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Generic Technology Connector Administrator's Guide

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Preface

This guide explains the procedures involved in creating and managing generic technology connectors.

Audience

This guide is intended for administrators who install and configure Oracle Identity Manager.

Documentation Accessibility

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

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Accessibility of Code Examples in Documentation

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Related Documents

The following guides are available in the Oracle Identity Manager documentation set:

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

Refer to the "[Related Documentation on Connectors](#)" section on page 1-5 for a listing of guides that supplement the information in this guide.

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.
<i>italic</i>	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.

About Generic Technology Connectors

This chapter introduces the generic technology connector concept and the features that Oracle Identity Manager provides for working with generic technology connectors.

This chapter is divided into the following sections:

- [Need for a Generic Technology Connector](#)
- [Introduction to Generic Technology Connectors](#)
- [Features of the Generic Technology Connector Framework](#)
- [How to Use This Guide](#)

Need for a Generic Technology Connector

Application-specific Oracle Identity Manager connectors are designed for target systems such as Microsoft Active Directory and PeopleSoft User Management. The architecture of such a connector is based on either the APIs that the target system supports or the data repository type and schema in which the target system stores identity data. This means that the connector is tightly integrated with its target system. The use of an application-specific connector is the preferred integration method if one is available for the target system.

Consider a scenario in which you use a provisioning system for which there is no corresponding application-specific connector. The following is an example of such a scenario:

All employees of Acme Inc. are allotted disk space on a backup server. An employee sends requests to the system administrator for managing the employee's account on the backup server. The system administrator has developed a Web-based application to capture, review, and act on requests from employees. The front end of this application is a Web service that accepts and stores data in CSV format. Employee account data stored in the back end can be exported as XML files to a specified location. The company has recently installed Oracle Identity Manager, and they want to set up the Web-based application as a target system.

Application-specific connector functionality does not support this scenario.

In such scenarios, you can create a custom connector to link the target system and Oracle Identity Manager. If the data format and data transport mechanism used by the target system can be converted to those supported by Oracle Identity Manager, then you can use Oracle Identity Manager to create the custom connector.

A custom connector created using Oracle Identity Manager is called a **generic technology connector**, because it is independent of the APIs that the target system

supports and the data repository type and schema in which the target system stores identity data.

Note: A single generic technology connector can be used as the link between Oracle Identity Manager and multiple target systems that support the same input and output data formats and data transport mechanisms.

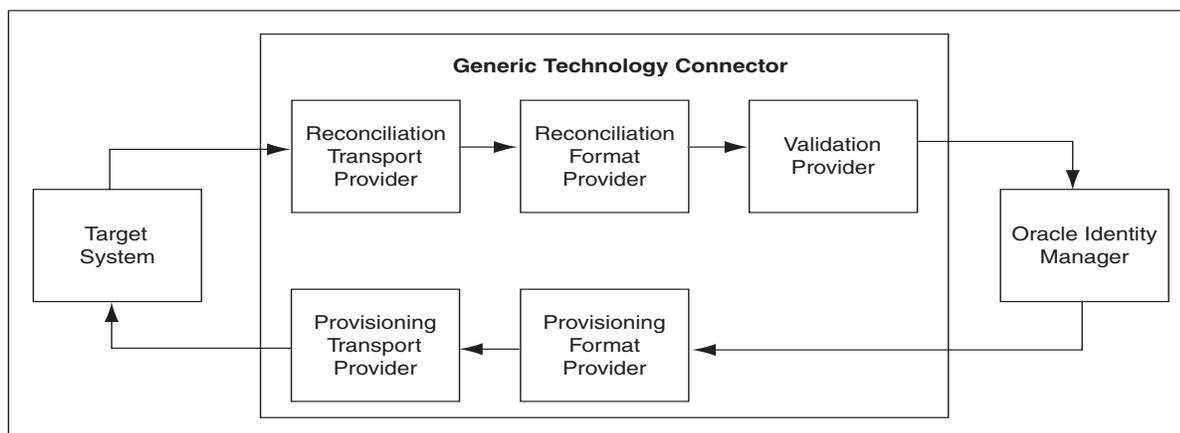
Introduction to Generic Technology Connectors

A generic technology connector is a collection of components. A component provides a service that is used by another component, the target system, or Oracle Identity Manager. Together, these components can be linked to support a wide variety of data formats and data transport mechanisms.

Providers

In this guide, the components that constitute a generic technology connector are called **providers**.

The following figure shows the provider-level architecture of a generic technology connector.



Oracle Identity Manager supports the following provider types:

- **Reconciliation Transport provider**
This provider carries reconciliation data from the target system to Oracle Identity Manager. The manner in which a Reconciliation Transport provider carries reconciliation data depends on the implementation of the provider. For example, a provider can read data from a file, accept data from a Web service, or query a database.
- **Reconciliation Format provider**
This provider parses a target system message (containing reconciliation data fetched by the Reconciliation Transport provider) into data structures that can be stored in Oracle Identity Manager.
- **Validation provider**
This provider validates data received from the Reconciliation Format provider before passing it on to the reconciliation engine of Oracle Identity Manager. You

can define the rules that the Validation provider uses to validate reconciliation data.

- Provisioning Format provider

This provider converts Oracle Identity Manager provisioning data into a format that is supported by the target system.

- Provisioning Transport provider

This provider carries provisioning data from the Provisioning Format provider to the target system.

Data Sets

A data set is a representation of data that is at a particular stage of transit between the target system and Oracle Identity Manager. Data sets can be visualized as data structures arranged in the form of layers, with data flowing from one layer to another during provisioning and reconciliation. Oracle Identity Manager provides features that enable you to specify the fields that constitute these data sets.

The following data set definitions are supported:

- Source data set

This is data that has been extracted from the target system by the Reconciliation Transport provider and processed by the Reconciliation format provider.

- Reconciliation Staging data set

This is source data that has been processed by the Validation provider before it is used to populate the reconciliation fields and passed to the reconciliation engine.

- Account data set

This is user account information that is stored in the process form fields of Oracle Identity Manager.

- User data set

This is the metadata (identity data attributes) that define the OIM User account. This data set cannot have child data sets.

- Provisioning Staging data set

This is the data that is sent to the Provisioning Format provider for conversion into a structure that can be accepted by the target system.

While defining data sets, you can also define:

- Mappings between fields of different data sets

A mapping serves one of the following purposes:

- Establishes a data flow path between fields of two data sets, for either provisioning or reconciliation
- Creates a basis for comparing (matching) field values of two data sets

- Validations to be performed on data that is fetched from the target system

Features of the Generic Technology Connector Framework

In this guide, the term **generic technology connector framework** refers to the Oracle Identity Manager module that is used to create and work with generic technology connectors.

The following is a summary of the features offered by the generic technology connector framework:

- Data set definition and modification

You can create data sets to represent the structure of data at various stages of transit between the target system and Oracle Identity Manager. You can define parent data sets and child data.

Note: A child data set holds multivalued identity attributes. Each record of a child data set is uniquely related to a single record of the corresponding parent data set.

For example, suppose a parent data set holds information such as the last name, e-mail address, and employee ID of users in a company. This parent data set can have a child data set that holds information about group membership of the users. Each child data set record can contain an employee ID, group ID, group name, and group membership expiry date.

While defining data sets, you can also define mappings between the fields that constitute the various data sets.

- Reconciliation can be either full or incremental

While creating a generic technology connector, you can specify that you want to use the connector for full or incremental reconciliation.

In incremental reconciliation, only those target system records that have changed after the last reconciliation run are reconciled (stored) into Oracle Identity Manager.

In full reconciliation, all the reconciliation records are extracted from the target system. However, the optimized reconciliation feature identifies and ignores records that have already been reconciled in Oracle Identity Manager. This helps reduce the space occupied by reconciliation data. If this feature were not present, then the amount of data stored in the Oracle Identity Manager database would increase rapidly with each reconciliation run.

- Batched reconciliation

You can specify a batch size for reconciliation. By doing this, you can break into batches the total number of records that the reconciliation engine fetches from the target system during each reconciliation run. This feature provides more control over the reconciliation process.

- Failure threshold for stopping reconciliation

During reconciliation, Validation providers can be used to run checks on target system data before it is stored in Oracle Identity Manager. You can use this feature to automatically stop a reconciliation run if the percentage of records that fail the validation checks to the total number of records processed exceeds a specified threshold percentage.

- Management of generic technology connectors

You can modify, export, and import generic technology connectors.

- **Multilanguage support**

The generic technology connector framework has been designed to handle non-ASCII data.

- **Using a single generic technology connector for multiple target systems**

You can use a single generic technology connector for multiple target systems that support the same data format and data transport mechanism.

Note: This release of the generic technology connector does not support trusted source reconciliation.

How to Use This Guide

The following is an overview of the remaining chapters and appendixes of this guide:

- [Chapter 2, "Creating Generic Technology Connectors"](#)

This chapter provides conceptual and procedural information about creating generic technology connectors.

- [Chapter 3, "Managing Generic Technology Connectors"](#)

This chapter provides procedural information about modifying, exporting, and importing generic technology connectors.

- [Chapter 4, "Standard Features of the Generic Technology Connector Framework"](#)

This chapter explains the features that generic technology connectors share with application-specific connectors.

- [Chapter 5, "Troubleshooting"](#)

This chapter provides solutions to some commonly encountered problems associated with using generic technology connectors for reconciliation and provisioning.

- [Chapter 6, "Known Issues"](#)

This chapter explains the limitations of the generic technology connector framework in this release of Oracle Identity Manager. Most of these limitations are also covered at appropriate places in the rest of the guide.

- [Appendix A, "Predefined Providers Shipped with Oracle Identity Manager"](#)

This appendix provides information about the predefined providers.

- [Appendix B, "Connector Objects Created by the Generic Technology Connector Framework"](#)

This appendix provides information about the connector objects that are automatically created by the generic technology connector framework.

- [Appendix C, "Validations Applied When Data Set Fields Are Added or Modified"](#)

This appendix lists the validations that are applied when you add or modify fields of data sets.

Related Documentation on Connectors

The following guides provide additional information about connectors and the features that Oracle Identity Manager provides for working with connectors:

- *Oracle Identity Manager Connector Framework Guide*
Refer to this guide for generic information about Oracle Identity Manager connectors. You can access this guide from the Oracle Identity Manager Connector Pack documentation library.
- *Oracle Identity Manager Glossary of Terms*
This is a glossary of frequently used terms related to Oracle Identity Manager. You can access this guide from the Oracle Identity Manager documentation library.
- *Oracle Identity Manager Administrative and User Console Guide*
Refer to this guide for information about using Administrative and User Console features that are not discussed in the following chapters. This information includes the procedures to perform reconciliation and provisioning. You can access this guide from the Oracle Identity Manager documentation library.
- *Oracle Identity Manager Design Console Guide*
Refer to this guide for additional information about Design Console procedures discussed in Chapter 2. You can access this guide from the Oracle Identity Manager documentation library.

Creating Generic Technology Connectors

This chapter discusses the following steps involved in creating generic technology connectors:

- [Step 1: Identifying Provider Requirements](#)
- [Step 2: Identifying the Predefined Providers That Meet the Provider Requirements](#)
- [Step 3: Addressing Requirements to Create the Generic Technology Connector](#)
- [Step 4: Using the Administrative and User Console to Create the Generic Technology Connector](#)
- [Step 5: Configuring Reconciliation](#)
- [Step 6: Configuring Provisioning](#)

Step 1: Identifying Provider Requirements

You must identify the combination of providers that you want to include in the connector. This decision must be based on the following factors:

- Outgoing and incoming data formats and data transport mechanisms that are supported by the target system
- Predefined providers shipped with Oracle Identity Manager

See Also: The "[Introduction to Generic Technology Connectors](#)" section on page 1-2 for conceptual information about providers

Based on your knowledge of the data formats and data transport mechanisms supported by the target system, identify the providers that must be included in the generic technology connector that you create. If the target system supports multiple data formats and data transport mechanisms, then you must select a single combination of the transport and format providers discussed in the first chapter. You cannot include, for example, multiple Reconciliation Format providers in a single generic technology connector.

Step 2: Identifying the Predefined Providers That Meet the Provider Requirements

The following predefined providers are shipped with this release of Oracle Identity Manager:

- Shared Drive Transport Provider for Reconciliation
- CSV Format Provider for Reconciliation

- SPML Format Provider for Provisioning
- Web Services Transport for Provisioning
- Various Validation Providers

Refer to [Appendix A](#) for information about these predefined providers. You must check if these providers meet the provider requirements that you determine in the preceding step.

Step 3: Addressing Requirements to Create the Generic Technology Connector

You must address the following requirements:

- Connectivity between the target system server and the Oracle Identity Manager server

You must ensure that connectivity can be established between the target system server and the Oracle Identity Manager server. For example, in a Linux environment, you must enter the fully qualified host name of the Oracle Identity Manager server in the `/etc/hosts` file on the target system server.

- User account used to create the generic technology connector

All users belonging to the `SYSTEM ADMINISTRATORS` group of Oracle Identity Manager can create generic technology connectors. Alternatively, members of a group to which you assign the required menu items and permissions can create generic technology connectors.

