Oracle® Identity Manager

Connector Guide for Novell eDirectory

Release 9.0.4

E10161-01

May 2007

ORACLE®

Oracle Identity Manager Connector Guide for Novell eDirectory, Release 9.0.4

E10161-01

Primary Authors: Debapriya Datta, Shiladitya Guha

Contributing Authors: Don Gosselin, Vijaykarthik Sathiyamurthy, Lyju Vadassery

Contents

3 Configuring the Connector

4 Testing and Troubleshooting

5 Known Issues

A Attribute Mappings Between Oracle Identity Manager and Novell eDirectory

Index

Preface

Oracle Identity Manager Connector Guide for Novell eDirectory provides information about integrating Oracle Identity Manager with Novell eDirectory.

Note: Some parts of the product and documentation still refer to the original Thor company name and Xellerate product name and will be rebranded in future releases.

Audience

This guide is intended for users who want to deploy the Oracle Identity Manager connector for Novell eDirectory.

Documentation Accessibility

Our goal is to make Oracle products, services, and supporting documentation accessible, with good usability, to the disabled community. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Accessibility standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For more information, visit the Oracle Accessibility Program Web site at

`http://www.oracle.com/accessibility/`

Accessibility of Code Examples in Documentation

Screen readers may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, some screen readers may not always read a line of text that consists solely of a bracket or brace.

Accessibility of Links to External Web Sites in Documentation

This documentation may contain links to Web sites of other companies or organizations that Oracle does not own or control. Oracle neither evaluates nor makes any representations regarding the accessibility of these Web sites.

TTY Access to Oracle Support Services

Oracle provides dedicated Text Telephone (TTY) access to Oracle Support Services within the United States of America 24 hours a day, seven days a week. For TTY support, call 800.446.2398.

Related Documents

For more information, refer to the following documents in the Oracle Identity Manager documentation library:

- *Oracle Identity Manager Release Notes*
- *Oracle Identity Manager Installation Guide for JBoss*
- *Oracle Identity Manager Installation Guide for Oracle Containers for J2EE*
- *Oracle Identity Manager Installation Guide for WebLogic*
- *Oracle Identity Manager Installation Guide for WebSphere*
- *Oracle Identity Manager Administrative and User Console Guide*
- *Oracle Identity Manager Administrative and User Console Customization Guide*
- *Oracle Identity Manager Design Console Guide*
- *Oracle Identity Manager Tools Reference Guide*
- *Oracle Identity Manager Audit Report Developer Guide*
- *Oracle Identity Manager Best Practices Guide*
- *Oracle Identity Manager Globalization Guide*
- *Oracle Identity Manager Glossary of Terms*

The following document is available in the Oracle Identity Manager Connector Pack documentation library:

- *Oracle Identity Manager Connector Framework Guide*

Documentation Updates

Oracle is committed to delivering the best and most recent information available. For information about updates to the Oracle Identity Manager Connector Pack Release 9.0.4 documentation library, visit Oracle Technology Network at

`http://www.oracle.com/technology/documentation/index.html`

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 the Oracle Identity Manager Connector for Novell eDirectory?

This chapter provides an overview of the updates made to the software and documentation for the Novell eDirectory connector in release 9.0.4 of the Oracle Identity Manager connector pack.

> **See Also:** The 9.0.3 release of this guide for information about updates that were new for the 9.0.3 release

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

- Software Updates

  These include updates made to the connector software.

- Documentation-Specific Updates

  These include major changes made to the connector documentation. These changes are not related to software updates.

> **See Also:** *Oracle Identity Manager Release Notes*

Software Updates

This section discusses the following software updates implemented in this release of the connector.

Enabling Provisioning of Users in Organizations and Organizational Units

Functionality for enabling provisioning of users in organizations and organizational units is discussed in the following section:

- Enabling Provisioning of Users in Organizations and Organizational Units on page 3-10

Functionality for Provisioning of Organizational Units, Groups, and Roles

From this release onward, the connector supports the provisioning of organizational units, groups, and roles. This functionality is discussed in the following sections:

- In the "Supported Functionality" section on page 1-4, the following functions have been added:
  - Create OU
  - Change OU Name

  - Delete OU
  - Move OU
  - Create eDirectory Group
  - Delete eDirectory Group
  - New Group Name Updated
  - Create eDirectory Role
  - Delete eDirectory Role
  - New Role Name Updated
- In the "Compiling Adapters" section on page 3-8, adapters to handle the new functions have been added.
- In Appendix A, the `ldapOrgUnitObjectClass` attribute has been added to the list of Oracle Identity Manager attributes.
- Provisioning Organizational Units, Groups, and Roles on page 3-10

Reconciliation of Organizations, Organizational Units, Groups, and Roles

For reconciliation of lookup fields, you need to specify values for the lookup fields scheduled task attributes. In this release of the connector, you can specify values for the lookup fields scheduled task attributes for reconciliation of organizations, organizational units, groups, and roles. These attribute values are listed in the "Lookup Fields Reconciliation Scheduled Task" section on page 3-5.

Partial Reconciliation

The `CustomizedReconQuery` parameter has been added to the IT resource definition. You can use this parameter to customize the query that the reconciliation module uses to determine the records to be retrieved from the target system. The `CustomizedReconQuery` parameter is explained in the following sections:

- Defining IT Resources on page 2-7
- Partial Reconciliation on page 3-1
- Testing Partial Reconciliation on page 4-2

Batched Reconciliation

In this release of the connector, the `StartRecord`, `BatchSize`, and `NumberofBatches` attributes have been added to the reconciliation scheduled task definition. By specifying values for these attributes, you can reconcile users in various batches. The scheduled task attributes are discussed in the following sections:

- User Reconciliation Scheduled Task on page 3-7
- Batched Reconciliation on page 3-3
- Testing Batched Reconciliation on page 4-3

Changes in the Supported Target Systems List

In the "Step 1: Verifying Deployment Requirements" section on page 2-1, the information on supported target system host platform has been modified. This release of the connector is not dependent on any target system host platform.

Enabling Logging

By following the instructions in the "Enabling Logging" section on page 2-4, you can configure the generation of log information that is specific to the target system.

Stopping Reconciliation

This release of the connector supports the stopping of reconciliation. This feature is discussed in the following section:

- Stopping Reconciliation on page 3-8

Documentation-Specific Updates

The following documentation-specific updates have been made in this release of the guide:

- Instructions in the "Determining the Release Number of the Connector" section on page 1-7 have been revised.
- The term "troubleshooting utility" has been replaced with "testing utility."
- In the "Lookup Fields Reconciliation" section on page 1-2, the domain scope data on the target system has been added to the list of reconciled lookup fields. Corresponding changes have been made in the "Lookup Fields Reconciliation Scheduled Task" section on page 3-5.

1

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. The connector for Novell eDirectory is used to integrate Oracle Identity Manager with Novell eDirectory.

