Oracle® Public Cloud Machine

Using the Oracle Mapper

Release 16.3.1

E67464-03

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This guide describes how to use the mapper to map source data structures to target data structures.

ORACLE

Oracle Public Cloud Machine Using the Oracle Mapper, Release 16.3.1

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Preface

Using the Oracle Mapper describes how to use the mapper to map source data structures to target data structures.

Topics:

- Audience
- Related Resources
- Conventions

Audience

Using the Oracle Mapper is intended for users who want to use the mapper to map source data structures to target data structures.

Related Resources

For more information, see these Oracle resources:

- Oracle Public Cloud Machine documentation in the Oracle Help Center:

  http://docs.oracle.com

- *Using Oracle Integration Cloud Service*

Conventions

The following text conventions are used in this document:

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

1

Getting Started with the Mapper

Review the following topics to learn how the mapper works to map source data structures to target data structures.

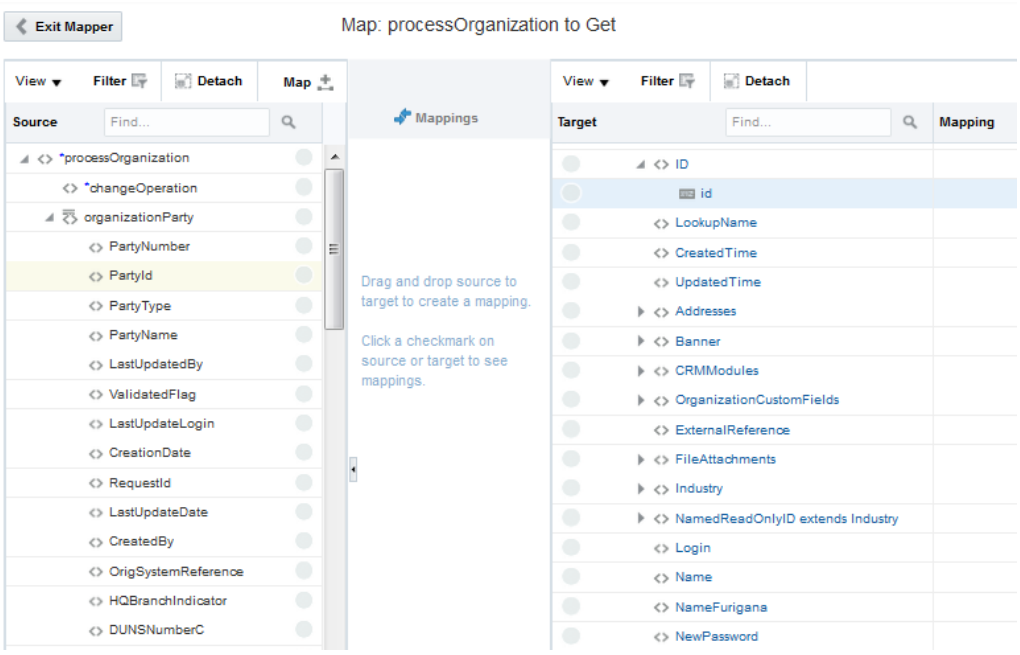
Topics

- About Mappings
- About Mapping Data Between Applications
- Building Expressions with the Mapping Builder

About Mappings

One of the key tasks to any integration is defining how data is transferred, or *mapped*, between two applications.

In most cases, the messages you want to transfer between the applications in an integration have different data structures. A visual mapper enables you to map fields between applications by dragging source fields onto target fields. When you open the mapper for a request or response message in an integration, the data structures are automatically populated with the information pulled from the source and target connections. You can expand and the load data structure levels on demand to display additional levels. There is no limit on the levels of display.



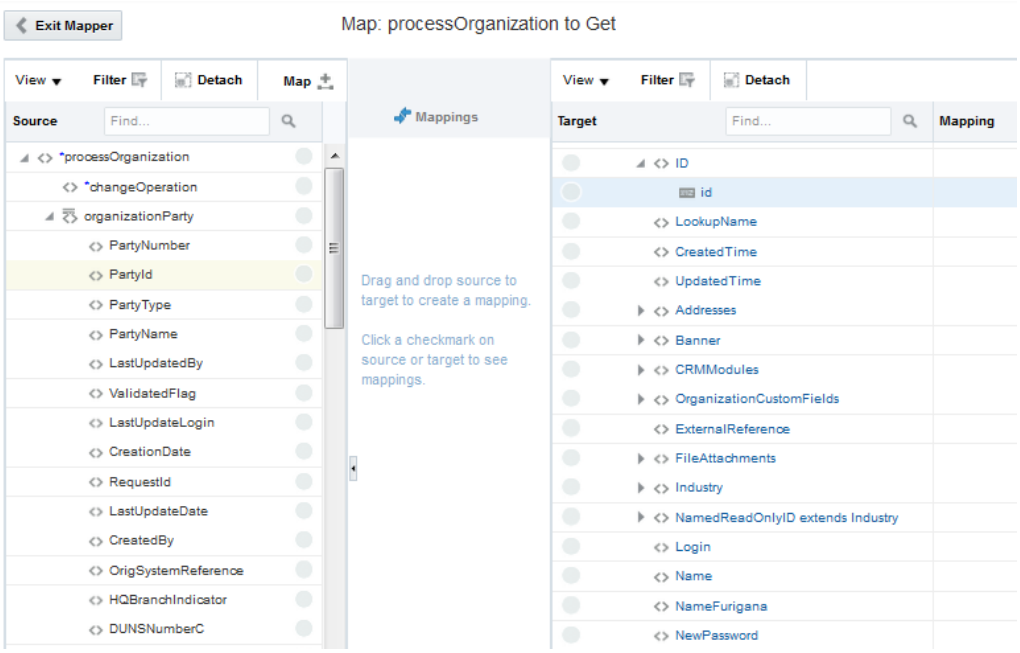
The maps you create are called transformation maps, and use the eXtensible Stylesheet Language (XSL) to describe the data mappings, which lets you perform complex data manipulation and transformation. A standard set of XPath functions are provided for you to define how data is modified when moving from one application to another. A specialized function is also provided for you to reference lookups directly from the mapper.

