Oracle® Identity Manager

Connector Guide for UNIX Telnet

Release 9.0.4

E10448-11

September 2013

ORACLE®

Oracle Identity Manager Connector Guide for UNIX Telnet, Release 9.0.4

E10448-11

Primary Author: Gauhar khan

Contributing Authors: Gowri.G.R, Prakash Hulikere, Sridhar Machani

Contents

2 Deploying the Connector

3 Using the Connector

List of Figures

List of Tables

Preface

This guide describes the connector that is used to integrate Oracle Identity Manager with UNIX Telnet.

Audience

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

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

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 Fusion Middleware User's Guide for Oracle Identity Manage*r.

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

http://download.oracle.com/docs/cd/E14571_01/im.htm

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

http://download.oracle.com/docs/cd/E22999_01/index.htm

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 UNIX Telnet?

This chapter provides an overview of the updates made to the software and documentation for the UNIX Telnet connector in release 9.0.4.15.

Note: Release 9.0.4.15 of the connector comes after release 9.0.4.12. Release numbers 9.0.4.13 and 9.0.4.14 have not been used.

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 9.0.4.2
- Software Updates in Release 9.0.4.3
- Software Updates in Release 9.0.4.4
- Software Updates in Release 9.0.4.5
- Software Updates in Release 9.0.4.6
- Software Updates in Release 9.0.4.7
- Software Updates in Release 9.0.4.11
- Software Updates in Release 9.0.4.12
- Software Updates in Release 9.0.4.15

Software Updates in Release 9.0.4.2

The following are software updates in release 9.0.4.2:

- Changes to the Testing Utility
- Enable User function Is supported on HP-UX Trusted Server

- Other Changes
- Resolved Issues

Changes to the Testing Utility

In Chapter 5, "Testing and Troubleshooting," the following attributes have been added to the list of testing utility attributes:

- `passwdMirrorFilePath`: This parameter is used to specify the passwd mirror file path for reconciliation.
- `shadowMirrorFilePath`: This parameter is used to specify the shadow mirror file path for reconciliation.
- `targetDateFormat`: This parameter is used to specify the date format of the target UNIX computer.

The action attribute now supports additional parameters. The values can be any one of the following:

- `CONNECT`
- `CREATE`
- `CHANGEPASSWORD`
- `MODIFY`
- `DELETE`
- `DISABLE`
- `ENABLE`
- `ENABLETRUSTED` (only for HP-UX trusted mode)

Enable User function Is supported on HP-UX Trusted Server

Corresponding changes have been made in the following sections:

- Supported Functionality on page 1-3
- Chapter 6, "Known Issues" on page 6-1

Other Changes

The following are the other software changes made in this release:

- In the Section 2.5.4, "Enabling Logging", the name of the adapter for this connector has been changed from `ADAPTERS.TELNETSSH` to `OIMCP.TELNETSSH`.
- In the "Compiling Adapters" section, the `SSH updateHomeDir` adapter has been added to the list of adapters.
- In the IT resource definition, the following parameters have been removed:
  - `Login Prompt`
  - `Password Prompt`
  - `Target Locale`
  - `Supported Character Encoding (en_US) - Target`

  The following scheduled task attributes have been converted into IT resource parameters:
  - `Passwd Mirror File/User Mirror File`

- Shadow Mirror File
- Target Date Format

Resolved Issues

The following table lists issues resolved from release 9.0.4.1 to this release of the connector:

Bug Number	Issue	Resolution
6375896	Target resource reconciliation threw exceptions when users were reconciled from Linux using a SUDO admin user.	Target resource reconciliation issues related to Linux used in the SUDO mode have been resolved.
6609731	The Supported Character Encoding and Target Locale IT resource parameters were not used by the connector.	The Supported Character Encoding and Target Locale IT resource parameters have been removed.
6642345	The connection retry feature of the connector was not working correctly.	Issues related to the connection retry feature have been resolved.
6680047	If a connection retry attempt was made, then previous sessions were not released and new sessions were established each time.	Connectivity issues related to session leakage have been resolved.
6728741	An incorrect response was received from the connector if the username value was greater than 8 characters and the Create Home directory check box was selected.	The responses received from the connector have been corrected.
6742869	A user could not be provisioned if there were spaces in value of the GECOS field.	Spaces are now allowed in the GECOS field.
6766705 and 6801405	The status of the resource object stayed at Provisioned even when provisioning tasks were rejected.	Issues related to the resource object status and response during provisioning have been resolved.
6786399	The connector was unable to handle responses from target systems running a non-English locale.	Responses from target systems running a non-English locale are now handled correctly.
6801537	During reconciliation, temporary files were created in the /etc directory.	During reconciliation, temporary files are now created in the /tmp folder.
6837471	A user could not be provisioned with spaces in the values of any of the user attributes.	Spaces are now allowed in many of the user attributes.
5180204	On AIX computers, the connector was not able to reconcile a large number of records.	Issues related to the reconciliation of a large number of users on AIX have been resolved.
5502324	Date format parsing errors were encountered during reconciliation.	The date format parsing error that was encountered during the user reconciliation has been resolved.
5503100	The message displayed when the user name had multibyte characters during a Create User provisioning operation was incorrect.	The message displayed when the user name has multibyte characters during a Create User provisioning operation has been modified.
5647992	On Linux, Solaris, and AIX computers, the Home Directory attribute could not be updated.	The Home Directory attribute is updated correctly on Linux, Solaris, and AIX targets.
5180227	The IT Resources contained two redundant parameters, Login Prompt and Password Prompt.	The Login Prompt and Password Prompt IT resource parameters have been deleted.

Bug Number	Issue	Resolution
6604117	The Password and Confirm Password fields on the process form were not encrypted.	The Password and Confirm Password fields have been modified to accept encrypted values.
6310073	During provisioning, if user creation on the target system failed at some stage, then the user was not cleaned up from the target system although the status of the resource was `Provisioning`. When this happened, another user with the same name could not be provisioned.	During provisioning, if the user is not created properly on the target, then the user is deleted from the target system and the resource object status is set to `Provisioning`.

Software Updates in Release 9.0.4.3

The following updates have been made in release 9.0.4.3:

- The `Primary Group Name` field on the process form has been converted into a lookup field. During a provisioning operation, you can now select a primary group instead of entering the name of the group. The `TelnetSSHGroupLookupReconTask` scheduled task has been added to reconcile (synchronize) the values in the lookup definition with primary group names in the target system.
- The name of the target resource reconciliation scheduled task has been changed from `Telnet User Non Trusted Reconciliation task` to `Telnet Target Resource User Reconciliation Task`.
- The level of detail has been increased for data logged when you set the log level to DEBUG. With this log level, it is now easier to track down the cause of an error recorded in the log file.
- In Chapter 6, "Known Issues," the following point has been added:

  Bug 7172629

  For a particular provisioning operation or reconciliation run, if the connector fails to establish a connection with the target system, then subsequent retries to establish a connection would fail. The number of retries is determined by the value specified for the `MaxRetry` IT resource parameter.

  After the cause of the connection failure is corrected, the connection attempt is successful for the next provisioning operation or reconciliation run.

- The following table lists issues resolved from release 9.0.4.1 to this release of the connector:

Bug Number	Issue	Resolution
7121688	On AIX 5.3, the `TELNET_USERUID_SIZE_FAIL` or `TELNET_USER_FAIL` exception was thrown if you tried to update the User Login attribute through a provisioning operation.	This issue has been resolved. You can now update the User Login attribute through a provisioning operation. **Note:** The Update User Login provisioning operation is not supported by default on AIX 4.x and 5.1. However, if you upgrade these versions of AIX to support the useradd, usermod, and userdel commands, then you can perform the Update User Login provisioning operation.
7143486	If a reconciliation run ended in an exception, then the connection with the target system was not closed.	This issue has been resolved. The connection with the target system is closed even if a reconciliation run ends in an exception.

Software Updates in Release 9.0.4.4

The following is a software update in release 9.0.4.4:

- Using the Connector Installer

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 Section 2.4, "Installing the Connector on Oracle Identity Manager Release 9.1.0.1 or Release 11.1.1" for details.

Software Updates in Release 9.0.4.5

The following are software updates in release 9.0.4.5:

- Changes in the IT Resource
- Resolved Issues in Release 9.0.4.5

Changes in the IT Resource

In the IT resource, the `Whether SUDO Admin Mode` parameter has been renamed to `Sudo Or RBAC`.

See Chapter 2, "Deploying the Connector" for information about these parameters.

Resolved Issues in Release 9.0.4.5

The following table lists issues resolved in release 9.0.4.5:

Bug Number	Issue	Resolution
5503263	The "Create Home Directory" field is a check box on the Administrative and User Console. If you selected this check box, the numeral 1 was displayed on the page that summarizes input you provide during provisioning operations.	The check box has been changed to a radio button. If you select the "Create Home Directory" option, then the word "Yes" is displayed on the page that summarizes input. If you do not select the option, then the word "No" is displayed.
7172629	The `Max Retries` parameter of the IT resource was not used when the connection between Oracle Identity Manager and the target system failed.	If the connection fails, then the connector attempts to reestablish a connection up to the number of times specified by the `Max Retries` parameter.
7210292	The home directory of a Telnet account was not deleted when you revoked the account.	The home directory of a Telnet account is deleted when you revoke the account.
7225692	To stop a scheduled task, you use the Stop Execution option in the Design Console. This option did not work in earlier releases.	You can now use the Stop Execution option to stop scheduled tasks. **Note**: When you stop a batched reconciliation run, reconciliation stops at the end of the current batch.
7237286	A Telnet account could not be provisioned on the Linux target system.	You can now provision Telnet accounts on the Linux target system.

Software Updates in Release 9.0.4.6

The following table lists issues resolved in release 9.0.4.6:

Bug Number	Issue	Resolution
7503701	The target system does not allow you to delete a user who is logged in to the system. This is expected behavior. However, even when the target system did not allow the deletion of a user, the status of the user (resource) on Oracle Identity Manager was changed to Deleted (Revoked).	This issue has been resolved. If the target system does not allow the deletion of a user, then an appropriate message is displayed as the outcome of the Delete User provisioning operation. The item describing this issue has been removed from the Chapter 6, "Known Issues".

Software Updates in Release 9.0.4.7

The following are software updates in release 9.0.4.7:

- Support for New Target System
- Resolved Issues

Support for New Target System

From this release onward, the connector adds supports for Oracle Enterprise Linux 5.2 as a target system.

This target system version is mentioned in "Verifying Deployment Requirements" on page 2-1.

Resolved Issues

The following table lists issues resolved in release 9.0.4.7:

Bug Number	Issue	Resolution
7520249	During reconciliation, you could not transform values of the target system field before they were stored in Oracle Identity Manager.	This issue has been resolved. You can now transform the values of the target system fields before they are stored in Oracle Identity Manager. See the "Transforming Data Reconciled Into Oracle Identity Manager" section for more information.
7563415	During reconciliation, the Group Name field was reconciled as a number and not as the exact name because it was stored directly as the group ID in the target system.	This issue has been resolved. During reconciliation, the exact name of the Group Name field is reconciled.
8396795	During connector deployment, the lib/xliTenet.jar file on the installation media was not automatically copied into the *OIM_HOME*/xellerate/ScheduleTask directory.	This issue has been resolved. The lib/xliTelnet.jar file is now automatically copied to the *OIM_HOME*/xellerate/ScheduleTask directory.

Software Updates in Release 9.0.4.11

The following table lists issues resolved in release 9.0.4.11:

Bug Number	Issue	Resolution
9100879	The Delete User provisioning operation did not work.	This issue has been resolved. The Delete User provisioning operation now works correctly.
9195323	The Create User provisioning operation failed when it was retried.	This issue has been resolved. The Create User provisioning operation can be retried.

Software Updates in Release 9.0.4.12

The following are the software updates in release 9.0.4.12:

- Support for New Oracle Identity Manager Release
- Support for Request-Based Provisioning
- Support for New Target System
- Support for User Account Status Reconciliation
- Resolved Issues in Release 9.0.4.12

Support for New Oracle Identity Manager Release

From this release onward, the connector can be installed and used on Oracle Identity Manager 11*g* release 1 (11.1.1). Where applicable, instructions specific to this Oracle Identity Manager release have been added in the guide.

See Section 1.1, "Certified Components" for the full list of certified Oracle Identity Manager releases.

Support for Request-Based Provisioning

From this release onward, the connector provides support for request-based provisioning on Oracle Identity Manager 11*g* release 1 (11.1.1).

See Section 3.6.2, "Request-Based Provisioning" for more information.

Support for New Target System

From this release onward, the connector adds support for IBM AIX 5L Version 6.1 as the target system.

See Section 1.1, "Certified Components" for the full list of certified target systems.

Support for User Account Status Reconciliation

From this release onward, the connector can reconcile user account status information from the target system.

Resolved Issues in Release 9.0.4.12

The following table lists issues resolved in release 9.0.4.12:

Bug Number	Issue	Resolution
7374688	Reconciliation of user records in the sudo mode failed because the connector attempted to run a shell.	This issue has been resolved.
9295029	When an update task failed, the status of the corresponding process task adapters changed from `Provisioned` to `Provisioning`.	This issue has been resolved. The status of the process task adapters do not change when the corresponding update task fails.

Bug Number	Issue	Resolution
9611960	When performing a Create User provisioning operation on AIX, the group name must be specified as the value of the Primary Group Name lookup field. However, instead of displaying group names, the Primary Group Name lookup field displayed group IDs. The happened due to the following reason: After performing lookup field synchronization by running the TelnetSSHGroupLookupReconTask scheduled task, the Code Key column of the UD_Lookup_SSH_PrimaryGroupNames lookup definition contained the group IDs, and the Decode column contained the group names.	This issue has been resolved. After you perform lookup field synchronization, the connector now reconciles group names into the Code Key column, and group IDs into the Decode column of the UD_Lookup_SSH_PrimaryGroupNames lookup definition. Therefore, for AIX and the other target systems, the connector passes the group name instead of the group ID.
9611211	The Confirm Password field on the process form required users to enter their passwords 2 times.	The Confirm Password field has been removed from the process form.

Software Updates in Release 9.0.4.15

The following are software updates implemented in release 9.0.4.15:

- Support for New Target System
- Support for Importing Request Dataset XML Files
- Resolved Issues in Release 9.0.4.15

Support for New Target System

From this release onward, the connector adds support for HP-UX version 11iv3 (11.31) as the target system.

See Section 1.1, "Certified Components", for the full list of certified target systems.

Support for Importing Request Dataset XML Files

From this release onward, the connector provides support for importing a request dataset XML file into Oracle Identity Manager by using the Deployment Manager on Oracle Identity Manager 11*g* release 1 (11.1.1).

The installation media of this release includes a request dataset file, TelnetConnectorRequestDatasets.xml, which is available in the xml directory.

See Section 2.5.5.1, "Importing Request Datasets Using Deployment Manager" for more information.

Resolved Issues in Release 9.0.4.15

The following table describes issues resolved in release 9.0.4.15:

Bug Number	Issue	Resolution
11737066	When running the SSH User Target Resource Reconciliation Task, if the number of users to be reconciled is greater than the batch size, an exception is thrown.	This issue has been resolved. The reconciliation task runs successfully for multiple batches.

