Oracle® Identity Manager

Connector Guide for Oracle E-Business Employee Reconciliation

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Oracle Identity Manager Connector Guide for Oracle E-Business Employee Reconciliation, Release 9.0.4

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Preface

This guide describes the connector that is used to integrate Oracle Identity Manager with Oracle E-Business Employee Reconciliation.

Audience

This guide is intended for resource administrators and target system integration teams.

Documentation Accessibility

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Related Documents

For information about installing and using Oracle Identity Manager, see the Oracle Identity Manager documentation library.

For generic information about connectors, see *Oracle Identity Manager Connector Concepts*.

The following Oracle Technology Network page provides links to Oracle Identity Manager documentation:

http://www.oracle.com/technology/documentation/oim.html

Documentation Updates

Oracle is committed to delivering the best and most recent information available. For information about updates to the Oracle Identity Manager Connectors documentation, visit Oracle Technology Network at

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Conventions

The following text conventions are used in this document:

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

What's New in Oracle Identity Manager Connector for Oracle E-Business Employee Reconciliation?

This chapter provides an overview of the updates made to the software and documentation for the Oracle E-Business Employee Reconciliation connector in release 9.0.4.3.

> **See Also:** The earlier release of this guide for information about updates that were new for that release

The updates discussed in this chapter are divided into the following categories:

- Software Updates

  This section describes updates made to the connector software.

- Documentation-Specific Updates

  This section describes major changes made to this guide. These changes are not related to software updates.

Software Updates

The following sections discuss software updates:

- Software Updates in Release 9.0.4.1_6728655
- Software Updates in Release 9.0.4.2
- Software Updates in Release 9.0.4.3

Software Updates in Release 9.0.4.1_6728655

The following are software updates in release 9.0.4.1_6728655:

- Script to Create the Target System Account for Connector Operations
- Resolved Issues in Release 9.0.4.1_6728655

Script to Create the Target System Account for Connector Operations

Instead of using the `apps` target system account for connector operations, you can now use scripts provided in the connector installation package to create an account and assign the minimum required privileges to the account.

See "Configuring the Target System" on page 2-2 for more information.

Resolved Issues in Release 9.0.4.1_6728655

The following are issues resolved in release 9.0.4.1_6728655:

Bug Number	Issue	Resolution
6006892 and 6656960	You had to use the APPS User with full privileges for connector operations.	You can now create a target system account for connector operations with the required privileges. Scripts have been provided in the connector installation package for creating this target system account. See "Configuring the Target System" on page 2-2 for more information.

Software Updates in Release 9.0.4.2

The following are software updates in release 9.0.4.2:

- Using the Connector Installer
- Support for New Languages
- Software Updates in Release 9.0.4.1_6728655

Using the Connector Installer

From Oracle Identity Manager release 9.1.0 onward, the Administrative and User Console provides the Connector Installer feature. This feature can be used to automate the connector installation procedure.

See "Installing the Connector on Oracle Identity Manager Release 9.1.0 or Later" on page 2-3 for details.

Support for New Languages

The following languages have been added to the list of supported languages:

- Arabic
- Japanese

See "Multilanguage Support" on page 1-3 for more information.

Resolved Issues in Release 9.0.4.2

The following are issues resolved in release 9.0.4.2:

Bug Number	Issue	Resolution
6924495	If a new attribute added for reconciliation had the same column name as an existing attribute, then the values of the attribute were not reconciled correctly. This occurred even if both columns were in different tables in the target system database.	This issue has been resolved. An attribute that you add for reconciliation can have the same column name as that of an existing mapped attribute.

Software Updates in Release 9.0.4.3

The following are software updates in release 9.0.4.3:

- The OracleHREmp.Organization Name parameter has been removed from the following sections:
  - "Configuring the IT Resource" on page 2-5

- "Importing the Connector XML File" on page 2-7

- In "Employee Reconciliation Scheduled Tasks" on page 3-5, the name of the scheduled task has been changed from `Reconcile Ora HR Emp Non Trusted` to `Reconcile Ora HR Emp Target Resource`.

- The following are issues resolved in release 9.0.4.3:

Bug Number	Issue	Resolution
7420297	You use the `XellerateOrganization` scheduled task attribute to specify the Oracle Identity Manager organization into which users must be reconciled. However, this attribute was ignored and users were always reconciled into the `Xellerate Users` organization during reconciliation.	This issue has been resolved. Users are reconciled into the organization whose name you specify as the value of the `XellerateOrganization` attribute. See "Employee Reconciliation Scheduled Tasks" on page 3-5 for more information. **Note:** The organization you specify must exist in Oracle Identity Manager.

Documentation-Specific Updates

The following sections discuss documentation-specific updates:

- The "Tables Used During Reconciliation" section has been added.

- The procedure described in "Adding Custom Attributes for Reconciliation" on page 3-6 has been modified.

- Appendix B, "query.properties File" has been added. This appendix describes the variables in the `query.properties` file.

- In the "Verifying Deployment Requirements" section, changes have been made in the "Target system" row.

- From this release onward:

  The minimum certified release of Oracle Identity Manager is release 9.1.0.1.

  The minimum certified release of JDK is release 1.4.2.

  See "Verifying Deployment Requirements" section for the complete listing of certified components.

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About the Connector

Oracle Identity Manager automates access rights management, security, and provisioning of IT resources. Oracle Identity Manager connectors are used to integrate Oracle Identity Manager with third-party applications. This guide discusses the procedure to deploy the connector that is used to integrate Oracle Identity Manager with Oracle E-Business Employee Reconciliation.

This chapter contains the following sections:

- Reconciliation Module
- Supported Functionality
- Multilanguage Support
- Files and Directories on the Installation Media
- Determining the Release Number of the Connector

> **Note:** In this guide, the term *Oracle Identity Manager server* refers to the computer on which Oracle Identity Manager is installed.
>
> At some places in this guide, Oracle E-Business Employee Reconciliation has been referred to as the *target system.*

1.1 Reconciliation Module

Reconciliation involves duplicating in Oracle Identity Manager the creation of and modifications to user accounts on the target system. It is an automated process initiated by a scheduled task that you configure.

> **See Also:** The "Deployment Configurations of Oracle Identity Manager" section in *Oracle Identity Manager Connector Concepts Guide* for conceptual information about reconciliation configurations

Based on the type of data reconciled from the target system, reconciliation can be divided into the following types:

- Lookup Fields Reconciliation
- Employee Reconciliation

The following section discusses the tables created by the connector in the APPS schema during the reconciliation process:

- Tables Used During Reconciliation

1.1.1 Lookup Fields Reconciliation

Lookup fields reconciliation involves reconciling the Person ID lookup field.

