```
                                    IsKey = true
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=Orig_Sys_Document_Ref::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = AfterCreateSP
                                    Type = String
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = SPN=cw_public_api_process_order;IP=Orig_Sys_Document_Ref
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Orig_Sys_Line_Ref
                                    Type = String
                                    Cardinality = 1
                                    MaxLength = 50
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = AfterUpdateSP
                                    Type = String
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = SPN=cw_public_api_process_order;IP=Orig_Sys_Document_Ref
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Accounting_Rule_ID
                                    Type = Integer
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=Accounting_Rule_ID::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Agreement_ID
                                    Type = Integer
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=Agreement_ID::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Context
                                    Type = String
                                    Cardinality = 1
                                    MaxLength = 30
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=Context::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Attribute1
                                    Type = String
                                    Cardinality = 1
                                    MaxLength = 240
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=Attribute1::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Attribute2
                                    Type = String
                                    Cardinality = 1
                                    MaxLength = 240
                                    IsKey = false
```

```
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute2::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute3
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute3::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute4
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute4::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Attribute5
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Attribute5::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Cancelled_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Cancelled_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Check_Number
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Check_Number::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Conversion_Rate
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Conversion_Rate::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Conversion_Rate_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Conversion_Rate_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Conversion_Type_Code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
```

```
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Conversion_Type_Code::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Created_BY
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = true
                        AppSpecificInfo = CN=Created_BY::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Creation_Date
                        Type = Date
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = true
                        AppSpecificInfo = CN=Creation_Date::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Credit_Card_Code
                        Type = String
                        Cardinality = 1
                        MaxLength = 80
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Credit_Card_Code::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Credit_Card_Expiration_Date
                        Type = Date
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Credit_Card_Expiration_Date::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Credit_Card_Holder_Name
                        Type = String
                        Cardinality = 1
                        MaxLength = 80
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Credit_Card_Holder_Name::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Credit_Card_Number
                        Type = String
                        Cardinality = 1
                        MaxLength = 80
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Credit_Card_Number::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Customer_PO_Number
                        Type = String
                        Cardinality = 1
                        MaxLength = 50
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Customer_PO_Number::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Customer_Payment_Term_ID
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
```

```
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Customer_Payment_Term_ID::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Delivery_TO_Contact_Id
                          Type = Integer
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Deliver_To_Contact_Id::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Delivery_TO_Org_Id
                          Type = Integer
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Deliver_To_Org_Id::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Demand_Class_Code
                          Type = String
                          Cardinality = 1
                          MaxLength = 30
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Demand_Class_Code::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = FOB_Point_Code
                          Type = String
                          Cardinality = 1
                          MaxLength = 30
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=FOB_Point_Code::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Freight_Term_Code
                          Type = String
                          Cardinality = 1
                          MaxLength = 30
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Freight_Terms_Code::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Header_Id
                          Type = Integer
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Header_Id::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Invoice_To_Contact_Id
                          Type = Integer
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          AppSpecificInfo = CN=Invoice_To_Contact_Id::::
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = Invoice_To_Org_Id
                          Type = Integer
                          Cardinality = 1
                          MaxLength = 1
                          IsKey = false
```

```
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Invoice_To_Org_Id::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Invoicing_Rule_Id
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Invoicing_Rule_Id::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Last_Updated_By
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = true
                        AppSpecificInfo = CN=Last_Updated_By::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Last_Update_Date
                        Type = Date
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = true
                        AppSpecificInfo = CN=Last_Update_Date::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Last_Update_login
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Last_Update_login::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Latest_Schedule_Limit
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Latest_Schedule_Limit::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Operation_Code
                        Type = String
                        Cardinality = 1
                        MaxLength = 30
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = true
                        AppSpecificInfo = CN=Operation_Code::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Order_Date_Type_Code
                        Type = String
                        Cardinality = 1
                        MaxLength = 30
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Order_Date_Type_Code::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Order_Number
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
```

```
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Order_Number::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Order_Source_ID
                         Type = Integer
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Order_Source_ID::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Order_Type_Id
                         Type = Integer
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = true
                         AppSpecificInfo = CN=Order_Type_Id::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Ordered_Date
                         Type = Date
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Ordered_Date::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Packing_Instructions
                         Type = String
                         Cardinality = 1
                         MaxLength = 240
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Packing_Instructions::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Payment_Amount
                         Type = Integer
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Payment_Amount::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Payment_Term_ID
                         Type = Integer
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Payment_Term_ID::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Payment_Type_Code
                         Type = String
                         Cardinality = 1
                         MaxLength = 30
                         IsKey = false
                         IsForeignKey = false
                         IsRequired = false
                         AppSpecificInfo = CN=Payment_Type_Code::::
                         IsRequiredServerBound = false
                         [End]
                         [Attribute]
                         Name = Price_List_ID
                         Type = Integer
                         Cardinality = 1
                         MaxLength = 1
                         IsKey = false
```

```
                                    IsForeignKey = false
                                    IsRequired = true
                                    AppSpecificInfo = CN=Price_List_ID::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Program_Application_Id
                                    Type = Integer
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=Program_Application_Id::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Program_ID
                                    Type = Integer
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=Program_ID::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Program_Update_Date
                                    Type = Date
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=Program_Update_Date::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Return_Reason_Code
                                    Type = String
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=Return_Reason_Code::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Sales_Channel_Code
                                    Type = String
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=Sales_Channel_Code::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = SalesRep_Id
                                    Type = Integer
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=SalesRep_Id::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Ship_From_Org_ID
                                    Type = Integer
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
                                    IsForeignKey = false
                                    IsRequired = false
                                    AppSpecificInfo = CN=Ship_From_Org_ID::::
                                    IsRequiredServerBound = false
                                    [End]
                                    [Attribute]
                                    Name = Ship_To_Contact_Id
                                    Type = Integer
                                    Cardinality = 1
                                    MaxLength = 1
                                    IsKey = false
```

```
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Ship_To_Contact_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Ship_to_Org_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Ship_to_Org_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Ship_Tolerance_Above
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Ship_Tolerance_Above::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Ship_Tolerance_below
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Ship_Tolerance_below::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Shipment_Priority_Code
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Shipment_Priority_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Shipping_Instructions
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Shipping_Instructions::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Shipping_Method_Code
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Shipping_Method_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Sold_From_Org_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Sold_From_Org_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Sold_To_Contact_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
```

```
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Sold_To_Contact_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Sold_To_Org_ID
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = true
                              AppSpecificInfo = CN=Sold_To_Org_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Tax_Exempt_Flag
                              Type = String
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Tax_Exempt_Flag::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Tax_Exempt_Number
                              Type = String
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Tax_Exempt_Number::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Tax_Exempt_Reason_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Tax_Exempt_Reason_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Tax_Point_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Tax_Point_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Transactional_Curr_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Transactional_Curr_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = ORACLEAPPS_Order_Line_Interface_BO
                              Type = ORACLEAPPS_Order_Line_Interface_BO
                              ContainedObjectVersion = 1.0.0
                              Relationship = Containment
                              Cardinality = n
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = ORACLEAPPS_Order_SalesCredit_Interface_BO
                              Type = ORACLEAPPS_Order_SalesCredits_Interface_BO
                              ContainedObjectVersion = 1.0.0
                              Relationship = Containment
```

```
                          Cardinality = n
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = ORACLEAPPS_Order_PriceAdj_Interface_BO
                          Type = ORACLEAPPS_Order_PriceAdj_Interface_BO
                          ContainedObjectVersion = 1.0.0
                          Relationship = Containment
                          Cardinality = n
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = ORACLEAPPS_Order_PriceAtts_Interface_BO
                          Type = ORACLEAPPS_Order_PriceAtts_Interface_BO
                          ContainedObjectVersion = 1.0.0
                          Relationship = Containment
                          Cardinality = n
                          MaxLength = 1
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          IsRequiredServerBound = false
                          [End]
                          [Attribute]
                          Name = ObjectEventId
                          Type = String
                          MaxLength = 255
                          IsKey = false
                          IsForeignKey = false
                          IsRequired = false
                          IsRequiredServerBound = false
                          [End]

                          [Verb]
                          Name = Create
                          [End]

                          [Verb]
                          Name = Delete
                          [End]

                          [Verb]
                          Name = Retrieve
                          [End]

                          [Verb]
                          Name = Update
                          [End]
                 [End]
```