Bug Number	Issue	Resolution
7498112	The connector did not support HP-UX11I V2,V3 as a target resource.	.This issue has been resolved. HP-UX11I V2,V3 is now supported as a target resource.

Documentation-Specific Updates

The following sections discuss documentation-specific updates:

Documentation-Specific Updates in Releases 9.0.4.1 Through 9.0.4.4

The following documentation-specific updates have been made in releases 9.0.4.1 through 9.0.4.4:

- In Section 2.3.2, "Configuration Steps for AIX," the command to create a user mirror file on the server has been changed.
- In Section 2.3.3, "Configuration Steps for HP-UX," the procedure has been modified.
- In the "Compiling Adapters" section on page 3-9, the list of adapters has been updated.
- Changes have been made in the following sections:
  - Adding Custom Attributes for Reconciliation
  - Adding Custom Attributes for Provisioning
- In Chapter 6, "Known Issues," the following items have been added:

  A reconciliation run stops if the scheduled task code encounters target system user data containing the character or characters that are same as the shell prompt of the target system.
- From Chapter 6, "Known Issues," the following item has been removed:

  When you configure an IT resource for a Telnet user account and then directly provision it to a user, the Create User Task function is rejected. The user account is not created on the target system. The following message is displayed:

  "`TELNET_USERCREATION_NOTCONNECTED_FAIL not able to connect successfully to the Target System Server`".

Documentation-Specific Updates in Release 9.0.4.5

The following are documentation-specific updates in release 9.0.4.5:

- In Chapter 2, "Deploying the Connector," the `Protocol` parameter has been added in the table that describes the IT resource parameters.
- In Chapter 6, "Known Issues":

- Bug numbers have been added for all the known issues.
- The following guidelines have been moved from Chapter 6, "Known Issues" to other parts of this guide:
  - This connector does not support logins that differ by case only. It also requires all logins to be distinct considering that their values are automatically converted to uppercase by Oracle Identity Manager.

    For example, the user logins `jdoe` and `JDOE` would be considered different on a UNIX server. However, from Oracle Identity Manager, the input would always be passed as `JDOE`, because user ID values are stored only in uppercase in Oracle Identity Manager.
  - During provisioning, the maximum permitted date value for account expiry is 31/12/2099.
- The following point has been removed from Chapter 6, "Known Issues":
  - The Update Secondary Group Names and Update User Login functions do not work simultaneously.

Documentation-Specific Updates in Release 9.0.4.6

At some places in this guide, corrections have been made to address some documentation issues.

Documentation-Specific Updates in Release 9.0.4.7

The following are documentation-specific updates in release 9.0.4.7:

- Changes have been made in the following sections:
  - Section 2.3.3, "Configuration Steps for HP-UX"
  - Scheduled Tasks for Trusted Source and Target Resource Reconciliation
- Section 4.4, "Transforming Data Reconciled Into Oracle Identity Manager" has been added.
- The following point has been removed from Chapter 6, "Known Issues":

  During reconciliation, the Group Name field is reconciled as a number and not as the exact name because it is stored directly as the group ID in the target system.
- The following appendixes have been added:
  - Appendix A, "Privileges Required for Performing Provisioning and Reconciliation"
  - Appendix B, "Sample Transformation Class"

Documentation-Specific Updates in Release 9.0.4.11

The following are documentation-specific updates in release 9.0.4.11:

- 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" for the complete listing of certified components

Documentation-Specific Updates in Release 9.0.4.12

Major changes have been made to the structure of the guide. The objective of these changes is to synchronize the guide with the changes made to the connector and to improve the usability of the information provided by the guide.

Documentation-Specific Updates in Release 9.0.4.15

The following is documentation-specific updates in release 9.0.4.15:

- In Chapter 2, "Deploying the Connector", Table 2–1, " Files and DIrectories on the Installation Media" has been updated.
- In Chapter 2, "Deploying the Connector", Section 2.4.2, "Copying the sshfactory.jar File" has been added.
- In Chapter 2, "Deploying the Connector", Section 2.4.4, "Copying the Configuration Files" has been added.
- In Chapter 2, "Deploying the Connector", Section 2.5.5.1, "Importing Request Datasets Using Deployment Manager" has been modified.
- In Section 2.4.3, "Configuring the IT Resource", the table values have been updated.
- In Chapter 3, "Using the Connector", Table 3–2, " Attributes of the User Reconciliation Scheduled Tasks" has been updated.
- In Chapter 3, "Using the Connector", Section 3.5, "Guidelines on Performing Provisioning Operations" has been updated.
- In Chapter 4, "Extending the Functionality of the Connector," Section 4.4, "Transforming Data Reconciled Into Oracle Identity Manager" has been modified.
- In Chapter 5, "Testing and Troubleshooting," expiry date format has been added in the table.
- In Chapter 5, "Testing and Troubleshooting," a note on testing utility has been added.
- The directory path in step 4 of section Section 2.5.1, "Configuring the Target System As a Trusted Source" has been changed.

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 external, identity-aware applications. This guide discusses the connector that enables you to integrate Oracle Identity Manager with target systems running AIX, HP-UX, Linux, and Solaris, using the Telnet protocol. This connector enables you to use the target system as a managed (target) resource or as an authoritative (trusted) source of identity data for Oracle Identity Manager.

In the account management (target resource) mode of the connector, information about users created or modified directly on the target system can be reconciled into Oracle Identity Manager. In addition, you can use Oracle Identity Manager to perform provisioning operations on the target system.

In the identity reconciliation (trusted source) configuration of the connector, users are created or modified only on the target system and information about these users is reconciled into Oracle Identity Manager.

This chapter contains the following sections:

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

1.1 Certified Components

Table 1–1 lists the certified components for this connector.

Table 1–1 Certified Components

Item	Requirement
Oracle Identity Manager	You can use one of the following releases of Oracle Identity Manager: ■ Oracle Identity Manager release 9.1.0.1 or later **Note:** In this guide, **Oracle Identity Manager release 9.1.0.*x*** has been used to denote Oracle Identity Manager release 9.1.0.1 and future releases in the 9.1.0.*x* series that the connector will support. ■ Oracle Identity Manager 11*g* release 1 (11.1.1) **Note:** In this guide, **Oracle Identity Manager release 11.1.1** has been used to denote Oracle Identity Manager 11*g* release 1 (11.1.1).
Target systems	The target system can be any one of the following: ■ HP-UX 11.11, 11.20, 11.31 ■ IBM AIX 5L Version 5.2, 5.3, 6.1 ■ Oracle Enterprise Linux 5.2 ■ Red Hat Enterprise Linux AS 2.1, 3, 4.x, Red Hat Enterprise Linux ES 3, 4.x ■ Solaris 8, 9, 10 **Note:** See the "Supported Shell Types" section for information about the supported shell types for the preceding operating systems.
Target system user account	root You provide the credentials of this user account while configuring the IT resource. The procedure is described later in this guide. If you do not provide the credentials of this user account, then the "Insufficient rights or privileges" message is displayed when Oracle Identity Manager tries to communicate with the target system.
External code	JSCAPE Telnet/SSH Libraries (SSH factory)
Character encoding supported by the target system	The target system must support the default C (POSIX) locale. Use the following command to check the locale that the target system supports: `locale -a`
Other systems	Operating system patches (HP-UX)
JDK	The JDK version can be one of the following: ■ For Oracle Identity Manager release 9.1.0.*x*, use JDK 1.5 or later in the 1.5 series. ■ For Oracle Identity Manager release 11.1.1, use JDK 1.6 update 18 or later, or JRockit JDK 1.6 update 17 or later.

Supported Shell Types

The supported shell types for various operating systems are given in the following table.

Solaris	HP-UX	Linux	AIX
sh	csh	ksh	csh
csh	ksh	bash	ksh
-	sh	sh	sh
-	-	csh	-

1.2 Certified Languages

The connector supports the following languages:

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

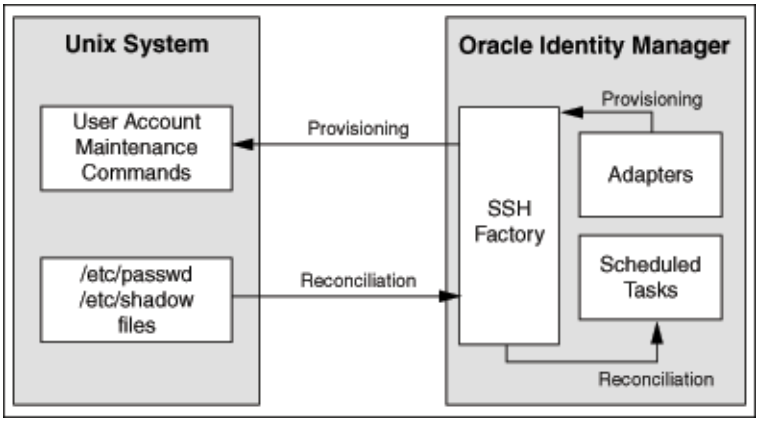
Note: The connector does not support the entry of multibyte characters in some of the fields.

See Also: *oracle Fusion Middleware Developer's Guide for Oracle Identity Manager* for information about supported special characters

1.3 Connector Architecture

This connector enables management of target system accounts through Oracle Identity Manager. Figure 1–1 shows the architecture of the connector.

Figure 1–1 Architecture of the Connector



The architecture of the connector can be explained in terms of the connector operations it supports:

- Section 1.3.1, "Reconciliation Process"
- Section 1.3.2, "Provisioning Process"

1.3.1 Reconciliation Process

This connector can be configured to perform either trusted source reconciliation or target resource reconciliation.

When you configure the target system as a target resource, the connector enables you to create and manage target accounts for OIM Users through provisioning. In addition, data related to newly created and modified target system accounts can be reconciled and linked with existing OIM Users and provisioned resources.

When you configure the target system as a trusted source, the connector fetches into Oracle Identity Manager, data about newly created or modified target system accounts. This data is used to create or update OIM Users.

> **See Also:** For conceptual information about target resource reconciliation and trusted source reconciliation, see one of the following guides:
>
> - For Oracle Identity Manager release 9.1.0.*x*: *Oracle Identity Manager Connector Concepts*
> - For Oracle Identity Manager release 11.1.1: *Oracle Fusion Middleware User's Guide for Oracle Identity Manager*

The following is an overview of the steps involved in reconciliation:

> **Note:** In Oracle Identity Manager release 11.1.1, a scheduled job is an instance of a scheduled task. In this guide, the term **scheduled task** used in the context of Oracle Identity Manager release 9.1.0.*x* is the same as the term **scheduled job** in the context of Oracle Identity Manager release 11.1.1.
>
> See *Oracle Fusion Middleware Administrator's Guide for Oracle Identity Manager* for more information about scheduled tasks and scheduled jobs.

1. The scheduled task is run at the time or frequency that you specify. This scheduled task contains details of the mode of reconciliation (trusted source or target resource) that you want to perform.
2. The scheduled task establishes a connection with the target system by using the SSH Factory.
3. The scheduled task performs the following tasks:
   - Reads the values that you set for the task attributes.
   - Reads the differences in the etc/passwd, /etc/shadow and their corresponding mirror files to determine user records to be fetched into Oracle Identity Manager.
   - Fetches user records into Oracle Identity Manager.
4. If you have configured your target system as a trusted source, then:
   a. Each user record fetched from the target system is compared with existing OIM Users. The reconciliation rule is applied during the comparison process. See Section 1.7.2, "Reconciliation Rule for Trusted Source Reconciliation" for information about the reconciliation rule.

b. The next step of the process depends on the outcome of the matching operation:

   – If a match is found between the target system record and the OIM User, then the OIM User attributes are updated with changes made to the target system record.

   – If no match is found, then the target system record is used to create an OIM User.

5. If you have configured your target system as a target resource, then:

   a. Each user record fetched from the target system is compared with existing target system resources assigned to OIM Users. The reconciliation rule is applied during the comparison process. See Section 1.6.2, "Reconciliation Rule for Target Resource Reconciliation" for information about the reconciliation rule.

   b. The next step of the process depends on the outcome of the matching operation:

      – If a match is found between the target system record and a resource provisioned to an OIM User, then the database user resource is updated with changes made to the target system record.

      – If no match is found, then the target system user record is compared with existing OIM Users. The next step depends on the outcome of the matching operation:

        If a match is found, then the target system record is used to provision a resource for the OIM User.

        If no match is found, then the status of the reconciliation event is set to No Match Found.

1.3.2 Provisioning Process

See Also: For conceptual information about provisioning, see one of the following guides:

- For Oracle Identity Manager release 9.1.0.*x*: *Oracle Identity Manager Connector Concepts*
- For Oracle Identity Manager release 11.1.1: *Oracle Fusion Middleware User's Guide for Oracle Identity Manager*

Provisioning involves creating and managing user accounts. When you allocate (or provision) a UNIX SSH resource to an OIM User, the operation results in the creation of an account on the target system for that user. Similarly, when you update the resource on Oracle Identity Manager, the same update is made to the account on the target system.

The provisioning process can be started through one of the following events:

- Direct provisioning

  The Oracle Identity Manager administrator uses the Administrative and User Console to create a target system account for a user.

- Provisioning triggered by access policy changes

An access policy related to accounts on the target system is modified. When an access policy is modified, it is reevaluated for all users to which it applies.

- Request-based provisioning

Note: Request-based provisioning can be performed only on Oracle Identity Manager release 11.1.1.

In request-based provisioning, an individual creates a request for a target system account. The provisioning process is completed when an OIM User with the required privileges approves the request and provisions the target system account to the requester.

During provisioning operations, adapters carry provisioning data submitted through the process form to the SSH factory, which in turn submits the provisioning data to the target system. The user account maintenance commands accept provisioning data from the adapters, carry out the required operation on the target system, and return the response from the target system to the adapters. The adapters return the response to Oracle Identity Manager.

1.4 Features of the Connector

1.4.1 Support for Both Target Resource and Trusted Source Reconciliation

You can use the connector to configure the target system as either a target resource or trusted source of Oracle Identity Manager.

See Section 3.3, "Configuring Reconciliation" for more information.

1.4.2 Support for Limited Reconciliation

You can set a reconciliation filter as the value of the UserNameFilter attribute of the scheduled tasks. This filter specifies the subset of newly added and modified target system records that must be reconciled.

See Section 3.3.2, "Limited Reconciliation" for more information.

1.4.3 Support for Batched Reconciliation

You can break down a reconciliation run into batches by specifying the number of records that must be included in each batch.

See Section 3.3.3, "Batched Reconciliation" for more information.

1.4.4 Support for Both Full and Incremental Reconciliation

After you deploy the connector, you can perform full reconciliation to bring all existing user data from the target system to Oracle Identity Manager. After the first full reconciliation run, incremental reconciliation is automatically enabled from the next run of the user reconciliation.

You can perform a full reconciliation run at any time. See Section 3.3.1, "Full Reconciliation" for more information.

1.4.5 Support for Adding Custom Attributes for Reconciliation and Provisioning

If you want to add custom attributes for reconciliation and provisioning, then perform the procedures described in Chapter 4, "Extending the Functionality of the Connector."

1.4.6 Transformation of Account Data

You can configure transformation of account data that is brought into Oracle Identity Manager during reconciliation.

See Section 4.4, "Transforming Data Reconciled Into Oracle Identity Manager" for more information.