1.1.2 Employee Reconciliation

Employee reconciliation involves reconciling the following fields:

1.1.2.1 Reconciled Resource Object Fields

The following target system fields are reconciled:

- First Name
- email
- PersonId
- Middle Name
- Last Name
- Dept
- SSN
- Title
- Location
- Manager
- City
- PostalCode
- Country
- Telno
- EmployeeNumber
- ManagerId
- Nationality

1.1.2.2 Reconciled Xellerate User (OIM User) Fields

The following target system fields are reconciled only if trusted source reconciliation is implemented:

- User ID
- First Name
- Last Name
- Organization
- User Type
- Employee Type

1.1.3 Tables Used During Reconciliation

The following table are created by the connector and used during reconciliation:

- gl_temp_tab Table

■ XELLERATE_TEMP_EMP Table

1.1.3.1 gl_temp_tab Table

The `gl_temp_tab` table is a temporary table created in the APPS schema during reconciliation. This table is populated by the SQL query that is stored in the `getNewEmps` variable of the `query.properties` file. This table contains the following columns:

■ RECNUM (NUMBER data type)

■ person_id (NUMBER data type)

■ LAST_UPDATE_DATE (DATE data type)

The `gl_temp_tab` table is dropped at the end of each reconciliation run.

1.1.3.2 XELLERATE_TEMP_EMP Table

The `XELLERATE_TEMP_EMP` table is created in the APPS schema at the start of the first reconciliation run. It contains the `person_id` column. This table is populated by the SQL query that is stored in the `getNewEmps` variable of the `query.properties` file. The person ID values stored in this table are copied from the `per_all_people_f` table of the APPS schema. From the second reconciliation run onward, the following steps are automatically performed:

1. Person ID values in the `per_all_people_f` table are compared with the ones in the `XELLERATE_TEMP_EMP` table. The person IDs that exist in `XELLERATE_TEMP_EMP` table and do not exist in the `per_all_people_f` table represent the accounts that have been deleted after the last reconciliation run.

2. Person IDs of the deleted accounts are sent to Oracle Identity Manager for deletion.

3. The rows of the `XELLERATE_TEMP_EMP` table are deleted and the existing rows of the `per_all_people_f` table are copied into the `XELLERATE_TEMP_EMP` table.

1.2 Supported Functionality

The following table lists the functions that are available with this connector.

Function	Type	Description
Reconcile New User	Reconciliation	Creates an Oracle Identity Manager user in trusted mode
Reconcile Delete User	Reconciliation	Deletes an Oracle Identity Manager user account, in both trusted source and target resource mode
Reconcile Updated User	Reconciliation	Updates an Oracle Identity Manager user record during reconciliation, in both trusted source and target resource mode

See Also: Appendix A for information about attribute mappings between Oracle Identity Manager and Oracle E-Business Employee Reconciliation.

1.3 Multilanguage Support

The connector supports the following languages:

■ Arabic

- Chinese Simplified

- Chinese Traditional

- Danish

- English

- French

- German

- Italian

- Japanese

- Korean

- Portuguese (Brazilian)

- Spanish

> **See Also:** *Oracle Identity Manager Globalization Guide* for information about supported special characters

1.4 Files and Directories on the Installation Media

The files and directories on the installation media are listed and described in Table 1–1.

Table 1–1   Files and Directories on the Installation Media

File in the Installation Media Directory	Description
`configuration/Oracle EBS Employee Reconciliation-CI.xml`	This XML file contains configuration information that is used during connector installation.
`config/attributemapping_recon.properties`	This file contains values for the attributes required for reconciliation.
`config/query.properties`	This file contains the queries used for reconciliation.
`lib/xlReconOraHREmp.jar`	This JAR file contains the class files that are required for reconciliation. During connector deployment, this file is copied into the following directories: *OIM_HOME*`/xellerate/ScheduleTask`
Files in the `resources` directory	Each of these resource bundles contains language-specific information that is used by the connector. During connector deployment, this file is copied into the following directories: *OIM_HOME*`/xellerate/connectorResources` **Note:** A **resource bundle** is a file containing localized versions of the text strings that are displayed on the Administrative and User Console. These text strings include GUI element labels and messages.
`scripts/OimUserSynonyms.sql`	This file contains commands to create synonyms for the OIM wrapper and various tables used in the target system schema for reconciliation.
`scripts/OimUserGrants.sql`	This file contains commands to provide the required grants to the target system account that is used for connector operations.
`scripts/OimUser.sql`	This file contains commands to create and configure the target system account that is used for connector operations.

Table 1–1   (Cont.) Files and Directories on the Installation Media

File in the Installation Media Directory	Description
scripts/OIM.sh scripts/OIM.bat	This script contains commands to call the SQL files in the scripts directory.
xml/oracleHRResAdp.xml	This XML file contains definitions for the following components of the connector: ■ IT resource type ■ IT resource ■ Provisioning process ■ Resource object ■ Scheduled tasks for user and lookup fields reconciliation
xml/XellOraEmp.xml	This XML file contains definitions of the resource object and scheduled task for trusted source reconciliation.

1.5 Determining the Release Number of the Connector

You might have a deployment of an earlier release of the connector. While deploying the latest release, you might want to know the release number of the earlier release. To determine the release number of the connector that has already been deployed:

1. In a temporary directory, extract the contents of the following JAR file:

    OIM_HOME/xellerate/ScheduleTask/xlReconOralHREmp.jar

2. Open the manifest.mf file in a text editor. The manifest.mf file is one of the files bundled inside the xlReconOralHREmp.jar file.

    In the manifest.mf file, the release number of the connector is displayed as the value of the Version property.