BO_ORACLEAPPS_ORDERRETRIEVE

Business object used for testing:

```
[ReposCopy]
Version = 3.1.0
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Order_Line_BO
Version = 1.0.0
AppSpecificInfo = TN=oe_order_lines_v

          [Attribute]
          Name = Line_ID
          Type = Integer
          Cardinality = 1
          MaxLength = 1
          IsKey = true
          IsForeignKey = false
          IsRequired = false
          AppSpecificInfo = CN=Line_ID::::
          IsRequiredServerBound = false
          [End]
          [Attribute]
          Name = Org_ID
          Type = Integer
          Cardinality = 1
          MaxLength = 1
```

```
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Org_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Header_ID
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Header_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Line_Type_ID
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Line_Type_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Line_Number
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Line_Number::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Ordered_Item
                              Type = String
                              Cardinality = 1
                              MaxLength = 2000
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Ordered_Item::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Request_Date
                              Type = Date
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Request_Date::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Promise_Date
                              Type = Date
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Promise_Date::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Order_Quantity_UOM
                              Type = String
                              Cardinality = 1
                              MaxLength = 3
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Order_Quantity_UOM::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Pricing_Quantity
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
```

```
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Pricing_Quantity::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Pricing_Quantity_UOM
                    Type = String
                    Cardinality = 1
                    MaxLength = 3
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Pricing_Quantity_UOM::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Cancelled_Quantity
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Cancelled_Quantity::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Shipped_Quantity
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Shipped_Quantity::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Ordered_Quantity
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Ordered_Quantity::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Fulfilled_Quantity
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Fulfilled_Quantity::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Shipping_Quantity
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Shipping_Quantity::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Cust_PO_Number
                    Type = String
                    Cardinality = 1
                    MaxLength = 50
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Cust_PO_Number::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Ship_Tolerance_Above
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
```

```
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Ship_Tolerance_Above::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Ship_Tolerance_Below
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Ship_Tolerance_Below::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = RLA_Schedule_Type_Code
                    Type = String
                    Cardinality = 1
                    MaxLength = 30
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=RLA_Schedule_Type_Code::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Customer_Dock_Code
                    Type = String
                    Cardinality = 1
                    MaxLength = 50
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Customer_Dock_Code::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Customer_Job
                    Type = String
                    Cardinality = 1
                    MaxLength = 50
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Customer_Job::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Customer_Production_Line
                    Type = String
                    Cardinality = 1
                    MaxLength = 50
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Customer_Production_Line::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Project_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Project_ID::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Task_Id
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Task_Id::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Sold_To_Org_Id
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
```

```
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Sold_To_Org_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Ship_From_Org_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Ship_From_Org_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Ship_To_Org_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Ship_To_Org_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Invoice_To_Org_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Invoice_To_Org_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Ship_To_Contact_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Ship_To_Contact_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Invoice_To_Contact_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Invoice_To_Contact_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Inventory_Item_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Inventory_Item_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Tax_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Tax_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Tax_Code
Type = String
Cardinality = 1
MaxLength = 50
```

```
                                         IsKey = false
                                         IsForeignKey = false
                                         IsRequired = false
                                         AppSpecificInfo = CN=Tax_Code::::
                                         IsRequiredServerBound = false
                                         [End]
                                         [Attribute]
                                         Name = Source_Type_Code
                                         Type = String
                                         Cardinality = 1
                                         MaxLength = 30
                                         IsKey = false
                                         IsForeignKey = false
                                         IsRequired = false
                                         AppSpecificInfo = CN=Source_Type_Code::::
                                         IsRequiredServerBound = false
                                         [End]
                                         [Attribute]
                                         Name = Price_List_ID
                                         Type = Integer
                                         Cardinality = 1
                                         MaxLength = 1
                                         IsKey = false
                                         IsForeignKey = false
                                         IsRequired = false
                                         AppSpecificInfo = CN=Price_List_ID::::
                                         IsRequiredServerBound = false
                                         [End]
                                         [Attribute]
                                         Name = Pricing_Date
                                         Type = Date
                                         Cardinality = 1
                                         MaxLength = 1
                                         IsKey = false
                                         IsForeignKey = false
                                         IsRequired = false
                                         AppSpecificInfo = CN=Pricing_Date::::
                                         IsRequiredServerBound = false
                                         [End]
                                         [Attribute]
                                         Name = Agreement_Id
                                         Type = Integer
                                         Cardinality = 1
                                         MaxLength = 1
                                         IsKey = false
                                         IsForeignKey = false
                                         IsRequired = false
                                         AppSpecificInfo = CN=Agreement_Id::::
                                         IsRequiredServerBound = false
                                         [End]
                                         [Attribute]
                                         Name = Shipment_Priority_Code
                                         Type = String
                                         Cardinality = 1
                                         MaxLength = 30
                                         IsKey = false
                                         IsForeignKey = false
                                         IsRequired = false
                                         AppSpecificInfo = CN=Shipment_Priority_Code::::
                                         IsRequiredServerBound = false
                                         [End]
                                         [Attribute]
                                         Name = Shipping_Method_Code
                                         Type = String
                                         Cardinality = 1
                                         MaxLength = 30
                                         IsKey = false
                                         IsForeignKey = false
                                         IsRequired = false
                                         AppSpecificInfo = CN=Shipping_Method_Code::::
                                         IsRequiredServerBound = false
                                         [End]
                                         [Attribute]
                                         Name = Freight_Terms_Code
                                         Type = String
                                         Cardinality = 1
                                         MaxLength = 30
                                         IsKey = false
                                         IsForeignKey = false
                                         IsRequired = false
                                         AppSpecificInfo = CN=Freight_Terms_Code::::
                                         IsRequiredServerBound = false
                                         [End]
                                         [Attribute]
                                         Name = Payment_Term_ID
                                         Type = Integer
                                         Cardinality = 1
                                         MaxLength = 1
```

```
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Payment_Term_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Invoicing_Rule_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Invoicing_Rule_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Accounting_Rule_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Accounting_Rule_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Source_Document_Type_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Source_Document_Type_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Orig_Sys_Document_Ref
Type = String
Cardinality = 1
MaxLength = 50
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Orig_Sys_Document_Ref::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Source_Document_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Source_Document_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Orig_Sys_Line_Ref
Type = String
Cardinality = 1
MaxLength = 50
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Orig_Sys_Line_Ref::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Source_Document_Line_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Source_Document_Line_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Item_Revision
Type = String
Cardinality = 1
MaxLength = 3
```

```
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Item_Revision::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Line_Category_Code
                        Type = String
                        Cardinality = 1
                        MaxLength = 30
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Line_Category_Code::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Unit_Selling_Price
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Unit_Selling_Price::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Unit_List_Price
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Unit_List_Price::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Tax_Value
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Tax_Value::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Creation_Date
                        Type = Date
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Creation_Date::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Created_By
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Created_By::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Last_Update_Login
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Last_Update_Login::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Last_Update_Date
                        Type = Date
                        Cardinality = 1
                        MaxLength = 1
```

```
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Last_Update_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Last_Updated_By
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Last_Updated_By::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Item_Type_Code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Item_Type_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Line_Type
Type = String
Cardinality = 1
MaxLength = 40
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Line_Type::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Agreement
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Agreement::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Pirce_List
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Pirce_List::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Customer_Number
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Customer_Number::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = ObjectEventId
Type = String
MaxLength = 255
IsKey = false
IsForeignKey = false
IsRequired = false
IsRequiredServerBound = false
[End]

[Verb]
Name = Create
[End]

[Verb]
Name = Delete
```

```
                    [End]

                    [Verb]
                    Name = Retrieve
                    [End]

                    [Verb]
                    Name = Update
                    [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Order_PriceAdj_BO
Version = 1.0.0
AppSpecificInfo = TN=OE_PRICE_ADJUSTMENTS_V

                    [Attribute]
                    Name = Price_Adjustment_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = true
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Price_Adjustment_ID::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Creation_Date
                    Type = Date
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Creation_Date::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Created_By
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Created_By::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Last_Update_Login
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Last_Update_Login::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Last_Update_Date
                    Type = Date
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Last_Update_Date::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Last_Updated_By
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Last_Updated_By::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Header_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = false
                    IsForeignKey = false
```

```
                              IsRequired = false
                              AppSpecificInfo = CN=Header_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Discount_ID
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Discount_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Discount_Line_ID
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Discount_Line_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Automatic_Flag
                              Type = String
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Automatic_Flag::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Percent
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Percent::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Line_ID
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Line_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Orig_Sys_Discount_Ref
                              Type = String
                              Cardinality = 1
                              MaxLength = 50
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Orig_Sys_Discount_Ref::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = List_Header_Id
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=List_Header_Id::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = List_Line_ID
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
```

```
                              IsRequired = false
                              AppSpecificInfo = CN=List_Line_ID::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = List_Line_Type_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=List_Line_Type_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Modifier_Mechanism_Type_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Modifier_Mechanism_Type_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Modifier_From
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Modifier_From::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Modifier_To
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Modifier_To::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Adjustment_Name
                              Type = String
                              Cardinality = 1
                              MaxLength = 240
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Adjustment_Name::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Adjustment_Type_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Adjustment_Type_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Adjustment_Type_Name
                              Type = String
                              Cardinality = 1
                              MaxLength = 240
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Adjustment_Type_Name::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Parent_Adjustment_ID
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
```

```
                        IsRequired = false
                        AppSpecificInfo = CN=Parent_Adjustment_ID::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Split_Action_Code
                        Type = String
                        Cardinality = 1
                        MaxLength = 30
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Split_Action_Code::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Adjustment_Amount
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Adjustment_Amount::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Adjustment_Description
                        Type = String
                        Cardinality = 1
                        MaxLength = 2000
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Adjustment_Description::::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = ObjectEventId
                        Type = String
                        MaxLength = 255
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        IsRequiredServerBound = false
                        [End]

                        [Verb]
                        Name = Create
                        [End]

                        [Verb]
                        Name = Delete
                        [End]

                        [Verb]
                        Name = Retrieve
                        [End]

                        [Verb]
                        Name = Update
                        [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Order_PriceAtts_BO
Version = 1.0.0
AppSpecificInfo = TN=OE_PRICE_ADJ_ATTRIBS_V

                        [Attribute]
                        Name = Price_Adj_Attrib_ID
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = true
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Price_Adj_Attrib_ID:::
                        IsRequiredServerBound = false
                        [End]
                        [Attribute]
                        Name = Price_Adjustment_ID
                        Type = Integer
                        Cardinality = 1
                        MaxLength = 1
                        IsKey = false
                        IsForeignKey = false
                        IsRequired = false
                        AppSpecificInfo = CN=Price_Adjustment_ID::::
```

```
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Flex_Title
                              Type = String
                              Cardinality = 1
                              MaxLength = 60
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Flex_Title::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Pricing_Context
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Pricing_Context::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Pricing_Attribute
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Pricing_Attribute::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Creation_Date
                              Type = Date
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Creation_Date::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Created_By
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Created_By::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Last_Update_Login
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Last_Update_Login::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Last_Update_Date
                              Type = Date
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Last_Update_Date::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Last_Updated_By
                              Type = Integer
                              Cardinality = 1
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Last_Updated_By::::
```

```
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Pricing_Attr_Value_From
                    Type = String
                    Cardinality = 1
                    MaxLength = 40
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Pricing_Attr_Value_From::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Pricing_Attr_Value_To
                    Type = String
                    Cardinality = 1
                    MaxLength = 40
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Pricing_Attr_Value_To::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Comparison_Operator
                    Type = String
                    Cardinality = 1
                    MaxLength = 30
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Comparison_Operator::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = ObjectEventId
                    Type = String
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    IsRequiredServerBound = false
                    [End]

                    [Verb]
                    Name = Create
                    [End]

                    [Verb]
                    Name = Delete
                    [End]

                    [Verb]
                    Name = Retrieve
                    [End]

                    [Verb]
                    Name = Update
                    [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Order_SalesCredit_BO
Version = 1.0.0
AppSpecificInfo = TN=oe_sales_credits_v

                    [Attribute]
                    Name = Sales_Credit_ID
                    Type = Integer
                    Cardinality = 1
                    MaxLength = 1
                    IsKey = true
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Sales_Credit_ID::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Salesrep
                    Type = String
                    Cardinality = 1
                    MaxLength = 255
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Salesrep::::
                    IsRequiredServerBound = false
                    [End]
```

```
[Attribute]
Name = Sales_Credit_Type_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Sales_Credit_Type_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Sales_Credit_Type
Type = String
Cardinality = 1
MaxLength = 240
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Sales_Credit_Type::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Quota_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Quota_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Percent
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Percent::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Header_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Header_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Line_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Line_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Salesrep_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Salesrep_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Creation_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Creation_Date::::
IsRequiredServerBound = false
[End]
```

```
                [Attribute]
                Name = Created_By
                Type = Integer
                Cardinality = 1
                MaxLength = 1
                IsKey = false
                IsForeignKey = false
                IsRequired = false
                AppSpecificInfo = CN=Created_By::::
                IsRequiredServerBound = false
                [End]
                [Attribute]
                Name = Last_Update_Login
                Type = Integer
                Cardinality = 1
                MaxLength = 1
                IsKey = false
                IsForeignKey = false
                IsRequired = false
                AppSpecificInfo = CN=Last_Update_Login::::
                IsRequiredServerBound = false
                [End]
                [Attribute]
                Name = Last_Update_Date
                Type = Date
                Cardinality = 1
                MaxLength = 1
                IsKey = false
                IsForeignKey = false
                IsRequired = false
                AppSpecificInfo = CN=Last_Update_Date::::
                IsRequiredServerBound = false
                [End]
                [Attribute]
                Name = Last_Updated_By
                Type = Integer
                Cardinality = 1
                MaxLength = 1
                IsKey = false
                IsForeignKey = false
                IsRequired = false
                AppSpecificInfo = CN=Last_Updated_By::::
                IsRequiredServerBound = false
                [End]
                [Attribute]
                Name = ObjectEventId
                Type = String
                MaxLength = 255
                IsKey = false
                IsForeignKey = false
                IsRequired = false
                IsRequiredServerBound = false
                [End]

                [Verb]
                Name = Create
                [End]

                [Verb]
                Name = Delete
                [End]

                [Verb]
                Name = Retrieve
                [End]

                [Verb]
                Name = Update
                [End]
[End]
[BusinessObjectDefinition]
Name = ORACLEAPPS_Order_Retrieve
Version = 1.0.0
AppSpecificInfo = TN=oe_order_headers_v

                [Attribute]
                Name = Header_ID
                Type = Integer
                Cardinality = 1
                MaxLength = 1
                IsKey = true
                IsForeignKey = false
                IsRequired = false
                AppSpecificInfo = CN=Header_ID::::
                IsRequiredServerBound = false
                [End]
                [Attribute]
                Name = Org_ID
```

```
                                        Type = Integer
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Org_ID::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Order_Type_ID
                                        Type = Integer
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Order_Type_ID::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Order_Number
                                        Type = Integer
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Order_Number::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Version_Number
                                        Type = Integer
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Version_Number::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Order_Source_ID
                                        Type = Integer
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Order_Source_ID::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Source_Document_Type_ID
                                        Type = Integer
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Source_Document_Type_ID::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Source_Document_ID
                                        Type = Integer
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Source_Document_ID::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Ordered_Date
                                        Type = Date
                                        Cardinality = 1
                                        MaxLength = 1
                                        IsKey = false
                                        IsForeignKey = false
                                        IsRequired = false
                                        AppSpecificInfo = CN=Ordered_Date::::
                                        IsRequiredServerBound = false
                                        [End]
                                        [Attribute]
                                        Name = Pricing_Date
```

```
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Pricing_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Shipment_Priority_Code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Shipment_Priority_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Price_List_Id
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Price_List_Id::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Tax_Exempt_Flag
Type = String
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Tax_Exempt_Flag::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Tax_Exempt_Number
Type = String
Cardinality = 1
MaxLength = 80
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Tax_Exempt_Number::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Tax_Exempt_Reason_Code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Tax_Exempt_Reason_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Conversion_Rate
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Conversion_Rate::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Conversion_Rate_Code
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Conversion_Rate_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Transactional_Curr_Code
```

```
                                Type = String
                                Cardinality = 1
                                MaxLength = 3
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Transactional_Curr_Code::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Agreement_ID
                                Type = Integer
                                Cardinality = 1
                                MaxLength = 1
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Agreement_ID::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Cust_PO_Number
                                Type = String
                                Cardinality = 1
                                MaxLength = 50
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Cust_PO_Number::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Invoicing_Rule_ID
                                Type = Integer
                                Cardinality = 1
                                MaxLength = 1
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Invoicing_Rule_ID::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Accounting_Rule_ID
                                Type = Integer
                                Cardinality = 1
                                MaxLength = 1
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Accounting_Rule_ID::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Payment_Term_ID
                                Type = Integer
                                Cardinality = 1
                                MaxLength = 1
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Payment_Term_ID::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Shipping_Method_Code
                                Type = String
                                Cardinality = 1
                                MaxLength = 30
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Shipping_Method_Code::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = FOB_POINT_CODE
                                Type = String
                                Cardinality = 1
                                MaxLength = 30
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=FOB_POINT_CODE::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Freight_Terms_Code
```

```
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Freight_Terms_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Sold_To_Org_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Sold_To_Org_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Ship_From_Org_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Ship_From_Org_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Ship_To_Org_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Ship_To_Org_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Invoice_To_Org_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Invoice_To_Org_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Sold_To_Contact_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Sold_To_Contact_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Ship_To_Contact_ID
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Ship_To_Contact_ID::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Creation_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Creation_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Created_By
```

```
                                Type = Integer
                                Cardinality = 1
                                MaxLength = 1
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Created_By::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Last_Update_Login
                                Type = Integer
                                Cardinality = 1
                                MaxLength = 1
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Last_Update_Login::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Last_Update_Date
                                Type = Date
                                Cardinality = 1
                                MaxLength = 1
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Last_Update_Date::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Last_Updated_By
                                Type = Integer
                                Cardinality = 1
                                MaxLength = 1
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Last_Updated_By::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Context
                                Type = String
                                Cardinality = 1
                                MaxLength = 30
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Context::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Attribute1
                                Type = String
                                Cardinality = 1
                                MaxLength = 240
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Attribute1::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Attribute2
                                Type = String
                                Cardinality = 1
                                MaxLength = 240
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Attribute2::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Attribute3
                                Type = String
                                Cardinality = 1
                                MaxLength = 240
                                IsKey = false
                                IsForeignKey = false
                                IsRequired = false
                                AppSpecificInfo = CN=Attribute3::::
                                IsRequiredServerBound = false
                                [End]
                                [Attribute]
                                Name = Attribute4
```

```
                    Type = String
                    Cardinality = 1
                    MaxLength = 240
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Attribute4::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Attribute5
                    Type = String
                    Cardinality = 1
                    MaxLength = 240
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Attribute5::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = source_Document_Type
                    Type = String
                    Cardinality = 1
                    MaxLength = 240
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=source_Document_Type::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Freight_Carrier_Code
                    Type = String
                    Cardinality = 1
                    MaxLength = 30
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Freight_Carrier_Code::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Customer_Number
                    Type = String
                    Cardinality = 1
                    MaxLength = 30
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Customer_Number::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Order_Source
                    Type = String
                    Cardinality = 1
                    MaxLength = 240
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Order_Source::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Order_Type
                    Type = String
                    Cardinality = 1
                    MaxLength = 40
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Order_Type::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Agreement
                    Type = String
                    Cardinality = 1
                    MaxLength = 240
                    IsKey = false
                    IsForeignKey = false
                    IsRequired = false
                    AppSpecificInfo = CN=Agreement::::
                    IsRequiredServerBound = false
                    [End]
                    [Attribute]
                    Name = Price_List
```

```
                                       Type = String
                                       Cardinality = 1
                                       MaxLength = 240
                                       IsKey = false
                                       IsForeignKey = false
                                       IsRequired = false
                                       AppSpecificInfo = CN=Price_List::::
                                       IsRequiredServerBound = false
                                       [End]
                                       [Attribute]
                                       Name = Converion_Type
                                       Type = String
                                       Cardinality = 1
                                       MaxLength = 30
                                       IsKey = false
                                       IsForeignKey = false
                                       IsRequired = false
                                       AppSpecificInfo = CN=Converion_Type::::
                                       IsRequiredServerBound = false
                                       [End]
                                       [Attribute]
                                       Name = Accoutning_Rule
                                       Type = String
                                       Cardinality = 1
                                       MaxLength = 30
                                       IsKey = false
                                       IsForeignKey = false
                                       IsRequired = false
                                       AppSpecificInfo = CN=Accoutning_Rule::::
                                       IsRequiredServerBound = false
                                       [End]
                                       [Attribute]
                                       Name = Invoicing_Rule
                                       Type = String
                                       Cardinality = 1
                                       MaxLength = 30
                                       IsKey = false
                                       IsForeignKey = false
                                       IsRequired = false
                                       AppSpecificInfo = CN=Invoicing_Rule ::::
                                       IsRequiredServerBound = false
                                       [End]
                                       [Attribute]
                                       Name = Terms
                                       Type = String
                                       Cardinality = 1
                                       MaxLength = 15
                                       IsKey = false
                                       IsForeignKey = false
                                       IsRequired = false
                                       AppSpecificInfo = CN=Terms::::
                                       IsRequiredServerBound = false
                                       [End]
                                       [Attribute]
                                       Name = Sold_To
                                       Type = String
                                       Cardinality = 1
                                       MaxLength = 255
                                       IsKey = false
                                       IsForeignKey = false
                                       IsRequired = false
                                       AppSpecificInfo = CN=Sold_To::::
                                       IsRequiredServerBound = false
                                       [End]
                                       [Attribute]
                                       Name = Sold_From
                                       Type = String
                                       Cardinality = 1
                                       MaxLength = 3
                                       IsKey = false
                                       IsForeignKey = false
                                       IsRequired = false
                                       AppSpecificInfo = CN=Sold_From::::
                                       IsRequiredServerBound = false
                                       [End]
                                       [Attribute]
                                       Name = Ship_From_Location
                                       Type = String
                                       Cardinality = 1
                                       MaxLength = 240
                                       IsKey = false
                                       IsForeignKey = false
                                       IsRequired = false
                                       AppSpecificInfo = CN=Ship_From_Location::::
                                       IsRequiredServerBound = false
                                       [End]
                                       [Attribute]
                                       Name = Ship_From_Address1
```

```
                               Type = String
                               Cardinality = 1
                               MaxLength = 240
                               IsKey = false
                               IsForeignKey = false
                               IsRequired = false
                               AppSpecificInfo = CN=Ship_From_Address1::::
                               IsRequiredServerBound = false
                               [End]
                               [Attribute]
                               Name = Ship_From_Address2
                               Type = String
                               Cardinality = 1
                               MaxLength = 240
                               IsKey = false
                               IsForeignKey = false
                               IsRequired = false
                               AppSpecificInfo = CN=Ship_From_Address2::::
                               IsRequiredServerBound = false
                               [End]
                               [Attribute]
                               Name = Ship_From_Address3
                               Type = String
                               Cardinality = 1
                               MaxLength = 240
                               IsKey = false
                               IsForeignKey = false
                               IsRequired = false
                               AppSpecificInfo = CN=Ship_From_Address3::::
                               IsRequiredServerBound = false
                               [End]
                               [Attribute]
                               Name = Ship_To_Location
                               Type = String
                               Cardinality = 1
                               MaxLength = 40
                               IsKey = false
                               IsForeignKey = false
                               IsRequired = false
                               AppSpecificInfo = CN=Ship_To_Location::::
                               IsRequiredServerBound = false
                               [End]
                               [Attribute]
                               Name = Ship_To_Address1
                               Type = String
                               Cardinality = 1
                               MaxLength = 240
                               IsKey = false
                               IsForeignKey = false
                               IsRequired = false
                               AppSpecificInfo = CN=Ship_To_Address1::::
                               IsRequiredServerBound = false
                               [End]
                               [Attribute]
                               Name = Ship_To_Address2
                               Type = String
                               Cardinality = 1
                               MaxLength = 240
                               IsKey = false
                               IsForeignKey = false
                               IsRequired = false
                               AppSpecificInfo = CN=Ship_To_Address2::::
                               IsRequiredServerBound = false
                               [End]
                               [Attribute]
                               Name = Ship_To_Address3
                               Type = String
                               Cardinality = 1
                               MaxLength = 240
                               IsKey = false
                               IsForeignKey = false
                               IsRequired = false
                               AppSpecificInfo = CN=Ship_To_Address3::::
                               IsRequiredServerBound = false
                               [End]
                               [Attribute]
                               Name = Invoice_To
                               Type = String
                               Cardinality = 1
                               MaxLength = 40
                               IsKey = false
                               IsForeignKey = false
                               IsRequired = false
                               AppSpecificInfo = CN=Invoice_To::::
                               IsRequiredServerBound = false
                               [End]
                               [Attribute]
                               Name = Invoice_To_Location
```

```
                           Type = String
                           Cardinality = 1
                           MaxLength = 40
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           AppSpecificInfo = CN=Invoice_To_Location::::
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = Invoice_To_Address1
                           Type = String
                           Cardinality = 1
                           MaxLength = 240
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           AppSpecificInfo = CN=Invoice_To_Address1::::
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = Invoice_To_Address2
                           Type = String
                           Cardinality = 1
                           MaxLength = 240
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           AppSpecificInfo = CN=Invoice_To_Address2::::
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = Invoice_To_Address3
                           Type = String
                           Cardinality = 1
                           MaxLength = 240
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           AppSpecificInfo = CN=Invoice_To_Address3::::
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = Sold_To_Contact
                           Type = String
                           Cardinality = 1
                           MaxLength = 333
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           AppSpecificInfo = CN=Sold_To_Contact::::
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = Ship_To_Contact
                           Type = String
                           Cardinality = 1
                           MaxLength = 333
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           AppSpecificInfo = CN=Ship_To_Contact::::
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = Salesrep_ID
                           Type = Integer
                           Cardinality = 1
                           MaxLength = 1
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           AppSpecificInfo = CN=Salesrep_ID::::
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = Order_Date_Type_Code
                           Type = String
                           Cardinality = 1
                           MaxLength = 30
                           IsKey = false
                           IsForeignKey = false
                           IsRequired = false
                           AppSpecificInfo = CN=Order_Date_Type_Code::::
                           IsRequiredServerBound = false
                           [End]
                           [Attribute]
                           Name = Payment_Type_Code
```

```
Type = String
Cardinality = 1
MaxLength = 30
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Payment_Type_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Payment_Amount
Type = Integer
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Payment_Amount::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Check_Number
Type = String
Cardinality = 1
MaxLength = 50
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Check_Number::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Credit_card_Code
Type = String
Cardinality = 1
MaxLength = 80
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Credit_card_Code::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = CreditCard_Holder_Name
Type = String
Cardinality = 1
MaxLength = 80
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=CreditCard_Holder_Name::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Credit_Card_Number
Type = String
Cardinality = 1
MaxLength = 80
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Credit_Card_Number::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Booked_Date
Type = Date
Cardinality = 1
MaxLength = 1
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Booked_Date::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Shipping_Instructions
Type = String
Cardinality = 1
MaxLength = 2000
IsKey = false
IsForeignKey = false
IsRequired = false
AppSpecificInfo = CN=Shipping_Instructions::::
IsRequiredServerBound = false
[End]
[Attribute]
Name = Packing_Instructions
```

Appendix D. Business object and stored procedure samples **245**

```
                              Type = String
                              Cardinality = 1
                              MaxLength = 2000
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Packing_Instructions::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Order_Category_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Order_Category_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = Sales_Channel_Code
                              Type = String
                              Cardinality = 1
                              MaxLength = 30
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              AppSpecificInfo = CN=Sales_Channel_Code::::
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = ORACLEAPPS_Order_Line_BO
                              Type = ORACLEAPPS_Order_Line_BO
                              ContainedObjectVersion = 1.0.0
                              Relationship = Containment
                              Cardinality = n
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = ORACLEAPPS_Order_PriceAdj_BO
                              Type = ORACLEAPPS_Order_PriceAdj_BO
                              ContainedObjectVersion = 1.0.0
                              Relationship = Containment
                              Cardinality = n
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = ORACLEAPPS_Order_PriceAtts_BO
                              Type = ORACLEAPPS_Order_PriceAtts_BO
                              ContainedObjectVersion = 1.0.0
                              Relationship = Containment
                              Cardinality = n
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = ORACLEAPPS_Order_SalesCredit_BO
                              Type = ORACLEAPPS_Order_SalesCredit_BO
                              ContainedObjectVersion = 1.0.0
                              Relationship = Containment
                              Cardinality = n
                              MaxLength = 1
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              IsRequiredServerBound = false
                              [End]
                              [Attribute]
                              Name = ObjectEventId
                              Type = String
                              MaxLength = 255
                              IsKey = false
                              IsForeignKey = false
                              IsRequired = false
                              IsRequiredServerBound = false
                              [End]
```

```
            [Verb]
            Name = Create
            [End]

            [Verb]
            Name = Delete
            [End]

            [Verb]
            Name = Retrieve
            [End]

            [Verb]
            Name = Update
            [End]
    [End]
```