> **Note:** Oracle Identity Manager connectors were referred to as *resource adapters* prior to the acquisition of Thor Technologies by Oracle.

This chapter contains the following sections:

> **Note:** At some places in this guide, Novell eDirectory has been referred to as the *target system*.

Reconciliation Module

Reconciliation involves duplicating in Oracle Identity Manager additions 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 Framework 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

Lookup fields reconciliation involves reconciling organization, organizational unit, group, role, domain scope, and profile master data.

User Reconciliation

User reconciliation involves reconciling the fields discussed in this section.

Reconciled Resource Object Fields

The following fields are reconciled:

Note: These fields do not have the `ldap` prefix.

- User ID
- First Name
- Last Name
- Middle Name
- Department
- Location
- Telephone
- Email
- Communication Language
- Timezone
- Logon Script
- Title
- Profile
- Organization Unit
- Security Group (multiple group names can be entered)
- Role
  - Role Name
  - Scope
  - Inheritance
- Trustee Rights
  - Property
  - Supervisor
  - Read
  - Write
  - Compare
  - Add Self
- Network Address

Reconciled Xellerate User Fields

The following fields are reconciled only if reconciliation is implemented in trusted mode:

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

Provisioning Module

Provisioning involves creating or modifying a user's account information on the target system through Oracle Identity Manager. You use the Administrative and User Console to perform provisioning operations.

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

For this target system, the following fields are provisioned:

- User ID
- First Name
- Last Name
- Middle Name
- Department
- Location
- Telephone
- Email
- Communication Language
- Timezone
- Logon Script
- Title
- Profile
- Organization Unit
- Server Name
- Security Group
- Role
  - Role Name
  - Scope
  - Inheritance

- Trustee Rights
  - Property
  - Supervisor
  - Read
  - Write
  - Compare
  - Add Self
- Network Address

For provisioning of organizational units, groups, and roles, refer to the "Supported Functionality" section on page 1-4.

Supported Functionality

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

Process Task	Type	Description
Create User	Provisioning	Creates a user in Novell eDirectory
Delete User	Provisioning	Deletes a user in Novell eDirectory
Enable User	Provisioning	Enables a user in Novell eDirectory
Disable User	Provisioning	Disables a user in Novell eDirectory
Move User	Provisioning	Moves a user from one container to another in Novell eDirectory
Update User Password	Provisioning	Updates the password of a user in Novell eDirectory
Add User to Group	Provisioning	Adds a user to a group in Novell eDirectory
Remove User from Group	Provisioning	Removes a user from a group in Novell eDirectory
Assign Role to User	Provisioning	Assigns a role to a user in Novell eDirectory
Remove Assigned Role from User	Provisioning	Removes a role from a user in Novell eDirectory
Assign Trustee Right to User	Provisioning	Adds a trustee right to a user in Novell eDirectory
Remove Trustee Right from User	Provisioning	Removes a trustee right from a user in Novell eDirectory
Add Network Address Restriction to User	Provisioning	Adds a network address restriction to a user in Novell eDirectory
Remove Network Address Restriction from User	Provisioning	Removes a network address restriction from a user in Novell eDirectory
Create OU	Provisioning	Creates an organizational unit
Change OU Name	Provisioning	Changes an organization name
Delete OU	Provisioning	Deletes an organizational unit
Move OU	Provisioning	Moves the organization sub unit to another parent organizational unit

Process Task	Type	Description
Create eDirectory Group	Provisioning	Creates a Novell eDirectory group
Delete eDirectory Group	Provisioning	Deletes a Novell eDirectory group
New Group Name Updated	Provisioning	Updates the group name
Create eDirectory Role	Provisioning	Creates a Novell eDirectory role
Delete eDirectory Role	Provisioning	Deletes a Novell eDirectory role
New Role Name Updated	Provisioning	Updates a role name
Create User	Reconciliation	Creates a user in Oracle Identity Manager
Delete User	Reconciliation	Deletes a user from Oracle Identity Manager
Enable User	Reconciliation	Enables a user in Oracle Identity Manager
Disable User	Reconciliation	Disables a user in Oracle Identity Manager
Move User	Reconciliation	Moves a user from one container to another in Oracle Identity Manager
Add User to Group	Reconciliation	Adds a user to a group in Oracle Identity Manager
Remove User from Group	Reconciliation	Removes a user from a group in Oracle Identity Manager
Assign Role to User	Reconciliation	Assigns a role to a user in Oracle Identity Manager
Remove Assigned Role from User	Reconciliation	Removes a role from a user in Oracle Identity Manager
Assign Trustee Right to User	Reconciliation	Adds a trustee right to a user in Oracle Identity Manager
Remove Trustee Right from User	Reconciliation	Removes a trustee right from a user in Oracle Identity Manager
Add Network Address Restriction to User	Reconciliation	Adds a network address restriction to a user in Oracle Identity Manager
Remove Network Address Restriction from User	Reconciliation	Removes a network address restriction from a user in Oracle Identity Manager
Reconciliation Insert Received	Reconciliation	Inserts a user in Oracle Identity Manager
Reconciliation Update Received	Reconciliation	Updates a user in Oracle Identity Manager

See Also: Appendix A for information about attribute mappings between Oracle Identity Manager and Novell eDirectory

Multilanguage Support

This release of the connector supports the following languages:

- Chinese Simplified
- Chinese Traditional
- English
- French
- German
- Italian
- Japanese
- Korean
- Portuguese (Brazilian)
- Spanish

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

Files and Directories That Comprise the Connector

The files and directories that comprise this connector are in the following directory on the installation media:

`Directory Servers/Novell eDirectory`

These files and directories are listed in the following table.

File in the Installation Media Directory	Description
`lib/eDirProv.jar`	This JAR file contains the class files required for provisioning and reconciliation.
Files in the `resources` directory	Each of these resource bundle files contains language-specific information that is used by the connector. **Note:** A **resource bundle** is a file containing localized versions of the text strings that are displayed on the user interface of Oracle Identity Manager. These text strings include GUI element labels and messages displayed on the Administrative and User Console.
Files in the `troubleshoot` directory	These files are used to implement test cases that are run by using the testing utility.
`xml/eDirResourceObject.xml`	This XML file contains definitions for the following components of the connector: ■ IT resource type ■ Custom process form ■ Process tasks and adapters (along with their mappings) ■ Resource object ■ Provisioning process ■ Pre-populate rules ■ Reconciliation process ■ Lookup definitions
`xml/eDirXLResourceObject.xml`	This XML file contains the configuration for the Xellerate User. You must import this file only if you plan to use the connector in trusted source reconciliation mode.

Note: The files in the `troubleshoot` directory are used only to run tests on the connector.

The "Step 2: Copying the Connector Files and External Code Files" section on page 2-1 provides instructions to copy these files into the required directories.