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Deploying the Connector

Deploying the connector involves the following steps:

- Verifying Deployment Requirements

- Using External Code Files

- Configuring the Target System

- Depending on the release of Oracle Identity Manager that you use, perform the procedures described in one of the following sections:

    - Installing the Connector on Oracle Identity Manager Release 9.1.0 or Later

    - Installing the Connector on Oracle Identity Manager Release 8.5.3.1 Through 9.0.3.x

- Configuring the Oracle Identity Manager Server

2.1 Verifying Deployment Requirements

The following table lists the deployment requirements for the connector:

Item	Requirement
Oracle Identity Manager	Oracle Identity Manager release 9.1.0.1 or later
Target system	Oracle E-Business Suite 11.5.10, 12.0.*x*
External code	JDBC class library (`classes12.jar/ojdbc14.jar`)
Target system user account	APPS system user with the required privileges
	You provide the credentials of this user account while configuring the IT resource. The procedure to configure the IT resource is described later in this guide.
	See "Configuring the Target System" on page 2-2 for information about the procedure to create the APPS system user account. In this guide, this user account is also referred to as the target system account for connector operations.
JDK	JDK 1.4.2

2.2 Using External Code Files

If the connector is used with Oracle8*i* Database, then the required external code file is `classes12.jar`.

If the connector is used with Oracle9*i* Database or Oracle Database 10*g*, then you can use either `ojdbc14.jar` or `classes12.jar`.

These JAR files are available in the Oracle Database installation at, for example, the following path:

`ORACLE_HOME`/jdbc/lib

In this directory path, `ORACLE_HOME` is the location where Oracle Database is installed. For example, `C:\Oracle\ora92`.

You must copy the required JAR file (`classes12.jar` or `ojdbc14.jar`) into the `ORACLE_HOME`/xellerate/ThirdParty directory.

2.3 Configuring the Target System

The connector uses a target system account to connect to the target system during reconciliation. You can use the script provided in the scripts directory on the installation media to create this account.

To create the target system user account for connector operations:

1. Copy the `scripts` directory from the installation media to a temporary directory on either the target system server or to a computer on which the Oracle Database client has been installed.

2. On the computer where you copy the scripts directory, verify that there is a TNS Entry in the `tnsnames.ora` file for the target system database.

3. Depending on the host platform, run either the `OIM.sh` or `OIM.bat` file.

4. When you run the script, you are prompted for the following information:

   - ORACLE_HOME path

     This prompt is displayed only if the `ORACLE_HOME` environment variable has not been set on the computer on which you are running the script.

   - Enter the system user name

     Enter the login (user name) of a DBA account with the privileges to create and configure a new target system user.

   - Enter the name of the database

     Enter the connection string or service name given in the tnsnames.ora file to connect to the target system database.

   - Enter password

     Enter the password of the DBA account whose login you enter earlier.

   - Details of the target system account that you want to create

     Enter a user name and password for the target system account that you want to create.

   - Connecting with APPS User

     Enter the password of the APPS User that can grant the required privileges to the target system account that you want to create.

   - Connecting with newly created database user

     Enter the connection string or service name that you provided earlier.

During the account creation process, the following privileges are granted to the account:

> **Note:** The `OimUserGrants.sql` file contains commands to grant these permissions.

- select on apps.per_all_people_f
- select on apps.per_addresses
- select on apps.per_all_assignments_f
- select on apps.hr_locations_all
- select on apps.hr_all_organization_units
- create session
- create synonym
- create table
- drop any table

At the end of the operation, a log file (`OIM_APPS_USER.log`) is created in the `scripts` directory. If no error messages are recorded in the log file, then the account has been created successfully.

2.4 Installing the Connector on Oracle Identity Manager Release 9.1.0 or Later

> **Note:** In this guide, the term **Connector Installer** has been used to refer to the Connector Installer feature of the Oracle Identity Manager Administrative and User Console.

Installing the connector on Oracle Identity Manager release 9.1.0 or later involves the following procedures:

- Running the Connector Installer
- Configuring the IT Resource

2.4.1 Running the Connector Installer

To run the Connector Installer:

1. Copy the contents of the connector installation media into the following directory:

   OIM_HOME/xellerate/ConnectorDefaultDirectory

2. Log in to the Administrative and User Console by using the user account described in the "Creating the User Account for Installing Connectors" section of *Oracle Identity Manager Administrative and User Console*.

3. Click **Deployment Management**, and then click **Install Connector**.

4. From the Connector List list, select **Oracle EBS Employee Reconciliation 9.0.4.3**. This list displays the names and release numbers of connectors whose installation files you copy into the default connector installation directory:

   OIM_HOME/xellerate/ConnectorDefaultDirectory

If you have copied the installation files into a different directory, then:

a. In the **Alternative Directory** field, enter the full path and name of that directory.

b. To repopulate the list of connectors in the Connector List list, click **Refresh**.

c. From the Connector List list, select **Oracle EBS Employee Reconciliation 9.0.4.3**.

5. Click **Load**.

6. To start the installation process, click **Continue**.

The following tasks are performed in sequence:

a. Configuration of connector libraries

b. Import of the connector Target Resource user configuration XML file (by using the Deployment Manager). If you want to import the target system as a trusted source for reconciliation, then see "Configuring the Target System As a Trusted Source" on page 3-2.

c. Compilation of adapters

On successful completion of a task, a check mark is displayed for the task. If a task fails, then an X mark and a message stating the reason for failure are displayed. Depending on the reason for the failure, make the required correction and then perform one of the following steps:

■ Retry the installation by clicking **Retry.**

■ Cancel the installation and begin again from Step 1.

7. If all three tasks of the connector installation process are successful, then a message indicating successful installation is displayed. In addition, a list of the steps that you must perform after the installation is displayed. These steps are as follows:

a. Ensuring that the prerequisites for using the connector are addressed

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Note: At this stage, run the `PurgeCache` utility to load the server cache with content from the connector resource bundle in order to view the list of prerequisites. Refer to "Clearing Content Related to Connector Resource Bundles from the Server Cache" on page 2-9 for information about running the `PurgeCache` utility.

There are no prerequisites for some predefined connectors.

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b. Configuring the IT resource for the connector

Record the name of the IT resource displayed on this page. The procedure to configure the IT resource is described later in this guide.

c. Configuring the scheduled tasks that are created when you installed the connector

Record the names of the scheduled tasks displayed on this page. The procedure to configure these scheduled tasks is described later in this guide.

8. Copy the files in the `config` directory on the installation media to the `OIM_HOME/xellerate/XLIntegrations/OracleEmpRecon/config` directory.

> **Note:** When you run the Connector Installer, it copies the connector files and external code files to destination directories on the Oracle Identity Manager host computer. These files are listed in Table 1–1.

Installing the Connector in an Oracle Identity Manager Cluster

While installing Oracle Identity Manager in a clustered environment, you must copy all the JAR files and the contents of the connectorResources directory into the corresponding directories on each node of the cluster. See "Files and Directories on the Installation Media" on page 1-4 for information about the files that you must copy and their destination locations on the Oracle Identity Manager server.