1.4.7 Support for Reconciliation of User Status from the Target System

From this release onward, the connector can reconcile user account status information from the target system

1.5 Lookup Definitions Used During Connector Operations

Lookup definitions used during connector operations can be divided into the following categories:

- Section 1.5.1, "Lookup Definitions Synchronized with the Target System"
- Section 1.5.2, "Other Lookup Definitions"

1.5.1 Lookup Definitions Synchronized with the Target System

During a provisioning operation, you use a lookup field on the process form to specify a single value from a set of values. For example, you use the Primary Group Name lookup field to select a group name for the user's initial login group. When you deploy the connector, lookup definitions corresponding to the lookup fields on the target system are automatically created in Oracle Identity Manager. Lookup field synchronization involves copying additions or changes made to the target system lookup fields into the lookup definitions in Oracle Identity Manager.

The UD_Lookup_Telnet_PrimaryGroupNames lookup definition is populated with group names fetched from the target system by the scheduled task for lookup field synchronization.

See Also: Section 3.2, "Scheduled Task for Lookup Field Synchronization" for information about this scheduled task

1.5.2 Other Lookup Definitions

Table 1–2 describes the other lookup definitions that are created in Oracle Identity Manager when you deploy the connector. These lookup definitions are either

prepopulated with values or values must be manually entered in them after the connector is deployed.

Table 1–2 Other Lookup Definitions

Lookup Definition	Description of Values	Method to Specify Values for the Lookup Definition
Lookup.Unix.Configuration	This lookup definition maps statuses of users accounts in the target system with the corresponding statuses to be displayed in the Status field of the OIM User form.	This lookup definition is preconfigured. It is used for performing user account status reconciliation. You cannot add or modify entries in this lookup definition.
Lookup.Reconciliation.TransformationMap	This lookup definition is used to configure transformation of attribute values that are fetched from the target system during user reconciliation.	You manually create entries in this lookup definition. See Section 4.4, "Transforming Data Reconciled Into Oracle Identity Manager" for more information.

1.6 Connector Objects Used During Target Resource Reconciliation and Provisioning

The following sections provide information about connector objects used during target resource reconciliation and provisioning:

> **See Also:** The "Reconciliation" section in *Oracle Identity Manager Connector Concepts* for conceptual information about reconciliation

The following sections provide information about connector objects used during reconciliation:

- Section 1.6.1, "User Attributes for Target Resource Reconciliation and Provisioning"
- Section 1.6.2, "Reconciliation Rule for Target Resource Reconciliation"
- Section 1.6.3, "Reconciliation Action Rules for Target Resource Reconciliation"
- Section 1.6.4, "Provisioning Functions"

1.6.1 User Attributes for Target Resource Reconciliation and Provisioning

Table 1–3 provides information about user attribute mappings for target resource reconciliation and provisioning.

Table 1–3 User Attributes for Target Resource Reconciliation and Provisioning

Process Form Field	Target System Field	Description
User Login	User Login	New login name, specified as a string of printable characters
Password	passwd	Password
Secondary Group Names	supplementary groups	List of supplementary groups, of which the user is also a member

Table 1–3 (Cont.) User Attributes for Target Resource Reconciliation and Provisioning

Process Form Field	Target System Field	Description
User UID	uid	Numeric value of the user ID This value must be unique and nonnegative. The default is to use the smallest ID value greater than 99 and greater than the number used for any other user. Values between 0 and 99 are typically reserved for system accounts.
Primary Group Name	initial group	The group name or number of the user's initial login group.
Default Shell	shell	User's login shell
GECOS	comment	Generally, a short description of the login It is used as the field for the user's full name. This information is stored in the user's /etc/passwd file entry. **Note:** The entry of multibyte characters is supported for this attribute.
Home Directory	home directory	Login directory of the new user The default directory name is obtained by appending the login name to the default home directory. For example, if the login name is jdoe, then the default home directory is /home/jdoe. **Note:** The entry of multibyte characters is supported for this attribute.
Account Expiry Date	expire date	Date on which the user account is disabled **Note:** For a trusted configuration, such as the HP-UX (trusted) mode, the Password Change Time and Account Expiry Date fields are not reconciled.
Password Change Time	maxdays	Maximum number of days for which a password is valid
Skeleton Directory	skeleton directory	Specifies the skeleton directory that contains information that can be copied to the new login's home directory An existing directory must be specified. The system provides a skeleton directory, /etc/skel, that can be used for this purpose. **Note:** The entry of multibyte characters is supported for this attribute.
Inactive Days	inactive days	Number of days after a password has expired before the account is disabled

1.6.2 Reconciliation Rule for Target Resource Reconciliation

See Also: For generic information about reconciliation matching and action rules, see one of the following guides:

- For Oracle Identity Manager release 9.1.0.1: *Oracle Identity Manager Connector Concepts*
- For Oracle Identity Manager release 11.1.1: *Oracle Fusion Middleware User's Guide for Oracle Identity Manager*

The following is the process-matching rule:

Rule name: Telnet User Rule

Rule element: User Login equals Users.UserLogin

In this rule:

- User Login for Oracle Identity Manager release 9.1.0.*x* or release 11.1.1:

  User ID attribute on the OIM User form.

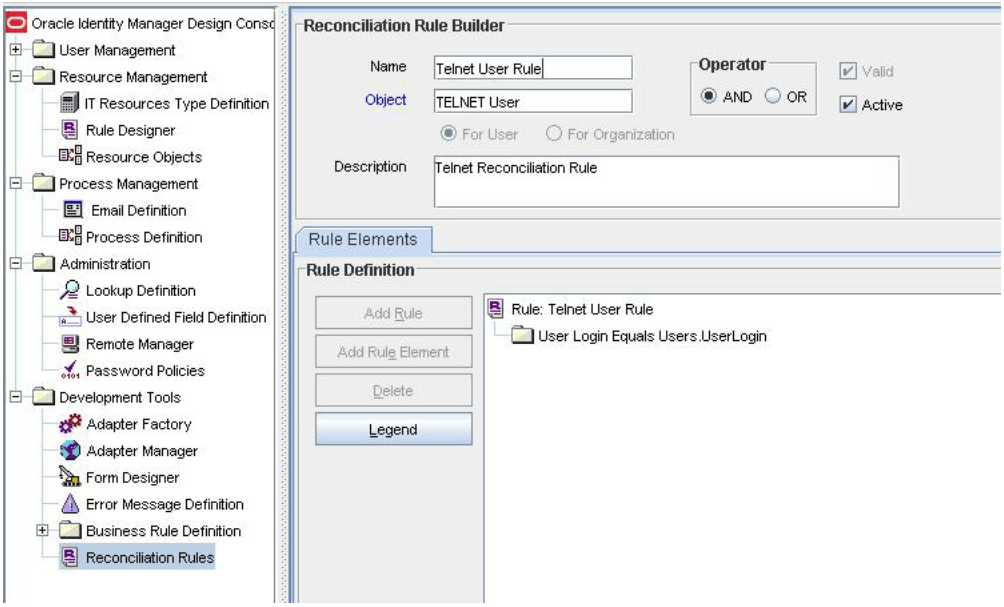
- Users.UserLogin is the User Login attribute of the target system.

After you deploy the connector, you can view the reconciliation rule for target resource reconciliation by performing the following steps:

> **Note:** Perform the following procedure only after the connector is deployed.

1. Log in to the Oracle Identity Manager Design Console.
2. Expand **Development Tools**.
3. Double-click **Reconciliation Rules**.
4. Search for **Telnet User Rule**. Figure 1–2 shows the reconciliation rule for target resource reconciliation.

Figure 1–2 Reconciliation Rule for Target Resource Reconciliation



1.6.3 Reconciliation Action Rules for Target Resource Reconciliation

Table 1–4 lists the action rules for target resource reconciliation.

Table 1–4 Action Rules for Target Resource Reconciliation

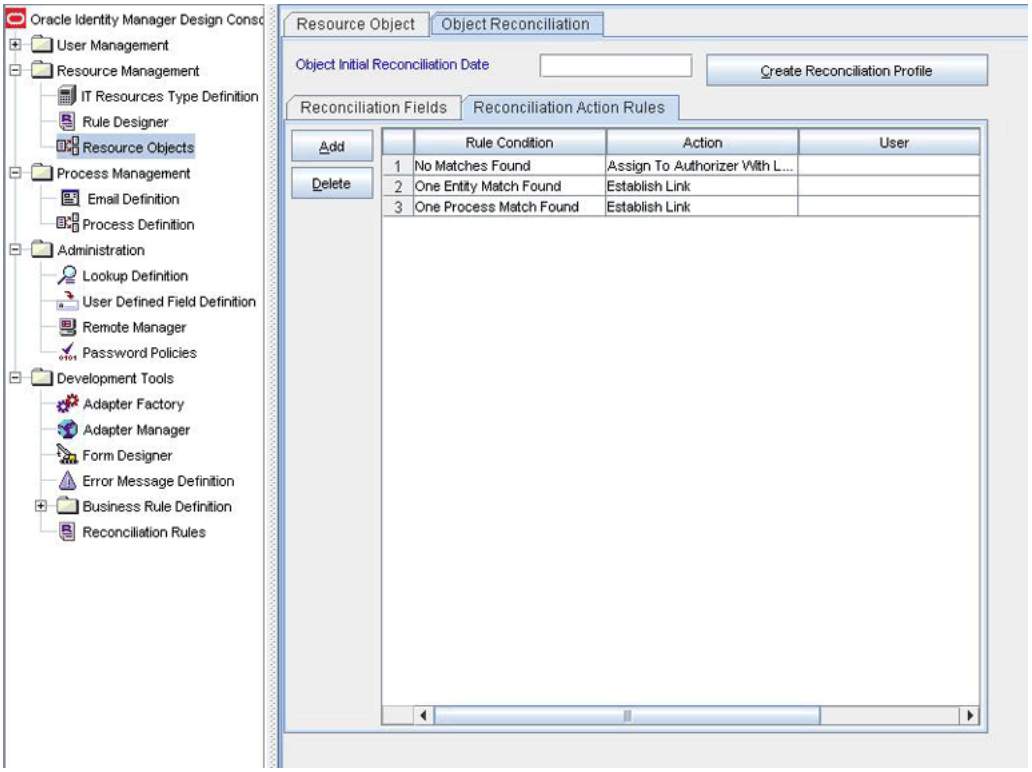
Rule Condition	Action
No Matches Found	Assign to Authorizer With Least Load
One Entity Match Found	Establish Link
One Process Match Found	Establish Link

Note: No action is performed for rule conditions that are not predefined for this connector. You can define your own action rule for such rule conditions. See *Oracle Fusion Middleware Developer's Guide for Oracle Identity Manager* for information about modifying or creating reconciliation action rules.

After you deploy the connector, you can view the reconciliation action rules for target resource reconciliation by performing the following steps:

1. Log in to the Oracle Identity Manager Design Console.
2. Expand **Resource Management**.
3. Double-click **Resource Objects**.
4. Search for and open the **Telnet User** resource object.
5. Click the **Object Reconciliation** tab, and then click the **Reconciliation Action Rules** tab. The Reconciliation Action Rules tab displays the action rules defined for this connector. Figure 1–3 shows the reconciliation action rule for target resource reconciliation.

Figure 1–3 Reconciliation Action Rules for Target Resource Reconciliation



1.6.4 Provisioning Functions

Table 1–5 lists the provisioning functions that are supported by the connector. The Adapter column gives the name of the adapter that is used when the function is performed.

Table 1–5 Provisioning Functions

Function	Adapter
Create User	adpTelnetCreateUser
Delete User	adpTelnetDeleteUser
Update User UID	adpTelnetupdateIntField
Update User Group	adpTelnetupdateStrField
Update User Password Change Time	adpTelnetupdateIntField
Update Shell	adpTelnetupdateStrField
Update Home Directory	adpTelnetupdateHomeDir
Update Account Expiry Date	adpTelnetupdateDateField
Update User GECOS	adpTelnetupdateStrField
Set Password	adpTelnetsetpassword
Update Secondary Group Names	adpTelnetupdateStrField
Update Inactive Days **Note:** This function is not supported on AIX 5.2.	adpTelnetupdateIntField
Update User Login	adpTelnetupdateStrField
Disable User	adpTelnetdisableUser
Enable User	adpTelnetenableUser

1.7 Connector Objects Used During Trusted Source Reconciliation

The following sections provide information about connector objects used during trusted source reconciliation:

- Section 1.7.1, "User Attributes for Trusted Source Reconciliation"
- Section 1.7.2, "Reconciliation Rule for Trusted Source Reconciliation"
- Section 1.7.3, "Reconciliation Action Rules for Trusted Source Reconciliation"

1.7.1 User Attributes for Trusted Source Reconciliation

Table 1–6 lists user attributes for trusted source reconciliation.

Table 1–6 User Attributes for Trusted Source Reconciliation

OIM User Form Field	Target System Attribute	Description
User ID	UserLogin	Common name
First Name	UserLogin	Given name
Last Name	UserLogin	Last name

Table 1–6 (Cont.) User Attributes for Trusted Source Reconciliation

OIM User Form Field	Target System Attribute	Description
Employee Type	NA	Default value: `Consultant`
User Type	NA	Default value: `End-User Administrator`
Organization	NA	Default value: `Xellerate Users`

1.7.2 Reconciliation Rule for Trusted Source Reconciliation

See Also: For generic information about reconciliation matching and action rules, see one of the following guides:

- For Oracle Identity Manager release 9.1.0.1: *Oracle Identity Manager Connector Concepts*
- For Oracle Identity Manager release 11.1.1: *Oracle Fusion Middleware User's Guide for Oracle Identity Manager*

The following is the process matching rule:

Rule name: Telnet Xellerate User Rule

Rule element: User Login equals Users.UserLogin

In this rule element:

- User Login for Oracle Identity Manager release 9.1.0.*x* or release 11.1.1:

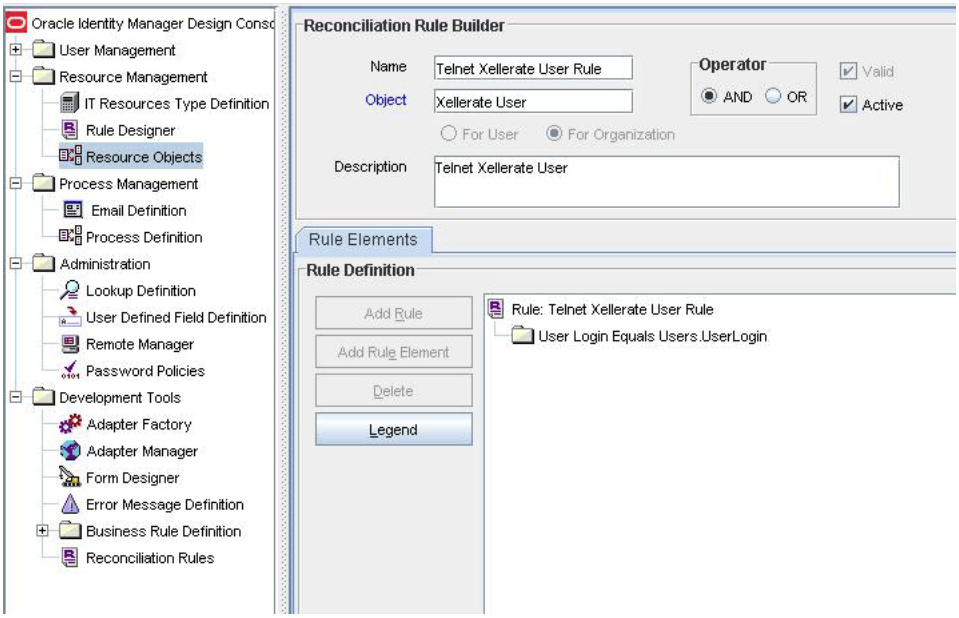
  User ID attribute on the OIM User form.
- Users.UserLogin is the User Login attribute of the target system.