Determining the Release Number of the Connector

You can use any one of the following methods to determine the release number of the connector.

Before Deployment

To determine the release number of a connector:

1. Extract the contents of the `eDirProv.jar` file. This file is in the following directory on the installation media:

   ```
   Directory Servers/Novell eDirectory/lib
   ```

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

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

Note: If you maintain a copy of the `eDirProv.jar` file after deployment, you can use this method to determine the release number of the connector at any stage. After you deploy the connector, it is recommended that you use the "After Deployment" method, which is described in the following section.

After Deployment

To determine the release number of a connector that has already been deployed:

See Also: *Oracle Identity Manager Design Console Guide*

1. Open the Oracle Identity Manager Design Console.
2. In the Form Designer, open the process form. The release number of the connector is the value of the **Version** field.

2

Deploying the Connector

Deploying the connector involves the following steps:

- Step 1: Verifying Deployment Requirements
- Step 2: Copying the Connector Files and External Code Files
- Step 3: Configuring the Oracle Identity Manager Server
- Step 4: Importing the Connector XML File
- Step 5: Configuring SSL

Step 1: Verifying Deployment Requirements

The following table lists the deployment requirements for the connector.

Item	Requirement
Oracle Identity Manager	Oracle Identity Manager release 8.5.3 or later
Target systems	Novell eDirectory 8.7.3
External code	`ldap.jar` and `ldapbp.jar` Refer to the "Step 2: Copying the Connector Files and External Code Files" section on page 2-1 for information about downloading this JAR file.
Target system user account	Novell eDirectory user account to which the Supervisor right has been assigned You provide the credentials of this user account while performing the procedure in the "Defining IT Resources" section on page 2-7. If this target system user account is not assigned the specified rights, then the following error message may be displayed during connector operations: `Transaction is not active (Transaction Manager error)`

Step 2: Copying the Connector Files and External Code Files

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

Note: The directory paths given in the first column of this table correspond to the location of the connector files in the following directory on the installation media:

`Directory Servers/Novell eDirectory`

Refer to the "Files and Directories That Comprise the Connector" section on page 1-6 for more information about these files.

File in the Installation Media Directory	Destination Directory
`lib/eDirProv.jar`	*OIM_home*`/xellerate/eDir/lib` *OIM_home*`/xellerate/JavaTasks`
Files in the `resources` directory	*OIM_home*`/xellerate/connectorResources`
Files in the `troubleshoot` directory	*OIM_home*`/xellerate/eDir/troubleshoot`
Files in the `xml` directory	*OIM_home*`/xellerate/eDir/xml`

To copy the `ldap.jar` file into the required directory:

1. Log on to the Novell Web site at

   `http://developer.novell.com/wiki/index.php/Special:Downloads/jldap/builds/netware_windows/`

2. Download the following file from the Novell Web site:

   `novell-jldap-devel-2005.10.03-1netware_windows.zip`

   The size of the file is 11.1 MB.

3. Extract the contents of the file that you downloaded in Step 2.

4. Copy the `ldap.jar` file from the `novell-jldap-devel-2005.10.03-1netware_windows\jldap_2005.10.03\lib` directory to the *OIM_home*`\xellerate\JavaTasks` directory on the Oracle Identity Manager server.

To copy the `ldapbp.jar` file into the required directory:

1. Log on the Sun Web site at

   `http://java.sun.com/products/jndi/downloads/index.html`

2. Click the **Download JNDI 1.2.1 & More** button.

3. From the table on the page that is displayed, select the **LDAP Service Provider 1.2.4** check box and download the `ldap-1_2_4.zip` file.

4. Extract the `ldapbp.jar` file from the `ldap-1_2_4.zip` file.

5. Copy the `ldapbp.jar` file into the *OIM_home*`/xellerate/JavaTasks` directory on the Oracle Identity Manager server.

Note: While installing Oracle Identity Manager in a clustered environment, you copy the contents of the installation directory to each node of the cluster. Similarly, you must copy the `connectorResources` directory and the JAR files to the corresponding directories on each node of the cluster.

Step 3: Configuring the Oracle Identity Manager Server

> **Note:** In this guide, the term *Oracle Identity Manager server* refers to the computer on which Oracle Identity Manager is installed.

Configuring the Oracle Identity Manager server involves performing the following procedures:

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

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

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.

Clearing Content Related to Connector Resource Bundles from the Server Cache

While performing the instructions described in the "Step 2: Copying the Connector Files and External Code Files" section on page 2-1, 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. If you run the command described in Step 2 as follows, then an exception is thrown:
   >
   > *`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`

Enabling Logging

When you enable logging, Oracle Identity Manager automatically stores in a log file information about events that occur during the course of provisioning and 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 informational messages that highlight the progress of the application at 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 still 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 and the log file path depend on the application server that you use:

- **BEA WebLogic**

  To enable logging:

  1. Add the following lines in the *OIM_home*`/xellerate/config/log.properties` file:

     ```
     log4j.logger.XELLERATE=log_level
     log4j.logger.XL_INTG.eDirectory=log_level
     ```

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

     For example:

```
log4j.logger.XELLERATE=INFO
log4j.logger.XL_INTG.eDirectory=INFO
```

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

WebLogic_home/user_projects/domains/*domain_name*/*server_name*/*server_name*.log

- **IBM WebSphere**

  To enable logging:

  1. Add the following lines in the *OIM_home*/xellerate/config/log.properties file:

     ```
     log4j.logger.XELLERATE=log_level
     log4j.logger.XL_INTG.eDirectory=log_level
     ```

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

     For example:

     ```
     log4j.logger.XELLERATE=INFO
     log4j.logger.XL_INTG.eDirectory=INFO
     ```

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

  WebSphere_home/AppServer/logs/*server_name*/startServer.log

- **JBoss Application Server**

  To enable logging:

  1. In the *JBoss_home*/server/default/conf/log4j.xml file, locate or add the following lines:

     ```
     <category name="XELLERATE">
        <priority value="log_level"/>
     </category>

     <category name="XL_INTG.eDirectory">
        <priority value="log_level"/>
     </category>
     ```

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

     ```
     <category name="XELLERATE">
        <priority value="INFO"/>
     </category>

     <category name="XL_INTG.eDirectory">
        <priority value="INFO"/>
     </category>
     ```

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

  JBoss_home/server/default/log/server.log

- **OC4J**

  To enable logging:

  1. Add the following lines in the *OIM_home*/xellerate/config/log.properties file:

```
log4j.logger.XELLERATE=log_level
log4j.logger.XL_INTG.eDirectory=log_level
```

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

   For example:

   ```
   log4j.logger.XELLERATE=INFO
   log4j.logger.XL_INTG.eDirectory=INFO
   ```

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

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

Step 4: Importing the Connector XML File

As mentioned in the "Files and Directories That Comprise the Connector" section on page 1-6, the connector XML file contains definitions of the components of the connector. By importing the connector XML file, you create these components in Oracle Identity Manager.