See Also: The "User Groups" chapter of *Oracle Identity Manager Administrative and User Console Guide* for information about creating groups and assigning menu items and permissions to them

The required menu items are as follows:

- Create Generic Technology Connector menu item
- Manage Generic Technology Connector menu item

The required permissions are as follows:

- Form Designer (Allow Insert, Write Access, Delete Access)
- Structure Utility.Additional Column (Allow Insert, Write Access, Delete Access)
- Meta-Table Hierarchy (Allow Insert, Write Access, Delete Access)

If these permissions are not correctly assigned to the group, then an error is thrown when a user belonging to this group starts creating a generic technology connector.

The user that you assign to this group is, by default, also a member of the `ALL USERS` group. Besides these two groups, if the user is a member of any other group to which these menu items and permissions have not been assigned, then an error *may* be thrown when the user clicks the Create button on the final Administrative and User Console screen for creating generic technology connectors. This problem is described in the "[User Account Used to Create Generic Technology Connectors](#)" section on page 6-3 of the "Known Issues" chapter.

Step 4: Using the Administrative and User Console to Create the Generic Technology Connector

You use the Oracle Identity Manager Administrative and User Console to create the generic technology connector.

Note: To fully understand the concepts explained in this section, you would need to view the Administrative and User Console screens that are used to create generic technology connectors. Therefore, it is recommended that you perform a trial run of the procedure described in this section.

At the start of the trial run, the generic technology connector name that you specify must be one that you do not plan to use when you actually start creating generic technology connectors. On the last screen, you can end the trial run by selecting the Cancel option.

In addition, refer to [Chapter 6](#) for information about known issues and limitations that you may encounter while creating generic technology connectors.

To navigate to the first Administrative and User Console screen for creating a generic technology connector, open the Administrative and User Console, expand **Generic Technology Connector**, and then click **Create**.

From this point onward, screen-wise instructions are provided in the following sections:

- [Step 1: Basic Information Screen](#)
- [Step 2: Define Parameters Screen](#)
- [Modify Connector Configuration Screen](#)
- [Step 3: Verify Connector Form Names Screen](#)
- [Step 4: Verify Connector Creation Information Screen](#)

Step 1: Basic Information Screen

To select the reconciliation and provisioning providers that you want to include in the generic technology connector, use this screen as follows:

1. In the **Name** field, specify a name for the generic technology connector.

You must ensure that the name you specify is not the same as:

- The name of any other connector (application-specific connector or generic technology connector) on this Oracle Identity Manager installation
- The name of any other connector object (such as resource objects, IT resources, and process forms) on this Oracle Identity Manager installation

An error is thrown if you specify a name that is the same as the name of an existing connector. However, an error is *not* thrown if you specify a name that is the same as the name of an existing connector object. Therefore, you must ensure that the name you want to specify is not the same as the name of any existing connector object.

Refer to [Appendix B](#) for more information about automatically created connector objects.

In addition, you must not enter non-ASCII characters in the Name field because Oracle Identity Manager does not support non-ASCII characters in connector names.

See Also: The "[Names of Generic Technology Connectors and Connector Objects](#)" section on page 6-1 of the "Known Issues" chapter for more information about both these limitations

2. If you want to use the generic technology connector for reconciliation, select **Reconciliation** and then perform the following steps:
 - From the **Transport Type** list, select the Reconciliation Transport provider that you want to use for this connector. This list displays the predefined Reconciliation Transport providers.
 - From the **Payload Format** list, select the Reconciliation Format provider that you want to use for this connector. This list displays the predefined Reconciliation Format providers.

The payload format is the format of the target system data. The Reconciliation Format provider parses and converts this data into a format that is supported by Oracle Identity Manager.

3. If you want to use the generic technology connector for provisioning, select **Provisioning** and then perform the following steps:

Note: You can choose only Reconciliation, only Provisioning, or both Reconciliation and Provisioning.

- From the **Transport Type** list, select the Provisioning Transport provider that you want to use for this connector. This list displays the predefined Provisioning Transport providers.
- From the **Payload Format** list, select the Provisioning Format provider that you want to use for this connector. This list displays the predefined Provisioning Format providers.

This payload format is the format into which provisioning data is converted by the Provisioning Format provider. The Provisioning Transport provider carries the output of the Provisioning Format provider to the target system.

4. Click **Continue**.

Step 2: Define Parameters Screen

Use this screen to specify values for the parameters of the providers that you select on the previous screen.

On this screen, the parameters are divided into two categories:

- Run-time parameters

The GUI elements displayed on this screen represent the run-time parameters for the providers that you select on the previous screen. A run-time parameter represents a value that you specify at run time. For example, the location of the directories containing the data files that you want to reconcile is a run-time parameter value.

Refer to [Appendix A](#) for information about the values to be specified for the parameters of the predefined providers.

- Design parameters

The parameters listed in this section are either design parameters of providers or reconciliation-specific parameters that are common to all generic technology connectors. A design parameter represents a value or set of values that is defined while the provider is being designed. For example, the format of data files that can be parsed by a Format provider is a design parameter for that provider.

The following are reconciliation-specific design parameters:

Note: If you do not select the Reconciliation option on the previous screen, then these reconciliation-specific design parameters are not displayed on this screen.

- Batch Size

Use this parameter to specify a batch size for the reconciliation run. The batch size represents the number of records per batch that is reconciled. By specifying a batch size, you can break into batches the total number of records that the reconciliation engine fetches from the target system.

The default value of this parameter is `All`.

- Stop Reconciliation Threshold

During reconciliation, data that is passed by the Reconciliation Format provider is accepted as input by the Validation provider. This provider checks the data on the basis of the validation rules that you define. Some of the reconciliation data records may not clear the validation checks. You can use the Stop Reconciliation Threshold parameter to automatically stop reconciliation if the percentage of records that fail the validation checks to the total number of reconciliation records processed exceeds the specified value.

The following example illustrates how this parameter works:

Suppose you specify 20 as the value of the Stop Reconciliation Threshold parameter. This means that you want reconciliation to stop if the percentage of the number of failed records to the total number of records processed becomes equal to or greater than 20. Suppose the second and eighth records fail the validation checks. At this stage, the number of failed records is 2 and the total number of records processed is 8. The percentage of failed records is 25, which is greater than the specified threshold of 20. Therefore, reconciliation is stopped after the eighth record is processed.

If reconciliation is stopped because the actual percentage of failed records exceeds the specified percentage, then the records that have already been reconciled into Oracle Identity Manager are not removed.

The default value of this parameter is `None`. This default value specifies that during any particular reconciliation run, you want all the target system records to be checked, regardless of the number of records that fail the checks.

- Stop Threshold Minimum Records

If you use the Stop Reconciliation Threshold parameter, then there may be a problem when several invalid records are encountered at the beginning of the reconciliation run. For example, suppose you specify a value of 40 for the Stop

Reconciliation Threshold parameter. When reconciliation starts, suppose the first record fails the validation checks. At this stage, the percentage of records failed to total records processed has reached 100. Therefore, reconciliation would stop.

To avoid such situations, you can use the Stop Threshold Minimum Records parameter in conjunction with the Stop Reconciliation Threshold parameter. The Stop Threshold Minimum Records parameter specifies the number of records that must be processed by the Validation provider before the Stop Reconciliation Threshold validation is automatically activated.

The following example illustrates how this parameter works:

Suppose you specify the following values:

Stop Reconciliation Threshold: 20

Stop Threshold Minimum Records: 80

With these values, from the eighty-first record onward, the Stop Reconciliation Threshold validation is activated. If any record fails the validation check, then the reconciliation engine calculates the percentage of failed records to total records processed.

Note: The default value of this parameter is `None`. You must specify a value for this parameter if you specify a value for the Stop Reconciliation Threshold parameter.

– Reconciliation Type

Use this parameter to specify whether you want the reconciliation engine to perform full or incremental reconciliation.

In incremental reconciliation, only those target system records that have changed after the last reconciliation run are reconciled (stored) into Oracle Identity Manager.

In full reconciliation, all the reconciliation records are extracted from the target system. However, the optimized reconciliation feature identifies and ignores records that have already been reconciled in Oracle Identity Manager. This helps reduce the space occupied by reconciliation data. If this feature were not present, then the amount of data stored in the Oracle Identity Manager database would increase rapidly with each reconciliation run.

You must select incremental reconciliation if either one of the following conditions is true:

- * The target system time-stamps or uniquely marks (in some way) files or individual data records that it generates and the Reconciliation Transport provider can recognize records that have been time-stamped or marked by the target system.

For example:

Suppose you can configure the target system to append "NEW_" to each new data file that it generates. If you select the Shared Drive Transport provider, then you can specify "NEW_" as the value of the File Prefix parameter. During reconciliation, this provider will copy only files that have "NEW_" appended to their names.

- * The target system only provides data records that have changed after the last reconciliation run.

If neither of these conditions is true, then you must select full reconciliation. In this case, as mentioned earlier, the optimized reconciliation feature identifies and ignores records that have already been reconciled.

After you specify values for the run-time and design parameters, click **Continue**.

Note: If the values that you provide on this screen are not correct, then the following error is displayed at the top of the screen when you submit the information:

"Problem encountered during metadata detection. Please check the server logs for more details."

This problem and its solution is discussed in the "[Step 2: Define Parameters Screen](#)" section on page 6-3 of the "Known Issues" chapter.

Modify Connector Configuration Screen

Use this screen to define data sets and mappings between the fields of the data sets. In other words, you use this screen to specify the identity data fields that you want to:

- Propagate from the target system to Oracle Identity Manager during reconciliation
- Propagate from Oracle Identity Manager to the target system during provisioning

After you click the **Continue** button on the second (previous) screen, the elements displayed on the Modify Connector Configuration screen depend on the input provided on the first and second screens:

- If you select the Reconciliation-only option or the Reconciliation and Provisioning option, then:
 - If there are no data files in the staging directories, then an error message is displayed. This issue is discussed in the "[Modify Connector Configuration Screen](#)" section on page 6-5 of the "Known Issues" chapter.

If this error occurs, then you must restart the procedure from the first step onward. To restart the procedure, you can specify a different name for the generic technology connector on the first screen and then continue. Alternatively, if you want to use the same generic technology connector name, you must restart the application server and then start from the first screen onward.

See Also: The "[Names of Generic Technology Connectors and Connector Objects](#)" section on page 6-1 of the "Known Issues" chapter for information about why you must follow one of these methods to restart the procedure

- If there are data files in the staging directories, then Oracle Identity Manager automatically reads metadata from the data files. This metadata is prepopulated in the data set fields displayed on the Modify Connector Configuration screen.
- If you select the Provisioning-only option on the first screen, then the data set fields displayed are empty.

However, if there are default fields defined for any of the provisioning-specific providers that you select, then these fields are displayed. For example, the ID field of the Account data set and the objectClass and containerID fields of the Provisioning Staging data set are displayed by default. These fields are discussed later in this guide.

See Also: The "[Multilanguage Support](#)" section on page 6-6 of the "Known Issues" chapter for information about limitations related to the display of non-ASCII characters on this screen

Data Set Categories

The data sets displayed on this screen are categorized as follows:

- **Source**

This category contains the Source data set and its child data sets. This category is displayed only if you select the Reconciliation option on the first screen, regardless of whether or not you select the Provisioning option.
- **Reconciliation Staging**

This category contains the Reconciliation Staging data set and its child data sets. This category is displayed only if you select the Reconciliation option on the first screen, regardless of whether or not you select the Provisioning option.
- **OIM**

This category contains the User data set, Account data set, and child data sets of the Account data set. This category is displayed, regardless of whether you select only Reconciliation, only Provisioning, or both Reconciliation and Provisioning on the first screen.

The ID field appears by default in the Account data set. This field is used to store the value that uniquely identifies individual records in Oracle Identity Manager and in the target system. For a particular user, this unique field is used to direct other operations, such as modify, delete, enable, disable and child data operations.

During reconciliation, the value of the ID field must come from the corresponding unique field of the Reconciliation Staging data set. To set this up, you must create a mapping between the two fields. The procedure to create a mapping is discussed later in this section.
- **Provisioning Staging**

This category contains the Reconciliation Staging data set and its child data sets. This category is displayed only if you select the Provisioning option on the first screen, regardless of whether or not you select the Reconciliation option.

See Also: The "[Introduction to Generic Technology Connectors](#)" section on page 1-2 for conceptual information about these data sets

Field Mappings

The flow lines displayed on this screen represent the mappings that are based on the metadata detected by the generic technology connector framework. A mapping represents a link between two fields of different data sets. It serves one of the following purposes:

- Establishes a data flow path between fields of two data sets, for either provisioning or reconciliation
- Creates a basis for comparing (matching) field values of two data sets

The following are examples of matching-only mappings:

- Mappings created between fields of the Reconciliation Staging data set and the User data set form the basis of reconciliation rules.
- A mapping between the unique field of the Reconciliation Staging data set and the ID field of the Account data set helps identify the key field for reconciliation matching. Along with the ID field, other fields of the Account data set can be (matching-only) mapped to corresponding fields of the Reconciliation Staging data set to create a composite key field for reconciliation matching.

Caution: Suppose you select both the Provisioning and Reconciliation options while creating a generic technology connector and you do not create a mapping between the ID field and the unique field of the target system. Without this mapping, the records that are linked through reconciliation cannot be used for further provisioning operations, such as modify, delete, enable, disable, and child data operations. This is because the ID field is not populated in the linked records.