After you deploy the connector, you can view the reconciliation rule for target resource reconciliation by performing the following steps:

Note: Perform the following procedure only after the connector is deployed.

1. Log in to the Oracle Identity Manager Design Console.
2. Expand **Development Tools**.
3. Double-click **Reconciliation Rules**.
4. Search for **Telnet Xellerate User Rule**. Figure 1–4 shows the reconciliation rule for trusted source reconciliation.

Figure 1–4 Reconciliation Rule for Trusted Source Reconciliation



1.7.3 Reconciliation Action Rules for Trusted Source Reconciliation

Table 1–7 lists the action rules for target resource reconciliation.

Table 1–7 Action Rules for Target Source Reconciliation

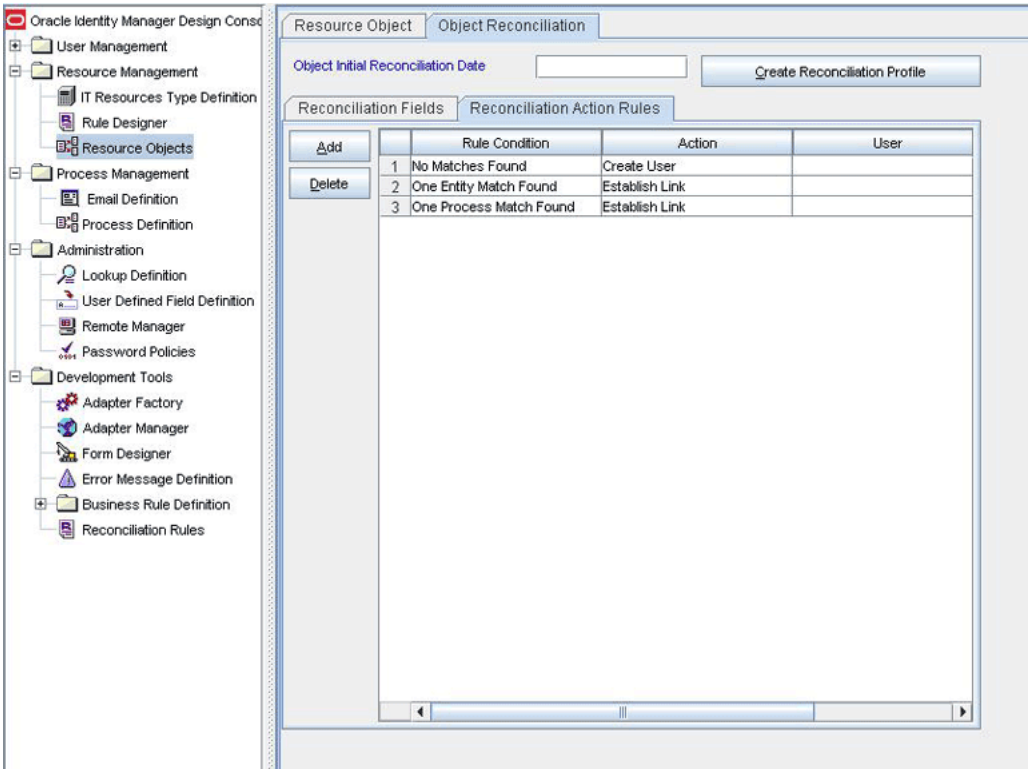
Rule Condition	Action
No Matches Found	Create User
One Entity Match Found	Establish Link
One Process Match Found	Establish Link

Note: No action is performed for rule conditions that are not predefined for this connector. You can define your own action rule for such rule conditions. See *oracle Fusion Middleware Developer's Guide for Oracle Identity Manager* for information about modifying or creating reconciliation action rules.

After you deploy the connector, you can view the reconciliation action rules for target resource reconciliation by performing the following steps:

1. Log in to the Oracle Identity Manager Design Console.
2. Expand **Resource Management**.
3. Double-click **Resource Objects**.
4. Search for and open the **Xellerate User** resource object.
5. Click the **Object Reconciliation** tab, and then click the **Reconciliation Action Rules** tab. The Reconciliation Action Rules tab displays the action rules defined for this connector. Figure 1–5 shows the reconciliation action rules for trusted source reconciliation.

Figure 1–5 Reconciliation Action Rules for Trusted Source Reconciliation



1.8 Roadmap for Deploying and Using the Connector

The following is the organization of information in the rest of this guide:

- Chapter 2, "Deploying the Connector" describes procedures that you must perform on Oracle Identity Manager and the target system during each stage of connector deployment.
- Chapter 3, "Using the Connector" describes guidelines on using the connector and the procedure to configure reconciliation runs and perform provisioning operations.
- Chapter 4, "Extending the Functionality of the Connector" describes procedures that you can perform if you want to extend the functionality of the connector.
- Chapter 5, "Testing and Troubleshooting" describes the procedure to use the connector testing utility for testing the connector.
- Chapter 6, "Known Issues" lists known issues associated with this release of the connector.
- Appendix A, "Privileges Required for Performing Provisioning and Reconciliation" provides information about privileges required for successful provisioning operations and reconciliation runs.
- Appendix B, "Sample Transformation Class" provides the code for a sample Java class. You can use this sample class to create a class for transforming reconciled data according to your requirements.

2

Deploying the Connector

Deploying the connector involves the following steps:

- Section 2.1, "Files and Directories on the Installation Media"
- Section 2.2, "Determining the Release Number of the Connector"
- Section 2.3, "Configuring the Target System"
- Section 2.4, "Installing the Connector on Oracle Identity Manager Release 9.1.0.1 or Release 11.1.1"
- Section 2.5, "Configuring the Oracle Identity Manager Server"

2.1 Files and Directories on the Installation Media

The files and directories on the installation media are listed and described in Table 2–1.

Table 2–1 Files and DIrectories on the Installation Media

File in the Installation Media Directory	Description
configuration/UNIX Telnet-CI.xml	This XML file contains configuration information that is used during connector installation.
ext/sshfactory.jar	This file contains the JSCAPE libraries. These libraries are used to open an Telnet session with the target server. During connector deployment, this file is copied to the following location: ■ For Oracle Identity Manager release 9.1.0.*x*: *OIM_HOME*/xellerate/ThirdParty ■ For Oracle Identity Manager release 11.1.1: Oracle Identity Manager database
lib/xliTelnet.jar	This JAR file contains the Java classes that are required for provisioning and reconciliation in Telnet. During connector deployment, this file is copied to the following location: ■ For Oracle Identity Manager release 9.1.0.*x*: *OIM_HOME*/xellerate/JavaTasks *OIM_HOME*/xellerate/ScheduleTask ■ For Oracle Identity Manager release 11.1.1: Oracle Identity Manager database

Table 2–1 (Cont.) Files and DIrectories on the Installation Media

File in the Installation Media Directory	Description
Files in the resources directory	Each of these resource bundles contains language-specific information that is used by the connector. During connector installation, these resource bundles are copied to the following location: ■ For Oracle Identity Manager release 9.1.0.*x*: *OIM_HOME*/xellerate/connectorResources ■ For Oracle Identity Manager release 11.1.1: Oracle Identity Manager database **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.
test/config/config.properties	This file is used to specify the parameters and settings required to connect to the target system by using the testing utility.
test/config/log.properties	This file is used to specify the log level and the directory in which the log file is to be created when you run the testing utility.
config/userAttribute_NonAIX_prov.properties	This file contains the parameters required for dynamic provisioning on non-AIX platforms.
config/userAttribute_AIX_prov.properties	This file contains the parameters required for dynamic provisioning on AIX platform.
config/userAttribute_NonAIX_recon.properties	This file contains the parameters required for dynamic reconciliation on non-AIX platforms.
config/userAttribute_AIX_recon.properties	This file contains the parameters required for dynamic reconciliation on AIX platform.
test/scripts/Telnet.bat test/scripts/telnet.sh	This file contains the script required to run the client for running test calls from the Oracle Identity Manager server.
xml/TelnetNonTrustedUser.xml	This file contains definitions for the following Telnet User components of the connector: ■ IT resource type ■ IT resource ■ Resource object ■ Process definition ■ Process tasks ■ Adapters ■ Process form ■ Reconciliation scheduled task
xml/XellTelnetUser.xml	This XML file contains the configuration for the Xellerate User (OIM User). You must import this file only if you plan to use the connector in trusted source reconciliation mode.
xml/TelnetConnectorRequestDatasets.xml	This file contains the request datasets for the connector. You import this file by using the Deployment Manager.

2.2 Determining the Release Number of the Connector

Note: If you are using Oracle Identity Manager release 9.1.0.*1*, then the procedure described in this section is optional.

If you are using Oracle Identity Manager release 11.1.1, then skip this section.

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/JavaTasks/xliTelnet.jar

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

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

2.3 Configuring the Target System

This section provides instructions to configure the target system on the following platforms:

- Section 2.3.1, "Configuration Steps for Solaris and Linux"
- Section 2.3.2, "Configuration Steps for AIX"
- Section 2.3.3, "Configuration Steps for HP-UX"

2.3.1 Configuration Steps for Solaris and Linux

Perform the following steps for Solaris and Linux environments:

1. Ensure that the /etc/passwd and /etc/shadow files are available on the UNIX server.
2. Create a passwd mirror file on the target server by using a command similar to the following:

   ```
   cp /etc/passwd /etc/passwd1
   ```

   You can specify any destination directory and file name when you run the command. While configuring the IT resource, you specify the name and path of this file as the value of the Passwd Mirror File/User Mirror File parameter of the IT resource for Solaris and Linux.

   Note: The administrator account whose credentials you provide as part of the IT resource definition must have read and write permissions on this file.

3. Create a shadow mirror file on the target server by using a command similar to the following:

   ```
   cp /etc/shadow /etc/shadow1
   ```

You can specify any destination directory and file name when you run the command. While configuring the IT resource, you specify the name and path of this file as the value of the Shadow Mirror File parameter of the IT resource.

Note: The administrator account whose credentials you provide as part of the IT resource definition must have read and write permissions on this file.

2.3.2 Configuration Steps for AIX

Perform the following steps for AIX environments:

1. Ensure that the /etc/passwd and /etc/security/user files are available on the server.
2. Create a user mirror file on the server by using a command similar to the following:

   ```
   > /etc/mainUserFile1
   ```

   You can specify any directory and file name when you run the command. While configuring the IT resource, you specify the name and path of this file as the value of the Passwd Mirror File/User Mirror File (AIX) parameter of the IT resource for AIX.

   Note: The administrator account whose credentials you provide as part of the IT resource definition must have read and write permissions on this file.

2.3.3 Configuration Steps for HP-UX

Perform the following steps for HP-UX environments:

1. If you want to switch to HP-UX Trusted mode, then:
   a. Log in as root and then run one of the following commands:

      ```
      /usr/bin/sam

      /usr/sbin/sam
      ```

   b. Select **Auditing and Security** and then select **System Security Policies.** A message is displayed asking if you want to switch to the trusted mode.
   c. Click **Yes.** The following message is displayed:

      ```
      System changed successfully to trusted system
      ```

2. Ensure that the /etc/passwd and /etc/shadow directories are available on the target server.
3. Create a passwd mirror file on the target server by using a command similar to the following:

   ```
   cp /etc/passwd /etc/passwd1
   ```

   You can specify any destination directory and file name when you run the command. While configuring the IT resource, you specify the name and path of

this file as the value of the Passwd Mirror File/User Mirror File parameters of the IT resource for HP-UX.

Note: The administrator account whose credentials you provide as part of the IT resource definition must have read and write permissions on this file.

4. Create a shadow mirror file on the target server by using a command similar to the following:

```
cp /etc/shadow /etc/shadow1
```

You can specify any destination directory and file name when you run the command. While configuring the IT resource, you specify the name and path of this file as the value of the Shadow Mirror File parameter of the IT resource.

Note: The administrator account whose credentials you provide as part of the IT resource definition must have read and write permissions on this file.

2.4 Installing the Connector on Oracle Identity Manager Release 9.1.0.*1* or Release 11.1.1

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.*x* or release 11.1.1 involves the following procedures:

- Section 2.4.1, "Running the Connector Installer"
- Section 2.4.2, "Copying the sshfactory.jar File"
- Section 2.4.3, "Configuring the IT Resource"
- Section 2.4.4, "Copying the Configuration Files"

2.4.1 Running the Connector Installer

To run the Connector Installer:

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

Note: In an Oracle Identity Manager cluster, copy this JAR file to each node of the cluster.

- For Oracle Identity Manager release 9.1.0.*x*: *OIM_HOME*/xellerate/ConnectorDefaultDirectory
- For Oracle Identity Manager release 11.1.1: *OIM_HOME*/server/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 the following guide:
   - For Oracle Identity Manager release 9.1.0.*1*:

     Oracle Identity Manager Administrative and User Console Guide
   - For Oracle Identity Manager release 11.1.1:

     Oracle Fusion Middleware Administrator's Guide for Oracle Identity Manager
3. Depending on the Oracle Identity Manager release you are using, perform one of the following steps:
   - For Oracle Identity Manager release 9.1.0.*x*:

     Click **Deployment Management**, and then click **Install Connector**.
   - For Oracle Identity Manager release 11.1.1:

     On the Welcome to Identity Manager Advanced Administration page, in the System Management region, click **Install Connector**.
4. From the Connector List list, select **UNIX Telnet *RELEASE_NUMBER*** This list displays the names and release numbers of connectors whose installation files you copy into the default connector in Step 1.

   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 **UNIX Telnet *RELEASE_NUMBER***.
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 Section 2.5.1, "Configuring the Target System As a Trusted Source."
   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

Note: At this stage, run the Oracle Identity Manager PurgeCache utility to load the server cache with content from the connector resource bundle in order to view the list of prerequisites. See Section 2.5.3, "Clearing Content Related to Connector Resource Bundles from the Server Cache" for information about running the PurgeCache utility.

There are no prerequisites for some predefined connectors.

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

Note: In Oracle Identity Manager release 11.1.1, a scheduled job is an instance of a scheduled task. In this guide, the term **scheduled task** used in the context of Oracle Identity Manager release 9.1.0.*x* is the same as the term **scheduled job** in the context of Oracle Identity Manager release 11.1.1.

See *Oracle Fusion Middleware Administrator's Guide for Oracle Identity Manager* for more information about scheduled tasks and scheduled jobs.

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

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 2–1.

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 Section 2.1, "Files and Directories on the Installation Media" for information about the files that you must copy and their destination locations on the Oracle Identity Manager server.

2.4.2 Copying the sshfactory.jar File

The sshfactory.jar file contains the JSCAPE libraries. These libraries are used to open a Telnet session with the target server. To copy the sshfactory.jar file, perform one of the following procedures depending on the version of Oracle Identity Manager:

- If you are using Oracle Identity Manager release 9.1.0.*x*, then copy the ext/sshfactory.jar file from the installation media to the *OIM_HOME*/xellerate/ThirdParty directory.