2.4.2 Configuring the IT Resource

> **Note:** Perform this procedure if you are installing the connector on Oracle Identity Manager release 9.1.0 or later.

You must specify values for the parameters of the Oracle HR IT resource as follows:

1. Log in to the Administrative and User Console.

2. Expand **Resource Management.**

3. Click **Manage IT Resource**.

4. In the IT Resource Name field on the Manage IT Resource page, enter Oracle HR and then click **Search**.

5. Click the edit icon for the IT resource.

6. From the list at the top of the page, select **Parameters**.

7. Specify values for the parameters of the IT resource. The following table describes each parameter:

Parameter	Description
Admin	User ID to connect to the target system database
	See "Configuring the Target System" for information about creating this user account.
	The default value is apps.
	See Also: "Configuring the Target System" on page 2-2 for information about creating this account and assigning the required privileges to it
AdminCredentials	Password of the administrator
Host	Host name or IP address of the target system database
Port	TCP/IP port at which the Oracle E-Business Employee Reconciliation server is listening
	The default value is 1521.
isSecure	This parameter is meant for use in a future release of the connector. The default value is no. Do not change the default value.
SID	SID for the target system database

Parameter	Description
TrustedTimeStamp	This parameter is used for trusted source reconciliation.
	Starting with the first reconciliation run, this parameter stores the time-stamp value at which the reconciliation run ends.
	The default value is 0.
	The time-stamp value that this parameter accepts is of the LONG data type, which stores the date and time value in milliseconds. You can determine the LONG data type equivalent of the required time-stamp value by using a SQL query. For example, to determine the TimeStamp parameter value for the date 31-Jan-2006, run the following SQL query:
	`SELECT ROUND((TO_DATE('31012006','ddmmyyyy') - TO_DATE('01011970', 'ddmmyyyy')) * 1440 * 60 * 1000) FROM dual;`
	When you specify the output of this query as the value of the TimeStamp parameter, all records that are created or updated after 31-Jan-2006 are reconciled during the next reconciliation run.
NonTrustedTimeStamp	This parameter is used for target resource reconciliation.
	Starting with the first reconciliation run, this parameter stores the time-stamp value at which the reconciliation run ends.
	The default value is 0.
	The time-stamp value that this parameter accepts is of the LONG data type, which stores the date and time value in milliseconds. You can determine the LONG data type equivalent of the required time-stamp value by using a SQL query. For example, to determine the TimeStamp parameter value for the date 31-Jan-2006, run the following SQL query:
	`SELECT ROUND((TO_DATE('31012006','ddmmyyyy') - TO_DATE('01011970', 'ddmmyyyy')) * 1440 * 60 * 1000) FROM dual;`
	When you specify the output of this query as the value of the TimeStamp parameter, all records that are created or updated after 31-Jan-2006 are reconciled during the next reconciliation run.

8. To save the values, click **Save**.

2.5 Installing the Connector on Oracle Identity Manager Release 8.5.3.1 Through 9.0.3.x

Installing the connector on any Oracle Identity Manager release between releases 8.5.3.1 and 9.0.3.x involves the following procedures:

- Copying the Connector Files
- Importing the Connector XML File

2.5.1 Copying the Connector Files

The connector files to be copied and the directories to which you must copy them are given in the following table.

> **See Also:** "Files and Directories on the Installation Media" section on page 1-4 for more information about these files

File in the Installation Media Directory	Destination Directory
Files in the config directory	OIM_HOME/xellerate/XLIntegrations/OracleEmpRecon/config

File in the Installation Media Directory	Destination Directory
`lib/xlReconOraHREmp.jar`	*OIM_HOME*`/xellerate/ScheduleTask`
Files in the `resources` directory	*OIM_HOME*`/xellerate/connectorResources`
Files in the `xml` directory	*OIM_HOME*`/xellerate/XLIntegrations/OracleEmpRecon/xml`

> **Note:** In a clustered environment, copy the JAR files and the contents of the `connectorResources` directory to the corresponding directories on each node of the cluster.

2.5.2 Importing the Connector XML File

To import the connector XML file:

1. Open the Oracle Identity Manager Administrative and User Console.

2. Click the **Deployment Management** link on the left navigation bar.

3. Click the **Import** link under Deployment Management. A dialog box for opening files is displayed.

4. Locate and open the `oracleHRResAdp.xml` file, which is in the *OIM_HOME*`/xellerate/XLIntegrations/OracleEmpRecon/xml` directory. Details of this XML file are shown on the File Preview page.

5. Click **Add File.** The Substitution page is displayed.

6. Click **Next.** The Confirmation page is displayed.

7. Click **Next.** The Provide IT Resource Instance Data page for the `Oracle HR` IT resource is displayed.

8. Specify values for the parameters of the `Oracle HR` IT resource. Refer to the following table for information about the values to be specified:

Parameter	Description
`Admin`	User ID to connect to the target system database
	The default value is `apps`.
	See Also: "Configuring the Target System" on page 2-2 for information about creating this account and assigning the required privileges to it
`AdminCredentials`	Password of the administrator
`Host`	Host name or IP address of the target system database
`Port`	TCP/IP port at which the Oracle E-Business Employee Reconciliation server is listening
	The default value is `1521`.
`isSecure`	This parameter is meant for use in a future release of the connector. The default value is `no`. Do not change the default value.
`SID`	SID for the target system database

Parameter	Description
TrustedTimeStamp	This parameter is used for trusted source reconciliation.
	Starting with the first reconciliation run, this parameter stores the time-stamp value at which the reconciliation run ends.
	The default value is 0.
	The time-stamp value that this parameter accepts is of the LONG data type, which stores the date and time value in milliseconds. You can determine the LONG data type equivalent of the required time-stamp value by using a SQL query. For example, to determine the TimeStamp parameter value for the date 31-Jan-2006, run the following SQL query:
	SELECT ROUND((TO_DATE('31012006','ddmmyyyy') - TO_DATE('01011970', 'ddmmyyyy')) * 1440 * 60 * 1000) FROM dual;
	When you specify the output of this query as the value of the TimeStamp parameter, all records that are created or updated after 31-Jan-2006 are reconciled during the next reconciliation run.
NonTrustedTimeStamp	This parameter is used for target resource reconciliation.
	Starting with the first reconciliation run, this parameter stores the time-stamp value at which the reconciliation run ends.
	The default value is 0.
	The time-stamp value that this parameter accepts is of the LONG data type, which stores the date and time value in milliseconds. You can determine the LONG data type equivalent of the required time-stamp value by using a SQL query. For example, to determine the TimeStamp parameter value for the date 31-Jan-2006, run the following SQL query:
	SELECT ROUND((TO_DATE('31012006','ddmmyyyy') - TO_DATE('01011970', 'ddmmyyyy')) * 1440 * 60 * 1000) FROM dual;
	When you specify the output of this query as the value of the TimeStamp parameter, all records that are created or updated after 31-Jan-2006 are reconciled during the next reconciliation run.