You can perform the following actions on this screen:

- [Adding Fields to Data Sets](#)
- [Editing Fields of Data Sets](#)
- [Creating or Modifying Field Mappings](#)
- [Removing Fields from Data Sets](#)

Adding Fields to Data Sets

To add a field to a data set:

See Also: [Appendix C, "Validations Applied When Data Set Fields Are Added or Modified"](#)

1. Click the Add icon for the data set.
2. Specify values for the following GUI elements:
 - **Field Name:** Specify a name for the field. The field name that you specify must not contain non-ASCII characters.
 - **Matching Only:** Select this check box if the field is to be used only for matching, and not to propagate values during reconciliation.
 - **Create End-to-End Mapping:** Select this check box if you want the same field to appear in the corresponding data sets of all the categories that are displayed to the right of the current category.
 - **Multi-Valued Field:** Select this check box if you want to add a child data set.
 - **Data Type:** Select the data type of the field.
 - **Length:** Specify the character length of the field.

Refer to the "[Modify Connector Configuration Screen](#)" section on page 6-5 for information about a known issue related to the entry of non-numeric values in this field.

- Required: Select this check box if you want to ensure that the field always contains a value.
 - Encrypted: Select this check box if the value of the field must be encrypted.
3. Click **Continue**.
 4. If required, select a validation check for the field and then click **Add**.

Note: The screen on which you select a validation check is displayed only when you are adding a field to a data set of the Source category.

The validation options displayed in this list are based on the predefined validation providers.

5. Click **Continue**, and then click **Close**.
6. If you do not want to perform any other action on the Modify Connector Configuration screen, then click the **Close** button that is displayed at the top of the screen. You must perform Step 5 before you click the Close button.

Editing Fields of Data Sets

To edit a field of a data set:

Caution: The following Caution notice applies if you are performing this procedure to modify a generic technology connector that you have already created.

If you modify the field size or field data type value of the Account data set or its child data sets, then corresponding changes are not made in the Oracle Identity Manager database entries for these data sets. At the same time, no error message is displayed.

Therefore, for this release of Oracle Identity Manager, it is recommended that you do not modify the fields or child data sets of the Account data set.

This point has also been discussed in the "[Modify Connector Configuration Screen](#)" section on page 6-5 of the "Known Issues" chapter.

See Also: [Appendix C, "Validations Applied When Data Set Fields Are Added or Modified"](#)

1. Click the Edit icon for the field.
2. Specify values for the following GUI elements:

Note: The list of GUI elements displayed on this screen depends on the data set to which the field belongs. Some of the following GUI elements may not appear for some data set fields. For example, for fields of the User data set, only the Matching Only GUI element is displayed.

- **Matching Only:** Select this check box if the field is to be used only for matching, and not to propagate values during reconciliation.
This check box is selected by default for fields of the User data set.
 - **Data Type:** Select the data type of the field.
 - **Length:** Specify the character length of the field.
Refer to the "[Modify Connector Configuration Screen](#)" section on page 6-5 for information about a known issue related to the entry of non-numeric values in this field.
 - **Required:** Select this check box if this is a mandatory field.
 - **Encrypted:** Select this check box if the value of the field must be encrypted.
3. Click **Continue**.
 4. Because it is assumed that you do not want to create a mapping, you need not perform any action on this screen. Alternatively, you can assign a literal value to the field.
 5. Click **Continue**, and then click **Close**.
 6. If you do not want to perform any other action on the Modify Connector Configuration screen, then click the **Close** button that is displayed at the top of the screen. You must perform Step 5 before you click the Close button.

Creating or Modifying Field Mappings

To create or modify a mapping:

Note: All the fields of data sets in the Provisioning Staging category must be mapped to corresponding fields of data sets in the OIM category.

1. Click the Edit icon for the mapping destination field (not the mapping source field).
For example, if you want to create a mapping between a field of the Source data set and a field of the Reconciliation Staging data set, then click the Edit icon for the field of the Reconciliation Staging data set.
2. On this screen, you can create one of the following types of mappings:
 - If you want to use the mapping to define a path for the data to flow from the source field to the destination field, then you need not specify any input.
 - If you want to use the mapping to compare (match) the values of the source field and the destination field, then select **Matching Only**. This check box is selected by default for fields of the User data set. You must select this check box while mapping the ID field of the Account data set and the unique field of the Reconciliation Staging data set.Because you only want to create a mapping, you do not need to specify values for any other GUI elements on this screen.
3. Click **Continue**.
4. Select the source data set and field to which you want to map the field.
5. Click **Continue**, and then click **Close**.

6. If you do not want to perform any other action on the Modify Connector Configuration screen, then click the **Close** button that is displayed at the top of the screen. You must perform Step 5 before you click the Close button.

When you create a mapping between two fields, a flow line is displayed between the fields on this screen.

To remove a mapping:

1. Delete either the source or destination field of the mapping.
2. Re-create the field that you delete in the previous step.
3. Re-create any other mapping that may have been removed when you perform the first step.
4. If you do not want to perform any other action on the Modify Connector Configuration screen, then click the **Close** button that is displayed at the top of the screen. You must perform Step 5 before you click the Close button.

Removing Fields from Data Sets

To remove a field from a data set:

1. Click the Delete icon for that field.
2. If you do not want to perform any other action on the Modify Connector Configuration screen, then click the **Close** button that is displayed at the top of the screen.

Step 3: Verify Connector Form Names Screen

Use this screen to specify form names for the process forms corresponding to data sets of the OIM category.

The generic technology connector framework automatically creates certain objects after you submit all the information required to create a generic technology connector. Parent and child process forms corresponding to the data sets of the OIM category are examples of objects that are automatically created. Each process form on a particular Oracle Identity Manager installation must have a unique name.

On this screen, the generic technology connector framework displays default names for these process forms. You must verify and, if required, change the names of these forms to ensure that they are unique for this installation of Oracle Identity Manager. In addition, you must not include non-ASCII characters in the form names. An error message is displayed if you submit non-unique form names or if any name contains non-ASCII characters.

After you specify the form names, click **Continue**.

Step 4: Verify Connector Creation Information Screen

Use this screen to review information that you have provided for the creation of the generic technology connector. The following is a screen-wise explanation of the changes that are permitted on the earlier screens:

- Step 1: Basic Information screen

You can use either the Change or Back button to reopen this screen. However, due to limitation explained in the "[Names of Generic Technology Connectors and Connector Objects](#)" section on page 6-1 of the "Known Issues" chapter, you must not revisit this screen to make changes. To make changes in information on this

screen, restart the procedure from the beginning and specify a new name for the generic technology connector. Alternatively, if you want to use the same name, then you must restart the application server before you start creating the generic technology connector a second time.

Note: The User Reconciliation field may be displayed along with the rest of the fields in the Basic Information table. Ignore this field. In future releases, this field will be used to indicate the reconciliation type (trusted/nontrusted) for the connector.

- Step 2: Define Parameters screen
You can use either the Change or Back button to reopen this screen. You can change parameter values on this screen. However, metadata detection does not take place when you submit the changed values.
- Modify Connector Configuration screen
You can use the Change button to reopen this screen and then change data set fields and mappings.
- Step 3: Verify Connector Form Names screen.
You cannot revisit this screen.

After you verify all the information displayed on the Step 4: Verify Connector Creation Information screen, click **Create**.

At this stage, the generic technology connector framework creates all the standard connector objects on the basis of the information that you provide. The list of these objects includes the connector XML file, which is created and imported automatically into Oracle Identity Manager. The names of these objects are the same as the name that you specify for the generic technology connector.

See Also: [Appendix B, "Connector Objects Created by the Generic Technology Connector Framework"](#)

At the end of the process, a message stating that the connector has been successfully created is displayed on the screen.

Note: If the creation process fails, then objects that are created are not automatically deleted.

This point is discussed in the "[Connector Objects](#)" section on page 6-9 of the "Known Issues" chapter.

Step 5: Configuring Reconciliation

Note: If you select only the Provisioning option on the first screen, then you can skip this section because you need not configure reconciliation.

A reconciliation scheduled task is created automatically when you create the generic technology connector. During reconciliation, this scheduled task performs the following steps:

1. Calls the Reconciliation Transport provider
2. Calls the Reconciliation Format provider to parse the transported data
3. Calls the Validation provider on the parsed data
4. Runs the function that processes the data flow based on mappings defined between the Source category and the Reconciliation Staging category.
5. Runs the function that generates reconciliation events for the data

You use the Design Console to set up the scheduled task that is created when you create a generic technology connector.

Note: You can perform this procedure only after you create the generic technology connector.

To set up the reconciliation scheduled task:

1. Open the Design Console.
2. Expand **Administration**.
3. Double-click **Task Scheduler**.
4. Click the Search icon.
5. Click the **Task Scheduler Table** tab.
6. To locate the scheduled task that was created as one of the objects of the generic technology connector, click the **Scheduled Task** column to sort the contents of that column in ascending or descending order.

The name of the scheduled task is the same as the name that you specify for the generic technology connector.

7. Select the row corresponding to the scheduled task for the generic technology connector.
8. To specify that you do want to save any changes, click **Yes**.
9. Click the **Task Scheduler** tab.
10. Enter a number in the **Max Retries** field. This number represents the number of times Oracle Identity Manager must attempt to complete the task before assigning the `ERROR` status to the task.
11. Ensure that the **Disabled** and **Stop Execution** check boxes are not selected.
12. In the Start region, double-click the **Start Time** field. From the date-time editor that is displayed, select the date and time at which you want the task to run.
13. In the Interval region, set the following schedule parameters:
 - To set the task to run on a recurring basis, select the **Daily, Weekly, Recurring Intervals, Monthly, or Yearly** option. If you select the **Recurring Intervals** option, then you must also specify the time interval at which you want the task to run on a recurring basis.
 - To set the task to run only once, select the **Once** option.
14. Click **Save**. The scheduled task is created. The `INACTIVE` status is displayed in the Status field, because the task is not currently running. The task is run at the date and time that you set in Step 12.

Refer to the "Other Known Issues" section on page 6-11 for information about a known issue related to the status of scheduled tasks.

See Also: *Oracle Identity Manager Design Console Guide*

Step 6: Configuring Provisioning

In the generic technology connector context, configuring provisioning involves the following procedures:

Note: If you select only the Reconciliation option on the first screen, then you can skip these procedures because you need not configure provisioning.

- [Compiling the Generic Adapter](#)
- [Modifying Default Process Task Assignments](#)

Compiling the Generic Adapter

In an application-specific connector, there is one adapter for each provisioning function that the connector supports. For a generic technology connector, there is only one adapter for all the provisioning functions. This adapter is known as a **generic adapter**. It is one of the objects that are automatically created when you create a generic technology connector. It is created only if you select the Provisioning option, regardless of whether or not you select the Reconciliation option, on the Step 1: Basic Information screen.

During provisioning, the generic adapter performs the following steps:

1. Runs the function that retrieves process instance data, IT resource data, and user and group assignment data
2. Calls the Provisioning Format provider to change the format of the data
3. Runs the function that processes the data flow based on mappings defined between the OIM category and the Provisioning Staging category.
4. Calls the Provisioning Transport provider to transport the formatted data to the target system

You must compile the generic adapter before it can be used for provisioning.

Note: You can perform this procedure only after you create the generic technology connector.

To compile the generic adapter:

1. Open the Design Console.
2. Expand **Development Tools**.
3. Double-click **Adapter Factory**.
4. Use the Search icon to locate the generic adapter. The name of the generic adapter is the same as the name that you specify for the generic technology connector.
5. To compile the adapter, click **Build**.

After the adapter is compiled, the Compile Status field shows the OK status.

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

See Also: *Oracle Identity Manager Design Console Guide*

Modifying Default Process Task Assignments

Note: This is an optional step.

Refer to *Oracle Identity Manager Design Console Guide* for conceptual information about process tasks and assignments.

A process definition is one of the objects that are automatically created when you create a generic technology connector. This process definition has the same name as the generic technology connector. The process tasks that constitute this process definition can be divided into two types:

- System-defined process tasks
These process tasks are included by default in all newly created process definitions.
- Framework-defined process tasks
The generic technology connector framework includes these process tasks in a process definition only if you select the Provisioning option on the "Screen 1: Basic Information" screen, regardless of whether or not you select the Reconciliation option.

The following are framework-defined process tasks:

- Create User
- Delete User
- Enable User
- Disable User
- Updated *Field_Name*
This task is created for each field of the Account data set, except the ID field.

In addition, the following framework-defined process tasks are created for each child data set of the Account data set:

- Child Table *Child_Form_Name* row Inserted
- Child Table *Child_Form_Name* row Updated
- Child Table *Child_Form_Name* row Deleted

All framework-defined process tasks have the following default assignments:

- Target Type: Group User With Highest Priority
- Group: SYSTEM ADMINISTRATORS
- User: XELSYSADM

If required, you can modify these default assignments by following the instructions given in the "Modifying Process Tasks" section in *Oracle Identity Manager Design Console Guide*.

Managing Generic Technology Connectors

The generic technology connector framework offers features that enable you to modify a generic technology connector. In addition, you can export or import a generic technology connector by using the deployment manager.