Note: In an Oracle Identity Manager cluster, copy this JAR file into the ThirdParty directory on each node of the cluster.

- If you are using Oracle Identity Manager release 11.1.1, then:

  Run the Upload JARs utility to post the ext/sshfactory.jar file from the installation media to the Oracle Identity Manager database. This utility is copied into the following location when you install Oracle Identity Manager:

  Note: Before you run this utility, verify that the WL_HOME environment variable is set to the directory in which Oracle WebLogic Server is installed.

  For Microsoft Windows:

  OIM_HOME/server/bin/UploadJars.bat

  For UNIX:

  OIM_HOME/server/bin/UploadJars.sh

  When you run the utility, you are prompted to enter the login credentials of the Oracle Identity Manager administrator, URL of the Oracle Identity Manager host computer, context factory value, type of JAR file being uploaded, and the location from which the JAR file is to be uploaded. To upload the sshfactory.jar file, specify `3` as the value of the JAR type.

  See Also: *Oracle Fusion Middleware Developer's Guide for Oracle Identity Manager* for detailed information about the Upload JARs utility.

2.4.3 Configuring the IT Resource

You must specify values for the parameters of the Telnet Server IT resource as follows:

1. Log in to the Administrative and User Console.
2. If you are using Oracle Identity Manager release 9.1.0.*x*, expand **Resource Management,** and then click **Manage IT Resource**.
3. If you are using Oracle Identity Manager release 11.1.1, then:
   - On the Welcome page, click **Advanced** in the upper-right corner of the page.
   - On the Welcome to Oracle Identity Manager Advanced Administration page, in the Configuration region, click **Manage IT Resource**.
4. In the IT Resource Name field on the Manage IT Resource page, enter `Telnet Server` and then click **Search**.
5. Click the edit icon for the IT resource.
6. From the list at the top of the page, select **Details and Parameters**.
7. Specify values for the parameters of the IT resource. The following table describes each parameter:

Parameter	Description and Sample Value
Admin UserId	User ID of the administrator `root`
Admin Password/Private file Pwd	Password of the administrator
Server IP Address	Server IP address

Parameter	Description and Sample Value
Port	The port at which the Telnet service is running on the server Default value: `23`
Server OS	Specify one of the following: ■ `AIX` ■ `HP-UX` ■ `SOLARIS` ■ `LINUX`
Shell Prompt	# or $
Whether Trusted System (HP-UX)	`YES` (for trusted HP-UX System) or `NO` (for non-trusted HP-UX system)
Sudo Or RBAC	The connector does not support these modes. Default value: `None` (specifies the root user).
Max Retries	Number of times that the UNIX Telnet connector should retry connecting to the target server if the connection fails Default value: `2`
Delay	Delay (in milliseconds) before the connector attempts to retry connecting to the target system, in case the connection fails Default value: `10000`
Timeout	Value of the timeout (in milliseconds) for the connection to the target server Default value: `20000`
Passwd Mirror File/User Mirror File	Name of the password mirror file/user mirror file. The user must have read and write permissions on this file. The sample value for this parameter is: `/etc/passwd1` This parameter is used for user reconciliation. The administrator account whose credentials you provide as part of the IT resource definition must have read and write permissions on this file.
Shadow Mirror File	Name of the shadow mirror file. The user must have read and write permissions on this file. This parameter is not required on AIX. The value of this attribute must not be null or blank, even for an HP-UX trusted system. However, the reconciliation process on an HP-UX trusted system ignores this attribute. The sample value for this parameter is: `/etc/shadow1` This parameter is used for user reconciliation.
Target Date Format	This parameter is used to specify the date format of the target UNIX computer. The default value for this parameter is: `MMddhhmmyy` This parameter is used for user reconciliation.
Protocol	Default value: `Telnet` Do not change this default value.

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

2.4.4 Copying the Configuration Files

Copy the files in the **config** directory of the installation media to the following directory on the Oracle Identity Manager host computer:

- *OIM_HOME*/xellerate/XLIntegrations/Telnet/config

2.5 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.

- Section 2.5.1, "Configuring the Target System As a Trusted Source"
- Section 2.5.2, "Changing to the Required Input Locale"
- Section 2.5.3, "Clearing Content Related to Connector Resource Bundles from the Server Cache"
- Section 2.5.4, "Enabling Logging"
- Section 2.5.5, "Configuring Oracle Identity Manager for Request-Based Provisioning"

2.5.1 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.

Configuring trusted source reconciliation involves the following steps:

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

2. Specify values for the attributes of the Telnet User Trusted Reconciliation task 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. If you are using Oracle Identity Manager release 9.1.0.*x* then:
   a. Click the **Deployment Management** link on the left navigation bar.
   b. Click the **Import** link under Deployment Management. A dialog box for opening files is displayed.
3. If you are using Oracle Identity Manager release 11.1.1, then:
   a. On the Welcome page, click **Advanced** in the upper-right corner.
   b. On the Welcome to Oracle Identity Manager Advanced Administration page, in the System Management region, click **Import Deployment Manager File.** A dialog box for opening files is displayed.
4. Locate and open the XellTelnetUser.xml file, which is in the following directory:
   - For Oracle Identity Manager release 9.1.0.*x*:

     OIM_HOME/xellerate/ConnectorDefaultDirectory/UNIX_Telnet_***RELEASE_NUMBER***/xml
   - For Oracle Identity Manager 11.1.1:

     OIM_HOME/server/ConnectorDefaultDirectory/UNIX_Telnet_***RELEASE_NUMBER***/xml
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**.

2.5.2 Changing to the Required Input Locale

Note: In an Oracle Identity Manager cluster, you must perform this step on each node of the cluster. Then, restart each node.

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.

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

Note: In an Oracle Identity Manager cluster, you must perform this step on each node of the cluster. Then, restart each node.

When you deploy the connector, the resource bundles are copied from the resources directory on the installation media into the *OIM_HOME*/xellerate/connectorResources directory for Oracle Identity Manager release 9.1.0.*1*, and Oracle Identity Manager database for Oracle Identity Manager release 11.1.1. Whenever you add a new resource bundle to 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, perform one of the following steps:
   - If you are using Oracle Identity Manager release 9.1.0.1, then switch to the *OIM_HOME*/xellerate/bin directory.
   - If you are using Oracle Identity Manager release 11.1.1, then switch to the *OIM_HOME*/server/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:

   For Oracle Identity Manager release 9.1.0.*1*:

   OIM_HOME/*xellerate*/bin/*SCRIPT_FILE_NAME*

   For Oracle Identity Manager release 11.1.1:

   OIM_HOME/*server*/bin/*SCRIPT_FILE_NAME*

2. Enter one of the following commands:

   Note: You can use the PurgeCache utility to purge the cache for any content category. Run `PurgeCache.bat` *`CATEGORY_NAME`* on Microsoft Windows or `PurgeCache.sh` *`CATEGORY_NAME`* on UNIX. The *`CATEGORY_NAME`* argument represents the name of the content category that must be purged.

   For example, the following commands purge Metadata entries from the server cache:

   ```
   PurgeCache.bat MetaData
   ```

   ```
   PurgeCache.sh MetaData
   ```

   - For Oracle Identity Manager release 9.1.0.*1*:

     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. This exception is different from the one mentioned in Step 1.

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

OIM_HOME/xellerate/config/xlconfig.xml

- For Oracle Identity Manager release 11.1.1:

  On Microsoft Windows: `PurgeCache.bat All`

  On UNIX: `PurgeCache.sh All`

  When prompted, enter the user name and password of an account belonging to the SYSTEM ADMINISTRATORS group. In addition, you are prompted to enter the service URL in the following format:

  `t3://`*`OIM_HOST_NAME`*`:`*`OIM_PORT_NUMBER`*

  In this format:

  - Replace *`OIM_HOST_NAME`* with the host name or IP address of the Oracle Identity Manager host computer.
  - Replace *`OIM_PORT_NUMBER`* with the port on which Oracle Identity Manager is listening.

See *Oracle Fusion Middleware Administrator's Guide for Oracle Identity Manager* for more information about the PurgeCache utility.

2.5.4 Enabling Logging

Depending on the Oracle Identity Manager release you are using, perform the procedure described in one of the following sections:

- Section 2.5.4.1, "Enabling Logging on Oracle Identity Manager Release 9.1.0.1"
- Section 2.5.4.2, "Enabling Logging on Oracle Identity Manager Release 11.1.1"

2.5.4.1 Enabling Logging on Oracle Identity Manager Release 9.1.0.1

Note: In an Oracle Identity Manager cluster, perform this procedure on each node of the cluster. Then, restart each node.

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 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 might 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:

- **IBM WebSphere Application Server**

  To enable logging:

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

     ```
     log4j.logger.OIMCP.TELNETSSH=log_level
     ```

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

     For example:

     ```
     log4j.logger.OIMCP.TELNETSSH=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="OIMCP.TELNETSSH">
        <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="OIMCP.TELNETSSH">
        <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.OIMCP.TELNETSSH=log_level
   ```

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

   For example:

   ```
   log4j.logger.OIMCP.TELNETSSH=INFO
   ```

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

```
ORACLE_HOME/opmn/logs/default_group~home~default_group~1.log
```

- **Oracle WebLogic Server**

  To enable logging:

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

     ```
     log4j.logger.OIMCP.TELNETSSH=log_level
     ```

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

     For example:

     ```
     log4j.logger.OIMCP.TELNETSSH=INFO
     ```

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

2.5.4.2 Enabling Logging on Oracle Identity Manager Release 11.1.1

Note: In an Oracle Identity Manager cluster, perform this procedure on each node of the cluster. Then, restart each node.

Oracle Identity Manager release 11.1.1 uses Oracle Java Diagnostic Logging (OJDL) for logging. OJDL is based on java.util.logger. 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:

- SEVERE.intValue()+100

  This level enables logging of information about fatal errors.

- SEVERE

  This level enables logging of information about errors that might allow Oracle Identity Manager to continue running.

- WARNING

  This level enables logging of information about potentially harmful situations.

- INFO

  This level enables logging of messages that highlight the progress of the application.

- CONFIG

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

- FINE, FINER, FINEST

  These levels enable logging of information about fine-grained events, where FINEST logs information about all events.

These log levels are mapped to ODL message type and level combinations as shown in Table 2–2.

Table 2–2 Log Levels and ODL Message Type:Level Combinations

Log Level	ODL Message Type:Level
SEVERE.intValue()+100	INCIDENT_ERROR:1
SEVERE	ERROR:1
WARNING	WARNING:1
INFO	NOTIFICATION:1
CONFIG	NOTIFICATION:16
FINE	TRACE:1
FINER	TRACE:16
FINEST	TRACE:32

The configuration file for OJDL is logging.xml, which is located at the following path:

DOMAIN_HOME/config/fmwconfig/servers/*OIM_SERVER*/logging.xml

Here, *DOMAIN_HOME* and *OIM_SERVER* are the domain name and server name specified during the installation of Oracle Identity Manager.

To enable logging in Oracle WebLogic Server:

1. Edit the logging.xml file as follows:

   a. Add the following blocks in the file:

```
<log_handler name='telnetssh-handler' level='[LOG_LEVEL]'
class='oracle.core.ojdl.logging.ODLHandlerFactory'>
<property name='logreader:' value='off'/>
     <property name='path' value='[FILE_NAME]'/>
     <property name='format' value='ODL-Text'/>
     <property name='useThreadName' value='true'/>
     <property name='locale' value='en'/>
     <property name='maxFileSize' value='5242880'/>
     <property name='maxLogSize' value='52428800'/>
     <property name='encoding' value='UTF-8'/>
   </log_handler>

<logger name="OIMCP.TELNETSSH" level="[LOG_LEVEL]"
useParentHandlers="false">
     <handler name="telnetssh-handler"/>
     <handler name="console-handler"/>
   </logger>
```

   b. Replace both occurrences of **[LOG_LEVEL]** with the ODL message type and level combination that you require. Table 2–2 lists the supported message type and level combinations.

Similarly, replace **[FILE_NAME]** with the full path and name of the log file in which you want log messages to be recorded.

The following blocks show sample values for **[LOG_LEVEL]** and **[FILE_NAME]** :

```
<log_handler name='telnetssh-handler' level='NOTIFICATION:1'
class='oracle.core.ojdl.logging.ODLHandlerFactory'>
<property name='logreader:' value='off'/>
     <property name='path'
value='F:\MyMachine\middleware\user_projects\domains\base_domain1\servers\o
im_server1\logs\oim_server1-diagnostic-1.log'/>
     <property name='format' value='ODL-Text'/>
     <property name='useThreadName' value='true'/>
     <property name='locale' value='en'/>
     <property name='maxFileSize' value='5242880'/>
     <property name='maxLogSize' value='52428800'/>
     <property name='encoding' value='UTF-8'/>
   </log_handler>