To import the connector XML file into Oracle Identity Manager:

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 locating files is displayed.
4. Locate and open the `eDirResourceObject.xml` file, which is in the *OIM_home*`/xellerate/eDir/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 **Next.** The Provide IT Resource Instance Data page for the `eDirectory IT Resource` IT resource is displayed.
8. Specify values for the parameters of the `eDirectory IT Resource` IT resource. Refer to the table in the "Defining IT Resources" section on page 2-7 for information about the values to be specified.
9. Click **Next.** The Provide IT Resource Instance Data page for a new instance of the `LDAP Server` 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 Tools Reference 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 XML file is imported into Oracle Identity Manager.

After you import the connector XML file, proceed to the "Step 5: Configuring SSL" section on page 2-8.

Defining IT Resources

You must specify values for the `eDirectory IT Resource` IT resource parameters listed in the following table.

Parameter	Description
`Admin ID`	DN value of the user who has administrator rights on the Novell eDirectory server Default value: `cn=Admin,o=PXED-DEV`
`Admin Password`	Password of the administrator
`Server Address`	Server address of the Novell eDirectory server
`Root DN`	Base DN on which all user operations are to be carried out Default value: `o=PXED-DEV`
`Port`	Port number to connect to the target Novell eDirectory server Default value: `389`
`SSL`	Specifies whether or not SSL is used to secure communication between Oracle Identity Manager and Novell eDirectory The value can be `true` or `false`. Default value: `false` **Note:** It is recommended that you enable SSL to secure communication with the target system.
`Last Recon TimeStamp`	For the first reconciliation run, the time stamp value is not set. For subsequent rounds of reconciliation, the time at which the previous round of reconciliation was completed is stored in this parameter. Default value: `20060519120000Z` In this value: ■ 2006 is the year ■ 05 is the month ■ 19 is the day of the month ■ 12 is the hour ■ 00 is the minute ■ 00 is the second ■ The letter Z is required at the end The time is displayed in GMT.
`Prov Attribute Lookup Code`	Name of the lookup definition that has the target attribute mappings required for provisioning Default value: `AttrName.Prov.Map.EDIR` **Note:** This value must not be changed.
`Recon Attribute Lookup Code`	Name of the lookup definition that has the target attribute mappings required for reconciliation Default value: `AttrName.Recon.Map.EDIR` **Note:** This value must not be changed.

Parameter	Description
`Use XL Org Structure`	If set to `true`, then the Oracle Identity Manager Organization structure is used during provisioning and reconciliation. If set to `false`, then the value of the Organization field in the process form is used for provisioning and the organization or container in the target LDAP is used for reconciliation. Default value: `false`
`CustomizedReconQuery`	Query condition on which reconciliation must be based If you specify a query condition for this parameter, then the target system records are searched based on the query condition. If you want to reconcile all the target system records, then do not specify a value for this parameter. The query can be composed with the AND (&) and OR (|) logical operators. Sample value: `givenname=John` For more information about this parameter, refer to the "Partial Reconciliation" section on page 3-1.

After you specify values for these IT resource parameters, proceed to Step 9 of the procedure to import the connector XML file.

Step 5: Configuring SSL

Note: This is an optional step of the deployment procedure.

To enable SSL connectivity between Oracle Identity Manager and the target Novell eDirectory:

1. Import the certificate from the target system into the JSDK (the JSDK that is used during installation of Oracle Identity Manager Server) `cacerts` keystore as follows:

   ```
   keytool -import -alias alias_name -file
   certificate_file_name_with_complete_path -keystore
   java_home/jre/lib/security/cacerts
   ```

2. Restart the Oracle Identity Manager server.
3. In the `eDirectory IT Resource` IT resource definition:
   - Set the `SSL` parameter value to `true`.
   - Set the `Port` parameter value to the SSL port number. Typically, this number is 636.

3

Configuring the Connector

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

> **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.

- Configuring Reconciliation
- Configuring Provisioning
- Configuring the Connector for Multiple Installations of the Target System

Configuring Reconciliation

As mentioned earlier in this guide, reconciliation involves duplicating in Oracle Identity Manager additions 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 Trusted Source Reconciliation
- Configuring the Reconciliation Scheduled Tasks

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.

For this connector, you create a filter by specifying values for the `CustomizedReconQuery` IT resource parameter while performing the procedure described in the "Defining IT Resources" section on page 2-7.

The following table lists the Novell eDirectory attributes, and the corresponding Oracle Identity Manager attributes, that you can use to build the query condition. You specify this query condition as the value of the `CustomizedReconQuery` parameter.

Oracle Identity Manager Attribute	Novell eDirectory Attribute
User Id	cn
First Name	givenname
Last Name	sn
Email	mail
Middle Name	initials
Title	title
Location	l
Telephone	telephoneNumber
Department	departmentNumber
Language	preferredLanguage

The following are sample query conditions:

- `givenname=John&sn=Doe`

  With this query condition, records of users whose first name is John and last name is Doe are reconciled.

- `givenname=John|departmentNumber=23`

  With this query condition, records of users who meet either of the following conditions are reconciled:

  – The user's first name is `John`.

  – The user belongs to the departmentNumber `23`.

If you do not specify values for the `CustomizedReconQuery` parameter, then all the records in the target system are compared with existing Oracle Identity Manager records during reconciliation.

The following are guidelines to be followed while specifying a value for the `CustomizedReconQuery` parameter:

- For the Novell eDirectory attributes, you must use the same case (uppercase or lowercase) as given in the table shown earlier in this section. This is because the attribute names are case-sensitive.
- You must not include unnecessary blank spaces between operators and values in the query condition.

  A query condition with spaces separating values and operators would yield different results as compared to a query condition that does not contain spaces between values and operators. For example, the output of the following query conditions would be different:

  ```
  givenname=John&sn=Doe
  ```

  ```
  givenname= John&sn= Doe
  ```

  In the second query condition, the reconciliation engine would look for first name and last name values that contain a space at the start.

- You must not include special characters other than the equal sign (=), ampersand (&), and vertical bar (|) in the query condition.

Note: An exception is thrown if you include special characters other than the equal sign (=), ampersand (&), and vertical bar (|).

You specify a value for the `CustomizedReconQuery` parameter while performing the procedure described in the "Defining IT Resources" section on page 2-7.

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 such problems.

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

- `StartRecord`: Use this attribute to specify the record number from which batched reconciliation must begin.
- `BatchSize`: Use this attribute to specify the number of records that must be included in each batch.
- `NumberOfBatches`: Use this attribute to specify the total number of batches that must be reconciled. If you do not want to use batched reconciliation, specify `All Available` as the value of this attribute.

Note: If you specify `All Available` as the value of this attribute, then the values of the `StartRecord` and `BatchSize` attributes are ignored.