9. Click **Next**. The Provide IT Resource Instance Data page for a new instance of the Oracle HR IT resource type is displayed.

10. Click **Skip** to specify that you do not want to define another IT resource. The Confirmation page is displayed.

> **See Also:** If you want to define another IT resource, then refer to *Oracle Identity Manager Administrative and User Console Guide* for instructions.

11. Click **View Selections.**

The contents of the XML file are displayed on the Import page. You *may* see a cross-shaped icon along with some nodes. These nodes represent Oracle Identity Manager entities that are redundant. Before you import the connector XML file, you must remove these entities by right-clicking each node and then selecting **Remove**.

12. Click **Import.** The connector file is imported into Oracle Identity Manager.

2.6 Configuring the Oracle Identity Manager Server

Configuring the Oracle Identity Manager server involves the following procedures:

> **Note:** In a clustered environment, you must perform this step on each node of the cluster. Then, restart each node.

- Changing to the Required Input Locale
- Clearing Content Related to Connector Resource Bundles from the Server Cache
- Enabling Logging

2.6.1 Changing to the Required Input Locale

Changing to the required input locale (language and country setting) involves installing the required fonts and setting the required input locale.

You may require the assistance of the system administrator to change to the required input locale.

2.6.2 Clearing Content Related to Connector Resource Bundles from the Server Cache

While performing the instructions described in the "Copying the Connector Files" section on page 2-6, you copy files from the `resources` directory on the installation media into the *OIM_HOME*/xellerate/connectorResources directory. Whenever you add a new resource bundle in the `connectorResources` directory or make a change in an existing resource bundle, you must clear content related to connector resource bundles from the server cache.

To clear content related to connector resource bundles from the server cache:

1. In a command window, change to the *OIM_HOME*/xellerate/bin directory.

> **Note:** You must perform Step 1 before you perform Step 2. An exception is thrown if you run the command described in Step 2 as follows:
>
> *OIM_HOME*\xellerate\bin*batch_file_name*

2. Enter one of the following commands:

   - On Microsoft Windows:

     ```
     PurgeCache.bat ConnectorResourceBundle
     ```

   - On UNIX:

     ```
     PurgeCache.sh ConnectorResourceBundle
     ```

   > **Note:** You can ignore the exception that is thrown when you perform Step 2.

   In this command, `ConnectorResourceBundle` is one of the content categories that you can remove from the server cache. Refer to the following file for information about the other content categories:

   OIM_HOME/xellerate/config/xlConfig.xml

2.6.3 Enabling Logging

When you enable logging, Oracle Identity Manager automatically stores in a log file information about events that occur during the course of reconciliation operations. To specify the type of event for which you want logging to take place, you can set the log level to one of the following:

- `ALL`

  This level enables logging for all events.

- `DEBUG`

  This level enables logging of information about fine-grained events that are useful for debugging.

- `INFO`

  This level enables logging of messages that highlight the progress of the application at a coarse-grained level.

- `WARN`

  This level enables logging of information about potentially harmful situations.

- `ERROR`

  This level enables logging of information about error events that may allow the application to continue running.

- `FATAL`

  This level enables logging of information about very severe error events that could cause the application to stop functioning.

- `OFF`

  This level disables logging for all events.

The file in which you set the log level depends on the application server that you use:

- **Oracle WebLogic Server**

  To enable logging:

  1. Add the following line in the
     OIM_HOME/xellerate/config/log.properties file:

     `log4j.logger.ADAPTER.ORACLEEMPRECON=log_level`

  2. In this line, replace `log_level` with the log level that you want to set.

     For example:

     `log4j.logger.ADAPTER.ORACLEEMPRECON=INFO`

  After you enable logging, log information is displayed on the server console.

- **IBM WebSphere Application Server**

  To enable logging:

  1. Add the following line in the
     OIM_HOME/xellerate/config/log.properties file:

     `log4j.logger.ADAPTER.ORACLEEMPRECON=log_level`

  2. In this line, replace `log_level` with the log level that you want to set.

For example:

```
log4j.logger.ADAPTER.ORACLEEMPRECON=INFO
```

After you enable logging, log information is written to the following file:

WEBSPHERE_HOME/AppServer/logs/*SERVER_NAME*/SystemOut.log

- **JBoss Application Server**

    To enable logging:

    1. In the *JBoss_home*/server/default/conf/log4j.xml file, add the following lines if they are not already present in the file:

    ```
    <category name="ADAPTER.ORACLEEMPRECON">
       <priority value="log_level"/>
    </category>
    ```

    2. In the second XML code line, replace *log_level* with the log level that you want to set. For example:

    ```
    <category name="ADAPTER.ORACLEEMPRECON">
       <priority value="INFO"/>
    </category>
    ```

    After you enable logging, log information is written to the following file:

    JBoss_home/server/default/log/server.log

- **Oracle Application Server**

    To enable logging:

    1. Add the following line in the *OIM_HOME*/xellerate/config/log.properties file:

    ```
    log4j.logger.ADAPTER.ORACLEEMPRECON=log_level
    ```

    2. In this line, replace *log_level* with the log level that you want to set.

    For example:

    ```
    log4j.logger.ADAPTER.ORACLEEMPRECON=INFO
    ```

    After you enable logging, log information is written to the following file:

    OC4J_home/opmn/logs/default_group~home~default_group~1.log

3

Configuring the Connector

After you deploy the connector, you must configure it to meet your requirements. This chapter discusses the following connector configuration procedure:

> **Note:** These sections provide both conceptual and procedural information about configuring the connector. It is recommended that you read the conceptual information before you perform the procedures.