These features of the generic technology connector framework are discussed in the following sections:

- [Modifying Generic Technology Connectors](#)
- [Exporting Generic Technology Connectors](#)
- [Importing Generic Technology Connectors](#)

Modifying Generic Technology Connectors

Caution: You must not use the Design Console to modify the connector objects that are automatically created by the generic technology connector framework. If you modify connector objects outside the generic technology connector framework, then the generic technology connector might not work.

Refer to [Appendix B](#) for information about connector objects that are created automatically by the generic technology connector framework.

In addition, you can modify only one connector at a time. If you try to use the Modify screens for two different connectors at the same time on the same computer, then the Modify features would not work correctly.

[Chapter 6, "Known Issues"](#) discusses both these points.

To modify a generic technology connector:

1. Open the Administrative and User Console.
2. Expand **Generic Technology Connector**.
3. Click **Manage**.
4. Search for the connector that you want to modify. To simplify your search, you can use a combination of the search criteria provided on this screen. Alternatively, to view all the generic technology connectors that have been created on this Oracle Identity Manager installation, click **Search connectors** without specifying any search criteria.

5. In the results that are displayed, click the generic technology connector that you want to modify.
6. Click **Edit Parameters**. The second screen of the connector creation process is displayed. From this point onward, follow the procedure described in the "[Step 2: Define Parameters Screen](#)" section on page 2-4.

Note: The only difference between this procedure and the procedure that you follow to create the generic technology connector procedure is that automatic metadata detection does not take place when you modify an existing generic technology connector.

Exporting Generic Technology Connectors

You can export the XML configuration file of a generic technology connector. This XML file contains definitions for all the objects that are part of the connector. If you want to use the same generic technology connector on a new Oracle Identity Manager installation, you must first export the XML file and then import it into the new Oracle Identity Manager installation.

To export the connector XML file:

1. Open the Administrative and User Console.
2. Expand **Deployment Management**.
3. Click **Export**.
4. On the first page of the Deployment Manager Wizard, select **Generic Connector** from the list and then click **Search**.
5. In the search results, select the generic technology connector whose XML file you want to export.
6. Click **Select Children**.
7. For the selected generic technology connector, select the child entities that you want to export and then click **Select Dependencies**.
8. Select the dependencies that you want to export, and then click **Confirmation**.
9. After you verify that the elements displayed on the screen cover your export requirements, click **Add for Export**.
10. Click **Exit wizard and show full selection**, and then click **OK**.

Importing Generic Technology Connectors

To copy a generic technology connector to a different Oracle Identity Manager installation, you first export the connector XML file and then import this XML file into the destination Oracle Identity Manager installation.

Caution: Suppose you create a generic technology connector on a staging server, and then want to import the connector to a production server. While creating the generic technology connector on the staging server, you would have ensured that the names of the generic technology connector and the connector objects are unique on that server. At the same time, you must also ensure that the names are not the same as the names of connectors and connector objects on the production server.

If any of the names happen to be the same, then the old objects would be overwritten by the new objects when you import the connector XML file from the staging server to the production server. No message is displayed during the overwrite process, and the process would lead to eventual failure of the affected connectors.

This is also mentioned in the "[Names of Generic Technology Connectors and Connector Objects](#)" section on page 6-1 of the "Known Issues" chapter.

To ensure that you are able to revert to a working state in the event that an object is overwritten, you must create a backup of the destination Oracle Identity Manager database before you import a connector XML file.

To import a generic technology connector, first copy the exported connector XML file to any directory on the destination Oracle Identity Manager server and then perform the following steps:

1. Open the Administrative and User Console.
2. Click the **Deployment Management** link on the left navigation bar.
3. Click the **Import** link under Deployment Management. A dialog box for locating files is displayed.
4. Locate and open the connector XML file from the directory into which you copy it.
5. Click **Add File**.
6. Click **Next**, **Next**, and then **Skip**.
7. Click **View Selections**.

The contents of the connector XML file are displayed on the Import page. You may see a cross-shaped icon along with some nodes. Remove these nodes by right-clicking each node and then selecting **Remove**.

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

After you import the connector XML file, you must update the run-time parameters of the generic technology connector.

Note: These values are not copied in the connector XML file when you export it.

To update the values of the run-time parameters, follow the procedure described in the "[Modifying Generic Technology Connectors](#)" section on page 3-1.

Standard Features of the Generic Technology Connector Framework

Standard features are features shared by the generic technology connector framework and the framework for application-specific connectors. This chapter discusses the following standard features:

- [Logging and Exception Handling](#)
- [Multilanguage Support](#)

See Also: The "[Features of the Generic Technology Connector Framework](#)" section on page 1-4 for information about features that are specific to the generic technology connector framework

Logging and Exception Handling

Because the generic technology connector framework is part of Oracle Identity Manager, the logging modules for the generic technology connector framework are an extension of the logging functionality of Oracle Identity Manager.

The following modules have been added to the Oracle Identity Manager logging mechanism.

Logging Module	Functional Module of the Generic Technology Connector Framework
XELLERATE.GC.IMAGEGENERATION	Image Generation
XELLERATE.GC.FRAMEWORKPROVISIONING	Framework Provisioning
XELLERATE.GC.PROVIDER.PROVISIONINGFORMAT	Provisioning Format Provider
XELLERATE.GC.PROVIDER.PROVISIONINGTRANSPORT	Provisioning Transport Provider
XELLERATE.GC.FRAMEWORKRECONCILIATION	Framework Reconciliation
XELLERATE.GC.PROVIDER.RECONCILIATIONTRANSPORT	Reconciliation Transport Provider
XELLERATE.GC.PROVIDER.TRANSFORMATION	Transformation Provider
XELLERATE.GC.PROVIDER.VALIDATION	Validation Provider

Depending on the application server that you use, refer to the "Setting Log Levels" section in one of the following guides for information about the procedure that you must follow to enable logging:

- *Oracle Identity Manager Installation Guide for JBoss*
- *Oracle Identity Manager Installation Guide for Oracle Containers for J2EE*
- *Oracle Identity Manager Installation Guide for WebSphere*
- *Oracle Identity Manager Installation Guide for WebLogic*

Multilanguage Support

This release of Oracle Identity Manager supports the following languages:

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

During installation, resource bundles for these 10 languages are copied to the Oracle Identity Manager server. These include the resource bundles for each of the predefined providers.

Note: A **resource bundle** is a file containing localized versions of the text strings that are displayed on the user interface of Oracle Identity Manager. These text strings include GUI element labels and messages displayed on the Administrative and User Console.

Some of the supported languages use non-ASCII character sets. The "[Multilanguage Support](#)" section on page 6-6 of the "Known Issues" chapter discusses limitations of the generic technology connector framework that are related to the use of non-ASCII characters.

See Also: *Oracle Identity Manager Globalization Guide*

Troubleshooting

This chapter provides solutions to some commonly encountered problems associated with using generic technology connectors for reconciliation and provisioning. The information in this chapter is divided into the following sections:

- [Common Errors Encountered During Reconciliation](#)
- [Common Errors Encountered During Provisioning](#)

Common Errors Encountered During Reconciliation

The following table provides solutions to some commonly encountered problems associated with the reconciliation process.

Note: These errors are logged only if you are using the using the Shared Drive Transport provider and the CSV Format provider.

If any of these errors occurs, then the error message is written to the application log file.

Problem Description (Error Message)	Solution
No run time provider parameters available	Use the Modify Generic Technology Connector feature of the Administrative and User Console to check the values specified for the run-time parameters. Then, retry reconciliation.
No design time provider parameters available	Use the Modify Generic Technology Connector feature of the Administrative and User Console to check the values specified for the design parameters. Then, retry reconciliation.
Staging directory location is not defined	Use the Modify Generic Technology Connector feature of the Administrative and User Console to check the value specified for the Staging Directory (Parent Data) parameter. Then, retry reconciliation.
File encoding is not defined	Use the Modify Generic Technology Connector feature of the Administrative and User Console to check the value specified for the File Encoding (Parent Data) parameter. Then, retry reconciliation.

Problem Description (Error Message)	Solution
<p>Unique attribute for parent which would Key in child, is not defined</p> <p>Note: This message has not been correctly worded. The message should read as follows:</p> <p>"Unique attribute for parent is not defined. This attribute would serve as the reference field in the child data file, which would link each record in the child data file with a record in the parent data file."</p>	<p>Use the Modify Generic Technology Connector feature of the Administrative and User Console to check the value specified for the Unique Attribute (Parent Data) parameter. Then, retry reconciliation.</p>
<p>Archive directory location is not defined</p>	<p>Use the Modify Generic Technology Connector feature of the Administrative and User Console to check the value specified for the Archiving Directory parameter. Then, retry reconciliation.</p>
<p>Cannot process files as not even fixed-width delimiter has been defined</p>	<p>Use the Modify Generic Technology Connector feature of the Administrative and User Console to check if a value has been specified for one of the following parameters:</p> <ul style="list-style-type: none"> ■ Specified Delimiter ■ Tab Delimiter ■ Fixed Column Width <p>Then, retry reconciliation.</p>
<p>No Parent files in staging directory No files available for reading</p>	<p>Ensure that data files are present in the directory specified as the value of the Staging Directory (Parent Data) parameter. Then, retry reconciliation.</p>
<p>No child data present in staging directory No files available for reading</p>	<p>Ensure that data files are present in the directory specified as the value of the Staging Directory (Multivalued Data) parameter. Then, retry reconciliation.</p>
<p>The Staging directory cannot be accessed. Either the directory path does not exist or necessary access permissions are missing</p>	<p>Ensure that the directories specified as parameter values have the required permissions. Refer to the "Shared Drive Transport Provider for Reconciliation" section on page A-1 for information about the required permissions. Then, retry reconciliation.</p>
<p>Data files could not be read as its File encoding is not supported.</p>	<p>Use the Modify Generic Technology Connector feature of the Administrative and User Console to check the value specified for the File Encoding parameter. Then, retry reconciliation.</p>
<p>Not able to parse metadata</p>	<p>Check the metadata (contents of the second row) present in the parent and child data files. There may be a problem with the delimiter used in the files. Fix the problem, and then retry reconciliation.</p>
<p>Not able to parse header</p>	<p>Check the header (contents of the first row) of the data files. There may be a problem in the format of the header. Refer to the "Shared Drive Transport Provider for Reconciliation" section on page A-1 for information about the header format.</p> <p>Fix the problem, and then retry reconciliation.</p>
<p>Current Record is erratic and cannot be parsed</p>	<p>Check the entry that is written to the application log file. It may contain errors that cannot be parsed. Fix the problem, and then retry reconciliation.</p>

Common Errors Encountered During Provisioning

The following table provides solutions to some commonly encountered problems associated with the provisioning process.

Note: Most of these errors are logged only if you are using the using the Web Services Transport Provider for Provisioning and the SPML Format Provider for Provisioning.

If any of these errors occurs, then the error message is displayed on the UI and written to the application log file.

Problem Description	Solution
<p>Response code: SPML Velocity Properties Not Read</p> <p>Response Description: Necessary SPML template properties could not be read.</p>	<p>There is a problem with the Oracle Identity Manager installation. Contact Oracle Support, and send them information about this problem and the response code and description displayed. In addition, send the relevant logs generated after running Oracle Identity Manager with logging set to the DEBUG level.</p>
<p>Response code: SPML Template Not Read</p> <p>Response Description: The SPML template file was not found.</p>	<p>There is a problem with the Oracle Identity Manager installation. Contact Oracle Support, and send them information about this problem and the response code and description displayed. In addition, send the relevant logs generated after running Oracle Identity Manager with logging set to the DEBUG level.</p>
<p>Response code: SPML Unknown Operation</p> <p>Response Description: Type of provisioning operation not in allowed set: Create, Delete, Enable, Disable, Modify, Child Table Operations.</p>	<p>There is a problem with the Oracle Identity Manager installation. Contact Oracle Support, and send them information about this problem and the response code and description displayed. In addition, send the relevant logs generated after running Oracle Identity Manager with logging set to the DEBUG level.</p>
<p>Response code: SPML Provisioning Input Null</p> <p>Response Description: SPML provisioning input data is null.</p>	<p>Check if the provider parameters have been correctly specified.</p> <p>Check if provisioning was initiated by direct provisioning or request provisioning. Retry the procedure by using the direct provisioning option.</p> <p>Refer to <i>Oracle Identity Manager Administrative and User Console Guide</i> for information about direct provisioning.</p>
<p>Response code: SPML Template Processing Error</p> <p>Response Description: An error in template processing for generation of SPML request occurred.</p>	<p>There is a problem with installation. Contact Oracle Support, and send them information about this problem and the response code and description displayed. In addition, send the relevant logs generated after running Oracle Identity Manager with logging set to the DEBUG level.</p>