CW_CUSTOMER_INTERFACE

Procedure to call an Oracle Application Submit_Request from a Oracle_Customer Business Object:

This procedure creates a concurrent request and imports customer information from the interface table. Oracle Application Log and Out files are in their respective directories. The user can view the Log and Out files with the View Request (log/out) option.

```
Create Or Replace Procedure Cw_Customer_Interface(pUserid Number, pResId Number,
pApplication_id Number) Is
v_reqid number;
v_retval boolean;
begin
    v_retval:=FND_REQUEST.SET_MODE(DB_TRIGGER => TRUE);
    v_retval:=FND_REQUEST.SET_OPTIONS(IMPLICIT => 'ERROR');

    fnd_global.APPS_INITIALIZE(pUserid, pResId, PApplication_Id);
    v_reqid := Fnd_Request.Submit_request('AR', 'RACUST', '', sysdate, FALSE) ;
    if v_reqid=0 then
      raise_application_error(-20160, FND_MESSAGE.GET);
    end if;
end;
```

CW_ITEM_INTERFACE

Procedure to call an Oracle Application Submit_Request from a Oracle_Customer Business Object:

This procedure creates a concurrent request and imports customer information from the interface table. Oracle Application Log and Out files are in their respective directories. The user can view the Log and Out files with the View Request (log/out) option.

```
Create Or Replace Procedure Cw_Item_Interface(pUserid Number, pResId Number,
pApplication_id Number, pOrgId Number, pAllOrg Number, pCreateUpdate Varchar2, pProcess_Id Number) Is
v_reqid number;
v_retval boolean;
v_Create_Update number;
begin
    v_retval:=FND_REQUEST.SET_MODE(DB_TRIGGER => TRUE);
    v_retval:=FND_REQUEST.SET_OPTIONS(IMPLICIT => 'ERROR');

    fnd_global.APPS_INITIALIZE(pUserid, pResId, pApplication_Id);

--      Input Parameters
--
--       - Oranization_ID
--       - All Organization (Yes/No)
--       - Validate Items (Yes/No)
--        - Process Items  (Yes/No)
--      - Delete Processed rows (Yes/No)
--       - Process Set
--       - CREATE/UPDATE Record (1/2)
        If pCreateUpdate = 'CREATE' Then
                v_Create_Update := 1;
        End If;
```

```
                If pCreateUpdate = 'UPDATE' Then
                        v_Create_Update := 2;
                End If;

     v_reqid := Fnd_Request.Submit_request('INV', 'INCOIN', '', sysdate, FALSE, pOrgId,
pAllOrg, 1, 1, 1, pProcess_Id, v_Create_Update) ;
     if v_reqid=0 then
       raise_application_error(-20170, FND_MESSAGE.GET);
     end if;
end;
/
show errors;
```