You specify values for these attributes by following the instructions described in the "User Reconciliation Scheduled Task" section on page 3-7.

After you configure batched reconciliation, if reconciliation fails during a batched reconciliation run, then refer to the log file for information about the batch at which reconciliation has failed. The log file provides the following information about batched reconciliation:

- Serial numbers of the batches that have been successfully reconciled
- User IDs associated with the records with each batch that has been successfully reconciled
- If the batched reconciliation run fails, then the serial number of the batch that has failed

Configuring Trusted Source Reconciliation

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 both newly created and modified user accounts are reconciled in Oracle Identity Manager. If you designate the target system as a **target resource**, then only modified user accounts are reconciled in Oracle Identity Manager.

Note: You can skip this section if you do not want to designate the target system as a trusted source for reconciliation.

Configuring trusted source reconciliation involves the following steps:

1. Import the XML file for trusted source reconciliation, `eDirXLResourceObject.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 `eDirXLResourceObject.xml` file while you have another trusted source configured, then both connector reconciliations would stop working.

2. Set the `TrustedSource` scheduled task attribute to `True`. You specify a value for this attribute while configuring the user reconciliation scheduled task, which 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 locating files is displayed.
4. Locate and open the `eDirXLResourceObject.xml` file, which is in the *`OIM_home`*`/xellerate/eDir/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**.

After you import the XML file for trusted source reconciliation, you must set the value of the `TrustedSource` reconciliation scheduled task attribute to `True`. This procedure is described in the "Configuring the Reconciliation Scheduled Tasks" section on page 3-4.

Configuring the Reconciliation Scheduled Tasks

When you perform the procedure described in the "Step 4: Importing the Connector XML File" section on page 2-6, the scheduled tasks for lookup fields and 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 **Xellerate 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 `ERROR` 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 3-5 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 define the second scheduled task.

After you configure both scheduled tasks, proceed to the "Configuring Provisioning" section on page 3-8.

Specifying Values for the Scheduled Task Attributes

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

- Lookup Fields Reconciliation Scheduled Task
- User Reconciliation Scheduled Task

Lookup Fields Reconciliation Scheduled Task You must specify values for the following attributes of the `eDirectory Lookup Reconciliation Task` 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.
- You must create a scheduled task for each master lookup data reconciliation: group, role, and profile.
- 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	Sample/Default Value
AttrTask	Name of the attribute task	■ For organizations: o ■ For domain scope and organizational units: ou ■ For groups, roles, and profiles cn
LookupCodeName	Name of the lookup definition to which the values are to be reconciled	■ For organizational units and organizations: Lookup.EDIR.Organization ■ For domain scope: Lookup.EDIR.DomainScope ■ For groups: Lookup.EDIR.UserGroup ■ For roles: Lookup.EDIR.AssignedRole ■ For profiles: Lookup.EDIR.Profile
ITResourceName	Name of the IT resource for setting up a connection with Novell eDirectory	eDirectory IT Resource
SearchContext	Search context to be used for searching for users	o=PXED-DEV
ObjectClass	Name of the object class	■ For Organizational units and domain scope: OrganizationalUnit ■ For groups: group ■ For roles: rBSRole ■ For profiles: profile ■ For organizations: organization
CodeKeyLTrimStr	String value for left-trimming the value obtained from the search If there is nothing to be trimmed, then specify the value [NONE].	cn= or uid=
CodeKeyRTrimStr	String value for right-trimming the value obtained from the search If there is nothing to be trimmed, then specify the value [NONE].	,o=PXED-DEV
ReconMode	Specify REFRESH to completely refresh the existing lookup. Specify UPDATE if you want to update the lookup with new values.	REFRESH or UPDATE

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

User Reconciliation Scheduled Task You must specify values for the following attributes of the `eDirectory User Recon Task` 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	Sample/Default Value
`ITResourceName`	Name of the IT resource for setting up a connection with Novell eDirectory	`eDirectory IT Resource`
`ResourceObjectName`	Name of the resource object into which users need to be reconciled	`eDirectory User`
`XLDeleteUsersAllowed`	If this attribute is set to `true`, then the Delete reconciliation event is started when the scheduled task is run. Users who are deleted from the target system are removed from Oracle Identity Manager. This requires all the users on the target system to be compared with all the users in Oracle Identity Manager. **Note:** This process affects performance.	`true`
`UserContainer`	DN value from where users are reconciled into Oracle Identity Manager	`o=PXED-DEV`

`Keystore`	Directory path to the Novell eDirectory keystore
	This is required to make a secure SSL connection. If an SSL connection is not required, then specify the value `[NONE]`.
		`E:\j2sdk1.4.2_05\jre\lib\security\cacerts`
		or
		`[NONE]`

`TrustedSource`	Specifies whether or not trusted source reconciliation is to be performed The value can be `True` or `False`.	`False`
`Xellerate Type`	Default xellerate type for the Xellerate User	`End-User Administrator`
`Organization`	Default organization for the Xellerate User	`Xellerate Users`
Role	Default role for the Xellerate User	`Consultant`
`StartRecord`	Specifies the start record for batching process This attribute is also discussed in the "Batched Reconciliation" section on page 3-3.	`1`

Attribute	Description	Sample/Default Value
BatchSize	Specifies how many records must be there in a batch This attribute is also discussed in the "Batched Reconciliation" section on page 3-3.	3
NumberOfBatches	Specifies the number of batches that must be reconciled This attribute is also discussed in the "Batched Reconciliation" section on page 3-3.	Default value: All Available (for reconciling all the users) Sample value: 50

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

Stopping Reconciliation

Suppose the User Reconciliation Scheduled Task for the connector is running and user records are being reconciled. If you want to stop the reconciliation process:

1. Perform Steps 1 through 4 of the procedure to configure reconciliation scheduled tasks.
2. Select the **Stop Execution** check box in the task scheduler.
3. Click **Save**.

Configuring Provisioning

As mentioned earlier in this guide, provisioning involves creating or modifying a user's account information on the target system through Oracle Identity Manager. Refer to the "Supported Functionality" section on page 1-4 for a listing of the provisioning functions that are available with this connector.

This section discusses the following topics related to configuring provisioning:

- Compiling Adapters
- Enabling Provisioning of Users in Organizations and Organizational Units
- Provisioning Organizational Units, Groups, and Roles

Compiling Adapters

Note: You must perform the procedure described in this section if you want to use the provisioning features of the connector.