3.1 Configuring Reconciliation

As mentioned earlier in this guide, reconciliation involves duplicating in Oracle Identity Manager the creation of and modifications to user accounts on the target system. This section discusses the following topics related to configuring reconciliation:

- Partial Reconciliation
- Batched Reconciliation
- Configuring the Target System As a Trusted Source
- Configuring the Reconciliation Scheduled Tasks
- Adding Custom Attributes for Reconciliation

3.1.1 Partial Reconciliation

By default, all target system records that are added or modified after the last reconciliation run are reconciled during the current reconciliation run. You can customize this process by specifying the subset of added or modified target system records that must be reconciled. You do this by creating filters for the reconciliation module.

Creating a filter involves specifying a value for a target system attribute, which will be used in the query SELECT criteria to retrieve the records to be reconciled. You can specify values for any one or a combination of the following target system attributes:

- Last Name
- Nationality

If you want to use multiple target system attributes to filter records, then you must also specify the logical operator (AND or OR) that you want to apply to the combination of target system attributes that you select.

For example, suppose you specify the following values for these attributes:

- Last Name: `Doe`

- Nationality: `US`

- Operator: `OR`

Because you are using the `OR` operator, during reconciliation, only user records for which *any one* of these criteria is met are reconciled. If you were to use the `AND` operator, then only user records for which *all* of these criteria are met are reconciled.

While deploying the connector, follow the instructions in the "Specifying Values for the Scheduled Task Attributes" section on page 3-4 to specify values for these attributes and the logical operator that you want to apply.

3.1.2 Batched Reconciliation

During a reconciliation run, all changes in the target system records are reconciled into Oracle Identity Manager. Depending on the number of records to be reconciled, this process may require a large amount of time. In addition, if the connection breaks during reconciliation, then the process would take longer to complete.

You can configure batched reconciliation to avoid these problems.

To configure batched reconciliation, you must specify values for the following user reconciliation scheduled task attributes:

- `BatchSize`: Use this attribute to specify the number of records that must be included in each batch. The default value is 1000.

- `NumOfBatches`: Use this attribute to specify the total number of batches that must be reconciled. The default value is `All`.

If you specify a value other than `All`, then some of the newly added or modified user records may not get reconciled during the current reconciliation run. The following example illustrates this:

Suppose you specify the following values while configuring the scheduled tasks:

- `BatchSize`: 20

- `NumOfBatches`: 10

Suppose that 314 user records were created or modified after the last reconciliation run. Of these 314 records, only 200 records would be reconciled during the current reconciliation run. The remaining 114 records would be reconciled during the next reconciliation run.

You specify values for the `BatchSize` and `NumOfBatches` attributes by following the instructions described in the "Specifying Values for the Scheduled Task Attributes" section on page 3-4.

3.1.3 Configuring the Target System As a Trusted Source

While configuring the connector, the target system can be designated as a trusted source or target resource. If you designate the target system as a **trusted source**, then during a reconciliation run:

- For each newly created user on the target system, an OIM User is created.

- Updates made to each user on the target system are propagated to the corresponding OIM User.

If you designate the target system as a **target resource**, then during a reconciliation run:

■ For each account created on the target system, a resource is assigned to the corresponding OIM User.

■ Updates made to each account on the target system are propagated to the corresponding resource.

> **Note:** Skip this section if you do not want to designate the target system as a trusted source for reconciliation.

1. Import the XML file for trusted source reconciliation, `XellOraEmp.xml`, by using the Deployment Manager. This section describes the procedure to import the XML file.

> **Note:** Only one target system can be designated as a trusted source. If you import the `XellOraEmp.xml` file while you have another trusted source configured, then both connector reconciliations would stop working.

2. Specify values for the attributes of the `Reconcile Ora HR EmpTrusted` scheduled task. This procedure is described later in this guide.

To import the XML file for trusted source reconciliation:

1. Open the Oracle Identity Manager Administrative and User Console.

2. Click the **Deployment Management** link on the left navigation bar.

3. Click the **Import** link under Deployment Management. A dialog box for opening files is displayed.

4. Locate and open the `XellOraEmp.xml` file, which is in the *OIM_HOME*/xellerate/XLIntegrations/OracleEmpRecon/xml directory. Details of this XML file are shown on the File Preview page.

5. Click **Add File**. The Substitutions page is displayed.

6. Click **Next**. The Confirmation page is displayed.

7. Click **Import**.

8. In the message that is displayed, click **Import** to confirm that you want to import the **XML** file and then click **OK**.

3.1.4 Configuring the Reconciliation Scheduled Tasks

When you perform the procedure described in the "Importing the Connector XML File" section on page 2-7, the scheduled tasks for lookup fields, trusted source user, and target resource user reconciliations are automatically created in Oracle Identity Manager. To configure these scheduled tasks:

1. Open the Oracle Identity Manager Design Console.

2. Expand the **Administration** folder.

3. Select **Task Scheduler.**

4. Click **Find**. The details of the predefined scheduled tasks are displayed on two different tabs.

5. For the first scheduled task, enter a number in the **Max Retries** field. This number represents the number of times Oracle Identity Manager must attempt to complete the task before assigning the FAILED status to the task.

6. Ensure that the **Disabled** and **Stop Execution** check boxes are not selected.

7. In the Start region, double-click the **Start Time** field. From the date-time editor that is displayed, select the date and time at which you want the task to run.

8. In the Interval region, set the following schedule parameters:

   - To set the task to run on a recurring basis, select the **Daily**, **Weekly**, **Recurring Intervals**, **Monthly**, or **Yearly** option.

     If you select the **Recurring Intervals** option, then you must also specify the time interval at which you want the task to run on a recurring basis.

   - To set the task to run only once, select the **Once** option.

9. Provide values for the attributes of the scheduled task. Refer to the "Specifying Values for the Scheduled Task Attributes" section on page 3-4 for information about the values to be specified.

   > **See Also:** *Oracle Identity Manager Design Console Guide* for information about adding and removing task attributes

10. Click **Save**. The scheduled task is created. The INACTIVE status is displayed in the **Status** field, because the task is not currently running. The task is run at the date and time that you set in Step 7.

11. Repeat Steps 5 through 10 to create the second scheduled task.

After you configure all three scheduled tasks, proceed to the "Adding Custom Attributes for Reconciliation" section on page 3-6.

3.1.4.1 Specifying Values for the Scheduled Task Attributes

This section provides information about the values to be specified for the following scheduled tasks:

- Lookup Fields Reconciliation Scheduled Task

- Employee Reconciliation Scheduled Tasks

3.1.4.1.1 Lookup Fields Reconciliation Scheduled Task You must specify values for the following attributes of the Reconcile Apps HR Emp Lookup lookup fields reconciliation scheduled task.