CW_PUBLIC_API_PROCESS_ORDER

The procedure `CW_PUBLIC_API_PROCESS_ORDER` calls the procedure
`DELETE_PROCESSED_RECORD`:

```
Create Or Replace Procedure Cw_Public_API_Process_Order (pOrder_Number Number)
IS
p_api_version_number              NUMBER;
p_init_msg_list                   VARCHAR2(1000);
l_init_msg_list                   VARCHAR2(1000);
p_return_values                   VARCHAR2(1000);
l_return_values                   VARCHAR2(1000);
p_action_commit                   VARCHAR2(1000);
l_action_commit                   VARCHAR2(1000);
l_return_status                   VARCHAR2(1000);
l_msg_count                       NUMBER;
l_msg_data                        VARCHAR2(1000);
l_header_rec                      OE_ORDER_PUB.Header_Rec_Type;
l_old_header_rec                  OE_ORDER_PUB.Header_Rec_Type;
l_header_val_rec                  OE_ORDER_PUB.Header_Val_Rec_Type;
l_old_header_val_rec              OE_ORDER_PUB.Header_Val_Rec_Type;
l_Header_Adj_tbl                  OE_ORDER_PUB.Header_Adj_Tbl_Type;
l_old_Header_Adj_tbl              OE_ORDER_PUB.Header_Adj_Tbl_Type;
l_Header_Adj_val_tbl              OE_ORDER_PUB.Header_Adj_Val_Tbl_Type;
l_old_Header_Adj_val_tbl          OE_ORDER_PUB.Header_Adj_Val_Tbl_Type;
l_Header_price_Att_tbl            OE_ORDER_PUB.Header_Price_Att_Tbl_Type;
l_old_Header_Price_Att_tbl        OE_ORDER_PUB.Header_Price_Att_Tbl_Type;
l_Header_Adj_Att_tbl              OE_ORDER_PUB.Header_Adj_Att_Tbl_Type;
l_old_Header_Adj_Att_tbl          OE_ORDER_PUB.Header_Adj_Att_Tbl_Type;
l_Header_Adj_Assoc_tbl            OE_ORDER_PUB.Header_Adj_Assoc_Tbl_Type;
l_old_Header_Adj_Assoc_tbl        OE_ORDER_PUB.Header_Adj_Assoc_Tbl_Type;
l_Header_Scredit_tbl              OE_ORDER_PUB.Header_Scredit_Tbl_Type;
l_old_Header_Scredit_tbl          OE_ORDER_PUB.Header_Scredit_Tbl_Type;
l_Header_Scredit_val_tbl          OE_ORDER_PUB.Header_Scredit_Val_Tbl_Type;
l_old_Header_Scredit_val_tbl      OE_ORDER_PUB.Header_Scredit_Val_Tbl_Type;
l_line_tbl                        OE_ORDER_PUB.Line_Tbl_Type;
l_old_line_tbl                    OE_ORDER_PUB.Line_Tbl_Type;
l_line_val_tbl                    OE_ORDER_PUB.Line_Val_Tbl_Type;
l_old_line_val_tbl                OE_ORDER_PUB.Line_Val_Tbl_Type;
l_Line_Adj_tbl                    OE_ORDER_PUB.Line_Adj_Tbl_Type;
l_old_Line_Adj_tbl                OE_ORDER_PUB.Line_Adj_Tbl_Type;
l_Line_Adj_val_tbl                OE_ORDER_PUB.Line_Adj_Val_Tbl_Type;
l_old_Line_Adj_val_tbl            OE_ORDER_PUB.Line_Adj_Val_Tbl_Type;
l_Line_price_Att_tbl              OE_ORDER_PUB.Line_Price_Att_Tbl_Type;
l_old_Line_Price_Att_tbl          OE_ORDER_PUB.Line_Price_Att_Tbl_Type;
l_Line_Adj_Att_tbl                OE_ORDER_PUB.Line_Adj_Att_Tbl_Type;
l_old_Line_Adj_Att_tbl            OE_ORDER_PUB.Line_Adj_Att_Tbl_Type;
l_Line_Adj_Assoc_tbl                OE_ORDER_PUB.Line_Adj_Assoc_Tbl_Type;
l_old_Line_Adj_Assoc_tbl            OE_ORDER_PUB.Line_Adj_Assoc_Tbl_Type;
l_Line_Scredit_tbl                OE_ORDER_PUB.Line_Scredit_Tbl_Type;
l_old_Line_Scredit_tbl            OE_ORDER_PUB.Line_Scredit_Tbl_Type;
l_Line_Scredit_val_tbl            OE_ORDER_PUB.Line_Scredit_Val_Tbl_Type;
l_old_Line_Scredit_val_tbl        OE_ORDER_PUB.Line_Scredit_Val_Tbl_Type;
l_Lot_Serial_tbl                  OE_ORDER_PUB.Lot_Serial_Tbl_Type;
l_old_Lot_Serial_tbl              OE_ORDER_PUB.Lot_Serial_Tbl_Type;
l_Lot_Serial_val_tbl              OE_ORDER_PUB.Lot_Serial_Val_Tbl_Type;
```

```
l_old_Lot_Serial_val_tbl            OE_ORDER_PUB.Lot_Serial_Val_Tbl_Type;
l_action_request_tbl                OE_ORDER_PUB.Request_Tbl_Type;

x_return_status                     VARCHAR2(1000);
x_msg_count                         NUMBER;
x_msg_data                          VARCHAR2(1000);
x_header_rec                        OE_ORDER_PUB.Header_Rec_Type;
x_header_val_rec                    OE_ORDER_PUB.Header_Val_Rec_Type;
x_Header_Adj_tbl                    OE_ORDER_PUB.Header_Adj_Tbl_Type;
x_Header_Adj_val_tbl                OE_ORDER_PUB.Header_Adj_Val_Tbl_Type;
x_Header_price_Att_tbl              OE_ORDER_PUB.Header_Price_Att_Tbl_Type;
x_Header_Adj_Att_tbl                OE_ORDER_PUB.Header_Adj_Att_Tbl_Type;
x_Header_Adj_Assoc_tbl              OE_ORDER_PUB.Header_Adj_Assoc_Tbl_Type;
x_Header_Scredit_tbl                OE_ORDER_PUB.Header_Scredit_Tbl_Type;
x_Header_Scredit_val_tbl            OE_ORDER_PUB.Header_Scredit_Val_Tbl_Type;
x_line_tbl                          OE_ORDER_PUB.Line_Tbl_Type;
x_line_val_tbl                      OE_ORDER_PUB.Line_Val_Tbl_Type;
x_Line_Adj_tbl                      OE_ORDER_PUB.Line_Adj_Tbl_Type;
x_Line_Adj_val_tbl                  OE_ORDER_PUB.Line_Adj_Val_Tbl_Type;
x_Line_price_Att_tbl                OE_ORDER_PUB.Line_Price_Att_Tbl_Type;
x_Line_Adj_Att_tbl                  OE_ORDER_PUB.Line_Adj_Att_Tbl_Type;
x_Line_Adj_Assoc_tbl                OE_ORDER_PUB.Line_Adj_Assoc_Tbl_Type;
x_Line_Scredit_tbl                  OE_ORDER_PUB.Line_Scredit_Tbl_Type;
x_Line_Scredit_val_tbl              OE_ORDER_PUB.Line_Scredit_Val_Tbl_Type;
x_Lot_Serial_tbl                    OE_ORDER_PUB.Lot_Serial_Tbl_Type;
x_Lot_Serial_val_tbl                OE_ORDER_PUB.Lot_Serial_Val_Tbl_Type;
x_action_request_tbl                OE_ORDER_PUB.Request_Tbl_Type;


-- Sales Credit and Price Adjustments can be for Header as Well as Lines,
-- When Line_Id is specified along with Header_Id
-- the Record is For LINES other wise for HEADER.


--
-- User_ID Is required for giving call to Fnd_Global.apps_Initialize
-- But CW User for each customer can have different Userid
-- So Instead of Defining UserID,
-- Define UserName Varchar2(30)
-- and a Select statement such as Select User_Id Into pUserId From Fnd_User Where
-- Upper(UserName) = User_Name
-- Define pUserId aLocal Variable of Type Number and Use it
-- In Fnd_Global.apps_Initialize Call.
--

Cursor    w_Oe_Order_Headers_All  Is
    Select    *
    From      OE_HEADERS_IFACE_ALL
    Where     Orig_Sys_Document_Ref=pOrder_Number;

Cursor    w_Oe_Price_Adjustments  Is
    Select    *
    From      OE_PRICE_ADJS_IFACE_ALL
    Where     Orig_Sys_Document_Ref=pOrder_Number;

Cursor    w_Oe_Sales_Credits  Is
    Select    *
    From      OE_CREDITS_IFACE_ALL
    Where     Orig_Sys_Document_Ref=pOrder_Number;

Cursor    w_Oe_Order_Lines_All  Is
    Select    *
    From      OE_LINES_IFACE_ALL
    Where     Orig_Sys_Document_Ref=pOrder_Number;

Cursor    w_Oe_Lot_Serial_Numbers  Is
    Select    *
    From      OE_LOTSERIALS_IFACE_ALL
```

```
            Where      Orig_Sys_Document_Ref=pOrder_Number;

        Cursor    w_Oe_Price_Adj_Attribs   Is
            Select     *
             From      OE_PRICE_ATTS_IFACE_ALL
            Where      Orig_Sys_Document_Ref=pOrder_Number;

        Cw_Oe_Order_Headers_All_Rec      w_Oe_Order_Headers_All%ROWTYPE;
        Cw_Oe_Price_Adjustments_Rec      w_Oe_Price_Adjustments%ROWTYPE;
        Cw_Oe_Sales_Credits_Rec      w_Oe_Sales_Credits%ROWTYPE;
        Cw_Oe_Order_Lines_All_Rec      w_Oe_Order_Lines_All%ROWTYPE;
        Cw_Oe_Lot_Serial_Numbers_Rec      w_Oe_Lot_Serial_Numbers%ROWTYPE;
        Cw_Oe_Price_Adj_Attribs_Rec      w_Oe_Price_Adj_Attribs%ROWTYPE;

        i     Number;

        BEGIN

        If w_Oe_Order_Headers_All%ISOPEN Then
            CLOSE w_Oe_Order_Headers_All;
                End If;
        OPEN w_Oe_Order_Headers_All;
        LOOP
            FETCH w_Oe_Order_Headers_All     INTO     Cw_Oe_Order_Headers_All_Rec;
            EXIT WHEN w_Oe_Order_Headers_All%NOTFOUND;

            l_header_rec := OE_ORDER_PUB.G_MISS_HEADER_REC;

            If Cw_Oe_Order_Headers_All_Rec.Accounting_Rule_Id Is Not Null Then
                l_header_rec.ACCOUNTING_RULE_ID
                        := Cw_Oe_Order_Headers_All_Rec.Accounting_Rule_Id;
            End If;
            If Cw_Oe_Order_Headers_All_Rec.Agreement_Id Is Not Null Then
                l_header_rec.AGREEMENT_ID
                        := Cw_Oe_Order_Headers_All_Rec.Agreement_Id;
            End If;
            If Cw_Oe_Order_Headers_All_Rec.CONTEXT Is Not Null Then
                l_header_rec.CONTEXT := Cw_Oe_Order_Headers_All_Rec.CONTEXT;
            End If;
            If Cw_Oe_Order_Headers_All_Rec.ATTRIBUTE1 Is Not Null Then
                l_header_rec.ATTRIBUTE1 := Cw_Oe_Order_Headers_All_Rec.ATTRIBUTE1;
            End If;
            If Cw_Oe_Order_Headers_All_Rec.ATTRIBUTE2 Is Not Null Then
                l_header_rec.ATTRIBUTE2 := Cw_Oe_Order_Headers_All_Rec.ATTRIBUTE2;
            End If;
            If Cw_Oe_Order_Headers_All_Rec.ATTRIBUTE3 Is Not Null Then
                l_header_rec.ATTRIBUTE3 := Cw_Oe_Order_Headers_All_Rec.ATTRIBUTE3;
            End If;
            If Cw_Oe_Order_Headers_All_Rec.ATTRIBUTE4 Is Not Null Then
                l_header_rec.ATTRIBUTE4 := Cw_Oe_Order_Headers_All_Rec.ATTRIBUTE4;
            End If;
            If Cw_Oe_Order_Headers_All_Rec.ATTRIBUTE5 Is Not Null Then
                l_header_rec.ATTRIBUTE5:= Cw_Oe_Order_Headers_All_Rec.ATTRIBUTE5;
            End If;
            If Cw_Oe_Order_Headers_All_Rec.CANCELLED_FLAG Is Not Null Then
                    l_header_rec.CANCELLED_FLAG
                        := Cw_Oe_Order_Headers_All_Rec.CANCELLED_FLAG;
            End If;
            If Cw_Oe_Order_Headers_All_Rec.Conversion_Rate Is Not Null Then
                l_header_rec.CONVERSION_RATE
                        := Cw_Oe_Order_Headers_All_Rec.Conversion_Rate;
            End If;
            If Cw_Oe_Order_Headers_All_Rec.Conversion_Type_code Is Not NUll Then
                l_header_rec.CONVERSION_TYPE_CODE
                        := Cw_Oe_Order_Headers_All_Rec.Conversion_Type_code;
            End If;
            If Cw_Oe_Order_Headers_All_Rec.Conversion_Rate_Date Is Not Null Then
```

```
                   l_header_rec.CONVERSION_RATE_DATE
                     := Cw_Oe_Order_Headers_All_Rec.Conversion_Rate_Date;
End If;
If Cw_Oe_Order_Headers_All_Rec.CREATION_DATE Is Not Null Then
      l_header_rec.CREATION_DATE
               := Cw_Oe_Order_Headers_All_Rec.CREATION_DATE;
End If;
If Cw_Oe_Order_Headers_All_Rec.CREATED_BY Is Not Null Then
      l_header_rec.CREATED_BY := Cw_Oe_Order_Headers_All_Rec.CREATED_BY;
End If;
If Cw_Oe_Order_Headers_All_Rec.Customer_Po_Number Is Not Null Then
      l_header_rec.CUST_PO_NUMBER
         := Cw_Oe_Order_Headers_All_Rec.Customer_Po_Number;
End If;
If Cw_Oe_Order_Headers_All_Rec.DELIVER_TO_CONTACT_ID Is Not Null Then
        l_header_rec.DELIVER_TO_CONTACT_ID
         := Cw_Oe_Order_Headers_All_Rec.DELIVER_TO_CONTACT_ID;
End If;
If Cw_Oe_Order_Headers_All_Rec.Deliver_To_Org_Id Is Not Null Then
        l_header_rec.DELIVER_TO_ORG_ID
         := Cw_Oe_Order_Headers_All_Rec.Deliver_To_Org_Id;
End If;
If Cw_Oe_Order_Headers_All_Rec.Demand_class_code Is Not Null Then
        l_header_rec.DEMAND_CLASS_CODE
         := Cw_Oe_Order_Headers_All_Rec.Demand_class_code;
End If;
If Cw_Oe_Order_Headers_All_Rec.earliest_SCHEDULE_LIMIT Is Not Null Then
        l_header_rec.earliest_SCHEDULE_LIMIT
      := Cw_Oe_Order_Headers_All_Rec.earliest_SCHEDULE_LIMIT;
End If;
If Cw_Oe_Order_Headers_All_Rec.Fob_Point_Code Is Not Null Then
        l_header_rec.FOB_POINT_CODE
         := Cw_Oe_Order_Headers_All_Rec.Fob_Point_Code;
End If;
If Cw_Oe_Order_Headers_All_Rec.Freight_Terms_Code Is Not Null Then
        l_header_rec.FREIGHT_TERMS_CODE
         := Cw_Oe_Order_Headers_All_Rec.Freight_Terms_Code;
End If;
If Cw_Oe_Order_Headers_All_Rec.Header_Id Is Not Null Then
      l_header_rec.Header_ID := Cw_Oe_Order_Headers_All_Rec.Header_Id;
End If;
If Cw_Oe_Order_Headers_All_Rec.Invoice_To_Contact_Id Is Not Null Then
         l_header_rec.INVOICE_TO_CONTACT_ID
         := Cw_Oe_Order_Headers_All_Rec.Invoice_To_Contact_Id;
End If;
If Cw_Oe_Order_Headers_All_Rec.Invoice_To_Org_Id Is Not Null Then
      l_header_rec.INVOICE_TO_ORG_ID
      := Cw_Oe_Order_Headers_All_Rec.Invoice_To_Org_Id;
      End If;
If Cw_Oe_Order_Headers_All_Rec.Invoicing_Rule_Id Is Not Null Then
      l_header_rec.INVOICING_RULE_ID
           := Cw_Oe_Order_Headers_All_Rec.Invoicing_Rule_Id;
End If;
If Cw_Oe_Order_Headers_All_Rec.LAST_UPDATE_DATE Is Not Null Then
        l_header_rec.LAST_UPDATE_DATE
         := Cw_Oe_Order_Headers_All_Rec.LAST_UPDATE_DATE;
End If;
If Cw_Oe_Order_Headers_All_Rec.LAST_UPDATED_BY Is Not Null Then
        l_header_rec.LAST_UPDATED_BY
         := Cw_Oe_Order_Headers_All_Rec.LAST_UPDATED_BY;
     End If;
If Cw_Oe_Order_Headers_All_Rec.LAST_UPDATE_LOGIN Is Not Null Then
        l_header_rec.LAST_UPDATE_LOGIN
         := Cw_Oe_Order_Headers_All_Rec.LAST_UPDATE_LOGIN;
End If;
If Cw_Oe_Order_Headers_All_Rec.LATEST_SCHEDULE_LIMIT Is Not Null Then
        l_header_rec.LATEST_SCHEDULE_LIMIT
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```
                                      := Cw_Oe_Order_Headers_All_Rec.LATEST_SCHEDULE_LIMIT;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Ordered_Date Is Not Null Then
                          l_header_rec.ORDERED_DATE := Cw_Oe_Order_Headers_All_Rec.Ordered_Date;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.ORDER_DATE_TYPE_CODE Is Not Null Then
                          l_header_rec.ORDER_DATE_TYPE_CODE
                              := Cw_Oe_Order_Headers_All_Rec.ORDER_DATE_TYPE_CODE;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Order_Number Is Not Null Then
                          l_header_rec.ORDER_NUMBER := Cw_Oe_Order_Headers_All_Rec.Order_Number;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Order_Type_Id Is Not Null Then
                          l_header_rec.ORDER_TYPE_ID := Cw_Oe_Order_Headers_All_Rec.Order_Type_Id;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Order_Source_Id Is Not Null Then
                          l_header_rec.ORDER_SOURCE_ID := Cw_Oe_Order_Headers_All_Rec.Order_Source_Id;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Orig_Sys_Document_Ref Is Not Null Then
                          l_header_rec.ORIG_SYS_DOCUMENT_REF
                                := Cw_Oe_Order_Headers_All_Rec.Orig_Sys_Document_Ref;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Payment_Term_Id Is Not Null Then
                          l_header_rec.PAYMENT_TERM_ID := Cw_Oe_Order_Headers_All_Rec.Payment_Term_Id;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Price_List_Id Is Not Null Then
                           l_header_rec.PRICE_LIST_ID := Cw_Oe_Order_Headers_All_Rec.Price_List_Id;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Ordered_Date Is Not Null Then
                          l_header_rec.PRICING_DATE := Cw_Oe_Order_Headers_All_Rec.Ordered_Date;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.PROGRAM_APPLICATION_ID Is Not Null Then
                          l_header_rec.PROGRAM_APPLICATION_ID
                              := Cw_Oe_Order_Headers_All_Rec.PROGRAM_APPLICATION_ID;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.PROGRAM_ID Is Not Null Then
                          l_header_rec.PROGRAM_ID := Cw_Oe_Order_Headers_All_Rec.PROGRAM_ID;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.PROGRAM_UPDATE_DATE Is Not Null Then
                          l_header_rec.PROGRAM_UPDATE_DATE
                              := Cw_Oe_Order_Headers_All_Rec.PROGRAM_UPDATE_DATE;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.REQUEST_ID IS Not Null Then
                          l_header_rec.REQUEST_ID := Cw_Oe_Order_Headers_All_Rec.REQUEST_ID;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.REQUEST_DATE IS Not Null Then
                           l_header_rec.REQUEST_DATE := Cw_Oe_Order_Headers_All_Rec.REQUEST_DATE;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.SALESREP_ID Is Not Null Then
                           l_header_rec.SALESREP_ID := Cw_Oe_Order_Headers_All_Rec.SALESREP_ID;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.SALES_CHANNEL_CODE Is Not Null Then
                           l_header_rec.SALES_CHANNEL_CODE
                                := Cw_Oe_Order_Headers_All_Rec.SALES_CHANNEL_CODE;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Shipment_Priority_Code Is Not Null Then
                          l_header_rec.SHIPMENT_PRIORITY_CODE
                              := Cw_Oe_Order_Headers_All_Rec.Shipment_Priority_Code;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Shipping_Method_Code Is Not Null Then
                          l_header_rec.SHIPPING_METHOD_CODE
                              := Cw_Oe_Order_Headers_All_Rec.Shipping_Method_Code;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Sold_To_Org_Id Is Not Null Then
                          l_header_rec.SOLD_TO_ORG_ID := Cw_Oe_Order_Headers_All_Rec.Sold_To_Org_Id;
                      End If;
                      If Cw_Oe_Order_Headers_All_Rec.Tax_Exempt_Flag Is Not Null Then
```

```
                l_header_rec.TAX_EXEMPT_FLAG
                    := Cw_Oe_Order_Headers_All_Rec.Tax_Exempt_Flag;
End If;
If Cw_Oe_Order_Headers_All_Rec.Tax_Exempt_Number Is Not Null Then
        l_header_rec.TAX_EXEMPT_NUMBER
                := Cw_Oe_Order_Headers_All_Rec.Tax_Exempt_Number;
End If;
If Cw_Oe_Order_Headers_All_Rec.Tax_Exempt_Reason_Code Is Not Null Then
        l_header_rec.TAX_EXEMPT_REASON_CODE
            := Cw_Oe_Order_Headers_All_Rec.Tax_Exempt_Reason_Code;
End If;
If Cw_Oe_Order_Headers_All_Rec.Transactional_Curr_Code Is Not Null Then
        l_header_rec.TRANSACTIONAL_CURR_CODE
                := Cw_Oe_Order_Headers_All_Rec.Transactional_Curr_Code;
End If;
If Cw_Oe_Order_Headers_All_Rec.Operation_Code Is Not Null Then
          l_header_rec.Operation   := Cw_Oe_Order_Headers_All_Rec.Operation_Code;
End If;
If Cw_Oe_Order_Headers_All_Rec.PAYMENT_TYPE_CODE Is Not Null Then
        l_header_rec.PAYMENT_TYPE_CODE
                := Cw_Oe_Order_Headers_All_Rec.PAYMENT_TYPE_CODE;
End If;
If Cw_Oe_Order_Headers_All_Rec.PAYMENT_AMOUNT Is Not Null Then
          l_header_rec.PAYMENT_AMOUNT
                := Cw_Oe_Order_Headers_All_Rec.PAYMENT_AMOUNT;
End If;
If Cw_Oe_Order_Headers_All_Rec.CHECK_NUMBER Is Not Null Then
        l_header_rec.CHECK_NUMBER := Cw_Oe_Order_Headers_All_Rec.CHECK_NUMBER;
End If;
If Cw_Oe_Order_Headers_All_Rec.CREDIT_CARD_CODE Is Not Null Then
        l_header_rec.CREDIT_CARD_CODE
                := Cw_Oe_Order_Headers_All_Rec.CREDIT_CARD_CODE;
End If;
If Cw_Oe_Order_Headers_All_Rec.CREDIT_CARD_HOLDER_NAME Is Not Null Then
        l_header_rec.CREDIT_CARD_HOLDER_NAME
            := Cw_Oe_Order_Headers_All_Rec.CREDIT_CARD_HOLDER_NAME;
End If;
If Cw_Oe_Order_Headers_All_Rec.CREDIT_CARD_NUMBER Is Not Null Then
          l_header_rec.CREDIT_CARD_NUMBER
              := Cw_Oe_Order_Headers_All_Rec.CREDIT_CARD_NUMBER;
End If;
If Cw_Oe_Order_Headers_All_Rec.CREDIT_CARD_EXPIRATION_DATE Is Not Null Then
        l_header_rec.CREDIT_CARD_EXPIRATION_DATE
            := Cw_Oe_Order_Headers_All_Rec.CREDIT_CARD_EXPIRATION_DATE;
End If;
If Cw_Oe_Order_Headers_All_Rec.CUSTOMER_PAYMENT_TERM_ID Is Not Null Then
        l_header_rec.CUSTOMER_PAYMENT_TERM_ID
            := Cw_Oe_Order_Headers_All_Rec.CUSTOMER_PAYMENT_TERM_ID;
End If;
If Cw_Oe_Order_Headers_All_Rec.SHIPPING_INSTRUCTIONS Is Not Null Then
        l_header_rec.SHIPPING_INSTRUCTIONS
                := Cw_Oe_Order_Headers_All_Rec.SHIPPING_INSTRUCTIONS;
End If;
If Cw_Oe_Order_Headers_All_Rec.PACKING_INSTRUCTIONS Is Not Null Then
        l_header_rec.PACKING_INSTRUCTIONS
            := Cw_Oe_Order_Headers_All_Rec.PACKING_INSTRUCTIONS;
End If;
If Cw_Oe_Order_Headers_All_Rec.Ship_Tolerance_above Is Not Null Then
        l_header_rec.SHIP_TOLERANCE_ABOVE
            := Cw_Oe_Order_Headers_All_Rec.Ship_Tolerance_above;
End If;
If Cw_Oe_Order_Headers_All_Rec.Ship_Tolerance_Below Is Not Null Then
        l_header_rec.SHIP_TOLERANCE_BELOW
            := Cw_Oe_Order_Headers_All_Rec.Ship_Tolerance_Below;
End If;
If Cw_Oe_Order_Headers_All_Rec.Tax_Point_Code Is Not Null Then
        l_header_rec.TAX_POINT_CODE
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                                    := Cw_Oe_Order_Headers_All_Rec.Tax_Point_Code;
                End If;
                If Cw_Oe_Order_Headers_All_Rec.Sold_From_Org_Id Is Not Null Then
                    l_header_rec.SOLD_FROM_ORG_ID
                        := Cw_Oe_Order_Headers_All_Rec.Sold_From_Org_Id;
                End If;
                If Cw_Oe_Order_Headers_All_Rec.Ship_From_Org_Id Is Not Null Then
                    l_header_rec.SHIP_FROM_ORG_ID
                        := Cw_Oe_Order_Headers_All_Rec.Ship_From_Org_Id;
                End If;
                If Cw_Oe_Order_Headers_All_Rec.Ship_To_Org_Id Is Not Null Then
                    l_header_rec.SHIP_TO_ORG_ID
                        := Cw_Oe_Order_Headers_All_Rec.Ship_To_Org_Id;
                End If;
                If Cw_Oe_Order_Headers_All_Rec.Sold_To_Contact_Id Is Not Null Then
                    l_header_rec.SOLD_TO_CONTACT_ID
                        := Cw_Oe_Order_Headers_All_Rec.Sold_To_Contact_Id;
                End If;
                If Cw_Oe_Order_Headers_All_Rec.Ship_To_Contact_Id Is Not Null Then
                    l_header_rec.SHIP_TO_CONTACT_ID
                        := Cw_Oe_Order_Headers_All_Rec.Ship_To_Contact_Id;
                End If;
                If Cw_Oe_Order_Headers_All_Rec.RETURN_REASON_CODE Is Not Null Then
                    l_header_rec.RETURN_REASON_CODE
                        := Cw_Oe_Order_Headers_All_Rec.RETURN_REASON_CODE;
                End If;

            END Loop;
            CLOSE w_Oe_Order_Headers_All;

            --      Order Header Adjustment