Adapters are used to implement provisioning functions. The following adapters are imported into Oracle Identity Manager when you import the connector XML file:

See Also: The "Supported Functionality" section on page 1-4 for a listing of the provisioning functions that are available with this connector

- eDir Create User

- eDir Delete User
- eDir Modify User
- eDir Move User
- eDir Add User to Group
- eDir Remove User from Group
- eDir Add Trustee Right to User
- eDir Remove Trustee Right from User
- eDir Add Assigned Role to User
- eDir Remove Assigned Role from User
- eDir Add Network Restriction
- eDir Remove Network Restriction
- eDir PP String
- Update eDirectory Role Details
- Update eDirectory Group Details
- EDIR Delete Group
- EDIR Create Group
- EDIR Remove User from Group
- Chk Process Parent Org eDir
- EDIR Create OU
- EDIR Remove User from Role
- EDIR Create Role
- EDIR Delete Role
- EDIR Move OU
- EDIR Change Org Name
- EDIR Delete OU

You must compile these adapters before they can be used in provisioning operations.

To compile adapters by using the Adapter Manager form:

1. Open the Adapter Manager form.
2. To compile all the adapters that you import into the current database, select **Compile All**.

   To compile multiple (but not all) adapters, select the adapters you want to compile. Then, select **Compile Selected**.

   Note: Click **Compile Previously Failed** to recompile only those adapters that were not compiled successfully. Such adapters do not have an OK compilation status.

3. Click **Start.** Oracle Identity Manager compiles the selected adapters.

4. If Oracle Identity Manager is installed in a clustered environment, then copy the compiled adapters from the *OIM_home*/xellerate/Adapter directory to the same directory on each of the other nodes of the cluster. If required, overwrite the adapter files on the other nodes.

If you want to compile one adapter at a time, then use the Adapter Factory form.

> **See Also:** *Oracle Identity Manager Tools Reference Guide* for information about using the Adapter Factory and Adapter Manager forms

To view detailed information about an adapter:

1. Highlight the adapter in the Adapter Manager form.
2. Double-click the row header of the adapter, or right-click the adapter.
3. Select **Launch Adapter** from the shortcut menu that is displayed. Details of the adapter are displayed.

Enabling Provisioning of Users in Organizations and Organizational Units

> **Note:** This section describes an optional procedure. You need not perform this procedure if you do not want to enable provisioning of users in organizations.

In the AttrName.Prov.Map.EDIR lookup definition, the following are default settings for enabling provisioning of users in organizational units:

- ldapOrgDNPrefix=ou
- ldapOrgUnitObjectClass=OrganizationalUnit

If you want to enable the provisioning of users in organizations, then change these settings as follows:

> **See Also:** *Oracle Identity Manager Design Console Guide* for detailed information about modifying lookup definitions

- ldapOrgDNPrefix=o
- ldapOrgUnitObjectClass=organization

Provisioning Organizational Units, Groups, and Roles

To provision an organizational unit:

1. Log in to the Oracle Identity Manager Administrative and User Console.
2. Expand **Organizations**.
3. Click **Create**.
4. Specify a name and the type for the organization that you want to create, and then click **Create Organization**.
5. Select **Resource Profile** from the list.
6. Click **Provision New Resource**.
7. Select the organizational unit option.

8. Click **Continue**, and then click **Continue** again.
9. From the IT server lookup field, select the resource object corresponding to the required IT resource.
10. Click **Continue**, and then click **Continue** again on the Verification page.

To provision a group or role:

1. Log in to the Oracle Identity Manager Administrative and User Console.
2. Expand **Organizations**.
3. Click **Manage**.
4. Search for the organizational unit under which you want to provision the group or role.
5. Select **Resource Profile** from the list.
6. Click **Provision New Resource**.
7. On this page, the option that must select depends on what you want to create:
   - Select the group option if you want to create a group.
   - Select the role option if you want to create a group.
8. Click **Continue**, and then click **Continue** again on the Verification page.
9. Enter a name for the group or role.
10. From the IT server lookup field, select the IT resource.
11. Click **Continue**, and then click **Continue** again on the Verification page.

Configuring the Connector for Multiple Installations of the Target System

Note: Perform this procedure only if you want to configure the connector for multiple installations of Novell eDirectory.

You may want to configure the connector for multiple installations of Novell eDirectory. The following example illustrates this requirement:

The Tokyo, London, and New York offices of Acme Multinational Inc. have their own installations of Novell eDirectory. The company has recently installed Oracle Identity Manager, and they want to configure Oracle Identity Manager to link all the installations of Novell eDirectory.

To meet the requirement posed by such a scenario, you must configure the connector for multiple installations of Novell eDirectory.

To configure the connector for multiple installations of the target system:

See Also: *Oracle Identity Manager Design Console Guide* for detailed instructions on performing each step of this procedure

1. Create and configure one resource object for each target system installation.

   The Resource Objects form is in the Resource Management folder. The `eDirectory User` resource object is created when you import the connector XML file. You can use this resource object as the template for creating the remaining resource objects.

2. Create and configure one IT resource for each resource object.

   The IT Resources form is in the Resource Management folder. The `eDirectory IT Resource` IT resource is created when you import the connector XML file. You can use this IT resource as the template for creating the remaining IT resources, of the same resource type.

3. Design one process form for each resource object.

   The Form Designer form is in the Development Tools folder. The following process forms are created when you import the connector XML file:

   - `UD_EDIR_USR` (main form, eDirectory User)
   - `UD_EDIR_GRP` (child form, eDirectory Security Group)
   - `UD_EDIR_ROL` (child form, eDirectory Assigned Role)
   - `UD_EDIR_NET` (child form, eDirectory Network Address Restriction)
   - `UD_EDIR_RIG` (child form, eDirectory Trustee Rights)

   You can use these process forms as templates for creating the remaining process forms.

4. Create and configure one process definition for each resource object.

   The Process Definition form is in the Process Management folder. The `iPlanet User` process definition is created when you import the connector XML file. You can use this process definition as the template for creating the remaining process definitions.

   While creating process definitions for each target system installation, the following steps that you must perform are specific to the creation of each process definition:

   - From the **Object Name** lookup field, select the resource object that you create in Step 1.
   - From the **Table Name** lookup field, select the process form that you create in Step 3.
   - While mapping the adapter variables for the IT Resource data type, ensure that you select the IT resource that you create in Step 2 from the **Qualifier** list.

5. Configure reconciliation for each target system installation. Refer to the "Configuring Reconciliation" section on page 3-1 for instructions. Note that only the values of the following attributes are to be changed for each reconciliation scheduled task:

   - `ITResourceName`
   - `ResourceObjectName`
   - `TrustedSource`

   Set the `TrustedSource` attribute to `True` for the Novell eDirectory installation that you want to designate as a trusted source.

6. If required, modify the fields to be reconciled for the Xellerate User resource object.

When you use the Administrative and User Console to perform provisioning, you can specify the IT resource corresponding to the Novell eDirectory installation to which you want to provision the user.

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:

- Running Test Cases
- Troubleshooting

Running Test Cases

You can use the testing utility to identify the cause of problems associated with connecting to the target system and performing basic operations on the target system.