Problem Description	Solution
<p>Response code: SPML Provisioning Operation Name Missing</p> <p>Response Description: Operation name for provisioning is missing.</p>	<p>The generic technology connector may not have been created correctly. Try creating another connector using the same set of configurations (providers) but with fewer attributes. Try direct provisioning.</p> <p>Refer to <i>Oracle Identity Manager Administrative and User Console Guide</i> for information about direct provisioning.</p>
<p>Response code: SPML Provisioning Child Name Missing</p> <p>Response Description: Child name is missing.</p>	<p>You may have been trying to perform provisioning for one particular type (for example, role or membership) of multivalued attribute when this error occurred.</p> <p>The connector may not have been created correctly. Try creating another connector using the same set of configurations (providers) but only one multivalued attribute, which is the one that failed the first time. Try direct provisioning.</p> <p>Refer to <i>Oracle Identity Manager Administrative and User Console Guide</i> for information about direct provisioning.</p>
<p>Response code: SPML Provisioning Child Meta-Data Null</p> <p>Response Description: Child meta-data list is null.</p>	<p>You may have been trying to perform provisioning for one particular type (for example, role or membership) of multivalued attribute when this error occurred.</p> <p>The connector may not have been created correctly. Try creating another connector using the same set of configurations (providers) but only one multivalued attribute, which is the one that failed the first time. Try direct provisioning.</p> <p>Refer to <i>Oracle Identity Manager Administrative and User Console Guide</i> for information about direct provisioning.</p>
<p>Response code: SPML Provisioning Child Meta-Data Problem</p> <p>Response Description: An error occurred while sorting the child meta-data list.</p>	<p>You may have been trying to perform provisioning for one particular type (for example, role or membership) of multivalued attribute when this error occurred.</p> <p>The connector may not have been created correctly. There is a problem in the order that has been set for the provisioning fields. Try creating another connector with fewer attributes for the relevant multivalued field. Try direct provisioning. After each successful round of provisioning, try adding fields one by one by performing the Manage Connector procedure. The point at which you start facing this issue again identifies the field that is not in the correct order.</p>
<p>Response code: SPML Provisioning Id Missing</p> <p>Response Description: Unique ID is missing.</p>	<p>You are trying to run an operation on a created user. However, the Create User operation itself may not have run successfully and the unique ID (PSO-ID) that was expected as the response was not received. Therefore, the provisioned instance data was not updated in Oracle Identity Manager. Check why this operation failed.</p>

Problem Description	Solution
<p>Response code: SPML Provisioning Target ID Missing</p> <p>Response Description: Unique Target ID is missing</p>	<p>Check the provider parameters that have been entered. TargetID may be missing.</p>
<p>Response code: OIM API Error</p> <p>Response Description: An error occurred in the OIM API layer.</p>	<p>Check if Oracle Identity Manager is operating correctly for other operations. Check the connectivity between the Oracle Identity Manager front end and the database.</p> <p>Note: This error is not related to the providers that you use.</p>
<p>Response code: OIM Process Form Not Found</p> <p>Response Description: Process form was not found in OIM</p>	<p>The generic technology connector may not have been created correctly. Try creating another connector using the same set of configurations. Try direct provisioning.</p> <p>Refer to <i>Oracle Identity Manager Administrative and User Console Guide</i> for information about direct provisioning.</p> <p>Note: This error is not related to the providers that you use.</p>
<p>Response code: OIM Process Form Instance Not Found</p> <p>Response Description: Process form instance was not found for the specified form during update</p>	<p>The provisioned instance information in the Oracle Identity Manager database may have become corrupted. Try direct provisioning.</p> <p>If the problem persists, then there may be an issue with the generic technology connector. Create another generic technology connector by using the same set of configurations.</p> <p>Note: This error is not related to the providers that you use.</p>
<p>Response code: OIM Atomic Process Instance Not Found</p> <p>Response Description: Process instance found is not an atomic process</p>	<p>The provisioned instance information in the Oracle Identity Manager database may have become corrupted. Try direct provisioning.</p> <p>If the problem persists, then there may be an issue with the generic technology connector. Create another generic technology connector by using the same set of configurations.</p> <p>Note: This error is not related to the providers that you use.</p>
<p>Response code: Column Not Found</p> <p>Response Description: An expected column was not found in the result set</p>	<p>The generic technology connector may not have been created correctly. Try creating another connector by using the same set of configurations. Try direct provisioning.</p> <p>Refer to <i>Oracle Identity Manager Administrative and User Console Guide</i> for information about direct provisioning.</p> <p>Note: This error is not related to the providers that you use.</p>

Problem Description	Solution
<p>Response code: IT Resource Instance Not Found</p> <p>Response Description: IT Resource Instance was not found in OIM</p>	<p>The generic technology connector may not have been created correctly. Try creating another generic technology connector by using the same set of configurations. Try direct provisioning.</p> <p>Refer to <i>Oracle Identity Manager Administrative and User Console Guide</i> for information about direct provisioning.</p> <p>Note: This error is not related to the providers that you use.</p>
<p>Response code: Version Not Found</p> <p>Response Description: The required process form version was not found in OIM</p>	<p>The generic technology connector may not have been created correctly. Try creating another connector by using the same set of configurations. If you have edited an existing connector by adding a new field to an existing data set, then that operation may have failed. Try making the same change again in the connector.</p> <p>Note: This error is not related to the providers that you use.</p>
<p>Response code: Version Not Defined</p> <p>Response Description: The required process form version was not defined in OIM</p>	<p>The generic technology connector may not have been created correctly. Try creating another connector by using the same set of configurations. If you have edited an existing connector by adding a new field to an existing data set, then that operation may have failed. Try making the same change again in the connector.</p> <p>Note: This error is not related to the providers that you use.</p>
<p>Response code: Web Service Not Found</p> <p>Response Description: Web Service not found on the target server. Check service name and IP address.</p>	<p>Check the service name and IP address provided in the Web service URL. If these are correct, then check if the Web service is running.</p>
<p>Response code: Web Service Connection Refused</p> <p>Response Description: Web Service connection could not be established. Check that server is running and port specified is correct.</p>	<p>Check if the Web service is running.</p>
<p>Response code: Web Service No Such Method</p> <p>Response Description: Unable to invoke web service method. Check operation name and parameters.</p>	<p>Check the operation name and parameters.</p>
<p>Response code: Web Service Null Parameter Value</p> <p>Response Description: The parameter value passed to web service is null.</p>	<p>Check if the provisioning process ran correctly. The Provisioning Format provider may not have run correctly and, therefore, may have generated NULL output.</p>

Problem Description	Solution
<p>Response code: Web Service HTTP Library Missing</p> <p>Response Description: Web Service HTTP library is missing from classpath.</p>	<p>There is a problem with the Oracle Identity Manager installation. Contact Oracle Support and send them information about this problem and the response code and description displayed. In addition, send the relevant logs generated after running Oracle Identity Manager with logging set to the DEBUG level.</p>
<p>Response code: Web Service Null Result Value</p> <p>Response Description: Web Service result value is null.</p>	<p>Check if the Web service is running correctly. At present, it is generating NULL output as the response to the Oracle Identity Manager provisioning request.</p>
<p>Response code: Web Service Invocation Issue</p> <p>Response Description: An error occurred during Web Service invocation.</p>	<p>Check the credentials of the Web service.</p>
<p>Response code: Web Service Target URL Missing</p> <p>Response Description: Web Service target URL is missing for invocation.</p>	<p>Check the values of the provider parameters. The Web service URL may be missing. Modify the generic technology connector and provide this value again.</p>
<p>Response code: Web Service Target Method Name Missing</p> <p>Response Description: Web Service target method name is missing for invocation.</p>	<p>Check the values of the provider parameters. The Web service operation name may be missing. Modify the generic technology connector and provide this value again.</p>
<p>Response code: Web Service Response XML Parsing Error</p> <p>Response Description: An error occurred during XML parsing of the web service response.</p>	<p>Check if the Web service is running correctly. It is generating an SPML response that does not conform to the format specified for the Web service provider.</p>
<p>Response code: An error occurred during XML parsing of the web service response. Web Service Response ID Error</p> <p>Response Description: Unique ID is not available in the Web Service response.</p>	<p>Check if the Web service is running correctly. For the Create User operation, it is generating an SPML response that does not conform to the specified format. In addition, it is not returning the PSO-ID created in the target system. The provider specification for the Web Service provider expects the return of the PSO-ID field.</p>
<p>Response code: Web Service Protocol Connection Error</p> <p>Response Description: An error occurred in the Oracle-SOAP HTTP connection.</p>	<p>Check the service name and IP address provided in the Web service URL. If these are correct, then check if the Web service is running. Check the operation name and parameters.</p>

Problem Description	Solution
Response code: Web Service Protocol Processing Error	Check the service name and IP address provided in the Web service URL. If these are correct, then check if the Web service is running. Check the operation name and parameters.
Response Description: An error occurred while calling the Oracle-SOAP API.	

Known Issues

This chapter discusses known issues related to the generic technology connector framework.

The known issues are divided into the following categories:

- [Names of Generic Technology Connectors and Connector Objects](#)
- [User Account Used to Create Generic Technology Connectors](#)
- [Step 2: Define Parameters Screen](#)
- [Modify Connector Configuration Screen](#)
- [Multilanguage Support](#)
- [Connector Objects](#)
- [Other Known Issues](#)

Names of Generic Technology Connectors and Connector Objects

This section describes the following known issues related to the names that you specify for generic technology connectors and connector objects:

- **Summary:**
 - No warning is displayed if the name that you specify for a generic technology connector is the same as the name of an existing connector object.
 - No warning is displayed if an existing connector object is overwritten by a new connector object when you import a connector XML file.

Description:

During the creation or modification of a generic technology connector, various objects are automatically created or modified by the generic technology connector framework. You are prompted to specify names for the generic technology connector and process forms. The framework automatically generates names for the remaining objects. These autogenerated names are based on the name that you specify for the generic technology connector.

When you specify a name for the generic technology connector, you must ensure that the name is unique across all object categories (such as resource objects and IT resources) for that Oracle Identity Manager installation. Similarly, you must also ensure that the process form names are unique. This guideline must be followed even while importing a generic technology connector XML configuration file to a different Oracle Identity Manager installation. You must ensure that the names of objects defined in the XML file are not the same as the names of objects belonging

to the same category on the destination Oracle Identity Manager installation. The scope of this guideline covers all connector objects, regardless of whether the object is used by an application-specific connector or a generic technology connector on the destination Oracle Identity Manager installation.

If you do not follow this guideline, then existing objects that have the same name as imported objects are overwritten during the XML file import operation. No message is displayed during the overwrite process, and the process leads to eventual failure of the affected connector.

This point has also been discussed in the "[Connector Objects](#)" section on page 6-9.

- **Summary:**

Oracle Identity Manager does not prevent the automatic creation of a resource object that has the same name, but different combination of uppercase and lowercase characters in its name, when compared with the name of an existing resource object.

Description:

Consider the following scenario:

There is a resource object definition named `MyConnRO` in the Oracle Identity Manager database. Now, if you use the Design Console to create another resource object named `myconnro`, then an error message is displayed. This error message tells you that there is an existing resource object with the same name. The check for the name of the resource object takes place at the UI level, and it does not take into account the case (uppercase or lowercase) of the resource object name.

However, this error message is not displayed if you import a connector XML file that contains the definition of the `myconnro` resource object. The Deployment Manager of Oracle Identity Manager does not perform a non-case-sensitive comparison of the resource object name defined in the XML file with the names of existing resource objects.

The same problem occurs if you create a generic technology connector with a name that is the same as the name of an existing resource object.

The existence of a duplicate resource object in the Oracle Identity Manager database causes problems during reconciliation and provisioning. Therefore, you must ensure that:

- A connector XML file that you import does not contain the definition of a resource object that has the same name as the name of an existing resource object.
- While creating a generic technology connector, you do not specify a name that is the same as the name of an existing resource object.

- **Summary:**

You are not allowed to specify a name containing non-ASCII characters for a generic technology connector.

Description:

Most of the connector objects that are automatically created at the end of the connector creation process have the same name as the generic technology connector. In the Oracle Identity Manager database, there is no provision for storing these objects with names in non-ASCII characters. Therefore, an error message is displayed if you enter non-ASCII characters while specifying the name of a generic technology connector.

This point has also been discussed in the ["Multilanguage Support"](#) section on page 6-6.

User Account Used to Create Generic Technology Connectors

This section describes the following known issues related to the user account used to create generic technology connectors:

- **Summary:**

An error may occur if the user account that is used to create a generic technology connector is a member of three or more groups.

Description:

You must assign certain menu items and permissions to the group whose members create generic technology connectors. The ["Step 3: Addressing Requirements to Create the Generic Technology Connector"](#) section on page 2-2 lists these menu items and permissions. Members of this group are also members of the ALL_USERS group, because every Oracle Identity Manager user is a member of the ALL_USERS group.

The user that you assign to this group is, by default, also a member of the ALL_USERS group. Besides these two groups, if the user is a member of any other group, then an error *may* occur when the user clicks the Create button on the final Administrative and User Console screen for creating generic technology connectors. The reason for this is as follows:

When the user clicks the Create button on the last screen, the generic technology connector framework checks the menu items and permissions assigned to the group (other than the ALL_USERS group) to which the user belongs. If the required menu items and permissions have not been assigned to this group, then an error is thrown.

Suppose the first group that the framework checks does not have the required menu items and permissions. The framework does not move on to the next group to check if that group meets the requirements. Instead, an error is thrown and the user must restart the procedure from the beginning by using a different generic technology connector name or by restarting the application server. However, if the first group that the framework checks has the required menu items and permissions, then the generic technology connector is created correctly.