            If w_Oe_Price_Adjustments%ISOPEN Then
                CLOSE    w_Oe_Price_Adjustments;
            End if;
                OPEN     w_Oe_Price_Adjustments;
                i := 1;
                LOOP
                FETCH w_Oe_Price_Adjustments    INTO    Cw_Oe_Price_Adjustments_Rec;
                EXIT WHEN w_Oe_Price_Adjustments%NOTFOUND;
                If Cw_Oe_Price_Adjustments_Rec.Orig_Sys_Document_Ref Is NULL Then
                    l_header_adj_tbl(i) := OE_ORDER_PUB.G_MISS_HEADER_ADJ_REC;

                If Cw_Oe_Price_Adjustments_Rec.Operation_Code = 'UPDATE' or
                    Cw_Oe_Price_Adjustments_Rec.Operation_Code = 'DELETE'  Then
                        l_header_adj_tbl(i).Price_Adjustment_ID
                            := Cw_Oe_Price_Adjustments_Rec.Orig_Sys_Discount_Ref;
                End If;

                If Cw_Oe_Price_Adjustments_Rec.PROGRAM_APPLICATION_ID Is Not Null Then
                    l_header_adj_tbl(i).PROGRAM_APPLICATION_ID
                        := Cw_Oe_Price_Adjustments_Rec.PROGRAM_APPLICATION_ID;
                End If;
                If Cw_Oe_Price_Adjustments_Rec.Program_Id Is Not Null Then
                    l_header_adj_tbl(i).PROGRAM_ID
                        := Cw_Oe_Price_Adjustments_Rec.Program_Id;
                    End If;
                If Cw_Oe_Price_Adjustments_Rec.Program_Update_Date Is Not Null Then
                    l_header_adj_tbl(i).PROGRAM_UPDATE_DATE
                        := Cw_Oe_Price_Adjustments_Rec.Program_Update_Date;
                End If;
                If Cw_Oe_Price_Adjustments_Rec.Request_Id Is Not Null Then
                    l_header_adj_tbl(i).REQUEST_ID
                        := Cw_Oe_Price_Adjustments_Rec.Request_Id;
                End If;
                If Cw_Oe_Price_Adjustments_Rec.Automatic_Flag Is Not Null Then
                    l_header_adj_tbl(i).AUTOMATIC_FLAG
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                               := Cw_Oe_Price_Adjustments_Rec.Automatic_Flag;
End If;
If Cw_Oe_Price_Adjustments_Rec.Percent Is Not Null Then
       l_header_adj_tbl(i).PERCENT
               := Cw_Oe_Price_Adjustments_Rec.Percent;
End If;
If Cw_Oe_Price_Adjustments_Rec.Context Is Not Null Then
       l_header_adj_tbl(i).CONTEXT
               := Cw_Oe_Price_Adjustments_Rec.Context;
End If;
If Cw_Oe_Price_Adjustments_Rec.Attribute1 Is Not Null Then
       l_header_adj_tbl(i).ATTRIBUTE1
     := Cw_Oe_Price_Adjustments_Rec.Attribute1;
End If;
If Cw_Oe_Price_Adjustments_Rec.Attribute2 Is Not Null Then
       l_header_adj_tbl(i).ATTRIBUTE2
     := Cw_Oe_Price_Adjustments_Rec.Attribute2 ;
End If;
If Cw_Oe_Price_Adjustments_Rec.Attribute3 Is Not Null Then
       l_header_adj_tbl(i).ATTRIBUTE3
     := Cw_Oe_Price_Adjustments_Rec.Attribute3;
End If;
If Cw_Oe_Price_Adjustments_Rec.Attribute4 Is Not Null Then
       l_header_adj_tbl(i).ATTRIBUTE4
     := Cw_Oe_Price_Adjustments_Rec.Attribute4 ;
End If;
If Cw_Oe_Price_Adjustments_Rec.Attribute5 Is Not Null Then
       l_header_adj_tbl(i).ATTRIBUTE5
     := Cw_Oe_Price_Adjustments_Rec.Attribute5;
End If;
If Cw_Oe_Price_Adjustments_Rec.ORIG_SYS_DISCOUNT_REF Is Not Null Then
       l_header_adj_tbl(i).ORIG_SYS_DISCOUNT_REF
               := Cw_Oe_Price_Adjustments_Rec.ORIG_SYS_DISCOUNT_REF;
End If;
If Cw_Oe_Price_Adjustments_Rec.LIST_HEADER_ID Is Not Null Then
       l_header_adj_tbl(i).LIST_HEADER_ID
               := Cw_Oe_Price_Adjustments_Rec.LIST_HEADER_ID;
End If;
If Cw_Oe_Price_Adjustments_Rec.LIST_LINE_ID Is Not Null Then
       l_header_adj_tbl(i).LIST_LINE_ID
                  := Cw_Oe_Price_Adjustments_Rec.LIST_LINE_ID;
End If;
If Cw_Oe_Price_Adjustments_Rec.CHANGE_REASON_CODE Is Not Null Then
     l_header_adj_tbl(i).CHANGE_REASON_CODE
         := Cw_Oe_Price_Adjustments_Rec.CHANGE_REASON_CODE;
End If;
If Cw_Oe_Price_Adjustments_Rec.CHANGE_REASON_TEXT Is Not Null Then
     l_header_adj_tbl(i).CHANGE_REASON_TEXT
           := Cw_Oe_Price_Adjustments_Rec.CHANGE_REASON_TEXT;
End If;
If Cw_Oe_Price_Adjustments_Rec.OPERAND Is Not Null Then
     l_header_adj_tbl(i).OPERAND
           := Cw_Oe_Price_Adjustments_Rec.OPERAND;
End If;
If Cw_Oe_Price_Adjustments_Rec.CREATION_DATE Is Not Null Then
     l_header_adj_tbl(i).CREATION_DATE
             := Cw_Oe_Price_Adjustments_Rec.CREATION_DATE;
End If;
If Cw_Oe_Price_Adjustments_Rec.CREATED_BY Is Not Null Then
     l_header_adj_tbl(i).CREATED_BY
               := Cw_Oe_Price_Adjustments_Rec.CREATED_BY;
End If;
If Cw_Oe_Price_Adjustments_Rec.LAST_UPDATE_DATE Is Not Null Then
     l_header_adj_tbl(i).LAST_UPDATE_DATE
             := Cw_Oe_Price_Adjustments_Rec.LAST_UPDATE_DATE;
End If;
If Cw_Oe_Price_Adjustments_Rec.LAST_UPDATED_BY Is not Null Then
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                    l_header_adj_tbl(i).LAST_UPDATED_BY
                        := Cw_Oe_Price_Adjustments_Rec.LAST_UPDATED_BY;
            End If;
            If Cw_Oe_Price_Adjustments_Rec.LAST_UPDATE_LOGIN Is Not Null Then
                    l_header_adj_tbl(i).LAST_UPDATE_LOGIN
                        := Cw_Oe_Price_Adjustments_Rec.LAST_UPDATE_LOGIN;
            End If;

            End If;
                i := i + 1;
            End Loop;
            CLOSE       w_Oe_Price_Adjustments;

        --    Order Header Sales Credits
            If w_Oe_Sales_Credits%ISOPEN Then
                CLOSE       w_Oe_Sales_Credits;
            End If;
            OPEN    w_Oe_Sales_Credits;
            i := 1;
            LOOP
            FETCH w_Oe_Sales_Credits    INTO    Cw_Oe_Sales_Credits_Rec;
            EXIT WHEN w_Oe_Sales_Credits%NOTFOUND;
            If Cw_Oe_Sales_Credits_Rec.Orig_Sys_Line_Ref Is NULL Then
                l_Header_Scredit_tbl(i) := OE_ORDER_PUB.G_MISS_HEADER_SCREDIT_REC;

            If Cw_Oe_Sales_Credits_Rec.SALESREP_ID Is Not Null Then
                    l_Header_Scredit_tbl(i).SALESREP_ID
                        := Cw_Oe_Sales_Credits_Rec.SALESREP_ID;
            End If;
            If Cw_Oe_Sales_Credits_Rec.PERCENT Is Not Null Then
                    l_Header_Scredit_tbl(i).PERCENT
                        := Cw_Oe_Sales_Credits_Rec.PERCENT;
            End If;
            If Cw_Oe_Sales_Credits_Rec.Orig_Sys_Credit_Ref Is Not Null and
            Cw_Oe_Sales_Credits_Rec.Operation_Code != 'CREATE' Then
                    l_Header_Scredit_tbl(i).Sales_Credit_ID
                        := Cw_Oe_Sales_Credits_Rec.Orig_Sys_Credit_Ref;
            End If;
            If Cw_Oe_Sales_Credits_Rec.CONTEXT Is Not Null Then
                    l_Header_Scredit_tbl(i).CONTEXT
                        := Cw_Oe_Sales_Credits_Rec.CONTEXT;
            End If;
            If Cw_Oe_Sales_Credits_Rec.ATTRIBUTE1 Is Not Null Then
                    l_Header_Scredit_tbl(i).ATTRIBUTE1
                        := Cw_Oe_Sales_Credits_Rec.ATTRIBUTE1;
            End If;
            If Cw_Oe_Sales_Credits_Rec.ATTRIBUTE2 Is Not Null Then
                    l_Header_Scredit_tbl(i).ATTRIBUTE2
                        := Cw_Oe_Sales_Credits_Rec.ATTRIBUTE2;
            End If;
            If Cw_Oe_Sales_Credits_Rec.ATTRIBUTE3 Is Not Null Then
                    l_Header_Scredit_tbl(i).ATTRIBUTE3
                        := Cw_Oe_Sales_Credits_Rec.ATTRIBUTE3;
            End If;
            If Cw_Oe_Sales_Credits_Rec.ATTRIBUTE4 Is Not Null Then
                    l_Header_Scredit_tbl(i).ATTRIBUTE4
                        := Cw_Oe_Sales_Credits_Rec.ATTRIBUTE4;
            End If;
            If Cw_Oe_Sales_Credits_Rec.ATTRIBUTE5 Is Not Null Then
                    l_Header_Scredit_tbl(i).ATTRIBUTE5
                        := Cw_Oe_Sales_Credits_Rec.ATTRIBUTE5;
            End If;
            If Cw_Oe_Sales_Credits_Rec.ORIG_SYS_CREDIT_REF Is Not Null Then
                    l_Header_Scredit_tbl(i).ORIG_SYS_CREDIT_REF
                        := Cw_Oe_Sales_Credits_Rec.ORIG_SYS_CREDIT_REF;
            End If;
            If Cw_Oe_Sales_Credits_Rec.SALES_CREDIT_TYPE_ID Is Not Null Then
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                          l_Header_Scredit_tbl(i).SALES_CREDIT_TYPE_ID
                                := Cw_Oe_Sales_Credits_Rec.SALES_CREDIT_TYPE_ID;
              End If;
              If Cw_Oe_Sales_Credits_Rec.CREATION_DATE Is Not Null Then
                      l_Header_Scredit_tbl(i).CREATION_DATE
                                := Cw_Oe_Sales_Credits_Rec.CREATION_DATE;
              End If;
              If Cw_Oe_Sales_Credits_Rec.CREATED_BY Is Not Null Then
                      l_Header_Scredit_tbl(i).CREATED_BY
                                := Cw_Oe_Sales_Credits_Rec.CREATED_BY;
              End If;
              If Cw_Oe_Sales_Credits_Rec.LAST_UPDATE_DATE Is Not Null Then
                      l_Header_Scredit_tbl(i).LAST_UPDATE_DATE
                                := Cw_Oe_Sales_Credits_Rec.LAST_UPDATE_DATE;
              End If;
              If Cw_Oe_Sales_Credits_Rec.LAST_UPDATED_BY Is Not Null Then
                      l_Header_Scredit_tbl(i).LAST_UPDATED_BY
                                  := Cw_Oe_Sales_Credits_Rec.LAST_UPDATED_BY;
              End If;
              If Cw_Oe_Sales_Credits_Rec.LAST_UPDATE_LOGIN Is Not Null Then
                      l_Header_Scredit_tbl(i).LAST_UPDATE_LOGIN
                                := Cw_Oe_Sales_Credits_Rec.LAST_UPDATE_LOGIN;
              End If;
              End If;
              i := i + 1;
              End Loop;
              CLOSE     w_Oe_Sales_Credits;


        --      Order Header Attributes
              If w_Oe_Price_Adj_Attribs%ISOPEN Then
                  CLOSE      w_Oe_Price_Adj_Attribs;
              End If;
              OPEN     w_Oe_Price_Adj_Attribs;
              i := 1;
              LOOP
              FETCH w_Oe_Price_Adj_Attribs    INTO    Cw_Oe_Price_Adj_Attribs_Rec;
              EXIT WHEN w_Oe_Price_Adj_Attribs%NOTFOUND;
              If Cw_Oe_Price_Adj_Attribs_Rec.Orig_Sys_Line_Ref Is Null Then
                  l_Line_Price_Att_tbl(i) := OE_ORDER_PUB.G_MISS_LINE_PRICE_ATT_REC;
              If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_CONTEXT Is Not Null Then
                      l_Line_Price_Att_tbl(i).PRICING_CONTEXT
                                := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_CONTEXT;
              End if;
              If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE1 Is Not Null Then
                      l_Line_Price_Att_tbl(i).PRICING_ATTRIBUTE1
                                := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE1;
              End if;
              If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE2 Is Not Null Then
                      l_Line_Price_Att_tbl(i).PRICING_ATTRIBUTE2
                                  := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE2;
              End if;
              If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE3 Is Not Null Then
                      l_Line_Price_Att_tbl(i).PRICING_ATTRIBUTE3
                                := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE3;
              End if;
              If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE4 Is Not Null Then
                      l_Line_Price_Att_tbl(i).PRICING_ATTRIBUTE4
                                  := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE4;
              End if;
              If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE5 Is Not Null Then
                      l_Line_Price_Att_tbl(i).PRICING_ATTRIBUTE5
                                    := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE5;
              End if;
              If Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_APPLICATION_ID Is Not Null Then
                      l_Line_Price_Att_tbl(i).PROGRAM_APPLICATION_ID
                                := Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_APPLICATION_ID;
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                    End if;
                    If Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_ID Is Not Null Then
                        l_Line_Price_Att_tbl(i).PROGRAM_ID
                            := Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_ID;
                    End if;
                    If Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_UPDATE_DATE Is Not Null Then
                        l_Line_Price_Att_tbl(i).PROGRAM_UPDATE_DATE
                            := Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_UPDATE_DATE;
                    End if;
                    If Cw_Oe_Price_Adj_Attribs_Rec.REQUEST_ID Is Not Null Then
                        l_Line_Price_Att_tbl(i).REQUEST_ID
                            := Cw_Oe_Price_Adj_Attribs_Rec.REQUEST_ID;
                    End if;
                    If Cw_Oe_Price_Adj_Attribs_Rec.FLEX_TITLE Is Not Null Then
                        l_Line_Price_Att_tbl(i).FLEX_TITLE
                            := Cw_Oe_Price_Adj_Attribs_Rec.FLEX_TITLE;
                    End if;
                    If Cw_Oe_Price_Adj_Attribs_Rec.CREATION_DATE Is Not Null Then
                        l_Line_Price_Att_tbl(i).CREATION_DATE
                            := Cw_Oe_Price_Adj_Attribs_Rec.CREATION_DATE;
                    End if;
                    If Cw_Oe_Price_Adj_Attribs_Rec.CREATED_BY Is Not Null Then
                        l_Line_Price_Att_tbl(i).CREATED_BY
                            := Cw_Oe_Price_Adj_Attribs_Rec.CREATED_BY;
                    End if;
                    If Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATE_DATE Is Not Null Then
                        l_Line_Price_Att_tbl(i).LAST_UPDATE_DATE
                            := Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATE_DATE;
                    End if;
                    If Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATED_BY Is Not Null Then
                        l_Line_Price_Att_tbl(i).LAST_UPDATED_BY
                            := Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATED_BY;
                    End if;
                    If Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATE_LOGIN Is Not Null Then
                        l_Line_Price_Att_tbl(i).LAST_UPDATE_LOGIN
                                := Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATE_LOGIN;
                    End if;
                    If Cw_Oe_Price_Adj_Attribs_Rec.Operation_Code= 'UPDATE' Or
                      Cw_Oe_Price_Adj_Attribs_Rec.Operation_Code= 'DELETE' Then
                    If Cw_Oe_Price_Adj_Attribs_Rec.Orig_Sys_Line_Ref Is Not Null Then
                        l_Line_Price_Att_tbl(i).Order_Price_Attrib_ID
                            := Cw_Oe_Price_Adj_Attribs_Rec.Orig_Sys_Line_Ref;
                    End if;
                    End If;
                    If Cw_Oe_Price_Adj_Attribs_Rec.Operation_Code= 'CREATE' Then
                        If Cw_Oe_Price_Adj_Attribs_Rec.Orig_Sys_Line_Ref Is Not Null Then
                            l_Line_Price_Att_tbl(i).Line_Index
                                    := Cw_Oe_Price_Adj_Attribs_Rec.Orig_Sys_Line_Ref;
                        End if;
                    End If;
                        End If;
                i := i + 1;
                End Loop;
                CLOSE      w_Oe_Price_Adj_Attribs;

        --    Order Line Details
            If w_Oe_Order_Lines_All%ISOPEN Then
                CLOSE      w_Oe_Order_Lines_All;
            End If;
            OPEN      w_Oe_Order_Lines_All;
            i := 1;
            LOOP
            FETCH w_Oe_Order_Lines_All    INTO      Cw_Oe_Order_Lines_All_Rec;
            EXIT WHEN w_Oe_Order_Lines_All%NOTFOUND;
                l_line_tbl(i) := OE_ORDER_PUB.G_MISS_LINE_REC;

                If Cw_Oe_Order_Lines_All_Rec.LINE_ID Is Not Null Then
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                        l_line_tbl(i).LINE_ID
                               := Cw_Oe_Order_Lines_All_Rec.LINE_ID;
End If;
If Cw_Oe_Order_Lines_All_Rec.LINE_TYPE_ID Is Not NUll Then
        l_line_tbl(i).LINE_TYPE_ID
                               := Cw_Oe_Order_Lines_All_Rec.LINE_TYPE_ID;
End If;
If Cw_Oe_Order_Lines_All_Rec.LINE_NUMBER Is Not Null Then
        l_line_tbl(i).LINE_NUMBER
                               := Cw_Oe_Order_Lines_All_Rec.LINE_NUMBER;
End If;
If Cw_Oe_Order_Lines_All_Rec.REQUEST_DATE Is Not Null Then
        l_line_tbl(i).REQUEST_DATE
                               := Cw_Oe_Order_Lines_All_Rec.REQUEST_DATE;
End If;
If Cw_Oe_Order_Lines_All_Rec.PROMISE_DATE Is Not Null Then
        l_line_tbl(i).PROMISE_DATE
                                := Cw_Oe_Order_Lines_All_Rec.PROMISE_DATE;
End If;
If Cw_Oe_Order_Lines_All_Rec.SCHEDULE_SHIP_DATE Is Not Null Then
          l_line_tbl(i).SCHEDULE_SHIP_DATE
                                 := Cw_Oe_Order_Lines_All_Rec.SCHEDULE_SHIP_DATE;
End If;
If Cw_Oe_Order_Lines_All_Rec.ORDER_QUANTITY_UOM Is Not NUll Then
          l_line_tbl(i).ORDER_QUANTITY_UOM
                                 := Cw_Oe_Order_Lines_All_Rec.ORDER_QUANTITY_UOM;
End If;
If Cw_Oe_Order_Lines_All_Rec.ORDERED_QUANTITY Is Not Null Then
          l_line_tbl(i).ORDERED_QUANTITY
                               := Cw_Oe_Order_Lines_All_Rec.ORDERED_QUANTITY;
End If;
If Cw_Oe_Order_Lines_All_Rec.DELIVERY_LEAD_TIME Is Not Null Then
        l_line_tbl(i).DELIVERY_LEAD_TIME
                               := Cw_Oe_Order_Lines_All_Rec.DELIVERY_LEAD_TIME;
End If;
If Cw_Oe_Order_Lines_All_Rec.TAX_EXEMPT_FLAG Is Not Null Then
        l_line_tbl(i).TAX_EXEMPT_FLAG
                            := Cw_Oe_Order_Lines_All_Rec.TAX_EXEMPT_FLAG;
End If;
If Cw_Oe_Order_Lines_All_Rec.TAX_EXEMPT_NUMBER Is Not Null Then
          l_line_tbl(i).TAX_EXEMPT_NUMBER
                                := Cw_Oe_Order_Lines_All_Rec.TAX_EXEMPT_NUMBER;
End If;
If Cw_Oe_Order_Lines_All_Rec.TAX_EXEMPT_REASON_CODE Is Not Null Then
          l_line_tbl(i).TAX_EXEMPT_REASON_CODE
                                  := Cw_Oe_Order_Lines_All_Rec.TAX_EXEMPT_REASON_CODE;
End If;
If Cw_Oe_Order_Lines_All_Rec.SHIP_FROM_ORG_ID Is Not Null Then
        l_line_tbl(i).SHIP_FROM_ORG_ID
                               := Cw_Oe_Order_Lines_All_Rec.SHIP_FROM_ORG_ID;
End If;
If Cw_Oe_Order_Lines_All_Rec.SHIP_TO_ORG_ID Is Not Null Then
        l_line_tbl(i).SHIP_TO_ORG_ID
                               := Cw_Oe_Order_Lines_All_Rec.SHIP_TO_ORG_ID;
End If;
If Cw_Oe_Order_Lines_All_Rec.INVOICE_TO_ORG_ID Is Not Null Then
        l_line_tbl(i).INVOICE_TO_ORG_ID
                               := Cw_Oe_Order_Lines_All_Rec.INVOICE_TO_ORG_ID;
End If;
If Cw_Oe_Order_Lines_All_Rec.DELIVER_TO_ORG_ID Is Not Null Then
        l_line_tbl(i).DELIVER_TO_ORG_ID
                               := Cw_Oe_Order_Lines_All_Rec.DELIVER_TO_ORG_ID;
End If;
If Cw_Oe_Order_Lines_All_Rec.SHIP_TO_CONTACT_ID Is Not Null Then
        l_line_tbl(i).SHIP_TO_CONTACT_ID
                               := Cw_Oe_Order_Lines_All_Rec.SHIP_TO_CONTACT_ID;
End If;
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If Cw_Oe_Order_Lines_All_Rec.DELIVER_TO_CONTACT_ID Is Not Null then
    l_line_tbl(i).DELIVER_TO_CONTACT_ID
            := Cw_Oe_Order_Lines_All_Rec.DELIVER_TO_CONTACT_ID;
End If;
If Cw_Oe_Order_Lines_All_Rec.INVOICE_TO_CONTACT_ID Is Not Null Then
    l_line_tbl(i).INVOICE_TO_CONTACT_ID
            := Cw_Oe_Order_Lines_All_Rec.INVOICE_TO_CONTACT_ID;
End If;
If Cw_Oe_Order_Lines_All_Rec.SOLD_FROM_ORG_ID Is Not Null then
    l_line_tbl(i).SOLD_FROM_ORG_ID
            := Cw_Oe_Order_Lines_All_Rec.SOLD_FROM_ORG_ID;
End If;
If Cw_Oe_Order_Lines_All_Rec.SOLD_TO_ORG_ID Is Not Null Then
    l_line_tbl(i).SOLD_TO_ORG_ID
            := Cw_Oe_Order_Lines_All_Rec.SOLD_TO_ORG_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.CUSTOMER_PO_NUMBER Is Not Null Then
    l_line_tbl(i).CUST_PO_NUMBER
            := Cw_Oe_Order_Lines_All_Rec.CUSTOMER_PO_NUMBER;
End If;
if Cw_Oe_Order_Lines_All_Rec.SHIP_TOLERANCE_ABOVE Is Not Null Then
    l_line_tbl(i).SHIP_TOLERANCE_ABOVE
            := Cw_Oe_Order_Lines_All_Rec.SHIP_TOLERANCE_ABOVE;
End If;
If Cw_Oe_Order_Lines_All_Rec.SHIP_TOLERANCE_BELOW Is Not Null Then
    l_line_tbl(i).SHIP_TOLERANCE_BELOW
            := Cw_Oe_Order_Lines_All_Rec.SHIP_TOLERANCE_BELOW;
End If;
if Cw_Oe_Order_Lines_All_Rec.DEMAND_BUCKET_TYPE_CODE Is Not Null Then
    l_line_tbl(i).DEMAND_BUCKET_TYPE_CODE
            := Cw_Oe_Order_Lines_All_Rec.DEMAND_BUCKET_TYPE_CODE;
End If;
if Cw_Oe_Order_Lines_All_Rec.VEH_CUS_ITEM_CUM_KEY_ID Is Not Null Then
    l_line_tbl(i).VEH_CUS_ITEM_CUM_KEY_ID
            := Cw_Oe_Order_Lines_All_Rec.VEH_CUS_ITEM_CUM_KEY_ID;
  End If;
If Cw_Oe_Order_Lines_All_Rec.CUSTOMER_DOCK_CODE Is Not Null Then
    l_line_tbl(i).CUSTOMER_DOCK_CODE
            := Cw_Oe_Order_Lines_All_Rec.CUSTOMER_DOCK_CODE;
End If;
if Cw_Oe_Order_Lines_All_Rec.CUSTOMER_JOB Is Not Null Then
    l_line_tbl(i).CUSTOMER_JOB
            := Cw_Oe_Order_Lines_All_Rec.CUSTOMER_JOB;
End If;
if Cw_Oe_Order_Lines_All_Rec.CUSTOMER_PRODUCTION_LINE Is Not Null Then
    l_line_tbl(i).CUSTOMER_PRODUCTION_LINE
            := Cw_Oe_Order_Lines_All_Rec.CUSTOMER_PRODUCTION_LINE;
End If;
if Cw_Oe_Order_Lines_All_Rec.CUST_MODEL_SERIAL_NUMBER Is Not Null Then
    l_line_tbl(i).CUST_MODEL_SERIAL_NUMBER
            := Cw_Oe_Order_Lines_All_Rec.CUST_MODEL_SERIAL_NUMBER;
End If;
if Cw_Oe_Order_Lines_All_Rec.PROJECT_ID Is Not Null Then
    l_line_tbl(i).PROJECT_ID
              := Cw_Oe_Order_Lines_All_Rec.PROJECT_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.TASK_ID Is Not Null Then