<logger name="OIMCP.TELNETSSH" level="NOTIFICATION:1"
useParentHandlers="false">
     <handler name="telnetssh-handler"/>
     <handler name="console-handler"/>
   </logger>
```

With these sample values, when you use Oracle Identity Manager, all messages generated for this connector that are of a log level equal to or higher than the `NOTIFICATION:1` level are recorded in the specified file.

2. Save and close the file.
3. Set the following environment variable to redirect the server logs to a file:

   For Microsoft Windows:

   ```
   set WLS_REDIRECT_LOG=FILENAME
   ```

   For UNIX:

   ```
   export WLS_REDIRECT_LOG=FILENAME
   ```

   Replace *FILENAME* with the location and name of the file to which you want to redirect the output.
4. Restart the application server.

2.5.5 Configuring Oracle Identity Manager for Request-Based Provisioning

Note: Perform the procedure described in this section only if you are using Oracle Identity Manager release 11.1.1 and you want to configure request-based provisioning.

In request-based provisioning, an end user creates a request for a resource by using the Administrative and User Console. Administrators or other users can also create requests for a particular user. Requests for a particular resource on the resource can be viewed and approved by approvers designated in Oracle Identity Manager.

The following are features of request-based provisioning:

- A user can be provisioned only one resource (account) on the target system.

  Note: Direct provisioning allows the provisioning of multiple target system accounts on the target system.

- Direct provisioning cannot be used if you enable request-based provisioning.

To configure request-based provisioning, perform the following procedures:

- Section 2.5.5.1, "Importing Request Datasets Using Deployment Manager"
- Section 2.5.5.2, "Copying Predefined Request Datasets"
- Section 2.5.5.3, "Importing Request Datasets into MDS"
- Section 2.5.5.4, "Enabling the Auto Save Form Feature"
- Section 2.5.5.5, "Running the PurgeCache Utility"

2.5.5.1 Importing Request Datasets Using Deployment Manager

Note:

- You can perform this procedure instead of the procedures described in Section 2.5.5.2, "Copying Predefined Request Datasets" and Section 2.5.5.3, "Importing Request Datasets into MDS".
- See *Oracle Fusion Middleware Administrator's Guide for Oracle Identity Manager* for detailed information about importing objects from an XML file using the Deployment Manager.

A request dataset is an XML file that specifies the information to be submitted by the requester during a provisioning operation. These request datasets specify information about the default set of attributes for which the requester must submit information during a request-based provisioning operation.

To import a request dataset XML file by using the Deployment Manager:

1. Log in to 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 request dataset XML file, TelnetConnectorRequestDatasets.xml, which is in the xml directory of the installation media.

   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. Close the Deployment Manager dialog box.

   The request dataset is imported into Oracle Identity Manager.

2.5.5.2 Copying Predefined Request Datasets

Predefined request datasets are shipped with this connector. The following are the predefined request dataset available in the DataSets directory on the installation media:

- ProvisionResourceTELNET User.xml
- ModifyResourceTELNET User.xml

Copy these files from the installation media to any directory on the Oracle Identity Manager host computer. It is recommended that you create a directory structure as follows:

/custom/connector/*RESOURCE_NAME*

For example:

E:\MyDatasets\custom\connector\TelnetStd

> **Note:** Until you complete the procedure to configure request-based provisioning, ensure that there are no other files or directories inside the parent directory in which you create the directory structure. In the preceding example, ensure that there are no other files or directories inside the E:\MyDatasets directory.

The directory structure to which you copy the dataset files is the MDS location into which these files are imported after you run the Oracle Identity Manager MDS Import utility. The procedure to import dataset files is described in the next section.

Depending on your requirement, you can modify the file names of the request datasets. In addition, you can modify the information in the request datasets. See *Oracle Fusion Middleware Developer's Guide* for Oracle Identity Manager for information on modifying request datasets.

2.5.5.3 Importing Request Datasets into MDS

You can configure request-based provisioning by importing the request datasets into into the metadata store (MDS) by using the Oracle Identity Manager MDS Import utility.

To import a request dataset definition into MDS:

1. Ensure that you have set the environment for running the MDS Import utility. See *Oracle Fusion Middleware Developer's Guide for Oracle Identity Manager* for detailed information about setting up the environment for MDS utilities.

> **Note:** While setting up the properties in the weblogic.properties file, ensure that the value of the metadata_from_loc property is the parent directory of the /custom/connector/*RESOURCE_NAME* directory. For example, while performing the procedure in Section 2.5.5.2, "Copying Predefined Request Datasets," if you copy the files to the E:\MyDatasets\custom\connector\TelnetStd directory, then set the value of the metada_from_loc property to `E:\MyDatasets`.

2. In a command window, change to the *OIM_HOME*\server\bin directory.
3. Run one of the following commands:
   - On Microsoft Windows

     `weblogicImportMetadata.bat`

   - On UNIX

     `weblogicImportMetadata.sh`
4. When prompted, enter the following values:
   - `Please enter your username [weblogic]`

     Enter the username used to log in to the WebLogic server

     Sample value: `WL_User`
   - `Please enter your password [weblogic]`

     Enter the password used to log in to the WebLogic server.
   - `Please enter your server URL [t3://localhost:7001]`

     Enter the URL of the application server in the following format:

     `t3://`*`HOST_NAME_IP_ADDRESS`*`:`*`PORT`*

     In this format, replace:
     - *HOST_NAME_IP_ADDRESS* with the host name or IP address of the computer on which Oracle Identity Manager is installed.
     - *PORT* with the port on which Oracle Identity Manager is listening.

   The request dataset is imported into MDS.

2.5.5.4 Enabling the Auto Save Form Feature

To enable the Auto Save Form feature:

1. Log in to the Design Console.
2. Expand **Process Management,** and then double-click **Process Definition.**
3. Search for and open the **Telnet User** process definition.
4. Select the **Auto Save Form** check box.
5. Click **Save**.

2.5.5.5 Running the PurgeCache Utility

Run the PurgeCache utility to clear content belonging to the Metadata category from the server cache. See Section 2.5.3, "Clearing Content Related to Connector Resource Bundles from the Server Cache" for instructions.

The procedure to configure request-based provisioning ends with this step.

3

Using 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.

3.1 Performing First-Time Reconciliation

First-time reconciliation involves synchronizing lookup definitions in Oracle Identity Manager with the lookup fields of the target system, and performing full reconciliation. In full reconciliation, all existing user records from the target system are brought into Oracle Identity Manager.

The following is the sequence of steps involved in reconciling all existing user records:

> **Note:** In Oracle Identity Manager release 11.1.1, a scheduled job is an instance of a scheduled task. In this guide, the term **scheduled task** used in the context of Oracle Identity Manager release 9.1.0.*x* is the same as the term **scheduled job** in the context of Oracle Identity Manager release 11.1.1.
>
> See *Oracle Fusion Middleware Administrator's Guide for Oracle Identity Manager* for more information about scheduled tasks and scheduled jobs.

1. Perform lookup field synchronization by running the scheduled tasks provided for this operation.

   See Section 3.2, "Scheduled Task for Lookup Field Synchronization" for information about the attributes of the scheduled tasks for lookup field synchronization.

   See Section 3.4, "Configuring Scheduled Tasks" for information about running scheduled tasks.

2. Perform user reconciliation by running the scheduled task for user reconciliation.

   See Section 3.3.4, "Reconciliation Scheduled Tasks" for information about the attributes of this scheduled task.

   See Section 3.4, "Configuring Scheduled Tasks" for information about running scheduled tasks.

The Passwd Mirror File/User Mirror File and Shadow Mirror File parameters of the SSH IT resource contain the name and full path of the password mirror and shadow mirror files, respectively. Before you perform first-time reconciliation, the passwd mirror and shadow mirror files are empty (do not contain any user records).

After first-time reconciliation, the user records in the passwd and passwd mirror files are the same. Similarly, the user records in the shadow and shadow mirror files are the same.

From the next reconciliation run onward, only target system user records that are added or modified after the last reconciliation run are considered for incremental reconciliation. This is done by examining differences between the /etc/passwd, /etc/shadow files and their corresponding mirror files."

Note: For AIX, first-time reconciliation involves reconciliation of all the users present in the target system. This functionality is different from that of other target systems. On other target systems, records of all existing users are fetched from the target system only if you have created the passwd mirror file and the shadow mirror file as empty files.

See Also: Section 2.4.3, "Configuring the IT Resource" for information about the parameters of the IT resource

3.2 Scheduled Task for Lookup Field Synchronization

The TelnetSSHGroupLookupReconTask scheduled task is used for lookup fields reconciliation.

Table 3–1 describes the attributes of this scheduled task. See Section 3.4, "Configuring Scheduled Tasks" for information about configuring 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.

Table 3–1 Attributes of the Scheduled Tasks for Lookup Field Synchronization

Attribute	Description
Server	Enter the name of the target system IT resource. Sample value: `Telnet Server`
Lookup Field Name	Enter the name of the lookup field (on the process form) to be used in lookup reconciliation. Default value: `UD_Lookup_Telnet_PrimaryGroupNames`.
Exclusion List	Enter a comma-delimited list of the names of groups on the target system that you do not want to reconcile. Sample value: `jdoe,ssam,jsmith`

3.3 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:

- Section 3.3.1, "Full Reconciliation"
- Section 3.3.2, "Limited Reconciliation"
- Section 3.3.3, "Batched Reconciliation"
- Section 3.3.4, "Reconciliation Scheduled Tasks"

3.3.1 Full Reconciliation

Full reconciliation involves reconciling all existing user records from the target system into Oracle Identity Manager. After you deploy the connector, you must first perform full reconciliation. In addition, you can switch from incremental reconciliation to full reconciliation whenever you want to ensure that all target system records are reconciled in Oracle Identity Manager.

To perform a full reconciliation run:

- Run the following commands on the target system before you run the scheduled tasks:

```
> etc/passwd1
> etc/shadow1
```

- Specify `All` as the value of the NumberOfBatches attribute of the user reconciliation scheduled task.

At the end of the reconciliation run, the user records in the passwrd mirror and shadow mirror files are the same as in the passwrd and shadow files, respectively. From the next reconciliation run onward, only records created or modified after the last reconciliation run are considered for reconciliation. This is incremental reconciliation.

3.3.2 Limited 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 the `UserNameFilter` scheduled task attribute, which will be used in the query SELECT criteria to retrieve the records to be reconciled. For example, if you specify the value `JDoe` for this attribute, then all target system user records with the user name `JDoe` are reconciled.

3.3.3 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`.
- NumberOfBatches: 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`
- NumberOfBatches: `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 NumberOfBatches attributes by following the instructions described in Section 3.4, "Configuring Scheduled Tasks."

3.3.4 Reconciliation Scheduled Tasks

When you run the Connector Installer or import the connector XML file, the following reconciliation scheduled tasks are automatically created in Oracle Identity Manager:

- Telnet User Trusted Reconciliation task

This scheduled task is used to reconcile user data in the trusted source (identity management) mode of the connector.

- Telnet Target Resource User Reconciliation

  This scheduled task is used to reconcile user data in the target resource (account management) mode of the connector.

Table 3–2 describes the attributes of both scheduled tasks. See Section 3.4, "Configuring Scheduled Tasks" for information about configuring scheduled tasks.

Table 3–2 Attributes of the User Reconciliation Scheduled Tasks

Attribute	Description
Server	Enter the name of the IT resource for the UNIX Telnet installation from which you want to reconcile user records. Default value: `Telnet Server`
IsTrusted	A value of `Yes` implies that you want to configure the connector for trusted source reconciliation. A value of `No` implies that you want to configure the connector for target resource reconciliation. The default value of this attribute in the SSH User Target Resource Reconciliation Task scheduled task is `No`. The default value of this attribute in the SSH User Trusted Source Reconciliation Task scheduled task is `Yes`. **Note:** It is recommended that you do not change the value of this attribute.
Target System Recon - Resource Object name	Enter the name of the resource object against which target resource reconciliation runs must be performed. Default value: `Telnet User`
Trusted Source Recon - Resource Object name	Enter the name of the resource object against which trusted source reconciliation runs must be performed. Default value: `Xellerate User` **Note:** Enter `false` (in lowercase) if you do not want to configure trusted source reconciliation
BatchSize	Enter the number of records that must be included in each batch fetched from the target system. If you do not want to implement batched reconciliation, then specify `nodata`. Default value: `1000` **See Also:** Section 3.3.3, "Batched Reconciliation"
NoOfBatches	This attribute specifies the number of batches to be reconciled. Enter `All` if you want to reconcile all the batches. This is the default value. Enter an integer value if you want to reconcile only a fixed number of batches. Default value: `All` Sample value: `50` The number of records in each batch is specified by the BatchSize attribute. **See Also:** Section 3.3.3, "Batched Reconciliation"

Table 3–2 (Cont.) Attributes of the User Reconciliation Scheduled Tasks

Attribute	Description
UserNameFilter	This is a filter attribute. Use this attribute to specify the user name (User Login) for which you want to reconcile user records. If you do not want to use this filter attribute, then specify `Nodata`. Default value: `Nodata` **See Also:** Section 3.3.2, "Limited Reconciliation"
TransformLookupName	Enter `Lookup.Reconciliation.TransformationMap`, which is the name of the lookup definition used for the transformation class map that is stored in the lookup tables. This attribute is valid only when the UseTransformMapping attribute is set to `Yes`. **Note:** You must not change the value of this attribute. See Section 4.4, "Transforming Data Reconciled Into Oracle Identity Manager" for detailed information about using the TransformLookupName attribute.
UseTransformMapping	Enter `Yes` if you want the transform mappings accessed by the `TransformLookupName` attribute to be used. Otherwise, enter `No`. The default value is `No`. See Section 4.4, "Transforming Data Reconciled Into Oracle Identity Manager" for detailed information about using the UseTransformMapping attribute.

3.4 Configuring Scheduled Tasks

You can apply this procedure to configure the scheduled tasks for lookup field synchronization and reconciliation.

Table 3–3 lists the scheduled tasks that form part of the connector.

Table 3–3 Scheduled Tasks for Lookup Field Synchronization and Reconciliation

Scheduled Task	Description
TelnetSSHGroupLookupReconTask	This scheduled task is used to synchronize the values of group lookup fields between Oracle Identity Manager and the target system. See Section 3.2, "Scheduled Task for Lookup Field Synchronization" for information about this scheduled task.
Telnet User Trusted Reconciliation Task	This scheduled task is used for reconciling user data when the target system is configured as a trusted source. See Section 3.3.4, "Reconciliation Scheduled Tasks" for information about this scheduled task.
Telnet Target Resource User Reconciliation	This scheduled task is used for reconciling user data when the target system is configured as a target resource. See Section 3.3.4, "Reconciliation Scheduled Tasks" for information about this scheduled task.

Depending on the Oracle Identity Manager release that you are using, perform the procedure described in the following section:

- Section 3.4.1, "Configuring Scheduled Tasks on Oracle Identity Manager Release 9.1.0.1 or Release 11.1.1"

3.4.1 Configuring Scheduled Tasks on Oracle Identity Manager Release 9.1.0.*1* or Release 11.1.1

To configure a scheduled task:

1. Log in to the Administrative and User Console.
2. Perform one of the following:

a. If you are using Oracle Identity Manager release 9.1.0.*x*, expand **Resource Management,** and then click **Manage Scheduled Task.**

b. If you are using Oracle Identity Manager release 11.1.1, then on the Welcome to Oracle Identity Manager Self Service page, click **Advanced** in the upper-right corner of the page.

3. Search for and open the scheduled task as follows:

   - If you are using Oracle Identity Manager release 9.1.0.*x*, then:

     a. On the Scheduled Task Management page, enter the name of the scheduled task as the search criteria and then click **Search**.

     b. In the search results table, click the edit icon in the Edit column for the scheduled task.

     c. On the Scheduled Task Details page where the details of the scheduled task that you selected is displayed, click **Edit**.

   - If you are using Oracle Identity Manager release 11.1.1, then:

     a. On the Welcome to Oracle Identity Manager Advanced Administration page, in the System Management region, click **Search Scheduled Jobs**.

     b. On the left pane, in the Search field, enter the name of the scheduled job as the search criterion. Alternatively, you can click **Advanced Search** and specify the search criterion.

     c. In the search results table on the left pane, click the scheduled job in the Job Name column.

4. Modify the details of the scheduled task. To do so:

   a. If you are using Oracle Identity Manager release 9.1.0.*x*, then on the Edit Scheduled Task Details page, modify the following parameters, and then click **Continue**:

      – **Status:** Specify whether you want to leave the task in the enabled state. In the enabled state, the task is ready for use.

      – **Max Retries:** Enter an integer value in this 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. The default value is 1.

      – **Next Start:** Use the date editor to specify the date when you want the task to run. After you select a date value in the date editor, you can modify the time value that is automatically displayed in the Next Start field.

      – **Frequency:** Specify the frequency at which you want the task to run.

   b. If you are using Oracle Identity Manager release 11.1.1, then on the Job Details tab, you can modify the following parameters:

      – **Retries:** Enter an integer value in this field. This number represents the number of times the scheduler tries to start the job before assigning the Stopped status to the job.

      – **Schedule Type:** Depending on the frequency at which you want the job to run, select the appropriate schedule type.

Note: See *Oracle Fusion Middleware Administrator's Guide for Oracle Identity Manager* for detailed information about schedule types.

In addition to modifying the job details, you can enable or disable a job.

5. Specify values for the attributes of the scheduled task. To do so:

   Note:

   - Attribute values are predefined in the connector XML file that you import. Specify values only for those attributes that you want to change.
   - Attributes of the scheduled task are discussed in Section 3.3.4, "Reconciliation Scheduled Tasks."

   - If you are using Oracle Identity Manager release 9.1.0.*x*, then on the Attributes page, select the attribute from the Attribute list, specify a value in the field provided, and then click **Update**.
   - If you are using Oracle Identity Manager release 11.1.1, then on the Job Details tab, in the Parameters region, specify values for the attributes of the scheduled task.

6. After specifying the attributes, perform one of the following:

   - If you are using Oracle Identity Manager release 9.1.0.*x*, then click **Save Changes** to save the changes.

     Note: The Stop Execution option is not available in the Administrative and User Console. If you want to stop a task, then click **Stop Execution** on the Task Scheduler form of the Design Console.

   - If you are using Oracle Identity Manager release 11.1.1, then click **Apply** to save the changes.

     Note: The Stop Execution option is available in the Administrative and User Console. You can use the Scheduler Status page to either start, stop, or reinitialize the scheduler.

3.5 Guidelines on Performing Provisioning Operations

Apply the following guidelines while performing provisioning operations:

- When you perform the Disable User provisioning operation, the connector disables a user account by prefixing the value in the password field of the shadow file with two exclamation points (!!). When you perform the Enable User provisioning operation, the connector enables a user account by removing the two exclamation points (!!) that were prefixed to the value in the password field. After the user account is enabled, to log in to the target system, the user can use the password that was last used before the user account was disabled.

  Therefore, to ensure that the user uses a new password after the account is enabled, you must perform the Set Password provisioning operation before you perform the Enable User provisioning operation.

- The Set Password provisioning operation resets the password of a target system user account.

If the Set Password provisioning operation is performed on a user account that has been disabled, then the account is automatically re enabled. This is because information on whether a user account is disabled is stored in the password field of the shadow file. Therefore, when you perform the Set Password provisioning operation, the value in the password field is reset, which causes information on whether or not a user account is disabled to be lost.

- While performing a Create User provisioning operation, before populating the Skeleton directory field, data must be populated in the Home Directory field and the Create Home Directory check box must also be selected.
- The value in the User Login field must not contain a colon (:) or a newline (\n) character.
- The value of the GECOS field must not contain a ' (single apostrophe) or : (colon) character.
- The group names that you specify in the Secondary Group Names field must be separated by commas, with no intervening whitespace between them.
- The value in the Home Directory field must not contain spaces.
- The maximum permitted date value for account expiry is 31-Dec-2099.
- When you specify the secondary group name for the first time and then run the Update Secondary Group Names provisioning operation, the primary group name is assigned the same value as the secondary group name. However, after the value of the primary group name is changed, you cannot set the secondary group name to the same value.
- On AIX 5.2, while performing an Update User Login provisioning operation, the GECOS field value must not contain spaces.
- On HP-UX, while performing a Create User provisioning operation, the Inactive Days field must be populated only when the UNIX server is configured in trusted mode.
- On Solaris, the value of the Secondary Group Names field in the User Defined process form must always be different from the value of the Primary Group Name field.
- On Solaris, while performing a Create User provisioning operation, the value in the Secondary Group Names field must be different from the value in the Primary Group Name field.

3.6 Performing Provisioning Operations

Provisioning a resource for an OIM User involves using Oracle Identity Manager to create a target system account for the user.

When you install the connector on Oracle Identity Manager release 11.1.1, the direct provisioning feature is automatically enabled. This means that the process form is enabled when you install the connector.

If you have configured the connector for request-based provisioning, then the process form is suppressed and the object form is displayed. In other words, direct provisioning is disabled when you configure the connector for request-based provisioning. If you want to revert to direct provisioning, then perform the steps described in Section 3.7, "Switching Between Request-Based Provisioning and Direct Provisioning on Oracle Identity Manager Release 11.1.1."

The following are types of provisioning operations:

- Direct provisioning
- Request-based provisioning
- Provisioning triggered by policy changes

See Also: *Oracle Identity Manager Connector Concepts* for information about the types of provisioning

This section discusses the following topics:

- Section 3.6.1, "Direct Provisioning"
- Section 3.6.2, "Request-Based Provisioning"

3.6.1 Direct Provisioning

To provision a resource by using the direct provisioning approach:

1. Log in to the Administrative and User Console.
2. If you want to first create an OIM User and then provision a target system account, then:
   - If you are using Oracle Identity Manager release 9.1.0.1, then:
     a. From the Users menu, select **Create**.
     b. On the Create User page, enter values for the OIM User fields and then click **Create User**.
   - If you are using Oracle Identity Manager release 11.1.1, then:
     a. On the Welcome to Identity Administration page, in the Users region, click **Create User**.
     b. On the Create User page, enter values for the OIM User fields, and then click **Save**.
3. If you want to provision a target system account to an existing OIM User, then:
   - If you are using Oracle Identity Manager release 9.1.0.*1*, then:
     a. From the Users menu, select **Manage**.
     b. Search for the OIM User and select the link for the user from the list of users displayed in the search results.
   - If you are using Oracle Identity Manager release 11.1.1, then:
     a. On the Welcome to Identity Administration page, search for the OIM User by selecting **Users** from the list on the left pane.
     b. From the list of users displayed in the search results, select the OIM User. The user details page is displayed on the right pane.
4. Depending on the Oracle Identity Manager release you are using, perform one of the following steps:
   - If you are using Oracle Identity Manager release 9.1.0.*1*, then:
     a. On the User Detail page, select **Resource Profile** from the list at the top of the page.
     b. On the Resource Profile page, click **Provision New Resource**.
   - If you are using Oracle Identity Manager release 11.1.1, then:

a. On the user details page, click the **Resources** tab.

b. From the Action menu, select **Add Resource**. Alternatively, you can click the add resource icon with the plus (+) sign. The Provision Resource to User page is displayed in a new window.

5. On the Step 1: Select a Resource page, select **Telnet User** from the list and then click **Continue**.
6. On the Step 2: Verify Resource Selection page, click **Continue**.
7. On the Step 5: Provide Process Data for Telnet User Details page, enter the details of the account that you want to create on the target system and then click **Continue**.
8. On the Step 6: Verify Process Data page, verify the data that you have provided and then click **Continue**.
9. The "Provisioning has been initiated" message is displayed. Perform one of the following steps:
   - If you are using Oracle Identity Manager release 9.1.0.*1*, click **Back to User Resource Profile.** The Resource Profile page shows that the resource has been provisioned to the user.
   - If you are using Oracle Identity Manager release 11.1.1, then:
     a. Close the window displaying the "Provisioning has been initiated" message.
     b. On the Resources tab, click **Refresh** to view the newly provisioned resource.

3.6.2 Request-Based Provisioning

Note: The information provided in this section is applicable only if you are using Oracle Identity Manager release 11.1.1.

A request-based provisioning operation involves both end users and approvers. Typically, these approvers are in the management chain of the requesters. The following sections discuss the steps to be performed by end users and approvers during a request-based provisioning operation:

Note: The procedures described in these sections are built on an example in which the end user raises or creates a request for provisioning a target system account. This request is then approved by the approver.

- Section 3.6.2.1, "End User's Role in Request-Based Provisioning"
- Section 3.6.2.2, "Approver's Role in Request-Based Provisioning"

3.6.2.1 End User's Role in Request-Based Provisioning

The following steps are performed by the end user in a request-based provisioning operation:

See Also: *Oracle Fusion Middleware User's Guide for Oracle Identity Manager* for detailed information about these steps

1. Log in to the Administrative and User Console.
2. On the Welcome page, click **Advanced** in the upper-right corner of the page.
3. On the Welcome to Identity Administration page, click the **Administration** tab, and then click the **Requests** tab.
4. From the Actions menu on the left pane, select **Create Request**.

   The Select Request Template page is displayed.
5. From the Request Template list, select **Provision Resource** and click **Next**.
6. On the Select Users page, specify a search criterion in the fields to search for the user that you want to provision the resource, and then click **Search**. A list of users that match the search criterion you specify is displayed in the Available Users list.
7. From the **Available Users** list, select the user to whom you want to provision the account.

   If you want to create a provisioning request for more than one user, then from the **Available Users** list, select users to whom you want to provision the account.
8. Click **Move** or **Move All** to include your selection in the Selected Users list, and then click **Next**.
9. On the Select Resources page, click the arrow button next to the Resource Name field to display the list of all available resources.
10. From the Available Resources list, select **Telnet User**, move it to the Selected Resources list, and then click **Next**.
11. On the Resource Details page, enter details of the account that must be created on the target system, and then click **Next**.
12. On the Justification page, you can specify values for the following fields, and then click **Finish**.
    - Effective Date
    - Justification

    On the resulting page, a message confirming that your request has been sent successfully is displayed along with the Request ID.
13. If you click the request ID, then the Request Details page is displayed.
14. To view details of the approval, on the Request Details page, click the **Request History** tab.

3.6.2.2 Approver's Role in Request-Based Provisioning

The following are steps performed by the approver in a request-based provisioning operation:

The following are steps that the approver can perform:

1. Log in to the Administrative and User Console.
2. On the Welcome page, click **Self-Service** in the upper-right corner of the page.
3. On the Welcome to Identity Manager Self Service page, click the **Tasks** tab.

4. On the **Approvals** tab, in the first section, you can specify a search criterion for request task that is assigned to you.
5. From the search results table, select the row containing the request you want to approve, and then click **Approve Task**.

   A message confirming that the task was approved is displayed.

3.7 Switching Between Request-Based Provisioning and Direct Provisioning on Oracle Identity Manager Release 11.1.1

Note: It is assumed that you have performed the procedure described in Section 2.5.5, "Configuring Oracle Identity Manager for Request-Based Provisioning."

On Oracle Identity Manager release 11.1.1, if you want to switch from request-based provisioning to direct provisioning, then:

1. Log in to the Design Console.
2. Disable the Auto Save Form feature as follows:
   a. Expand **Process Management**, and then double-click **Process Definition**.
   b. Search for and open the **Telnet User** process definition.
   c. Deselect the **Auto Save Form** check box.
   d. Click the Save icon.
3. If the Self Request Allowed feature is enabled, then:
   a. Expand **Resource Management**, and then double-click **Resource Objects**.
   b. Search for and open the **Telnet User** resource object.
   c. Deselect the **Self Request Allowed** check box.
   d. Click the Save icon.

On Oracle Identity Manager release 11.1.1, if you want to switch from direct provisioning back to request-based provisioning, then:

1. Log in to the Design Console.
2. Enable the Auto Save Form feature as follows:
   a. Expand **Process Management**, and then double-click **Process Definition**.
   b. Search for and open the **Telnet User** process definition.
   c. Select the **Auto Save Form** check box.
   d. Click the Save icon.
3. If you want to enable end users to raise requests for themselves, then:
   a. Expand **Resource Management**, and then double-click **Resource Objects**.
   b. Search for and open the **Telnet User** resource object.
   c. Select the **Self Request Allowed** check box.
   d. Click the Save icon.

4

Extending the Functionality of the Connector

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

- Section 4.1, "Adding Custom Attributes for Reconciliation"
- Section 4.2, "Adding Custom Attributes for Provisioning"
- Section 4.3, "Configuring the Connector for Multiple Installations of the Target System"
- Section 4.4, "Transforming Data Reconciled Into Oracle Identity Manager"

4.1 Adding Custom Attributes for Reconciliation

Note:

- In this section, the term "attribute" refers to the identity data fields that store user data.

- You need not perform this procedure if you do not want to add custom attributes for reconciliation

By default, the attributes listed in Section 1.6.1, "User Attributes for Target Resource Reconciliation and Provisioning" are mapped for reconciliation between Oracle Identity Manager and the target system. If required, you can map additional attributes for reconciliation as follows:

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

1. Open the following file in the *OIM_HOME*/xellerate/XLIntegrations/Telnet/config directory:

   For AIX:

   userAttribute_AIX_recon.properties

   For non-AIX platforms:

   userAttribute_NonAIX_recon.properties

2. 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:

For AIX:

TARGET_SYSTEM_ATTRIBUTE=OIM_SERVER_ATTRIBUTE

For example:

```
maxage=Users.AccountExpiryDate
```

In this example, `AccountExpiryDate` is the reconciliation field and `maxage` is the equivalent server command parameter. As a standard, the prefix "`Users.`" is added at the start of all reconciliation field names.

For non-AIX platforms:

OIM_SERVER_ATTRIBUTE=TARGET_SYSTEM_ATTRIBUTE_INDEX

For example:

```
Users.DefaultShell=6
```

In this example, `DefaultShell` is the reconciliation field and `6` is the equivalent server Target Server Attributes index. As a standard, the prefix "`Users.`" is added at the start of all reconciliation field names.

3. 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. Click **Query for Records**.
   c. On the Resource Objects Table tab, double-click the **Telnet User** 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.

      For AIX:

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

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

      For non-AIX platforms:

      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.DefaultShell=6` line in Step 2, then you must specify `Users.DefaultShell` 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.
   i. If you are using Oracle Identity Manager release 11.1.1, then click **Create Reconciliation Profile.** This copies changes made to the resource object into the MDS.

4. Add a new field in the process form.
   a. Open the **UD_TELNET** process form. This form is in the Development Tools folder of the Oracle Identity Manager Design Console.
   b. Click **Create New Version**.
   c. 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.
   d. From the **Current Version** list, select the newly created version.
   e. On the Additional Columns tab, click **Add**.
   f. Specify the new field name and other values. For the example described in Step 3 in the connector guide, you enter the value `UD_TELNET_DEFAULTSHELL`.
   g. Click **Make Version Active** and then save the changes.
5. Modify the provisioning process to include the mapping between the newly added attribute and the corresponding reconciliation field as follows:
   a. Open the **TELNET User** provisioning process. The provisioning process 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.

      For the example described in Step 3 in the connector guide, you enter the values `Users.DefaultShell [String]` and `UD_TELNET_DEFAULTSHELL`.
   d. If required, repeat Steps b and c to map more fields.

4.2 Adding Custom Attributes for Provisioning

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

By default, the attributes listed in Section 1.6.1, "User Attributes for Target Resource Reconciliation and Provisioning" are mapped for provisioning between Oracle Identity Manager and the target system. If required, you can map additional attributes for provisioning as follows:

See Also: *oracle Fusion Middleware Developer's Guide for Oracle Identity Manager*

1. Modify the attribute entries in the following file:

   For the AIX platform:

   OIM_HOME`/xellerate/XLIntegrations/Telnet/config/userAttribute_AIX_prov.properties`

   For non-AIX platforms:

   OIM_HOME`/xellerate/XLIntegrations/Telnet/config/userAttribute_NonAIX_prov.prope`

```
rties
```

If required, you can add new attributes in this file. The format that you must use is as follows:

OIM_ATTRIBUTE_NAME=TARGET_ATTRIBUTE_NAME

For example:

```
homeDir=-d
```

2. Add a new column in the process form.

> **Note:** If you have already performed Step 4 of Section 4.1, "Adding Custom Attributes for Reconciliation," then directly proceed to Step 3.

   a. Open the process form. This form is in the Development Tools folder of the Oracle Identity Manager Design Console.
   b. Click **Create New Version**.
   c. 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.
   d. From the **Current Version** list, select the newly created version.
   e. On the Additional Columns tab, click **Add**.
   f. Specify the new field name and other values.
   g. Click **Make Version Active** and save the changes.

3. Add a new variable in the variable list.
   a. Open the Adapter Factory form. This form is in the Development Tools folder of the Oracle Identity Manager Design Console.
   b. Click the **Query for Records** icon.
   c. On the Adapter Factory Table tab, double-click the **adpTELNETCREATEUSER** adapter from the list.
   d. On the Variable List tab, click **Add**.
   e. In the Add a Variable dialog box, specify the required values and then save and close the dialog box.

4. Define an additional adapter task for the newly added variable in the **adpTELNETCREATEUSER** adapter.
   a. On the Adapter Tasks tab of the Adapter Factory form, click **Add**.
   b. In the Adapter Task Selection dialog box, select **Functional Task**, select **Java** from the list of functional task types, and then click **Continue**.
   c. In the Object Instance Selection dialog box, select **Persistent Instance** and then click **Continue**.
   d. In the Add an Adapter Factory Task dialog box, specify the task name, select the **setProperty** method from the **Method** list, and then click **Save**.
   e. Map the application method parameters, and then save and close the dialog box. To map the application method parameters:

      For the "Output: String Return variable (Adapter Variable)" parameter:

i. From the **Map to** list, select **Literal**.

ii. From the **Name** list, select **Return variable**.

For the "Input: String input (Adapter Variable)" parameter:

i. From the **Map to** list, select **Adapter Variables**.

ii. From the **Name** list, select **Input**.

For the "Input: String (Literal)" parameter:

i. From the **Map to** list, select **Literal**.

ii. From the **Name** list, select **String**.

iii. In the **Value** field, specify the name that is to the left of the equal sign in the line that you uncomment or add while performing Step 1.

For example, if you uncomment the `homeDir=-d` line in Step 1, then you must specify `homeDir` as the attribute name.

For the "Input: String (Adapter Variable)" parameter:

i. From the **Map to** list, select **Adapter Variables**.

ii. From the **Name** list, select the newly added adapter variable.

f. Repeat Steps b through g to create more adapter tasks.

5. Create an additional adapter task to set the input variable.

a. Open the Adapter Factory form. This form is in the Development Tools folder in the Oracle Identity Manager Design Console.

b. On the Adapter Tasks tab, click **Add**.

c. In the Adapter Task Selection dialog box, select **Logic Task**, select **SET VARIABLE** from the list, and then click **Continue**.

d. In the Edit Set Variable Task Parameters dialog box, select **input** from the **Variable Name** list, select **Adapter Task** from the **Operand Type** list, and the Operand Qualifier as the Adapter Task that you have created in the previous step. Then, click **Save**.

6. Map the process form columns and adapter variables for the Create User process task as follows:

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

b. Click the **Query for Records** icon.

c. On the Process Definition Table tab, double-click the **TELNET User** process.

d. On the Tasks tab, double-click the **Create User** task.

e. In the Closing Form dialog box, click **Yes**.

f. On the Integration tab of the Editing Task Columns Create User dialog box, map the unmapped variables, and then save and close the dialog box. To map an unmapped variable:

i. Double-click the row in which **N** is displayed in the Status column. The value `N` signifies that the variable is not mapped.

ii. From the **Map to** list in the Edit Data Mapping for Variables dialog box, select **Process Data**.

iii. From the **Qualifier** list, select the name of the variable.

Repeat Steps i through iii for all unmapped variables.

Repeat Steps 1 through 6 if you want to add more attributes.

7. Update the request datasets.

Note: Perform steps 7 through 9 only if you want to perform request-based provisioning.

When you add an attribute on the process form, you also update the XML files containing the request dataset definitions. To update a request dataset:

a. In a text editor, open the XML file located in the *OIM_HOME*/DataSet/file directory for editing.

b. Add the AttributeReference element and specify values for the mandatory attributes of this element.

See Also: The "Configuring Requests" chapter of the *Oracle Fusion Middleware Developer's Guide for Oracle Identity Manager* guide for more information about creating and updating request datasets

For example, while performing Step 2 of this procedure, if you added Employee ID as an attribute on the process form, then enter the following line:

```
<AttributeReference
name = "Employee ID"
attr-ref = "Employee ID"
type = "String"
widget = "text"
length = "50"
available-in-bulk = "false"/>
```

In this AttributeReference element:

– For the name attribute, enter the value in the Name column of the process form without the tablename prefix.

For example, if UD_TELNET_EMP_ID is the value in the Name column of the process form, then you must specify `Employee ID` as the value of the name attribute in the AttributeReference element.

– For the attr-ref attribute, enter the value that you entered in the Field Label column of the process form while performing Step 2.

– For the type attribute, enter the value that you entered in the Variant Type column of the process form while performing Step 2.

– For the widget attribute, enter the value that you entered in the Field Type column of the process form, while performing Step 2.

– For the length attribute, enter the value that you entered in the Length column of the process form while performing Step 2.

– For the available-in-bulk attribute, specify `true` if the attribute must be available during bulk request creation or modification. Otherwise, specify `false`.

If you added more than one attribute on the process form, then repeat this step for each attribute added.

c. Save and close the XML file.

8. Run the PurgeCache utility to clear content related to request datasets from the server cache.

   See *Oracle Fusion Middleware Administrator's Guide for Oracle Identity Manager* for more information about the PurgeCache utility.

9. Import into MDS the request dataset definitions in XML format.

   See Section 2.5.5.3, "Importing Request Datasets into MDS" for detailed information about the procedure.

4.3 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 the target system.

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

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

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

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

See Also: *oracle Fusion Middleware Developer's Guide for Oracle Identity Manager* for detailed instructions on performing each step of this procedure

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

   The IT Resources form is in the Resource Management folder. An 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.

2. Configure reconciliation for each target system installation. See Section 3.4, "Configuring Scheduled Tasks" for instructions. Note that you only need to modify the attributes that are used to specify the IT resource and to specify whether or not the target system installation is to be set up as a trusted source.

3. 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 target system installation to which you want to provision the user.

4.4 Transforming Data Reconciled Into Oracle Identity Manager

This section discusses the TransformLookupName and UseTransformMapping attributes of the scheduled tasks for target resource reconciliation (Telnet User Target

Resource Reconciliation Task) and trusted source reconciliation (Telnet User Trusted Source Reconciliation Task.).

During reconciliation, you may want to transform the values of some target system fields before they are stored in Oracle Identity Manager. Appending a number at the end of the user ID is an example of a data transformation.

The TransformLookupName and UseTransformMapping attributes provide a method for implementing such transformations. To use these attributes

1. Identify the fields that you want to transform.
2. Create the Java file containing the code implementation of the transformation that must be performed during reconciliation. See Appendix B, "Sample Transformation Class" for information about creating a transformation class.
3. Compile the Java file. While compiling the file, you must reference the xliTelnet.jar file. See Section 2.1, "Files and Directories on the Installation Media" for information about the xliTelnet.jar file.
4. Create JAR files containing the code to implement the required transformations on the fields.
5. If you are using Oracle Identity Manager release 9.1.0.*x*, then copy the JAR files into the following directory:

   OIM_HOME/xellerate/ScheduleTask
6. If you are using Oracle Identity Manager release 11.1.1, then run the Oracle Identity Manager Upload JARs utility to post the JAR file to the Oracle Identity Manager database. This utility is copied into the following location when you install Oracle Identity Manager:

   Note: Verify that the WL_HOME environment variable is set to the directory in which Oracle WebLogic Server is installed.

   For Microsoft Windows:

   OIM_HOME/server/bin/UploadJars.bat

   For UNIX:

   OIM_HOME/server/bin/UploadJars.sh

   When you run the utility, you are prompted to enter the login credentials of the Oracle Identity Manager administrator, URL of the Oracle Identity Manager host computer, context factory value, type of JAR file being uploaded, and the location from which the JAR file is to be uploaded. Specify `2` as the value of the JAR type.

   See Also: *Oracle Fusion Middleware Developer's Guide for Oracle Identity Manager* for detailed information about the Upload JARs utility
7. In the Lookup.Reconciliation.TransformationMap lookup definition, add an entry for the transformation. In the Code Key column, enter the name of the reconciliation field (in the resource object) on which you want the transformation to be performed. In the Decode column, enter the name of the class file. For example:

Note: You can use this lookup definition for both UNIX SSH and SSH Telnet.

Code Key: `User.UserLogin`

Decode:
`com.thortech.xl.schedule.telnetssh.tasks.AppendTransformer`

See Also: *oracle Fusion Middleware Developer's Guide for Oracle Identity Manager* for information about creating lookup definitions

8. While configuring the Telnet User Target Resource Reconciliation Task and Telnet User Trusted Source Reconciliation Task scheduled tasks by performing the procedure described in Section 3.4, "Configuring Scheduled Tasks":
   - Enter the name of the lookup definition as the value of the TransformLookupName attribute.
   - Enter `yes` as the value of the UseTransformMapping attribute to specify that you want transformations to be applied. If you enter `no` as the value, then the transformations are not applied.

5

Testing and Troubleshooting

Note: : ■Before running the test utility for 11.1.1, make sure that you have copied the required jar files (xliTelnet.jar or xliSSH.jar) into the folders JavaTasks and ScheduleTask, and sshfactory.jar is copied to ThirdParty folder.

- If the SSHVersion of the target resource is client, then the connector may not work expectedly. In this case you need to replace the sshfactory.jar in Thirdparty with latest version of sshafactory.jar

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.

Before you use the testing utility, copy the files in the test directory on the installation media to one of the following directories:

- For Oracle Identity Manager release 9.1.0.*1*:

  OIM_HOME/xellerate/XLIntegrations/Telnet

- For Oracle Identity Manager release 11.1.1:

  OIM_HOME/server/XLIntegrations/Telnet

Set the required values in the config.properties file. This file is in one of the following directories:

- For Oracle Identity Manager release 9.1.0.*1*:

  OIM_HOME/xellerate/XLIntegrations/Telnet/config/config.properties

- For Oracle Identity Manager release 11.1.1:

  OIM_HOME/server/XLIntegrations/Telnet/config/config.properties

Use the information in the following table to modify the default attributes of the config.properties file.

Attribute	Description	Default Attribute (Sample Value)
hostname	IP address of the target server on which user provisioning is to be performed	`10.1.1.114`

Attribute	Description	Default Attribute (Sample Value)
shellPrompt	Default shell prompt of the UNIX server: # for Solaris, Linux, and HP-UX $ for AIX	#
Port	Port at which the Telnet server is listening	23
Os Type	Operating system type of the UNIX server Accepted values are SOLARIS, LINUX, HP-UX, and AIX.	SOLARIS
adminpassword	Admin user password	password1
Admin	UNIX server administrator credentials for the Telnet server	root
Action	Action to be tested The value can be any of the following: ■ CONNECT ■ CREATE ■ CHANGEPASSWORD ■ MODIFY ■ DELETE ■ DISABLE ■ ENABLE ■ ENABLETRUSTED (only for HP-UX trusted mode)	CREATE
UserName	User attribute	jdoe
Max Retries	Number of times that the UNIX Telnet connector should retry connecting to the target server if the connection fails	2
Delay	Delay (in milliseconds) before the connector attempts to retry connecting to the target system, in case the connection fails	2000
Timeout	Value of the timeout (in milliseconds) for the connection to the target server	10000
passwdMirrorFilePath	This parameter is used to specify the passwd mirror file path for reconciliation.	/etc/passwd1
shadowMirrorFilePath	This parameter is used to specify the shadow mirror file path for reconciliation.	/etc/shadow1
targetDateFormat	This parameter is used to specify the date format of the target UNIX computer.	MMddhhmmyy
expiryDateFormat	This parameter is used to specify the expiry date format of the target UNIX computer.	yyyy-MM-dd HH:mm:ss

After you specify values in the config.properties file, perform one of the following steps:

- If you are using Oracle Identity Manager release 9.1.0.*1*, then run the following script:

  For UNIX:

  OIM_HOME/xellerate/XLIntegrations/Telnet/scripts/telnet.sh

  For Microsoft Windows:

  OIM_HOME\xellerate\XLIntegrations\Telnet\scripts\Telnet.bat

- If you are using Oracle Identity Manager release 11.1.1, then run the following script:

  For UNIX:

  OIM_HOME/server/XLIntegrations/Telnet/scripts/telnet.sh

  For Microsoft Windows:

  OIM_HOME\server\XLIntegrations\Telnet\scripts\Telnet.bat

6

Known Issues

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

- **Bug 6923238**

  During provisioning, the data in the User Defined form fields must not contain the shell prompt character. Because there is a variation in shell prompt character depending on the target UNIX server, it should be checked in the target system.

  A reconciliation run stops if the scheduled task code encounters target system user data containing the character or characters that are same as the shell prompt of the target system.

A

Privileges Required for Performing Provisioning and Reconciliation

This appendix lists the privileges required for successful provisioning operations and reconciliation runs.

This appendix includes the following topics:

- Appendix A.1, "Privileges Required for Running Commands on Non-AIX"
- Appendix A.2, "Privileges Required for Running Commands on HP-UX"
- Appendix A.3, "Privileges Required for Running Commands on AIX"

A.1 Privileges Required for Running Commands on Non-AIX

Users must have privileges to run the following commands:

`usermod, useradd, userdel, passwd, chage`

In addition, the users must have execute permissions for the following commands:

`sed, cat, diff, sort, rm, grep, egrep, echo, /usr/bin/sh, /bin/sh`

Users must have read and write permissions on the `/etc, /home`, and `/tmp` directories.

A.2 Privileges Required for Running Commands on HP-UX

Users must have privileges to execute the `modprpw` command.

In addition, users must have read and write permissions on the `/etc, /home`, and `/tmp` directories.

A.3 Privileges Required for Running Commands on AIX

User must have privileges to execute the following commands:

`mkuser, chuser, rmuser, lsuser, /usr/bin/usermod, /usr/chuser`

In addition, the users must have execute permissions for the following commands:

`/usr/bin/bdiff, sh, cat, /usr/bin/sort, /usr/bin/rm, /usr/bin/grep, /bin/echo, /bin/sed, command.`

Users must have read and write permissions on the `/home, / (root)`, and `/tmp` directories.

B

Sample Transformation Class

When you use this connector, you can transform reconciled data according to your requirements. This feature has been described in Section 4.4, "Transforming Data Reconciled Into Oracle Identity Manager," along with the discussion on the Transform Lookup Code and Use Transform Mapping attributes.

If you want to transform the value of a target system field that is fetched during reconciliation, then the first step is to implement the required transformation logic in a Java class. This transformation class must implement the com.thortech.xl.schedule.telnetssh.tasks.AttributeTransformer interface and the transform method.

The following is a sample transformation class:

```
package com.thortech.xl.schedule.telnetssh.tasks;
import java.util.Hashtable;
import com.thortech.util.logging.Logger;
import com.thortech.xl.integration.telnetssh.util.TelnetSSHConstants;
public class AppendTransformer implements AttributeTransformer
{
/**
 * sample transformation method
 *  it appends '123' to the key if present in the data to be reconciled
 *  @param sKeyToBeTransformed - key to be transformed for example: Users.GECOS
 *  @paramhtReconData - hash table of the data to be reconciled
*/
public Hashtable transform(String sKeyToBeTransformed, Hashtable htReconData)
{
if(htReconData != null && sKeyToBeTransformed != null ) {
if(htReconData.get(sKeyToBeTransformed) != null) {
String sValue = (String)htReconData.get(sKeyToBeTransformed) ;
sValue+="123";
htReconData.put(sKeyToBeTransformed, sValue);
}
}
return htReconData;
}
}
```

The method defined in this class accepts the value of the field to be transformed, appends the string 123 to it, and returns the transformed string value.

Index

T

V