Therefore, to ensure that an error does not occur when the framework checks for the required permissions, the user account that you plan to use to create generic technology connectors must not be a member of more than two groups.

Step 2: Define Parameters Screen

This section describes the following known issues related to the input that you specify on the Step 2: Define Parameters screen:

- **Summary:**

- Existing files in the archiving directory are deleted if you specify the same path for the staging and archiving directories.
- Existing files in the archiving directory are overwritten at the end of a reconciliation run if these files have the same name as the files placed in the staging directory.

Description:

When you use the predefined Shared Drive Transport provider, after each reconciliation run, data files are moved from the staging directory to the archiving directory. The files moved to the archiving directory are not time-stamped or marked in any way. Therefore, when you use the Shared Drive Transport provider, bear in mind the following guidelines:

- The archiving directory path that you specify must not be the same as the staging directory path. If you specify the same path, then the existing files in the archiving directory are deleted at the end of the reconciliation run.
- During the current reconciliation run, if data files with the same names as the files used in the last reconciliation run are placed in the staging directory, then the existing files in the archiving directory are overwritten by the new files from the staging directory. This can be illustrated by the following example:

Suppose that at the end of the last reconciliation run, the following files were moved automatically from the staging directory to the archiving directory:

```
usrdataParentData.csv
usrdataRoleData.csv
usrdataGroupMembershipData.txt
```

For the current reconciliation run, you place the following files in the staging directory:

```
usrdataParentData.csv
usrdataRoleData_04Feb07.csv
usrdataGroupMembershipData_04Feb07.txt
```

At the end of the current reconciliation run, these files are moved to the archiving directory. When this happens, the old `usrdataParentData.csv` file is overwritten by the new one.

Therefore, if you want to ensure that files in the archiving directory are not overwritten at the end of a reconciliation run, then you must ensure that the names of files in the staging directory are not the same as the names of files in the archiving directory.

■ **Summary:**

- Metadata detection does not take place a second time if an error occurs the first time you submit information through the Step 2: Define Parameters screen.
- Metadata detection does not take place a second time if you go back to the Step 2: Define Parameters screen or the Step 1: Basic Information screen to make changes in the input that you have already specified.

Description:

Suppose the values that you provide on the Step 2: Define Parameters screen are not correct. When you submit the information, the following error is displayed at the top of the screen:

"Problem encountered during metadata detection. Please check the server logs for more details."

If the cause of this error is the entry of incorrect provider parameter values, then the same error message is displayed even after you rectify and resubmit the parameter values. This is because all the values that you specify on the first and second screen are stored in the cache memory of the application and are associated with the name of the generic technology connector. For the same reason, you

cannot go back to the Step 2: Define Parameters screen or the Step 1: Basic Information screen to make changes in the input that you have already specified.

To circumvent this problem, you must start the entire procedure again and provide a new name for the generic technology connector. Alternatively, if you want to specify the same name for the generic technology connector, then you must restart Oracle Identity Manager.

You must follow either one of these two methods only if the error is caused by the entry of incorrect provider parameter values. The information in the server logs can help you determine the actual cause of the error.

- **Summary:**

While creating a connector in which you want to enable reconciliation, if there are no data files in the staging directories, then an error occurs after you enter and submit parameter values on the Step 2: Define Parameters screen.

Description:

On the Step 1: Basic Information screen, suppose you select the Reconciliation-only option or the Reconciliation and Provisioning option and then enter and submit values for the parameters displayed on the Step 2: Define Parameters screen.

At this point, if there are no data files in the staging directories, then an error occurs. This will be fixed in a future release of Oracle Identity Manager. If this error occurs while you are using the current release of Oracle Identity Manager, then you must restart the procedure. Refer to the "[Names of Generic Technology Connectors and Connector Objects](#)" section on page 6-1 for information about why you need to restart the procedure.

Modify Connector Configuration Screen

This section describes the following known issues related to the input that you specify on the Modify Connector Configuration screen:

- **Summary:**

Suppose you create a generic technology connector, use it for provisioning or reconciliation, and then delete fields or child data sets of the Account data set. An error occurs the next time you perform provisioning or reconciliation by using the same generic technology connector.

Description:

Suppose you create a generic technology connector and then use it for provisioning or reconciliation. You then delete some fields or child data sets of the Account data set of this generic technology connector. Now, the next time you perform provisioning or reconciliation by using the same generic technology connector, an exception is displayed on the screen.

After you use the generic technology connector for provisioning or reconciliation even once, deleting the fields or child data sets of the Account data set is an invalid operation. This is because data linked to the fields or child data sets that you delete has already been stored in the Oracle Identity Manager database.

Therefore, you must not delete fields or child data sets of the Account data set if the generic technology connector has already been used to perform provisioning or reconciliation.

In a future release, an appropriate error message will be displayed instead of the exception that is thrown at present.

- **Summary:**

While modifying an existing generic technology connector, if you modify the fields or child data sets of the Account data set, then corresponding changes are not made in the Oracle Identity Manager database entries for the forms that are based on these data sets. At the same time, no error message is displayed.

Description:

While modifying an existing generic technology connector, the Modify Connector Configuration screen provides features that enable you to add, modify, and delete fields and field mappings. You can also use these features to make changes in the data sets of an existing generic technology connector.

You could use these features to modify the field size or field data type value of the Account data set or its child data sets. However, this action would not translate into corresponding changes in the Oracle Identity Manager database entries for these data sets. At the same time, no error message is displayed.

This issue will be fixed in a future release of Oracle Identity Manager. Until then, you must not make changes in the fields or child data sets of the Account data set.

- **Summary:**

The Length field displayed on the Add and Edit windows that you open through the Modify Connector Configuration screen accepts non-numeric values.

Description:

The Modify Connector Configuration screen provides features that enable you to add, modify, and delete fields and field mappings. The Length field on the Add Field and Modify Field windows must accept only a numeric value. However, there is no validation to stop you from entering non-numeric values, such as `abcd`, in this field.

For the Length field, the generic technology connector framework automatically replaces a non-numeric value that you enter with the default numeric value, which is 20.

Multilanguage Support

This section describes the following known issues related to the Multilanguage Support feature:

- **Summary:**

You are not allowed to specify a name containing non-ASCII characters for a generic technology connector.

Description:

Most of the connector objects that are automatically created at the end of the connector creation process have the same name as the generic technology connector. In the Oracle Identity Manager database, there is no provision for storing these objects with names in non-ASCII characters. Therefore, an error message is displayed if you enter non-ASCII characters while specifying the name of a generic technology connector.

This point has also been discussed in the ["Names of Generic Technology Connectors and Connector Objects"](#) section on page 6-1.

- **Summary:**

No warning is displayed if there are non-ASCII characters in the first or second line of the data files in the staging directory.

Description:

There is no support for non-ASCII data in the metadata of target system identity data. In the case of the CSV Format provider, this limitation means that you cannot include non-ASCII characters in the metadata line (second line) of the parent and child data files that you store in the staging directory.

The reason for this limitation is as follows:

The generic technology connector framework creates User Defined process forms in Oracle Identity Manager and names the forms and their fields on the basis of the input metadata. In addition, database tables and columns are created for these forms and their fields, respectively. Because non-ASCII characters cannot be used in database object names, these characters are not supported in the target system metadata.

The generic technology connector framework may be able to parse and correctly display non-ASCII characters in the first and second lines of the data files. However, to ensure that the Oracle Identity Manager data objects of the generic technology connector are created correctly, you must ensure that non-ASCII characters are not used in the first and second lines of the data files.

Note: From the third line onward in the data files, the field data values can contain non-ASCII characters. These data values are correctly reconciled and stored in the Oracle Identity Manager database.

- **Summary:**

For any language that Oracle Identity Manager supports, if the browser language setting does not match the operating system language setting, then data is not displayed correctly on the Modify Connector Configuration screen.

Description:

The Modify Connector Configuration screen displays an image that is dynamically created by the generic technology connector framework. The following are limitations related to the display of localized text items on this screen:

The language in which you want field names to be displayed must match the following language settings:

- Oracle Identity Manager language
- Operating system language
- Browser language

If the browser language is the same as the operating system language, then all the text items (field names and GUI element labels) are displayed in the required language.

Note: If you are using the Traditional Chinese or Simplified Chinese language, then the browser locale (language and country/region) must be the same as the operating system locale (language and country/region) for all the text items to be displayed in the required language.

If the browser language is not the same as the operating system language, then the following static labels would be displayed in English (regardless of the browser language):

- Labels of the User and Account data sets, "User" and "Account"
- Labels of the fields that constitute the User data set:
 - * "User ID"
 - * "Email"
 - * "First Name"
 - * "Last Name"

For non-ASCII languages, labels for the remaining items on this screen would not be displayed correctly.

■ **Summary:**

Certain text items displayed on screens associated with using generic technology connectors are always displayed in English.

Description:

For this release, some of the static text displayed on the screens associated with using a generic technology connector has not been localized. For example, suppose you create a generic technology connector named `MyGTC`. When you provision the resource object of this connector to a user, the following text is displayed on the screen:

"Provisioning form for MyGTC

Child Form of MyGTC representing child-dataset: *child_data_set_name*"

In this release of Oracle Identity Manager, the static part of this text is always displayed in English.

If required, you can localize the static text as follows:

See Also: *Oracle Identity Manager Globalization Guide*

1. For the language to which you want to localize the text, open the corresponding `customResources.properties` file. The files for all the languages that Oracle Identity Manager supports are inside the `OIM_home\xellerate\customResources` directory.
2. In the `customResources.properties` file for the required language, add the following lines:

```
global.UD_PARENT_FORM_NAME.description=Localized_text_for_"Provisioning  
form for" GTC_name
```

```
global.UD_CHILD_FORM_NAME.description=Localized_text_for_"Child Form of"  
GTC_name Localized_text_for_"representing the child data set":  
child_data_set_name
```

In these two lines, replace:

- * *PARENT_FORM_NAME* with the name of the parent form

The parent form name is always converted to uppercase letters in Oracle Identity Manager. Therefore, the name that you enter must be in uppercase letters.

- * *Localized_text_for_"Provisioning form for"* with localized text for the words "Provisioning form for"

- * *GTC_name* with the name of the generic technology connector

- * *CHILD_FORM_NAME* with the name of the child form

The child form name is always converted to uppercase letters in Oracle Identity Manager. Therefore, the name that you enter must be in uppercase letters.

- * *Localized_text_for_"Child Form of"* with localized text for the words "Child form for"

- * *child_data_set_name* with the name of the child data set

The following example illustrates this procedure.

Suppose you specify the following values while creating a generic technology connector:

- Connector Name: MyGTC
- Parent Form name: ADUser
- Child data set name: ADUserRole
- Child form name: ADURole1

If you want the static text to be displayed in the Spanish language, then:

1. Open the `customResources_es.properties` file for the Spanish language. This file is inside the `OIM_home\xellerate\customResources` directory.
2. In the `customResources.properties` file, add the following lines:

```
global.UD_ADUSER.description=Spanish_text_for_"Provisioning form for" MyGTC
```

```
global.UD_ADURole1.description=Spanish_text_for_"Child Form of" MyGTC
Spanish_text_for_"representing the child data set": ADUserRole
```

Connector Objects

This section describes the following known issues related to the connector objects that are automatically created by the generic technology connector framework:

- **Summary:**
 - No warning is displayed if the name that you specify for a generic technology connector is the same as the name of an existing connector object.
 - No warning is displayed if an existing connector object is overwritten by a new connector object when you import a connector XML file.

Description:

During the creation or modification of a generic technology connector, various objects are automatically created or modified by the generic technology connector framework. You are prompted to specify names for the generic technology connector and process forms. The framework automatically generates names for the remaining objects. These autogenerated names are based on the name that you specify for the generic technology connector.

When you specify a name for the generic technology connector, you must ensure that the name is unique across all object categories (such as resource objects and IT resources) for that Oracle Identity Manager installation. Similarly, you must also ensure that the process form names are unique. This guideline must be followed even while importing a generic technology connector XML configuration file to a different Oracle Identity Manager installation. You must ensure that the names of objects defined in the XML file are not the same as the names of objects belonging to the same category on the destination Oracle Identity Manager installation. The scope of this guideline covers all connector objects, regardless of whether the object is used by an application-specific connector or a generic technology connector on the destination Oracle Identity Manager installation.

If you do not follow this guideline, then existing objects that have the same name as imported objects would be overwritten during the XML file import operation. No message is displayed during the overwrite process, and the process leads to eventual failure of the affected connector.

This point has also been discussed in the ["Names of Generic Technology Connectors and Connector Objects"](#) section on page 6-1.

- **Summary:**

A generic technology connector might not work if you use the Design Console to modify connector objects created by the generic technology connector framework.

Description:

The Design Console provides features that enable you to modify connector objects. In general, these features are meant for use with application-specific connectors. For most scenarios, you do not need to modify the connector objects that are automatically created by the generic technology connector framework. If you modify connector objects outside the generic technology connector framework, then the generic technology connector might not work.

- **Summary:**

Connector objects that are automatically created are not deleted even if the generic technology connector creation process fails.

Description:

Certain connector objects may be created even if the overall creation process fails and an error message to this effect is displayed on the Step 4: Verify Connector Creation Information screen. If such an event occurs, then it is recommended that you contact Oracle Support and send them a description of the error message and the server logs.