    l_line_tbl(i).TASK_ID
            := Cw_Oe_Order_Lines_All_Rec.TASK_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.INVENTORY_ITEM_ID Is Not Null Then
    l_line_tbl(i).INVENTORY_ITEM_ID
            := Cw_Oe_Order_Lines_All_Rec.INVENTORY_ITEM_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.TAX_DATE Is Not Null Then
    l_line_tbl(i).TAX_DATE
                := Cw_Oe_Order_Lines_All_Rec.TAX_DATE;
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End If;
if Cw_Oe_Order_Lines_All_Rec.TAX_CODE Is Not Null Then
        l_line_tbl(i).TAX_CODE
                    := Cw_Oe_Order_Lines_All_Rec.TAX_CODE;
End If;
if Cw_Oe_Order_Lines_All_Rec.DEMAND_CLASS_CODE Is Not Null Then
        l_line_tbl(i).DEMAND_CLASS_CODE
                    := Cw_Oe_Order_Lines_All_Rec.DEMAND_CLASS_CODE;
End If;
if Cw_Oe_Order_Lines_All_Rec.PRICE_LIST_ID Is Not Null Then
        l_line_tbl(i).PRICE_LIST_ID
                := Cw_Oe_Order_Lines_All_Rec.PRICE_LIST_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.PRICING_DATE Is Not Null Then
        l_line_tbl(i).PRICING_DATE
                := Cw_Oe_Order_Lines_All_Rec.PRICING_DATE;
End If;
if Cw_Oe_Order_Lines_All_Rec.AGREEMENT_ID Is Not Null Then
        l_line_tbl(i).AGREEMENT_ID
                := Cw_Oe_Order_Lines_All_Rec.AGREEMENT_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.SHIPMENT_PRIORITY_CODE Is Not Null Then
        l_line_tbl(i).SHIPMENT_PRIORITY_CODE
                := Cw_Oe_Order_Lines_All_Rec.SHIPMENT_PRIORITY_CODE;
End If;
if Cw_Oe_Order_Lines_All_Rec.SHIPPING_METHOD_CODE Is Not Null Then
        l_line_tbl(i).SHIPPING_METHOD_CODE
                := Cw_Oe_Order_Lines_All_Rec.SHIPPING_METHOD_CODE;
End If;
if Cw_Oe_Order_Lines_All_Rec.FREIGHT_TERMS_CODE Is Not Null Then
        l_line_tbl(i).FREIGHT_TERMS_CODE
                := Cw_Oe_Order_Lines_All_Rec.FREIGHT_TERMS_CODE;
End If;
if Cw_Oe_Order_Lines_All_Rec.FOB_POINT_CODE Is Not Null Then
        l_line_tbl(i).FOB_POINT_CODE
                := Cw_Oe_Order_Lines_All_Rec.FOB_POINT_CODE;
End If;
If Cw_Oe_Order_Lines_All_Rec.TAX_POINT_CODE Is Not Null Then
        l_line_tbl(i).TAX_POINT_CODE
                := Cw_Oe_Order_Lines_All_Rec.TAX_POINT_CODE;
End If;
if Cw_Oe_Order_Lines_All_Rec.PAYMENT_TERM_ID Is Not Null Then
        l_line_tbl(i).PAYMENT_TERM_ID
                := Cw_Oe_Order_Lines_All_Rec.PAYMENT_TERM_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.INVOICING_RULE_ID Is Not Null Then
        l_line_tbl(i).INVOICING_RULE_ID
                := Cw_Oe_Order_Lines_All_Rec.INVOICING_RULE_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.ACCOUNTING_RULE_ID Is Not Null Then
        l_line_tbl(i).ACCOUNTING_RULE_ID
                    := Cw_Oe_Order_Lines_All_Rec.ACCOUNTING_RULE_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.ORIG_SYS_DOCUMENT_REF Is Not Null Then
        l_line_tbl(i).ORIG_SYS_DOCUMENT_REF
                := Cw_Oe_Order_Lines_All_Rec.ORIG_SYS_DOCUMENT_REF;
End If;
if Cw_Oe_Order_Lines_All_Rec.ORIG_SYS_LINE_REF Is Not Null Then
        l_line_tbl(i).Header_ID
                := Cw_Oe_Order_Lines_All_Rec.ORIG_SYS_LINE_REF;
End If;
if Cw_Oe_Order_Lines_All_Rec.ITEM_REVISION Is Not Null Then
        l_line_tbl(i).ITEM_REVISION
                    := Cw_Oe_Order_Lines_All_Rec.ITEM_REVISION;
End If;
if Cw_Oe_Order_Lines_All_Rec.UNIT_SELLING_PRICE Is Not Null Then
        l_line_tbl(i).UNIT_SELLING_PRICE
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                            := Cw_Oe_Order_Lines_All_Rec.UNIT_SELLING_PRICE;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.UNIT_LIST_PRICE Is Not Null Then
                        l_line_tbl(i).UNIT_LIST_PRICE
                               := Cw_Oe_Order_Lines_All_Rec.UNIT_LIST_PRICE;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.LINE_PO_CONTEXT Is Not Null Then
                        l_line_tbl(i).CONTEXT
                                := Cw_Oe_Order_Lines_All_Rec.LINE_PO_CONTEXT;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.ATTRIBUTE1 Is Not Null Then
                        l_line_tbl(i).ATTRIBUTE1
                                := Cw_Oe_Order_Lines_All_Rec.ATTRIBUTE1;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.ATTRIBUTE2 Is Not Null Then
                        l_line_tbl(i).ATTRIBUTE2
                                := Cw_Oe_Order_Lines_All_Rec.ATTRIBUTE2;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.ATTRIBUTE3 Is Not Null Then
                        l_line_tbl(i).ATTRIBUTE3
                                := Cw_Oe_Order_Lines_All_Rec.ATTRIBUTE3;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.ATTRIBUTE4 Is Not Null Then
                        l_line_tbl(i).ATTRIBUTE4
                                := Cw_Oe_Order_Lines_All_Rec.ATTRIBUTE4;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.ATTRIBUTE5 Is Not Null Then
                        l_line_tbl(i).ATTRIBUTE5
                                := Cw_Oe_Order_Lines_All_Rec.ATTRIBUTE5;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.PROGRAM_APPLICATION_ID Is Not Null Then
                        l_line_tbl(i).PROGRAM_APPLICATION_ID
                              := Cw_Oe_Order_Lines_All_Rec.PROGRAM_APPLICATION_ID;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.PROGRAM_ID Is Not Null Then
                        l_line_tbl(i).PROGRAM_ID
                                  := Cw_Oe_Order_Lines_All_Rec.PROGRAM_ID;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.PROGRAM_UPDATE_DATE Is Not Null Then
                        l_line_tbl(i).PROGRAM_UPDATE_DATE
                                := Cw_Oe_Order_Lines_All_Rec.PROGRAM_UPDATE_DATE;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.REQUEST_ID Is Not Null Then
                        l_line_tbl(i).REQUEST_ID
                                := Cw_Oe_Order_Lines_All_Rec.REQUEST_ID;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.COMPONENT_CODE Is Not Null Then
                        l_line_tbl(i).COMPONENT_CODE
                                := Cw_Oe_Order_Lines_All_Rec.COMPONENT_CODE;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.RETURN_ATTRIBUTE1 Is Not Null Then
                        l_line_tbl(i).RETURN_ATTRIBUTE1
                                := Cw_Oe_Order_Lines_All_Rec.RETURN_ATTRIBUTE1;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.RETURN_ATTRIBUTE2 Is Not Null Then
                        l_line_tbl(i).RETURN_ATTRIBUTE2
                                := Cw_Oe_Order_Lines_All_Rec.RETURN_ATTRIBUTE2;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.RETURN_ATTRIBUTE3 Is Not Null Then
                        l_line_tbl(i).RETURN_ATTRIBUTE3
                                := Cw_Oe_Order_Lines_All_Rec.RETURN_ATTRIBUTE3;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.RETURN_ATTRIBUTE4 Is Not Null Then
                        l_line_tbl(i).RETURN_ATTRIBUTE4
                                := Cw_Oe_Order_Lines_All_Rec.RETURN_ATTRIBUTE4;
                End If;
                if Cw_Oe_Order_Lines_All_Rec.RETURN_ATTRIBUTE5 Is Not Null Then
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                    l_line_tbl(i).RETURN_ATTRIBUTE5
                        := Cw_Oe_Order_Lines_All_Rec.RETURN_ATTRIBUTE5;
End If;
if Cw_Oe_Order_Lines_All_Rec.SCHEDULE_ARRIVAL_DATE Is Not Null Then
        l_line_tbl(i).SCHEDULE_ARRIVAL_DATE
                := Cw_Oe_Order_Lines_All_Rec.SCHEDULE_ARRIVAL_DATE;
End If;
if Cw_Oe_Order_Lines_All_Rec.SOURCE_TYPE_CODE Is Not Null Then
        l_line_tbl(i).SOURCE_TYPE_CODE
                    := Cw_Oe_Order_Lines_All_Rec.SOURCE_TYPE_CODE;
End If;
if Cw_Oe_Order_Lines_All_Rec.SALESREP_ID Is Not Null Then
        l_line_tbl(i).SALESREP_ID
                := Cw_Oe_Order_Lines_All_Rec.SALESREP_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.RETURN_REASON_CODE Is Not Null Then
        l_line_tbl(i).RETURN_REASON_CODE
                := Cw_Oe_Order_Lines_All_Rec.RETURN_REASON_CODE;
End If;
if Cw_Oe_Order_Lines_All_Rec.ARRIVAL_SET_ID Is Not Null Then
        l_line_tbl(i).ARRIVAL_SET_ID
                := Cw_Oe_Order_Lines_All_Rec.ARRIVAL_SET_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.SHIP_SET_ID Is Not Null Then
        l_line_tbl(i).SHIP_SET_ID
                := Cw_Oe_Order_Lines_All_Rec.SHIP_SET_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.SPLIT_FROM_LINE_ID Is Not Null Then
        l_line_tbl(i).SPLIT_FROM_LINE_ID
                := Cw_Oe_Order_Lines_All_Rec.SPLIT_FROM_LINE_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.CUST_PRODUCTION_SEQ_NUM Is Not Null Then
        l_line_tbl(i).CUST_PRODUCTION_SEQ_NUM
                := Cw_Oe_Order_Lines_All_Rec.CUST_PRODUCTION_SEQ_NUM;
End If;
if Cw_Oe_Order_Lines_All_Rec.AUTHORIZED_TO_SHIP_FLAG Is Not Null Then
        l_line_tbl(i).AUTHORIZED_TO_SHIP_FLAG
                := Cw_Oe_Order_Lines_All_Rec.AUTHORIZED_TO_SHIP_FLAG;
End If;
if Cw_Oe_Order_Lines_All_Rec.OVER_SHIP_RESOLVED_FLAG Is Not Null Then
        l_line_tbl(i).OVER_SHIP_RESOLVED_FLAG
                := Cw_Oe_Order_Lines_All_Rec.OVER_SHIP_RESOLVED_FLAG;
End If;
if Cw_Oe_Order_Lines_All_Rec.CREDIT_INVOICE_LINE_ID Is Not Null Then
        l_line_tbl(i).CREDIT_INVOICE_LINE_ID
                := Cw_Oe_Order_Lines_All_Rec.CREDIT_INVOICE_LINE_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.ORDER_SOURCE_ID Is Not Null Then
        l_line_tbl(i).ORDER_SOURCE_ID
                := Cw_Oe_Order_Lines_All_Rec.ORDER_SOURCE_ID;
End If;
if Cw_Oe_Order_Lines_All_Rec.ORIG_SYS_SHIPMENT_REF Is Not Null Then
        l_line_tbl(i).ORIG_SYS_SHIPMENT_REF
                := Cw_Oe_Order_Lines_All_Rec.ORIG_SYS_SHIPMENT_REF;
End If;
if Cw_Oe_Order_Lines_All_Rec.CHANGE_SEQUENCE Is Not Null Then
        l_line_tbl(i).CHANGE_SEQUENCE
                := Cw_Oe_Order_Lines_All_Rec.CHANGE_SEQUENCE;
End If;
if Cw_Oe_Order_Lines_All_Rec.CUSTOMER_LINE_NUMBER Is Not Null Then
        l_line_tbl(i).CUSTOMER_LINE_NUMBER
                := Cw_Oe_Order_Lines_All_Rec.CUSTOMER_LINE_NUMBER;
End If;
    if Cw_Oe_Order_Lines_All_Rec.CUSTOMER_SHIPMENT_NUMBER Is Not Null Then
        l_line_tbl(i).CUSTOMER_SHIPMENT_NUMBER
                := Cw_Oe_Order_Lines_All_Rec.CUSTOMER_SHIPMENT_NUMBER;
End If;
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                    if Cw_Oe_Order_Lines_All_Rec.CUSTOMER_ITEM_NET_PRICE Is Not Null Then
                        l_line_tbl(i).CUSTOMER_ITEM_NET_PRICE
                            := Cw_Oe_Order_Lines_All_Rec.CUSTOMER_ITEM_NET_PRICE;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.CUSTOMER_PAYMENT_TERM_ID Is Not Null Then
                        l_line_tbl(i).CUSTOMER_PAYMENT_TERM_ID
                            := Cw_Oe_Order_Lines_All_Rec.CUSTOMER_PAYMENT_TERM_ID;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.END_ITEM_UNIT_NUMBER Is Not Null Then
                        l_line_tbl(i).END_ITEM_UNIT_NUMBER
                            := Cw_Oe_Order_Lines_All_Rec.END_ITEM_UNIT_NUMBER;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.SHIPPING_INSTRUCTIONS Is Not Null Then
                        l_line_tbl(i).SHIPPING_INSTRUCTIONS
                            := Cw_Oe_Order_Lines_All_Rec.SHIPPING_INSTRUCTIONS;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.PACKING_INSTRUCTIONS Is Not Null Then
                        l_line_tbl(i).PACKING_INSTRUCTIONS
                            := Cw_Oe_Order_Lines_All_Rec.PACKING_INSTRUCTIONS;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.SERVICE_TXN_REASON_CODE Is Not Null Then
                        l_line_tbl(i).SERVICE_TXN_REASON_CODE
                             := Cw_Oe_Order_Lines_All_Rec.SERVICE_TXN_REASON_CODE;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.SERVICE_TXN_COMMENTS Is Not Null Then
                        l_line_tbl(i).SERVICE_TXN_COMMENTS
                            := Cw_Oe_Order_Lines_All_Rec.SERVICE_TXN_COMMENTS;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.SERVICE_DURATION Is Not Null Then
                        l_line_tbl(i).SERVICE_DURATION
                             := Cw_Oe_Order_Lines_All_Rec.SERVICE_DURATION;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.SERVICE_START_DATE Is Not Null Then
                        l_line_tbl(i).SERVICE_START_DATE
                             := Cw_Oe_Order_Lines_All_Rec.SERVICE_START_DATE;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.SERVICE_END_DATE Is Not Null Then
                        l_line_tbl(i).SERVICE_END_DATE
                            := Cw_Oe_Order_Lines_All_Rec.SERVICE_END_DATE;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.SERVICE_COTERMINATE_FLAG Is Not Null Then
                        l_line_tbl(i).SERVICE_COTERMINATE_FLAG
                                := Cw_Oe_Order_Lines_All_Rec.SERVICE_COTERMINATE_FLAG;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.UNIT_LIST_PERCENT Is Not Null Then
                        l_line_tbl(i).UNIT_LIST_PERCENT
                                := Cw_Oe_Order_Lines_All_Rec.UNIT_LIST_PERCENT;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.UNIT_SELLING_PERCENT Is Not Null Then
                        l_line_tbl(i).UNIT_SELLING_PERCENT
                            := Cw_Oe_Order_Lines_All_Rec.UNIT_SELLING_PERCENT;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.SERVICE_PERIOD Is Not Null Then
                        l_line_tbl(i).SERVICE_PERIOD
                            := Cw_Oe_Order_Lines_All_Rec.SERVICE_PERIOD;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.TP_CONTEXT Is Not Null Then
                        l_line_tbl(i).TP_CONTEXT
                                := Cw_Oe_Order_Lines_All_Rec.TP_CONTEXT;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.TP_ATTRIBUTE1 Is Not Null Then
                        l_line_tbl(i).TP_ATTRIBUTE1
                                := Cw_Oe_Order_Lines_All_Rec.TP_ATTRIBUTE1;
                    End If;
                    if Cw_Oe_Order_Lines_All_Rec.TP_ATTRIBUTE2 Is Not Null Then
                        l_line_tbl(i).TP_ATTRIBUTE2
                                := Cw_Oe_Order_Lines_All_Rec.TP_ATTRIBUTE2;
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                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.TP_ATTRIBUTE3 Is Not Null Then
                                l_line_tbl(i).TP_ATTRIBUTE3
                                        := Cw_Oe_Order_Lines_All_Rec.TP_ATTRIBUTE3;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.TP_ATTRIBUTE4 Is Not Null Then
                                l_line_tbl(i).TP_ATTRIBUTE4
                                        := Cw_Oe_Order_Lines_All_Rec.TP_ATTRIBUTE4;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.TP_ATTRIBUTE5 Is Not Null Then
                                l_line_tbl(i).TP_ATTRIBUTE5
                                        := Cw_Oe_Order_Lines_All_Rec.TP_ATTRIBUTE5;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.SERVICE_REFERENCE_TYPE_CODE Is Not Null Then
                                l_line_tbl(i).SERVICE_REFERENCE_TYPE_CODE
                                        := Cw_Oe_Order_Lines_All_Rec.SERVICE_REFERENCE_TYPE_CODE;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.CALCULATE_PRICE_FLAG Is Not Null Then
                                l_line_tbl(i).CALCULATE_PRICE_FLAG
                                        := Cw_Oe_Order_Lines_All_Rec.CALCULATE_PRICE_FLAG;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.PREFERRED_GRADE Is Not Null Then
                                l_line_tbl(i).PREFERRED_GRADE
                                        := Cw_Oe_Order_Lines_All_Rec.PREFERRED_GRADE;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.ORDERED_QUANTITY2 Is Not Null Then
                                l_line_tbl(i).ORDERED_QUANTITY2
                                        := Cw_Oe_Order_Lines_All_Rec.ORDERED_QUANTITY2;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.CREATION_DATE Is Not Null Then
                                l_line_tbl(i).CREATION_DATE
                                        := Cw_Oe_Order_Lines_All_Rec.CREATION_DATE;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.CREATED_BY Is Not Null Then
                                l_line_tbl(i).CREATED_BY
                                        := Cw_Oe_Order_Lines_All_Rec.CREATED_BY;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.LAST_UPDATE_DATE Is Not Null Then
                                l_line_tbl(i).LAST_UPDATE_DATE
                                        := Cw_Oe_Order_Lines_All_Rec.LAST_UPDATE_DATE;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.LAST_UPDATED_BY  Is Not Null Then
                                l_line_tbl(i).LAST_UPDATED_BY
                                        := Cw_Oe_Order_Lines_All_Rec.LAST_UPDATED_BY ;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.LAST_UPDATE_LOGIN Is Not Null Then
                                l_line_tbl(i).LAST_UPDATE_LOGIN
                                        := Cw_Oe_Order_Lines_All_Rec.LAST_UPDATE_LOGIN;
                        End If;
                        if Cw_Oe_Order_Lines_All_Rec.Operation_Code Is Not Null Then
                                l_line_tbl(i).Operation
                                        := Cw_Oe_Order_Lines_All_Rec.Operation_Code;
                        End If;

                        i := i + 1;
                        End Loop;
                        CLOSE    w_Oe_Order_Lines_All;


        --    Order Line Adjustment
                If w_Oe_Price_Adjustments%ISOPEN Then
                    CLOSE    w_Oe_Price_Adjustments;
                End If;
                OPEN    w_Oe_Price_Adjustments;
                i := 1;
                LOOP
                FETCH w_Oe_Price_Adjustments    INTO    Cw_Oe_Price_Adjustments_Rec;
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                     EXIT WHEN w_Oe_Price_Adjustments%NOTFOUND;
                     If Cw_Oe_Price_Adjustments_Rec.Orig_Sys_Line_Ref Is not Null Then
                        l_Line_Adj_tbl(i) := OE_ORDER_PUB.G_MISS_LINE_ADJ_REC;


                     If Cw_Oe_Price_Adjustments_Rec.Operation_Code = 'UPDATE' or
                        Cw_Oe_Price_Adjustments_Rec.Operation_Code = 'DELETE'  Then
                              l_Line_adj_tbl(i).Line_ID
                                 := Cw_Oe_Price_Adjustments_Rec.Orig_Sys_Line_Ref;
                     End If;

                     If Cw_Oe_Price_Adjustments_Rec.PROGRAM_APPLICATION_ID Is Not Null Then
                          l_Line_Adj_Tbl(i).PROGRAM_APPLICATION_ID
                                 := Cw_Oe_Price_Adjustments_Rec.PROGRAM_APPLICATION_ID;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Program_Id Is Not Null Then
                          l_Line_Adj_Tbl(i).PROGRAM_ID
                                 := Cw_Oe_Price_Adjustments_Rec.Program_Id;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Program_Update_Date Is Not Null Then
                          l_Line_Adj_Tbl(i).PROGRAM_UPDATE_DATE
                                 := Cw_Oe_Price_Adjustments_Rec.Program_Update_Date;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Request_Id Is Not Null Then
                          l_Line_Adj_Tbl(i).REQUEST_ID
                                 := Cw_Oe_Price_Adjustments_Rec.Request_Id;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Automatic_Flag Is Not Null Then
                          l_Line_Adj_Tbl(i).AUTOMATIC_FLAG
                                 := Cw_Oe_Price_Adjustments_Rec.Automatic_Flag;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Percent Is Not Null Then
                          l_Line_Adj_Tbl(i).PERCENT
                                 := Cw_Oe_Price_Adjustments_Rec.Percent;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Orig_Sys_Line_Ref Is Not Null Then
                          l_Line_Adj_Tbl(i).LINE_ID
                                 := Cw_Oe_Price_Adjustments_Rec.Orig_Sys_Line_Ref;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Context Is Not Null Then
                          l_Line_Adj_Tbl(i).CONTEXT
                                 := Cw_Oe_Price_Adjustments_Rec.Context;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Attribute1 Is Not Null Then
                          l_Line_Adj_Tbl(i).ATTRIBUTE1
                                                   := Cw_Oe_Price_Adjustments_Rec.Attribute1;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Attribute2 Is Not Null Then
                          l_Line_Adj_Tbl(i).ATTRIBUTE2
                                 := Cw_Oe_Price_Adjustments_Rec.Attribute2 ;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Attribute3 Is Not Null Then
                          l_Line_Adj_Tbl(i).ATTRIBUTE3
                                 := Cw_Oe_Price_Adjustments_Rec.Attribute3;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Attribute4 Is Not Null Then
                          l_Line_Adj_Tbl(i).ATTRIBUTE4
                                 := Cw_Oe_Price_Adjustments_Rec.Attribute4 ;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.Attribute5 Is Not Null Then
                          l_Line_Adj_Tbl(i).ATTRIBUTE5
                                 := Cw_Oe_Price_Adjustments_Rec.Attribute5;
                     End If;
                     If Cw_Oe_Price_Adjustments_Rec.ORIG_SYS_DISCOUNT_REF Is Not Null Then
                          l_Line_Adj_Tbl(i).ORIG_SYS_DISCOUNT_REF
                                 := Cw_Oe_Price_Adjustments_Rec.ORIG_SYS_DISCOUNT_REF;
                     End If;