> **Note:**
> - Attribute values are predefined in the connector XML file that you import. Specify values only for those attributes that you want to change.
> - Values (either default or user-defined) must be assigned to all the attributes. If even a single attribute value were left empty, then reconciliation would not be performed.

Attribute	Description	Default/Sample Value
Server	Name of the IT resource instance that the connector uses to reconcile data	Oracle HR
LookupField Name	Name of the lookup field to be reconciled	OracleHR.Employees

After you specify values for these task attributes, proceed to Step 10 of the procedure to create scheduled tasks.

3.1.4.1.2 Employee Reconciliation Scheduled Tasks Depending on whether you want to implement trusted or target resource reconciliation, you must specify values for the attributes of one of the following employee reconciliation scheduled tasks:

- Reconcile Ora HR EmpTrusted (Scheduled task for trusted source reconciliation)
- Reconcile Ora HR Emp Target Resource (Scheduled task for target resource reconciliation)

The following table describes the attributes of both scheduled tasks.

Note:

- Attribute values are predefined in the connector XML file that you import. Specify values only for those attributes that you want to change.

- Values (either default or user-defined) must be assigned to all the attributes. If even a single attribute value were left empty, then reconciliation would not be performed.

Attribute	Description	Default/Sample Value
Target System Recon – Resource Object name	Name of the resource object	Oracle HR Employee
Server	IT resource instance that the connector uses to reconcile data	Oracle HR
IsTrusted	Specifies whether or not reconciliation must be performed in trusted mode	For trusted source reconciliation, set the value of this attribute to Yes. For target resource reconciliation, set the value of this attribute to No.
XellerateOrganization	Default name of the Oracle Identity Manager organization The organization you specify is used to create the Xellerate User (OIM User) in trusted source reconciliation mode. This organization must be one of the existing organizations in Oracle Identity Manager. **Note:** This attribute is specific to the scheduled task for trusted source reconciliation.	Xellerate Users

Attribute	Description	Default/Sample Value
BatchSize	Number of records in each batch that is reconciled You must specify an integer value greater than zero. **See Also:** The "Batched Reconciliation" section on page 3-2	The default value is 1000.
NumOfBatches	Number of batches to be reconciled The number of records in each batch is specified by the BatchSize attribute. **See Also:** The "Batched Reconciliation" section on page 3-2	Specify All if you want to reconcile all the batches. This is the default value. Specify an integer value if you want to reconcile only a fixed number of batches
Last Name	This is a filter attribute. Use this attribute to specify the last name of the user whose records you want to reconcile. If you do not want to use this filter attribute, then specify nodata. **See Also:** The "Partial Reconciliation" section on page 3-1	The value can be either the last name or nodata. The default value is nodata.
Nationality	This is a filter attribute. Use this attribute to specify the nationality of the user whose records you want to reconcile. If you do not want to use this filter attribute, then specify nodata. **See Also:** The "Partial Reconciliation" section on page 3-1	The value can be either the nationality or nodata. The default value is nodata.
Operator	Specifies the logical operator to be applied to the filter attribute. **See Also:** The "Partial Reconciliation" section on page 3-1	The value can be one of the following: ■ AND ■ OR The default value is AND.

After you specify values for these task attributes, proceed to Step 10 of the procedure to create scheduled tasks.

3.1.5 Adding Custom Attributes for Reconciliation

> **Note:** In this section, the term "attributes" refers to the identity data fields that store user data.

By default, the attributes listed in the "Reconciliation Module" section on page 1-1 are mapped for reconciliation between Oracle Identity Manager and the target system. If required, you can map additional attributes for reconciliation as follows:

> **Note:** You need not perform this procedure if you do not want to add custom attributes for reconciliation.

> **See Also:** *Oracle Identity Manager Design Console* for detailed instructions on performing the following steps

1. Modify the `attributemapping_recon.properties` file, which is in the *OIM_HOME*`/xellerate/XLIntegrations/OracleEmpRecon/config` directory.

   At the end of this file, some of the attribute definitions are preceded by comment characters. You can uncomment the definition of an attribute to make it a part of the list of reconciliation attributes. If required, you can also add new attributes in this file. The format that you must use is as follows:

   `OimAttributeName=TargetAttributeTableNamee.Field_Name`

   For example:

   `Users.email=per_all_people_f.email_address`

   In this example, `email` is the reconciliation field and `per_all_people_f` is the equivalent table name and `email_address` is the column name on the target system. As a standard, the prefix "`Users.`" is added at the start of all reconciliation field names.

2. In a text editor, open the following file:

   OIM_HOME`/xellerate/XLIntegrations/OracleEmpRecon/config/query.properties`

   > **See Also:**

3. In the getEmp2 variable of this file, the FROM clause contains the names of the APPS schema tables that store the attributes listed in the `attributemapping_recon.properties` file. If the table that stores the custom attribute that you want to add is not in this FROM clause, then add the name of the table to the FROM clause.

4. In the Design Console, add the new attribute as a field on the `UD_ORAHR_EM` process form as follows:

   a. Open the Form Designer form. This form is in the Development Tools folder.

   b. Use the binoculars icon to search for and then open the `UD_ORAHR_EM` form for editing.

   c. Click **Create New Version**.

   d. In the Create a New Version dialog box, specify the version name in the **Label** field, save the changes, and then close the dialog box.

   e. From the **Current Version** list, select the newly created version.

   f. On the Additional Columns tab, click **Add**.

   g. Specify the name and other values of the new field.

   h. Click **Make Version Active**.

5. In the resource object definition, add a reconciliation field corresponding to the new attribute as follows:

   a. Open the Resource Objects form. This form is in the Resource Management folder.

   b. Use the binoculars icon to search for the `Oracle HR Employee` resource object.

   c. On the Resource Objects Table tab, double-click the `Oracle HR Employee` resource object to open it for editing.

    d. On the Object Reconciliation tab, click **Add Field** to open the Add Reconciliation Field dialog box.

    e. Specify a value for the field name.

        You must specify the name that is to the left of the equal sign in the line that you uncomment or add while performing Step 2.

        For example, if you uncomment the `Users.email=per_all_people_f.email_address` line in Step 2, then you must specify `Users.email` as the attribute name.

    f. From the **Field Type** list, select a data type for the field.

        For example: `String`

    g. Save the values that you enter, and then close the dialog box.

    h. If required, repeat Steps d through g to map more fields.