To use the testing utility:

1. Specify the required values in the `global.properties` file.

   This file is in the *`OIM_home`*`/xellerate/eDir/troubleshoot` directory. The following table describes the sections of this file in which you must provide information for running the tests.

Section	Information
Novell eDirectory Server Parameters	Parameters required to connect to Novell eDirectory Refer to the "Defining IT Resources" section on page 2-7 for information about the values that you must provide.
Create User Parameters	Values required to create a user on the target system
Modify User Parameters	Values required to modify a user
Delete User Parameters	DN of the user to be deleted

2. Add the following to the `CLASSPATH` environment variable:

   ```
   OIM_home/xellerate/lib/xlLogger.jar
   OIM_home/xellerate/lib/xlUtils.jar
   OIM_home/xellerate/JavaTasks/eDirProv.jar
   OIM_home/xellerate/JavaTasks/ldap.jar
   OIM_home/xellerate/ext/log4j-1.2.9.jar
   ```

3. Create an ASCII-format copy of the `global.properties` file as follows:

   Note: You must perform this procedure every time you make a change in the contents of the `global.properties` file.

a. In a command window, change to the following directory:

   OIM_home/xellerate/eDir/troubleshoot

b. Enter the following command:

   ```
   native2ascii global.properties troubleshoot.properties
   ```

   The `troubleshoot.properties` file is created when you run the `native2ascii` command. The contents of this file are an ASCII-format copy of the contents of the `global.properties` file.

4. Run the following tests:

   - Enter the following command to create a Novell eDirectory user:

     ```
     java
     -DpropertyFile=OIM_home/xellerate/eDir/troubleshoot/troubleshoot.properties
     -Dlog4j.configuration=file:/OIM_home/xellerate/eDir/troubleshoot/log.proper
     ties TroubleShootingUtilityLdap createUser
     ```

   - Enter the following command to modify a Novell eDirectory user:

     ```
     java
     -DpropertyFile=OIM_home/xellerate/eDir/troubleshoot/troubleshoot.properties
     -Dlog4j.configuration=file:/OIM_home/xellerate/eDir/troubleshoot/log.proper
     ties TroubleShootingUtilityLdap modifyUser
     ```

   - Enter the following command to delete a Novell eDirectory user:

     ```
     java
     -DpropertyFile=OIM_home/xellerate/eDir/troubleshoot/troubleshoot.properties
     -Dlog4j.configuration=file:/OIM_home/xellerate/eDir/troubleshoot/log.proper
     ties TroubleShootingUtilityLdap deleteUser
     ```

Testing Partial Reconciliation

To test partial reconciliation, you can specify the following types of query conditions as values for the `CustomizedReconQuery` IT resource parameter:

- Value assigned to the `CustomizedReconQuery` parameter:

  `group=group1`

  Outcome: Records of users belonging to `group1` are reconciled.

- Value assigned to the `CustomizedReconQuery` parameter:

  `sn=Doe&group=group1`

  Outcome: Records of users with last name `Doe` and belonging to `group1` are reconciled.

- Query consisting of roles and basic attributes
  - Value assigned to the `CustomizedReconQuery` parameter:
    `sn=Doe&role=role1`

    Outcome: Users with last name `Doe` and who belong to `role1` are reconciled.
  - Value assigned to the `CustomizedReconQuery` parameter:
    `sn=Doe&role=role1,role2`

    Outcome: Users with last name `Doe` and who belong to both the roles `role1` and `role2` are reconciled.

- Value assigned to the CustomizedReconQuery parameter:

  `sn=Doe&group=group1&role=role1`

  Outcome: Records of users with last name `Doe` and who belong to `group1` as well as `role1` are reconciled.

Testing Batched Reconciliation

You can test reconciliation based on batching and data paging of user records by specifying values for the following user reconciliation scheduled task attributes:

- If you set the value of `StartRecord` to `1`, `BatchSize` to `0`, and `NumberOfBatches` to `All Available`, then all the users are reconciled.
- If you set the value of `StartRecord` to `1`, `BatchSize` to `5`, and `NumberOfBatches` to `50`, then the user records starting from record 1 are reconciled in 50 batches, with 5 records in each batch.
- If you set the value of `StartRecord` to `200`, `BatchSize` to `5`, and `NumberOfBatches` to `50`, then the users starting from record 200 are reconciled in 50 batches, with 5 records in each batch.

The results of batching are displayed in the logger file, which is located in the following path:

`JBOSS_HOME/server/default/log/server.log`

In this file, you can view the batch numbers, the user ids of the users that are reconciled, and whether the reconciliation is successful or not.

Troubleshooting

This section provides instructions for identifying and resolving some commonly encountered errors of the following types:

- Connection Errors
- Create User Errors
- Modify User Errors
- Delete User Errors

Connection Errors

The following table provides solutions to some commonly encountered connection errors.

Problem Description	Solution
Oracle Identity Manager cannot establish a connection to Novell eDirectory. **Returned Error Message:** Error encountered while connecting to target server **Returned Error Code:** `INVALID_CONNECTION_ERROR`	▪ Ensure that Novell eDirectory is running. ▪ Ensure that Oracle Identity Manager is running. ▪ Ensure that all the adapters have been compiled. ▪ Use the IT Resources form to examine the Oracle Identity Manager record. Ensure that the IP address, admin ID, and admin password are correct.

Problem Description	Solution
Target not available. **Returned Error Message:** Target server is not available **Returned Error Code:** TARGET_UNAVAILABLE_ERROR	Ensure that the specified Novell eDirectory connection values are correct.
Returned Error Message: Invalid or incorrect password **Returned Error Code:** AUTHENTICATION_ERROR	Ensure that the specified Novell eDirectory connection values are correct.

Create User Errors

The following table provides solutions to some commonly encountered Create User errors.

Problem Description	Solution
Oracle Identity Manager cannot create a user. **Returned Error Message:** Required information missing **Returned Error Code:** INSUFFICIENT_INFORMATION_PROVIDED	■ Ensure that the specified IP address, admin ID, and administrator password are correct. ■ Ensure that the following information has been provided: User ID User password User container User first name User last name
Oracle Identity Manager cannot create a user. **Returned Error Message:** User already exists **Returned Error Code:** USER_ALREADY_EXISTS	A user with the assigned ID already exists in Novell eDirectory.
Oracle Identity Manager cannot create a user. **Returned Error Message:** Naming exception encountered **Returned Error Code:** INVALID_NAMING_ERROR	■ Ensure that the specified Novell eDirectory connection values are correct. ■ Check if the value for an attribute violates the schema definition.
Oracle Identity Manager cannot create a user. **Returned Error Message:** Could not create user **Returned Error Code:** USER_CREATION_FAILED	The user cannot be created because one or more attribute values violate the schema definition.