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                    If Cw_Oe_Price_Adjustments_Rec.LIST_HEADER_ID Is Not Null Then
                        l_Line_Adj_Tbl(i).LIST_HEADER_ID
                            := Cw_Oe_Price_Adjustments_Rec.LIST_HEADER_ID;
                    End If;
                    If Cw_Oe_Price_Adjustments_Rec.LIST_LINE_ID Is Not Null Then
                        l_Line_Adj_Tbl(i).LIST_LINE_ID
                            := Cw_Oe_Price_Adjustments_Rec.LIST_LINE_ID;
                    End If;
                    If Cw_Oe_Price_Adjustments_Rec.CHANGE_REASON_CODE Is Not Null Then
                        l_Line_Adj_Tbl(i).CHANGE_REASON_CODE
                            := Cw_Oe_Price_Adjustments_Rec.CHANGE_REASON_CODE;
                    End If;
                    If Cw_Oe_Price_Adjustments_Rec.CHANGE_REASON_TEXT Is Not Null Then
                        l_Line_Adj_Tbl(i).CHANGE_REASON_TEXT
                            := Cw_Oe_Price_Adjustments_Rec.CHANGE_REASON_TEXT;
                    End If;
                    If Cw_Oe_Price_Adjustments_Rec.OPERAND Is Not Null Then
                        l_Line_Adj_Tbl(i).OPERAND
                            := Cw_Oe_Price_Adjustments_Rec.OPERAND;
                    End If;
                    If Cw_Oe_Price_Adjustments_Rec.CREATION_DATE Is Not Null Then
                        l_Line_Adj_Tbl(i).CREATION_DATE
                            := Cw_Oe_Price_Adjustments_Rec.CREATION_DATE;
                    End If;
                    If Cw_Oe_Price_Adjustments_Rec.CREATED_BY Is Not Null Then
                        l_Line_Adj_Tbl(i).CREATED_BY
                            := Cw_Oe_Price_Adjustments_Rec.CREATED_BY;
                    End If;
                    If Cw_Oe_Price_Adjustments_Rec.LAST_UPDATE_DATE Is Not Null Then
                        l_Line_Adj_Tbl(i).LAST_UPDATE_DATE
                            := Cw_Oe_Price_Adjustments_Rec.LAST_UPDATE_DATE;
                    End If;
                    If Cw_Oe_Price_Adjustments_Rec.LAST_UPDATED_BY Is not Null Then
                        l_Line_Adj_Tbl(i).LAST_UPDATED_BY
                            := Cw_Oe_Price_Adjustments_Rec.LAST_UPDATED_BY;
                    End If;
                    If Cw_Oe_Price_Adjustments_Rec.LAST_UPDATE_LOGIN Is Not Null Then
                        l_Line_Adj_Tbl(i).LAST_UPDATE_LOGIN
                            := Cw_Oe_Price_Adjustments_Rec.LAST_UPDATE_LOGIN;
                    End If;
                    If Cw_Oe_Price_Adjustments_Rec.Operation_Code = 'CREATE' Then
                    If Cw_Oe_Price_Adjustments_Rec.Orig_Sys_Line_Ref Is Not Null Then
                        l_Line_Adj_Tbl(i).line_index
                            := Cw_Oe_Price_Adjustments_Rec.Orig_Sys_Line_Ref;
                        End If;
                      End If;
                      End If;
                    i := i + 1;
                    End Loop;
                    CLOSE     w_Oe_Price_Adjustments;


    --    Order Line Attributes
        If w_Oe_Price_Adj_Attribs%ISOPEN Then
            CLOSE     w_Oe_Price_Adj_Attribs;
        End If;
        OPEN     w_Oe_Price_Adj_Attribs;
        i := 1;
        LOOP
        FETCH w_Oe_Price_Adj_Attribs   INTO    Cw_Oe_Price_Adj_Attribs_Rec;
        EXIT WHEN w_Oe_Price_Adj_Attribs%NOTFOUND;
        If Cw_Oe_Price_Adj_Attribs_Rec.Orig_Sys_Line_Ref Is Not Null Then
            l_Line_Price_Att_tbl(i) := OE_ORDER_PUB.G_MISS_LINE_PRICE_ATT_REC;
        If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_CONTEXT Is Not Null Then
            l_Line_Price_Att_tbl(i).PRICING_CONTEXT
                := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_CONTEXT;
        End if;
```

```
If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE1 Is Not Null Then
    l_Line_Price_Att_tbl(i).PRICING_ATTRIBUTE1
        := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE1;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE2 Is Not Null Then
    l_Line_Price_Att_tbl(i).PRICING_ATTRIBUTE2
        := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE2;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE3 Is Not Null Then
    l_Line_Price_Att_tbl(i).PRICING_ATTRIBUTE3
        := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE3;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE4 Is Not Null Then
    l_Line_Price_Att_tbl(i).PRICING_ATTRIBUTE4
        := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE4;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE5 Is Not Null Then
    l_Line_Price_Att_tbl(i).PRICING_ATTRIBUTE5
        := Cw_Oe_Price_Adj_Attribs_Rec.PRICING_ATTRIBUTE5;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_APPLICATION_ID Is Not Null Then
    l_Line_Price_Att_tbl(i).PROGRAM_APPLICATION_ID
        := Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_APPLICATION_ID;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_ID Is Not Null Then
    l_Line_Price_Att_tbl(i).PROGRAM_ID
            := Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_ID;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_UPDATE_DATE Is Not Null Then
    l_Line_Price_Att_tbl(i).PROGRAM_UPDATE_DATE
        := Cw_Oe_Price_Adj_Attribs_Rec.PROGRAM_UPDATE_DATE;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.REQUEST_ID Is Not Null Then
    l_Line_Price_Att_tbl(i).REQUEST_ID
            := Cw_Oe_Price_Adj_Attribs_Rec.REQUEST_ID;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.FLEX_TITLE Is Not Null Then
    l_Line_Price_Att_tbl(i).FLEX_TITLE
            := Cw_Oe_Price_Adj_Attribs_Rec.FLEX_TITLE;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.CREATION_DATE Is Not Null Then
    l_Line_Price_Att_tbl(i).CREATION_DATE
            := Cw_Oe_Price_Adj_Attribs_Rec.CREATION_DATE;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.CREATED_BY Is Not Null Then
    l_Line_Price_Att_tbl(i).CREATED_BY
            := Cw_Oe_Price_Adj_Attribs_Rec.CREATED_BY;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATE_DATE Is Not Null Then
    l_Line_Price_Att_tbl(i).LAST_UPDATE_DATE
            := Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATE_DATE;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATED_BY Is Not Null Then
    l_Line_Price_Att_tbl(i).LAST_UPDATED_BY
            := Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATED_BY;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATE_LOGIN Is Not Null Then
    l_Line_Price_Att_tbl(i).LAST_UPDATE_LOGIN
            := Cw_Oe_Price_Adj_Attribs_Rec.LAST_UPDATE_LOGIN;
End if;
If Cw_Oe_Price_Adj_Attribs_Rec.Operation_Code= 'UPDATE' Or
   Cw_Oe_Price_Adj_Attribs_Rec.Operation_Code= 'DELETE' Then
If Cw_Oe_Price_Adj_Attribs_Rec.Orig_Sys_Line_Ref Is Not Null Then
    l_Line_Price_Att_tbl(i).Line_ID
            := Cw_Oe_Price_Adj_Attribs_Rec.Orig_Sys_Line_Ref;
End if;
End If;
```

```
                        If Cw_Oe_Price_Adj_Attribs_Rec.Operation_Code= 'CREATE' Then
                        If Cw_Oe_Price_Adj_Attribs_Rec.Orig_Sys_Line_Ref Is Not Null Then
                            l_Line_Price_Att_tbl(i).Line_Index
                                := Cw_Oe_Price_Adj_Attribs_Rec.Orig_Sys_Line_Ref;
                                End if;
                            End If;
                                    End If;
                    i := i + 1;
                End Loop;
                CLOSE       w_Oe_Price_Adj_Attribs;


        --    Order Line Sales Credits
            If w_Oe_Sales_Credits%ISOPEN Then
                CLOSE       w_Oe_Sales_Credits;
            End If;
            OPEN     w_Oe_Sales_Credits;
            i := 1;
            LOOP
            FETCH w_Oe_Sales_Credits    INTO     Cw_Oe_Sales_Credits_Rec;
            EXIT WHEN w_Oe_Sales_Credits%NOTFOUND;
            If Cw_Oe_Sales_Credits_Rec.Orig_Sys_Line_Ref Is Not Null Then
                l_Line_Scredit_tbl(i) := OE_ORDER_PUB.G_MISS_LINE_SCREDIT_REC;

            If Cw_Oe_Sales_Credits_Rec.Operation_Code = 'CREATE' Then
            If Cw_Oe_Sales_Credits_Rec.Orig_Sys_Line_Ref Is Not Null Then
                l_Line_Scredit_tbl(i).Line_Index
                        := Cw_Oe_Sales_Credits_Rec.Orig_Sys_Line_Ref;
            End If;
            End If;
            If Cw_Oe_Sales_Credits_Rec.SALESREP_ID Is Not Null Then
                l_Line_Scredit_tbl(i).SALESREP_ID
                        := Cw_Oe_Sales_Credits_Rec.SALESREP_ID;
            End If;
            If Cw_Oe_Sales_Credits_Rec.PERCENT Is Not Null Then
                l_Line_Scredit_tbl(i).PERCENT
                            := Cw_Oe_Sales_Credits_Rec.PERCENT;
            End If;
            If Cw_Oe_Sales_Credits_Rec.Operation_Code != 'CREATE' Then
            If Cw_Oe_Sales_Credits_Rec.Orig_Sys_Line_Ref Is Not Null Then
                l_Line_Scredit_tbl(i).LINE_ID
                        := Cw_Oe_Sales_Credits_Rec.Orig_Sys_Line_Ref;
            End If;
            End If;
            If Cw_Oe_Sales_Credits_Rec.CONTEXT Is Not Null Then
                l_Line_Scredit_tbl(i).CONTEXT
                        := Cw_Oe_Sales_Credits_Rec.CONTEXT;
            End If;
            If Cw_Oe_Sales_Credits_Rec.ATTRIBUTE1 Is Not Null Then
                l_Line_Scredit_tbl(i).ATTRIBUTE1
                    := Cw_Oe_Sales_Credits_Rec.ATTRIBUTE1;
            End If;
            If Cw_Oe_Sales_Credits_Rec.ATTRIBUTE2 Is Not Null Then
                l_Line_Scredit_tbl(i).ATTRIBUTE2
                        := Cw_Oe_Sales_Credits_Rec.ATTRIBUTE2;
            End If;
            If Cw_Oe_Sales_Credits_Rec.ATTRIBUTE3 Is Not Null Then
                l_Line_Scredit_tbl(i).ATTRIBUTE3
                        := Cw_Oe_Sales_Credits_Rec.ATTRIBUTE3;
            End If;
            If Cw_Oe_Sales_Credits_Rec.ATTRIBUTE4 Is Not Null Then
                l_Line_Scredit_tbl(i).ATTRIBUTE4
                            := Cw_Oe_Sales_Credits_Rec.ATTRIBUTE4;
            End If;
            If Cw_Oe_Sales_Credits_Rec.ATTRIBUTE5 Is Not Null Then
                l_Line_Scredit_tbl(i).ATTRIBUTE5
                        := Cw_Oe_Sales_Credits_Rec.ATTRIBUTE5;
```

```
                    End If;
                    If Cw_Oe_Sales_Credits_Rec.ORIG_SYS_CREDIT_REF Is Not Null Then
                        l_Line_Scredit_tbl(i).ORIG_SYS_CREDIT_REF
                            := Cw_Oe_Sales_Credits_Rec.ORIG_SYS_CREDIT_REF;
                    End If;
                    If Cw_Oe_Sales_Credits_Rec.SALES_CREDIT_TYPE_ID Is Not Null Then
                        l_Line_Scredit_tbl(i).SALES_CREDIT_TYPE_ID
                            := Cw_Oe_Sales_Credits_Rec.SALES_CREDIT_TYPE_ID;
                    End If;
                    If Cw_Oe_Sales_Credits_Rec.CREATION_DATE Is Not Null Then
                        l_Line_Scredit_tbl(i).CREATION_DATE
                            := Cw_Oe_Sales_Credits_Rec.CREATION_DATE;
                    End If;
                    If Cw_Oe_Sales_Credits_Rec.CREATED_BY Is Not Null Then
                        l_Line_Scredit_tbl(i).CREATED_BY
                            := Cw_Oe_Sales_Credits_Rec.CREATED_BY;
                    End If;
                    If Cw_Oe_Sales_Credits_Rec.LAST_UPDATE_DATE Is Not Null Then
                        l_Line_Scredit_tbl(i).LAST_UPDATE_DATE
                            := Cw_Oe_Sales_Credits_Rec.LAST_UPDATE_DATE;
                    End If;
                    If Cw_Oe_Sales_Credits_Rec.LAST_UPDATED_BY Is Not Null Then
                        l_Line_Scredit_tbl(i).LAST_UPDATED_BY
                            := Cw_Oe_Sales_Credits_Rec.LAST_UPDATED_BY;
                    End If;
                    If Cw_Oe_Sales_Credits_Rec.LAST_UPDATE_LOGIN Is Not Null Then
                        l_Line_Scredit_tbl(i).LAST_UPDATE_LOGIN
                            := Cw_Oe_Sales_Credits_Rec.LAST_UPDATE_LOGIN;
                    End If;
                    End If;
                    i := i + 1;
                    End Loop;
                    CLOSE    w_Oe_Sales_Credits;


            --    Order Line Lot Serial Number
                    If w_Oe_Lot_Serial_Numbers%ISOPEN Then
                        CLOSE     w_Oe_Lot_Serial_Numbers;
                    End If;
                    OPEN    w_Oe_Lot_Serial_Numbers;
                    i := 1;
                    LOOP
                    FETCH w_Oe_Lot_Serial_Numbers    INTO    Cw_Oe_Lot_Serial_Numbers_Rec;
                    EXIT WHEN w_Oe_Lot_Serial_Numbers%NOTFOUND;
                    If Cw_Oe_Lot_Serial_Numbers_Rec.Orig_Sys_Line_Ref Is Not Null Then
                        l_Lot_Serial_tbl(i) := OE_ORDER_PUB.G_MISS_LOT_SERIAL_REC;


                    If Cw_Oe_Lot_Serial_Numbers_Rec.Orig_Sys_Line_Ref Is Not Null Then
                        l_Lot_Serial_tbl(i).LINE_ID
                        := Cw_Oe_Lot_Serial_Numbers_Rec.Orig_Sys_Line_Ref;
                    End If;


                    If Cw_Oe_Lot_Serial_Numbers_Rec.Orig_Sys_Line_Ref Is Not Null Then
                        l_Lot_Serial_tbl(i).Line_Index
                            := Cw_Oe_Lot_Serial_Numbers_Rec.Orig_Sys_Line_Ref;

                    End If;
                    If Cw_Oe_Lot_Serial_Numbers_Rec.LOT_NUMBER Is Not Null Then
                        l_Lot_Serial_tbl(i).LOT_NUMBER
                                    := Cw_Oe_Lot_Serial_Numbers_Rec.LOT_NUMBER;
                    End If;
                    If Cw_Oe_Lot_Serial_Numbers_Rec.FROM_SERIAL_NUMBER Is Not Null Then
                        l_Lot_Serial_tbl(i).FROM_SERIAL_NUMBER
                            := Cw_Oe_Lot_Serial_Numbers_Rec.FROM_SERIAL_NUMBER;
                    End If;
```

```
If Cw_Oe_Lot_Serial_Numbers_Rec.TO_SERIAL_NUMBER Is Not Null Then
    l_Lot_Serial_tbl(i).TO_SERIAL_NUMBER
            := Cw_Oe_Lot_Serial_Numbers_Rec.TO_SERIAL_NUMBER;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.QUANTITY Is Not Null Then
    l_Lot_Serial_tbl(i).QUANTITY
            := Cw_Oe_Lot_Serial_Numbers_Rec.QUANTITY;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.CONTEXT Is Not Null Then
    l_Lot_Serial_tbl(i).CONTEXT
            := Cw_Oe_Lot_Serial_Numbers_Rec.CONTEXT;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.ATTRIBUTE1 Is Not Null Then
    l_Lot_Serial_tbl(i).ATTRIBUTE1
            := Cw_Oe_Lot_Serial_Numbers_Rec.ATTRIBUTE1;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.ATTRIBUTE2 Is Not Null Then
    l_Lot_Serial_tbl(i).ATTRIBUTE2
            := Cw_Oe_Lot_Serial_Numbers_Rec.ATTRIBUTE2;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.ATTRIBUTE3 Is Not Null Then
    l_Lot_Serial_tbl(i).ATTRIBUTE3
            := Cw_Oe_Lot_Serial_Numbers_Rec.ATTRIBUTE3;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.ATTRIBUTE4 Is Not Null Then
    l_Lot_Serial_tbl(i).ATTRIBUTE4
            := Cw_Oe_Lot_Serial_Numbers_Rec.ATTRIBUTE4;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.ATTRIBUTE5 Is Not Null Then
    l_Lot_Serial_tbl(i).ATTRIBUTE5
            := Cw_Oe_Lot_Serial_Numbers_Rec.ATTRIBUTE5;
End If;

If Cw_Oe_Lot_Serial_Numbers_Rec.ORIG_SYS_LOTSERIAL_REF
    Is Not Null Then
    l_Lot_Serial_tbl(i).ORIG_SYS_LOTSERIAL_REF
            := Cw_Oe_Lot_Serial_Numbers_Rec.ORIG_SYS_LOTSERIAL_REF;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.CREATION_DATE Is Not Null Then
    l_Lot_Serial_tbl(i).CREATION_DATE
            := Cw_Oe_Lot_Serial_Numbers_Rec.CREATION_DATE;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.CREATED_BY Is Not Null Then
    l_Lot_Serial_tbl(i).CREATED_BY
            := Cw_Oe_Lot_Serial_Numbers_Rec.CREATED_BY;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.LAST_UPDATE_DATE Is Not Null Then
    l_Lot_Serial_tbl(i).LAST_UPDATE_DATE
            := Cw_Oe_Lot_Serial_Numbers_Rec.LAST_UPDATE_DATE;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.LAST_UPDATED_BY Is Not Null Then
    l_Lot_Serial_tbl(i).LAST_UPDATED_BY
            := Cw_Oe_Lot_Serial_Numbers_Rec.LAST_UPDATED_BY;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.LAST_UPDATE_LOGIN Is Not Null Then
    l_Lot_Serial_tbl(i).LAST_UPDATE_LOGIN
                := Cw_Oe_Lot_Serial_Numbers_Rec.LAST_UPDATE_LOGIN;
End If;
If Cw_Oe_Lot_Serial_Numbers_Rec.OPERATION_CODE Is Not Null Then
    l_Lot_Serial_tbl(i).OPERATION
            := Cw_Oe_Lot_Serial_Numbers_Rec.OPERATION_CODE;
      End If;
       End If;
    i := i + 1;
End Loop;
CLOSE    w_Oe_Lot_Serial_Numbers;
```

```
fnd_global.apps_initialize (0, 21623, NULL);

OE_ORDER_PUB.process_order (
        p_api_version_number => 1.0 ,
        p_init_msg_list => l_init_msg_list,
        p_return_values => l_return_values,
        p_action_commit => l_action_commit,
        x_return_status => l_return_status,
        x_msg_count    => l_msg_count,
        x_msg_data    => l_msg_data,
        p_header_rec => l_header_rec,
        p_old_header_rec => l_old_header_rec,
        p_header_val_rec => l_header_val_rec,
        p_old_header_val_rec => l_old_header_val_rec,
        p_Header_Adj_tbl    => l_header_adj_tbl,
        p_old_Header_Adj_tbl => l_old_header_adj_tbl,
        p_Header_Adj_val_tbl => l_header_adj_val_tbl,
        p_old_Header_Adj_val_tbl => l_old_header_adj_val_tbl,
        p_Header_price_Att_tbl => l_header_price_att_tbl,
        p_old_Header_Price_Att_tbl => l_old_header_price_att_tbl,
        p_Header_Adj_Att_tbl    => l_header_adj_att_tbl,
        p_old_Header_Adj_Att_tbl => l_old_header_adj_att_tbl,
        p_Header_Adj_Assoc_tbl => l_header_adj_assoc_tbl,
        p_old_Header_Adj_Assoc_tbl => l_old_header_adj_assoc_tbl,
        p_Header_Scredit_tbl    => l_header_scredit_tbl,
        p_old_Header_Scredit_tbl => l_old_header_scredit_tbl,
        p_Header_Scredit_val_tbl => l_header_scredit_val_tbl,
        p_old_Header_Scredit_val_tbl => l_old_header_scredit_val_tbl,
        p_line_tbl              => l_line_tbl,
        p_old_line_tbl          => l_old_line_tbl,
        p_line_val_tbl          => l_line_val_tbl,
        p_old_line_val_tbl      => l_old_line_val_tbl,
        p_Line_Adj_tbl          => l_line_adj_tbl,
        p_old_Line_Adj_tbl      => l_old_line_adj_tbl,
        p_Line_Adj_val_tbl    => l_line_adj_val_tbl,
        p_old_Line_Adj_val_tbl => l_old_line_adj_val_tbl,
        p_Line_price_Att_tbl => l_line_price_att_tbl,
        p_old_Line_Price_Att_tbl => l_old_line_price_att_tbl,
        p_Line_Adj_Att_tbl      => l_line_adj_att_tbl,
        p_old_Line_Adj_Att_tbl => l_old_line_adj_att_tbl,
        p_Line_Adj_Assoc_tbl  => l_line_adj_assoc_tbl,
        p_old_Line_Adj_Assoc_tbl => l_old_line_adj_assoc_tbl,
        p_Line_Scredit_tbl      => l_line_scredit_tbl,
        p_old_Line_Scredit_tbl => l_old_line_scredit_tbl,
        p_Line_Scredit_val_tbl => l_line_scredit_val_tbl,
        p_old_Line_Scredit_val_tbl => l_old_line_scredit_val_tbl,
        p_Lot_Serial_tbl        => l_lot_serial_tbl,
        p_old_Lot_Serial_tbl    => l_old_lot_serial_tbl,
        p_Lot_Serial_val_tbl    => l_lot_serial_val_tbl,
        p_old_Lot_Serial_val_tbl => l_old_lot_serial_val_tbl,
        x_header_rec                => l_header_rec,
        x_header_val_rec            => l_header_val_rec,
        x_Header_Adj_tbl           => l_header_adj_tbl,
        x_Header_Adj_val_tbl       => l_header_adj_val_tbl,
        x_Header_price_Att_tbl => l_header_price_att_tbl,
        x_Header_Adj_Att_tbl  => l_header_adj_att_tbl,
        x_Header_Adj_Assoc_tbl => l_header_adj_assoc_tbl,
        x_Header_Scredit_tbl  => l_header_scredit_tbl,
        x_Header_Scredit_val_tbl => l_header_scredit_val_tbl,
        x_line_tbl              => l_line_tbl,
        x_line_val_tbl          => l_line_val_tbl,
        x_Line_Adj_tbl          => l_line_adj_tbl,
        x_Line_Adj_val_tbl => l_line_adj_val_tbl,
        x_Line_price_Att_tbl => l_line_price_att_tbl,
        x_Line_Adj_Att_tbl    => l_line_adj_att_tbl ,
        x_Line_Adj_Assoc_tbl  => l_line_adj_assoc_tbl,
```

```
                                    x_Line_Scredit_tbl    => l_line_scredit_tbl,
                                    x_Line_Scredit_val_tbl => l_line_scredit_val_tbl,
                                    x_Lot_Serial_tbl          => l_lot_serial_tbl,
                                    x_Lot_Serial_val_tbl     => l_lot_serial_val_tbl,
                                    x_action_request_tbl     => l_action_request_tbl);

                  if l_msg_count > 0 then
                  for l_index in 1..l_msg_count loop
                  l_msg_data
                  := oe_msg_pub.get(p_msg_index => l_index, p_encoded => 'F');
                          insert into CW_Oe_Api_Errors values
                      ('Order Number - ' ||
                  Cw_Oe_Order_Headers_All_Rec.Order_Number
                      || ' - ' || l_msg_data);
                  end loop;
                  end if;
                      DBMS_OUTPUT.PUT_LINE(l_msg_data);
                      DBMS_OUTPUT.PUT_LINE(x_msg_data);
                      DBMS_OUTPUT.PUT_LINE(x_return_status);
                  If l_return_status = 'S' Then
                  delete from CW_Oe_Api_Errors ;
                  Commit;
                  DBMS_OUTPUT.PUT_LINE('Delete Processed Record');
                  Delete_Processed_Record(pOrder_Number);
                  End If;

                  If l_return_status = 'E' Then
                      insert into CW_Oe_Api_Errors  values (l_msg_data);
                      DBMS_OUTPUT.PUT_LINE('Error');
                  End If;

                  If l_return_status = 'U' Then
                      DBMS_OUTPUT.PUT_LINE('UnExpected Error');
                  End If;

--      END Loop;
--      CLOSE w_Oe_Order_Headers_All;
END;
/
Show errors;
```