- **Summary:**

The resource object created automatically for a reconciliation-only generic technology connector cannot be used for provisioning.

Description:

Suppose you select only the Reconciliation option while creating a generic technology connector. At the end of the creation process, a resource object is one of

the objects created automatically for this generic technology connector. However, you cannot provision this resource object to any user because a generic adapter is not created for a reconciliation-only generic technology connector.

Other Known Issues

This section describes the following known issues that do not fall under any of the preceding categories:

- This release of the generic technology connector does not support trusted source reconciliation.
- You can modify only one connector at a time. If you try to use the Modify screens for two different connectors at the same time on the same computer, then the Modify features would not work correctly.

- **Summary:**

The display of the Create End-to-End Mapping check box is of no significance if you are adding a field in the data set category that is at the right end of the Modify Connector Configuration screen.

Description:

As described in the "[Adding Fields to Data Sets](#)" section on page 2-9, you select the Create End-to-End Mapping check box if you want the same field to be part of the corresponding data sets of all the categories that are displayed to the *right* of the current category. However, this check box is also displayed when you add a field to a data set in a category that does not have any categories to its right. For example, this check box would be displayed on the screen for adding a field to the Provisioning Staging category data set, although there are no data set categories to the right of the Provisioning Staging category.

- There are limitations related to creating mappings across the following data sets categories:
 - Source category and Reconciliation Staging category
 - OIM category and Provisioning Staging category

These limitations are as follows:

- You cannot create a mapping between one child data set of the source category and a different child data set of the destination category.

The following example illustrates this limitation:

Suppose the Source category contains the following child data sets:

MyGTC:Group data set

- * Field 1: Group Name
- * Field 2: Group Type

MyGTC:Role data set

- * Field 1: Role Name
- * Field 2: Role Type

Suppose the Reconciliation Staging category contains the following child data sets:

MyGTC:Group data set

- * Field 1: Group Name

- * Field 2: Group Type

MyGTC:Role data set

- * Field 1: Role Definition

According to this limitation, you cannot create a mapping between, for example, the Group Name field of the Source category and the Role Definition field of the Reconciliation Staging category.

- You cannot create a mapping between a parent data set of the source category and a child data set of the destination category.

The following example illustrates this limitation:

Suppose the OIM category contains the following data set:

Account data set

- * Field 1: Name

- * Field 2: Address

- * Field 3: User ID

- * . . .

Suppose the Provisioning Category contains the following child data set:

Group data set

- * Field 1: Group Name

- * Field 2: Group Type

According to this limitation, you cannot create a mapping between, for example, the Name field of the Account data set and the Group Name field of the Group data set.

- **Summary:**

If there is no data from the third line onward in the data files that you place in the staging directory, then an exception is thrown during reconciliation.

Description:

In the data files that you place in the staging directories, the actual target-system data that you want to reconcile must be placed from the third line onward. Suppose these data files only contain header and metadata information in the first and second line, respectively. During reconciliation, an exception is thrown and the results of a stack trace are displayed on the screen.

When this happens, you must retry reconciliation after ensuring that there is data from the third line onward in the data files.

- **Summary:**

An error message is displayed on the Edit page for a resource object if you enter special characters in any field displayed on that page.

Description:

Suppose you create a generic technology connector. While provisioning the resource object of the generic technology connector to a newly created user, you need to use the Resource Profile page of the Administrative and User Console. On this page, suppose you select a child form from the Additional Details list, enter a

special character in any field of the Edit page, and then click Add. The following message is displayed, because the framework does not support the entry of special characters in any of these fields:

"The page cannot be displayed."

Note: Special characters are characters such as the number sign (#) and equal sign (=).

- **Summary:**

Changes made in the field values of the OIM User form are not automatically propagated to corresponding fields of the provisioning process form.

Description:

Suppose you create a mapping between the First Name field of the User data set and the Name field of the Provisioning data set. At the end of the generic technology connector creation process, a link is set up between the First Name field of the OIM User form and the Name field of the process form.

However, when you make changes in the First Name field of the OIM User form, these changes are not automatically propagated to the Name field of the process form for *existing* user accounts. User accounts created after the change in the field value are correctly updated.

This issue will be fixed in a future release of Oracle Identity Manager. For the current release, you must manually make changes in both forms at the same time.

- **Summary:**

The deletion of a child record from an existing parent-child pair of records is not reconciled.

Description:

Consider the following scenario:

You have selected the Full Reconciliation feature while creating a generic technology connector. During the first reconciliation run, a parent data record with its child data record is reconciled. Before the next reconciliation run, the child record is deleted from the target system. During the next reconciliation run, this deletion of the child record is not reconciled because the required reconciliation event is not created.

This issue will be fixed in a future release of Oracle Identity Manager.

- Scheduled tasks that are not currently running have the `INACTIVE` status. These tasks run at the next specified date and time. Under certain conditions, a scheduled task is automatically assigned the `NONE` status. However, this status change does not affect the functionality of the task, which continues to run at the specified date and time.

- **Summary:**

While a generic adapter is in the `RECOMPILE` state, a system error occurs if you try to modify the process form for a resource object that has been provisioned to a user.

Description:

Consider the following scenario:

You create a generic technology connector and then assign the resource object of the generic technology connector to a user. Next, you modify the generic technology connector, but you do not recompile the generic adapter after modifying the generic technology connector. Now, you modify the process form for the generic technology connector. When you try to save the changes that you make to the process form, a system error occurs.

This issue will be fixed in a future release of Oracle Identity Manager.

Predefined Providers Shipped with Oracle Identity Manager

After you determine the provider requirements, you must identify the predefined providers that meet these requirements. To perform this step, use the information provided in this appendix.

The following providers are shipped with the current release of Oracle Identity Manager:

- [Shared Drive Transport Provider for Reconciliation](#)
- [CSV Format Provider for Reconciliation](#)
- [SPML Format Provider for Provisioning](#)
- [Web Services Transport Provider for Provisioning](#)
- [Validation Providers](#)

Shared Drive Transport Provider for Reconciliation

This provider reads data from flat files stored in staging directories on the target system server and copies the data to a file in an archiving directory on the Oracle Identity Manager server. If the staging directories are on a different computer, then they must be shared and mapped as network drives on the Oracle Identity Manager server.

The following are parameters of this provider:

- **Staging Directory (Parent Data)**

Use this parameter to specify the path of the directory in which files containing parent data are stored. It is mandatory to specify a value for this parameter.

In this context, "parent data" means the user information that is stored in the target system. The staging directory must be a shared directory that is mapped on the Oracle Identity Manager server.

Sample value for this parameter:

```
T:\TargetSystemDirectory\ParentData
```

Data stored in the parent data files must conform to the following conventions:

- First line of the file: File header that describes the contents of the file

The file header can be preceded by number signs (#). These are ignored while the file is read. However, you must ensure that there are no spaces at the start

of the header. If you are using a language other than English, then you must not enter non-ASCII characters on this line.

Note: There are no checks to stop you from entering non-ASCII characters on the first line. In addition, the generic technology connector framework can parse such characters. However, the use of non-ASCII characters would result in problems at the time when the framework automatically creates objects for the generic technology connector that you create. Refer to the "[Multilanguage Support](#)" section on page 6-6 of the "Known Issues" chapter for more information about this limitation.

- Second line of the file: Metadata, or the field names for the data in the file

If you are using a language other than English, then you must not enter non-ASCII characters on this line. Refer to the Note in the preceding point for more information about this limitation.

- Third line of the file onward: Actual data rows or lines

From the third line onward, you can enter data in the language that you have selected for Oracle Identity Manager, regardless of whether the language has an ASCII or non-ASCII character set.

During reconciliation, if there is no data from the third line onward, then an exception is thrown and the results of a stack trace are displayed on the screen. When this happens, you must retry reconciliation after ensuring that there is data from the third line onward in the data files. This point has also been discussed in the "[Other Known Issues](#)" section on page 6-11 of the "Known Issues" chapter.

The following are contents of a sample parent data file:

```
##Active Directory user
Name TD,Address TD,User ID TD
John Doe,Park Street,jodoe
Jane Doe,Mark Street,jadoe
```

- **Staging Directory (Multivalued Data)**

Use this parameter to specify the directory path at which files containing multivalued data (for example, role or group membership data) are stored. It is *not* mandatory to specify a value for this parameter.

Sample value for this parameter:

```
T:\TargetSystemDirectory\ChildData
```

The staging directory must be a shared directory on the target system that is mapped on the Oracle Identity Manager server. In addition, for each category of multivalued data, there must be a different file in the shared directory. For example, if the multivalued data for a particular target system is group membership data and role data, then there must be one file for group membership data and a second file for role data.

Data stored in the child data files must conform to the conventions that are defined for the parent data files.

In addition, the same unique field must be present in the parent data file and each child data file. This field is used as the reference value to uniquely link each record

of the child data files with a single record in the parent data file. This structure is similar to the concept of integrity constraints (primary key-foreign key) in RDBMSs.

Note: The unique field must be the first field in the child data files.

The following are contents of a sample child data file holding role information that is linked to the sample parent data file listed earlier:

```
###Role
User ID TD,Role Name TD,Role Type TD
jodoe,admin1,admin
jodoe,admin2,admin
```

The following are contents of a sample child data file holding group membership information that is linked to the sample parent data file listed earlier:

```
###Group Membership
User ID TD,Group Name TD,Group Type TD
jodoe,OracleDev1,OracleDev
jodoe,OracleDev2,OracleDev
jodoe,OracleDev3,OracleDev
jodoe,OracleDev4,OracleDev
jodoe,OracleDev5,ConnectorDev
```

Note that the name of the unique field, `User ID TD`, is the same in the child data files and their parent data file.

On the Modify Connector Configuration screen, the name of a child data set is the same as the header that you provide in the child data file. For these sample child data files, the child data sets displayed on the would be labeled `Role` and `Group Membership`. In addition, on the Step 3: Verify Connector Form Names screen, the default names displayed for forms corresponding to the child data sets would be `Role` and `Group Membership`. As mentioned in the "[Step 3: Verify Connector Form Names Screen](#)" section on page 2-12, you can either accept the default form names or change them.

- **Archiving Directory**

Use this parameter to specify the Oracle Identity Manager server directory path at which data files that have already been reconciled are to be stored.

It is mandatory to specify a value for this parameter.

At the end of the reconciliation run, the data files are copied into the archiving directory and deleted from the staging directory.

The files moved to the archiving directory are not time-stamped or marked in any way. Therefore, while specifying the path of the archiving directory, bear in mind the following limitations:

- The archiving directory path that you specify must not be the same as the staging directory path. If you specify the same path, then the existing files in the archiving directory are deleted at the end of the reconciliation run.
- During the current reconciliation run, if data files with the same names as the files used in the last reconciliation run are placed in the staging directory, then the existing files in the archiving directory are overwritten by the new files from the staging directory.

Both these limitations are mentioned in the ["Step 2: Define Parameters Screen"](#) section on page 6-3 of the "Known Issues" chapter.

- **File Prefix**

Use this parameter to specify the prefix added to the names of the files in the staging directories for both parent and child data files. During reconciliation, all files with names that start with the specified prefix are processed, regardless of the file extension.

For example:

If you specify `usrdata` as the value of the File Prefix parameter, then data is parsed from the following files placed in the staging directory for multivalued (child) data files:

```
usrdataRoleData.csv
usrdataGroupMembershipData.txt
```

Data is not extracted from the following files in the same directory, because the file names do not begin with `usrdata`:

```
RoleData.csv
GroupMembershipData.txt
```

- **Specified Delimiter**

Use this parameter to specify the character that is used as the delimiter character in the files in the staging directories.

You can specify only a single character as the value of this parameter.

Note: You cannot use the space character () as a delimiter.

In addition, you must ensure that the character you specify is used only as the delimiter in the data files. If this character also appears inside the data itself, then the data row (or record) is not parsed correctly. For example, you cannot use the comma (,) as the delimiter if it also appears inside the data itself.

- **Tab Delimiter**

Use this parameter to specify whether or not the file is tab delimited. This parameter is ignored if you specify a value for the Specified Delimiter parameter.

- **Fixed Column Width**

If the input file contains fixed-width data, then use this parameter to specify the character width of the data columns.

Note: In this context, the term "fixed-width" refers to the number of characters in the data field, not the byte length of the field. This means that, for example, four characters of single-byte data and four characters of multibyte data are the same in terms of width.

This parameter is ignored if you specify a value for the Specified Delimiter or the Tab Delimiter parameter.

- **Unique Attribute (Parent Data)**

For multivalued data, use this parameter to specify the field that is common to both the parent data and child data files.

- **File Encoding**

Use this parameter to specify the character set encoding used in the parent and data files.

Specify Cp1251 for data files stored on a computer running an operating system with the English-language setting. This is the canonical name for the `java.io` API that is supported by the generic technology connector framework. For any other language that you choose from the list given in the "[Multilanguage Support](#)" section on page 4-2, you must specify the canonical name for the corresponding `java.io` API listed on the following Web page:

<http://java.sun.com/j2se/1.4.2/docs/guide/intl/encoding.doc.html>

Note: The canonical name that you specify for the API must be entered exactly the way it appears on this Web page. You must not change the case (uppercase or lowercase) of the canonical name.