6. Modify the process definition to include the mapping between the newly added attribute and the corresponding reconciliation field as follows:

    a. Open the Process Definition form. This form is in the Process Management folder.

    b. On the Reconciliation Field Mappings tab, click **Add Field Map** to open the Add Reconciliation Field Mapping dialog box.

    c. Enter the required values, save the values that you enter, and then close the dialog box.

    d. If required, repeat Steps b and c to map more fields.

4

Testing and Troubleshooting

After you deploy the connector, you must test it to ensure that it functions as expected. This chapter discusses the following topics related to connector testing:

- Connector Test Cases
- Troubleshooting

4.1 Connector Test Cases

There are two types of tests that you can perform for reconciliation testing:

- A test from the trusted source/target resource to Oracle Identity Manager (a T-X test).
- A test from the target resource/target resource to Oracle Identity Manager (an N-X test).

The following table describes sample test cases based on these test types.

Test Case	Type	Test Type	Description/Comments
If an Xellerate User (OIM User) is not found, then create the Xellerate User (OIM User) and provision a resource object for the user.	Functional	T-X	The user should be reconciled successfully.
If the Xellerate User (OIM User) is found, then update the user and the corresponding resource objects.	Functional	T-X	The user should be updated successfully.
Check if resource objects have been provisioned an Xellerate User (OIM User). If resource objects are found, then do not delete the user. If resource objects are not found, then delete the user.	Functional	T-X	If there are no resource objects, then the user should be deleted successfully from Oracle Identity Manager. If resource objects are found, then the user should not be deleted from Oracle Identity Manager.
If the Xellerate User (OIM User) exists, then update the user and the corresponding resource object.	Functional	N-X	The Xellerate User (OIM User) should be updated successfully.
If the Xellerate User (OIM User) is not found, then do not perform any action.	Functional	N-X	No action is performed.

4.2 Troubleshooting

This section provides solutions to a commonly encountered problem associated with the connector.

Problem 1:

Oracle Identity Manager cannot establish a connection with the Oracle E-Business Employee Reconciliation server.

Solution:

- Ensure that the Oracle E-Business Employee Reconciliation server is running.

- Ensure that the Oracle Identity Manager server is running.

- Examine the Oracle Identity Manager record (in the IT Resources form). Ensure that the IP address, administrator ID, and administrator password are correct.

Problem 2:

One of the following error messages is thrown when Oracle Identity Manager tries to exchange data with the target system:

```
table or view does not exist
insufficient privileges
```

Solution:

This error message is thrown because the target system account for connector operations does not have the required privileges. See "Configuring the Target System" on page 2-2 for information about creating this account and assigning the required privileges to it.

5

Known Issues

The following is a known issue associated with this release of the connector:

- **Bug 7167800**

  SSL communication is not supported.

A

Attribute Mappings Between Oracle Identity Manager and Oracle E-Business Employee Reconciliation

The following table discusses attribute mappings between Oracle Identity Manager and Oracle E-Business Employee Reconciliation.

> **Note:** Some Asian languages use multibyte character sets. If the character limit for the fields in the target system is specified in bytes, then the number of Asian-language characters that you can enter in a particular field may be less than the number of English-language characters that you can enter in the same field. The following example illustrates this limitation:
>
> Suppose you can enter 50 characters of English in the User Last Name field of the target system. If you have configured the target system for the Japanese language, then you would not be able to enter more than 25 characters in the same field.

Oracle Identity Manager Attribute	Oracle E-Business Employee Reconciliation Attribute	Description
First Name	PER_ALL_PEOPLE_F.FIRST_NAME	First name
Email	PER_ALL_PEOPLE_F.EMAIL_ADDRESS	E-mail address
Person ID	PER_ALL_PEOPLE_F.PERSON_ID	Identification ID
Middle Name	PER_ALL_PEOPLE_F.MIDDLE_NAMES	Middle name
Last Name	PER_ALL_PEOPLE_F.LAST_NAME	Last name
Department	HR_ALL_ORGANIZATION_UNITS.ORGANIZATION_ID	Organization
SSN	PER_ALL_PEOPLE_F.NATIONAL_IDENTIFIER	Social security number
Title	PER_ALL_PEOPLE_F.TITLE	Title
Location	HR_LOCATIONS_ALL.LOCATION_CODE	Location
Manager	PER_ALL_PEOPLE_F.FULL_NAME	Supervisor's name
City	PER_ADDRESSES.TOWN_OR_CITY	City
Postal Code	PER_ADDRESSES.POSTAL_CODE	Postal code
Country	PER_ADDRESSES.COUNTRY	Country name

Oracle Identity Manager Attribute	Oracle E-Business Employee Reconciliation Attribute	Description
Telephone Number	PER_ADDRESSES.TELEPHONE_NUMBER_1	Telephone number
Employee number	PER_ALL_PEOPLE_F.EMPLOYEE_NUMBER	Assignment number
Manager ID	PER_ALL_PEOPLE_F.PERSON_ID	Identification ID for supervisor
Nationality	PER_ALL_PEOPLE_F.NATIONALITY	Nationality

B

query.properties File

The `query.properties` file is used during reconciliation. While deploying the connector, you copy this file into the following directory:

OIM_home/xellerate/XLIntegrations/OracleEmpRecon/config

The `query.properties` file contains the following variables:

- **getEmp1 Variable**

  The `getEmp1` variable is used to hold the SELECT clause of the SQL query that fetches data from the target system during reconciliation.

  You must not modify the value of this variable.

- **getEmp2 Variable**

  The `getEmp2` variable is used to hold the FROM and WHERE clauses of the SQL query that fetches data from the target system during reconciliation. The SELECT clause of this query is stored in the `getEmp1` variable. You can modify the value of the `getEmp2` variable while performing the procedure described in the "Adding Custom Attributes for Reconciliation" section on page 3-6. If the custom attribute that you want to add belongs to a table that is not listed in the FROM clause stored in the `getEmp2` variable, then you add the name of that table to the FROM clause.

- **getNewEmps Variable**

  The `getNewEmps` variable is used to hold the values of the filter attributes that you specify when you want to configure limited reconciliation. These filters are applied during reconciliation. They are discussed in the "Employee Reconciliation Scheduled Tasks" section on page 3-5.

  You must not modify the value of the `getNewEmps` variable.

- **getAllEmps Variable**

  The `getAllEmps` variable is used to hold the SQL query that is used for the reconciliation of account deletion information from the target system.

  You must not modify the value of this variable.

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