CW_DEL_PROCESSED_ORDER

```
Create Or Replace Procedure Delete_Processed_Record (POrder_Number Number)
IS
BEGIN

      Delete
      From Oe_Headers_Iface_All
      Where        Orig_Sys_Document_Ref=pOrder_Number;

      Delete
      From        Oe_Price_Adjs_Iface_all
      Where        Orig_Sys_Document_Ref=pOrder_Number;

      Delete
      From        Oe_Price_Atts_Iface_All
      Where        Orig_Sys_Document_Ref=pOrder_Number;

      Delete
      From        Oe_Lines_Iface_All
      Where        Orig_Sys_Document_Ref=pOrder_Number;

      Delete
      From        Oe_LotSerials_Iface_All
      Where        Orig_Sys_Document_Ref=pOrder_Number;

      Delete
      From        Oe_Credits_Iface_All
      Where        Orig_Sys_Document_Ref=pOrder_Number;
```

```
            Commit;
END;
/
show errors;
```

Appendix E. Support for null and blank values

This appendix details different pass and fail scenarios where the key value in a business object is blank or null. This appendix also contains the functional changes required for blank or null business object values.

Pass and fail scenarios

If a key value in a business object is blank or has a null value in the database, then build the where clause with the ″ is null″ type instead of the ″=″ operator type.

IBM recommends that business objects have at least one key attribute that does not have a blank value.

The following scenario is a parent object with one key that has a null value. This scenario fails under these conditions.

Table 20. Customer

Attribute	Type
cid	Integer (Key)
name	String
comments	String

The following scenario is a parent object with two keys and one key has a null value. This scenario passes under these conditions.

Table 21. Customer

Attribute	Type
cid	Integer (Key)
name	String
comments	String

In scenario two, build the retrieve query by selecting cid, name, and comments from customer, where cid=1000 and name is set to null.

The following scenario is a parent object with one child object in a container object with a foreign key reference. This scenario fails under these conditions.

Table 22. Customer

Attribute	Type
cid	Integer (Key)
name	String (Key)
comments	String
Address	Address
Aid	Integer (Key) ASI:FK=cid
Acity	String

Table 22. Customer (continued)

Attribute	Type
Azip	String

If cid contains a null value, then build the retrieve query by selecting Aid, Acity, and Azip from address. Set the value of Aid to null.

The following scenario is a parent object with one child object in a container object with two key references. This scenario passes under these conditions.

Table 23. Customer

Attribute	Type
cid	Integer (Key)
name	String
comments	String
Address	Address
Aid	Integer (Key) ASI:FK=cid
Acity	String (Key) ASI:FK=name
Azip	String

If name has a null value, then build the Retrieve query by selecting Aid, Acity, and Azip from address, where Aid=Cid and Acity has a null value.

Functionality

If the connector encounters a blank value on a key, it then compares that value with the UseNull value in the attribute. If the value is true, then the connector adds null value to the query. This affects the following verb operations:

- Retrieve
- RetrieveBy Content
- Update
- Delete

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