For example, if you want to specify the encoding set for the Traditional Chinese language on a Microsoft Windows computer, then you specify MS950 as the value of the File Encoding parameter.

The following table describes the impact of the various permissions on the shared directories that are used to hold staging and archiving data files.

Storage entity	Access Permission	Impact If This Permission Is Missing
Staging directory parent	Read	Reconciliation is not performed. An error message is logged.
Staging directory parent	Write	Data files in the parent staging directory are not deleted at the end of the archiving process.
Staging directory parent	Execute	No impact
Staging directory child	Read	Reconciliation is not performed for child data. An error message is logged.
Staging directory child	Write	Data files in the child staging directory are not deleted at the end of the archiving process.
Staging directory child	Execute	No impact
Archiving directory	Read	Reconciliation is performed for parent and child data. During the archiving process, files are not copied to the archiving directory. However, these files are deleted from the parent and child staging directories if the required permissions have been set on those directories.

Storage entity	Access Permission	Impact If This Permission Is Missing
Archiving directory	Write	Reconciliation is performed for parent and child data. During the archiving process, files are not copied to the archiving directory. However, these files are deleted from the parent and child staging directories if the required permissions have been set on those directories.
Archiving directory	Execute	No impact
Staging directory parent file	Read	Reconciliation is performed for all parent data files that have the Read permission, but not for this file. An error message is logged.
Staging directory parent file	Write	Data in this file is reconciled. However, this file is not deleted at the end of the archiving process. An error message is logged.
Staging directory parent file	Execute	No impact
Staging directory child file	Read	Reconciliation is performed for all parent data files that have the Read permission, but not for this file. An error message is logged.
Staging directory child file	Write	Data in this file is reconciled. However, this file is not deleted at the end of the archiving process. An error message is logged.
Staging directory child file	Execute	No impact

Note: Data files in the staging directory cannot be deleted if they are open in any editor.

CSV Format Provider for Reconciliation

Although this provider is packaged as a standalone provider, all of its parameters are bundled with the Shared Drive Transport provider. If you select the Shared Drive Transport Provider on the Step 1: Basic Information screen, then you must select the CSV Format provider. When you select this provider, its parameters are displayed along with the Shared Drive Transport provider parameters.

SPML Format Provider for Provisioning

The following is the parameter of this provider:

Target ID

Use this parameter to define the target ID of the actual target.

A Velocity template engine is used to create the SPML requests. For the following processes, the provider generates requests based on the SPML 2.0 DSML profile:

- Add request
- Modify request for the following Oracle Identity Manager process tasks:
 - Field updated
 - Add child data

- Modify child data
- Delete child data
- Suspend request (for Disable Oracle Identity Manager process tasks)
- Resume request (for Enable Oracle Identity Manager process tasks)
- Delete request

This provider also has the following default identity fields:

- objectClass
- containerID

Note: On the Modify Connector Configuration screen, these two fields are displayed by default in the Provisioning Staging data set.

For each provisioning task (for example, Create User and Modify User), the provider generates a request in a predefined format.

The following sections list the XML definition code for provisioning requests and responses implemented by the provider, for the various provisioning tasks:

Note: The definition XML code for requests and responses is for your reference. You cannot customize this code in the provider.

The Provisioning Transport provider expects responses that are based on the sample response formats described in these sections.

- [Create User](#)
- [Modify User](#)
- [Delete User](#)
- [Disable User](#)
- [Enable User](#)
- [Child Table Insert](#)
- [Child Table Update](#)
- [Child Table Delete](#)

Create User

The following is sample SPML code for the Add request:

```
<addRequest xmlns="urn:oasis:names:tc:SPML:2:0"
xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core">
  <targetID ID="ADServer_124" />
  <containerID ID="Contractors" />
  <data>
    <dsml:attr name="objectclass">
      <dsml:value>userObject</dsml:value>
    </dsml:attr>
    <dsml:attr name="firstName">
      <dsml:value>John</dsml:value>
    </dsml:attr>
  </data>
</addRequest>
```

```
        <dsml:attr name="lastName">
          <dsml:value>Doe</dsml:value>
        </dsml:attr>
      </data>
    </addRequest>
```

The following is sample SPML code for the Add response:

```
<addResponse status="success">
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
</addResponse>
```

Modify User

The following is sample SPML code for the Modify request:

```
<modifyRequest xmlns="urn:oasis:names:tc:SPML:2:0"
xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core">
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
  <modification>
    <dsml:modification name="lastName" operation="replace">
      <dsml:value>Doe</dsml:value>
    </dsml:modification>
  </modification>
</modifyRequest>
```

The following is sample SPML code for the Modify response:

```
<modifyResponse status="success" >
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
</modifyResponse>
```

Delete User

The following is sample SPML code for the Delete request:

```
<deleteRequest xmlns="urn:oasis:names:tc:SPML:2:0"
xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core">
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
</deleteRequest>
```

The following is sample SPML code for the Delete response:

```
<deleteResponse status="success" >
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
</deleteResponse>
```

Disable User

The following is sample SPML code for the Suspend request:

```
<suspendRequest xmlns="urn:oasis:names:tc:SPML:2:0"
xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core">
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
</suspendRequest>
```

The following is sample SPML code for the Suspend response:

```
<suspendResponse status="success" >
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
</suspendResponse>
```

Enable User

The following is sample SPML code for the Resume request:

```
<resumeRequest xmlns="urn:oasis:names:tc:SPML:2:0"
xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core">
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
</resumeRequest>
```

The following is sample SPML code for the Resume response:

```
<resumeResponse status="success" >
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
</resumeResponse>
```

Child Table Insert

The following is sample SPML code for the Modify request that captures the input for inserting child table data.

```
<modifyRequest xmlns="urn:oasis:names:tc:SPML:2:0"
xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core">
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
  <modification>
    <dsml:modification name="Group Membership" operation="add">
      <dsml:value>AdminOra, System Admins, USA </dsml:value>
    </dsml:modification>
  </modification>
</modifyRequest>
```

Note: There is no standard format for child table operations. Therefore, child data provisioning is handled through the SPML Modify request. The modification involves the use of a single attribute whose name is the same as the name of the corresponding child data set. The order in which field values are placed in the XML request file must be the same as the order in which the corresponding fields are displayed on the relevant child form. The data set name and field values are highlighted in bold font in the preceding XML code lines.

This also applies to the requests used for the Child Table Update and Child Table Delete operations.

The following is sample SPML code for the Modify response:

```
<modifyResponse status="success" >
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
</modifyResponse>
```

Child Table Update

The following is sample SPML code for the Modify request that captures the input for updating child table data.

```
<modifyRequest xmlns="urn:oasis:names:tc:SPML:2:0"
xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core">
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
  <modification>
    <dsml:modification name="Group Membership" operation="replace">
      <dsml:value>AdminOra, System Admins, USA </dsml:value>
    </dsml:modification>
  </modification>
</modifyRequest>
```

The following is sample SPML code for the Modify response:

```
<modifyResponse status="success" >
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
</modifyResponse>
```

Child Table Delete

The following is sample SPML code for the Modify request that captures the input for deleting child table data.

```
<modifyRequest xmlns="urn:oasis:names:tc:SPML:2:0"
xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core">
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
```

```

<modification>
  <dsml:modification name="Group Membership" operation="delete">
    <dsml:value>AdminOra, System Admins, USA </dsml:value>
  </dsml:modification>
</modification>
</modifyRequest>

```

The following is sample SPML code for the Modify response:

```

<modifyResponse status="success" >
  <psoID ID="jdoe">
    <targetID ID="ADServer_124"/>
    <containerID ID="Contractors"/>
  </psoID>
</modifyResponse>

```

Web Services Transport Provider for Provisioning

The following are parameters of this provider:

- **Web Service URL**

Use this parameter to specify the URL of the Web service that you want to use.

- **Operation Name**

Use this parameter to specify the name of the Web service method that you want the provider to run.

In addition, the target Web service must meet the following requirements:

- The input parameter of the target operation must be a byte array (`byte []`). This parameter holds the SPML provisioning request.
- The parameter returned by the target operation must be a byte array (`byte []`). This parameter holds the SPML response.

The following is the signature of a sample operation:

```
public byte[] doProvisioning(byte[] requestData){
```

In this sample, the name of the operation is `doProvisioning`.

Validation Providers

The following table describes the Validation providers that are shipped with this release of Oracle Identity Manager.

Validation Provider	Description
IsNotBlankOrNull	Checks if the field value is null or blank
IsValidDate	Checks if the field value is a valid date
IsInRange	Checks if the field value is within a range specified by a minimum and maximum value pair
IsByte	Checks if the field value can be converted to a byte primitive
IsDouble	Checks if the field value can be converted to a double primitive
IsFloat	Checks if the field value can be converted to a float primitive
IsInteger	Checks if the field value can be converted to an integer primitive

Validation Provider	Description
IsLong	Checks if the field value can be converted to a long primitive
IsShort	Checks if the field value can be converted to a short primitive
MatchRegexp	Checks if the field value matches the specified regular expression
MaxLength	Checks if the length of the field value is less than or equal to the specified value
MinLength	Checks if the length of the field value is greater than or equal to the specified value

Connector Objects Created by the Generic Technology Connector Framework

The list of connector objects created by the generic technology connector framework depends on the combination of the Reconciliation and Provisioning options that you select on the Step 1: Basic Information screen:

- [Both Reconciliation and Provisioning Are Selected](#)
- [Only Reconciliation Is Selected](#)
- [Only Provisioning Is Selected](#)

Both Reconciliation and Provisioning Are Selected

The following objects are created when you select both the Provisioning and Reconciliation options on the Step 1: Basic Information screen:

- IT resource type
The parameters of the IT resource type are the run-time parameters of the Format and Transport providers (for both reconciliation and provisioning) that you select on the first screen. The name of the IT resource type is the same as the name of the generic technology connector.
- IT resource
The IT resource is an instance of the IT resource type. It contains the run-time parameter values of the providers. Its name is the same as the name of the generic technology connector.
- Resource object
The resource object holds the values of the fields that constitute the parent data set in the Reconciliation Staging category. The name of the resource object is the same as the name of the generic technology connector. For each child data set in the Reconciliation Staging category, multivalued reconciliation fields (with corresponding child fields as their attributes) are automatically created.
You can modify the resource object definition by using the features of the Modify Connector Configuration screen to add or modify fields in this category.
- Parent and child forms
Parent and child forms are based on the Account data set and its child data sets, respectively. By default, the names of the forms are the same as the names of their corresponding data sets. On the Step 3: Verify Form Names screen, you can change the form names as required.

- Generic adapter
The generic adapter contains the code for all the provisioning functions that a generic technology connector performs. Its name is same as the name of the generic technology connector.
- Process definition
The process definition contains the reconciliation field mappings and the process tasks. Its name is the same as the name of the generic technology connector. Refer to the "[Modifying Default Process Task Assignments](#)" section on page 2-16 for information about the process tasks that are included in the process definition.
- Scheduled task
During a reconciliation run, the scheduled task triggers the reconciliation processes in the predefined sequence. The name of the scheduled task is the same as the name of the generic technology connector. The "[Step 5: Configuring Reconciliation](#)" section on page 2-13 provides information about setting up the scheduled task.
- Reconciliation rule
The reconciliation rule is made up of rule elements. A single rule element represents a mapping created between a field of the Reconciliation Staging data set and a field of the User data set. The name of the reconciliation rule is the same as the name of the generic technology connector.

The user group to which the creator of the generic technology connector belongs is made the administrator of the following connector objects that are automatically created during the generic technology connector creation process:

- IT resource
- Resource object (Administrator and Object Authorizer)
- All forms
- Process definition

Only Reconciliation Is Selected

Refer to the "[Both Reconciliation and Provisioning Are Selected](#)" section on page B-1 for the list of objects that are created when you select both the Reconciliation and Provisioning options. From that list, the following objects are *not* created when you select only the Reconciliation option on the Step 1: Basic Information screen:

- Generic adapter
- Framework-defined process tasks

However, the process definition itself and its constituent system-defined process tasks are created. Refer to the "[Modifying Default Process Task Assignments](#)" section on page 2-16 for information about the types of process tasks.

Only Provisioning Is Selected

Refer to the "[Both Reconciliation and Provisioning Are Selected](#)" section on page B-1 for the list of objects that are created when you select both the Reconciliation and Provisioning options. From that list, the following objects are *not* created when you select only the Provisioning option on the Step 1: Basic Information screen:

- Reconciliation rules

- Scheduled task
- Reconciliation field
- Reconciliation field mappings

Validations Applied When Data Set Fields Are Added or Modified

On the Modify Connector Configuration screen, the following validations are applied when you add or modify fields of data sets:

- Two fields that belong to the same data set (parent or child) cannot have the same name.
- Two child data sets of the same parent data set cannot have the same name.
- In a particular data set category, the name of a field in the parent data set cannot be the same as the name of a child data set.
- Two different child data sets, (regardless of whether or not they belong to the same parent data set) can have fields that have the same name. For example, the `GroupMembership` data set and `Role` data set can each have a field with the name `UsrID`.
- Two different parent data sets can have fields that have the same name. Similarly, these data sets can also have child data sets that have the same name.
- The name of a child data set can be the same as one of its fields.

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