Problem Description	Solution
The Create User function failed because a value was being added to a nonexistent attribute. **Returned Error Message:** Attribute does not exist **Returned Error Code:** ATTRIBUTE_DOESNOT_EXIST	In the AttrName.Prov.Map.EDIR lookup definition, check if the decode values are valid attribute names in the target system.
The Create User function failed because an invalid value was specified. **Returned Error Message:** Invalid value specified for an attribute **Returned Error Code:** INVALID_ATTR_VALUE_ERROR	Check the values specified during user creation.

Modify User Errors

The following table provides solutions to some commonly encountered Modify User errors.

Problem Description	Solution
Oracle Identity Manager cannot modify the value of a user. **Returned Error Message:** Invalid attribute value or state **Returned Error Code:** INVALID_ATTR_MODIFY_ERROR	Check the attribute ID and value that were specified.
The Modify User function failed because a value was being added to a nonexistent attribute. **Returned Error Message:** Attribute does not exist **Returned Error Code:** ATTRIBUTE_DOESNOT_EXIST	1. From the corresponding process task, get the value specified for AttrName of the connector. 2. Using the name obtained in the previous step, check in the AttrName.Prov.Map.EDIR lookup definition if the decode value is a valid attribute name in the target.
The Modify User function failed because an invalid value was specified. **Returned Error Message:** Invalid value specified for an attribute **Returned Error Code:** INVALID_ATTR_VALUE_ERROR	Check the value entered.

Problem Description	Solution
The Modify User function failed because a value was specified for an attribute that does not exist in the `AttrName.Prov.Map.EDIR` lookup definition. **Returned Error Message:** One or more attribute mappings are missing **Returned Error Code:** `ATTR_MAPPING_NOT_FOUND`	1. From the corresponding process task, get the value specified for `AttrName` of the connector. 2. Using the name obtained in the previous step, check if an entry has been made in the `AttrName.Prov.Map.EDIR` lookup definition.
Error caused because a duplicate value was specified for an attribute. **Returned Error Message:** Duplicate value encountered **Returned Error Code:** `DUPLICATE_VALUE_ERROR`	The attribute specified already exists for another user in the system.
Oracle Identity Manager cannot move a user from one container to another. **Returned Error Message:** Could not move user to a different container **Returned Error Code:** `USER_MOVE_FAILED`	Generic error. Review the log for more details.
Oracle Identity Manager cannot add a user to a security group. **Returned Error Message:** Group does not exist **Returned Error Code:** `SEC_GROUP_DOESNOT_EXIST`	The specified user security group does not exist in Novell eDirectory.
Oracle Identity Manager cannot add a user to a security group. **Returned Error Message:** Duplicate value encountered **Returned Error Code:** `DUPLICATE_VALUE`	The user is already a member of the specified security group.
Oracle Identity Manager cannot add the trustee right to a user. **Returned Error Message:** Duplicate value encountered **Returned Error Code:** `DUPLICATE_VALUE`	Check if the trustee right has already been assigned to the user in Novell eDirectory.

Problem Description	Solution
Oracle Identity Manager cannot add a role to a user. **Returned Error Message:** Role does not exist **Returned Error Code:** ROLE_DOESNOT_EXIST	The specified role for the user in Oracle Identity Manager does not exist in Novell eDirectory. Create the role in Novell eDirectory.
Oracle Identity Manager cannot add a role to a user. **Returned Error Message:** Could not update user **Returned Error Code:** USER_UPDATE_FAILED	Generic error. Review the log for more details.
Oracle Identity Manager cannot add a role to a user. **Returned Error Message:** Duplicate value encountered **Returned Error Code:** DUPLICATE_VALUE	The user has already been assigned this role.
Oracle Identity Manager cannot remove an assigned role from a user. **Returned Error Message:** Could not remove assigned role **Returned Error Code:** USER_DELETE_ASSIGNED_ROLE_FAILED	Generic error. Review the log for more details.
Oracle Identity Manager cannot add a network restriction. **Returned Error Message:** Duplicate value encountered **Returned Error Code:** DUPLICATE_VALUE	The specified network restriction already exists for this user in Novell eDirectory.

Delete User Errors

The following table provides solutions to a commonly encountered Delete User error.

Problem Description	Solution
Oracle Identity Manager cannot delete a user. **Returned Error Message:** User does not exist **Returned Error Code:** USER_DOESNOT_EXIST	The specified user does not exist in Novell eDirectory.

5

Known Issues

The following are known issues associated with this release of the connector:

- The user search operation is based only on the user ID.
- The user ID in the process form must be the same as that of the Oracle Identity Manager User login. Otherwise, reconciliation of the enable/disable status of the user and the organization update fails because these operations require direct API calls to update information.
- 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 were using the Japanese language and if the character limit for the target system fields were specified in bytes, then you would not be able to enter more than 25 characters in the same field.

A

Attribute Mappings Between Oracle Identity Manager and Novell eDirectory

The following table discusses attribute mappings between Oracle Identity Manager and Novell eDirectory.

Oracle Identity Manager Attribute	Novell eDirectory Attribute	Description
Logon Script	loginScript	Login script that is used to log in to Novell eDirectory
Communication Language	language	Language of communication
ldapOrgDNPrefix	ou	Organizational unit for organization
ldapPassword	userPassword	Password
ldapOrgPersonObject	OrganizationalPerson	Object class
Timezone	timezone	Time zone of the Novell eDirectory system
ldapRoleObjectClass	rBSRole	Object class of role
ldapRoleDNPrefix	cn	Role object
Profile	profile	Profile
loginDisabled	loginDisabled	Disabled status login
ldapUserUniqueAttr	cn	User name attribute
ldapUserObjectClass	inetOrgPerson	Object class
ldapUserDNPrefix	cn	User object
ldapUserDisableAttr	loginDisabled	Login disable attribute
ldapObjectClass	objectclass	Object class
ldapGroupObjectClass	group	Object class of group
ldapGroupMemberAttr	groupMembership	Group member attribute
ldapGroupDNPrefix	cn	Group object
ldapFirstName	givenName	First name
ldapLastName	sn	Last name
Title	title	Title
Location	l	Location
Telephone	telephoneNumber	Telephone number
Email	mail	Email address

Oracle Identity Manager Attribute	Novell eDirectory Attribute	Description
Department	departmentNumber	Department number
Middle Name	initials	Initials
User ID	cn	User ID
Organization Unit	o	Organizational unit
ldapOrgUnitObjectClass	ldunit	Object class of organizational unit
ldapTargetResourceTimeStampField	modifyTimestamp	Time stamp of the Novell eDirectory system
ldapMultiValAttr	Security Group, Group Name|Trustee Rights, Trustee Rights|Role, Role Name|Network Address, NetAdd	Multivalue attribute
Trustee Rights	ACL	Trustee rights
Role Name	rBSAssignedRoles	User role
NetAdd	networkAddressRestriction	Network address that is restricted for the user
First Name	givenname	First name
Last Name	sn	Last name

Index

M

O

P

R

S

T

U

X