The mapper supports both qualified and unqualified schemas (that is, schemas without `elementFormDefault="qualified"`). Elements and attributes with and without namespace prefixes are also supported.

About Mapping Data Between Applications

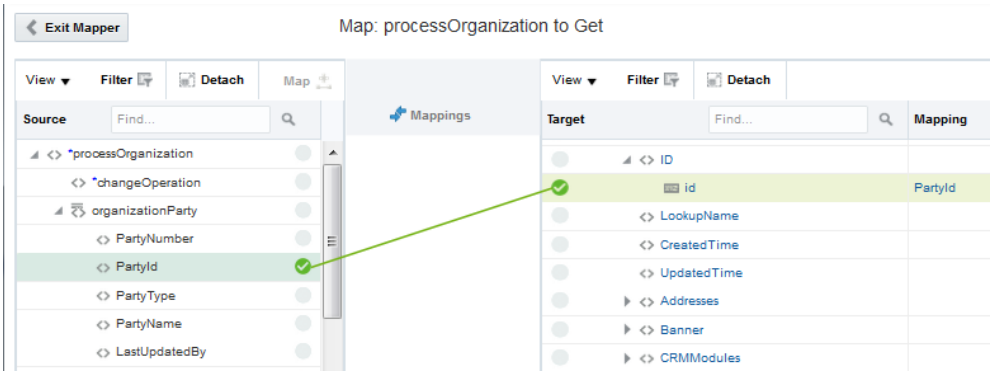
Once you create an integration and have the source and target connections in place, you can define how data is mapped between the two data structures.

The mapper appears with the source data structure on the left and the target data structure on the right.



1. To map fields directly, click a field in the source and drag it to the corresponding field in the target.

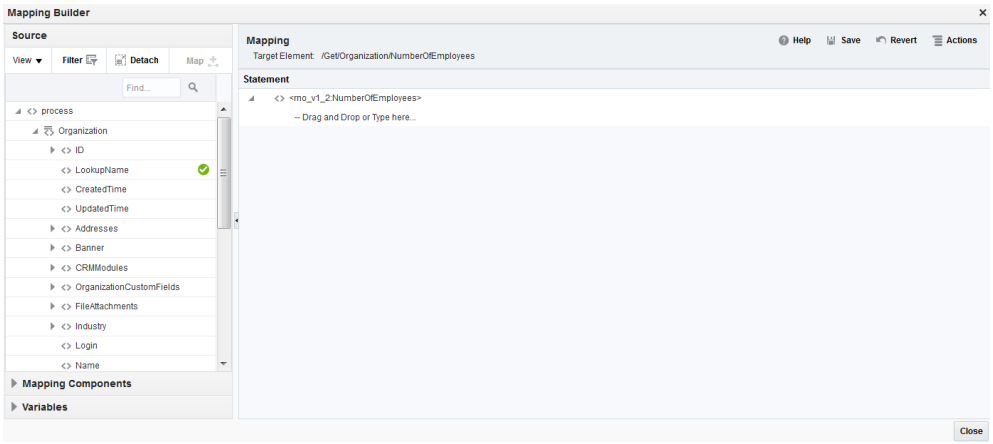
   The name of the source field appears in the target **Mapping** column, and a green check mark icon appears next to both fields. The most recently mapped fields are connected by a green line. Click the green check mark of other sources and targets to see their current mappings.



2. To use XPath functions in your mapping, see Using XPath Functions for instructions.
3. To use lookups in your mapping, see Referencing Lookups for instructions.
4. When you are done mapping data, click **Save**, then click **Exit Mapper**.
5. On the toolbar, click **Save**.
6. Click the map icon between the response operations, and repeat the above steps to map the response. Make sure to save the integration when you are done.

Building Expressions with the Mapping Builder

Use the Mapping Builder to create and modify advanced mappings. For example, you can loop through repeating elements, create conditional statements, use XPath functions, and reference lookups. The Mapping Builder is displayed when you click a field in the target data structure of the mapper.



For more information, see Building Expressions.

2

Mapping Data

Use the intelligent data mapper to drag fields from the source structure to the target structure to map elements between the two.

Topics

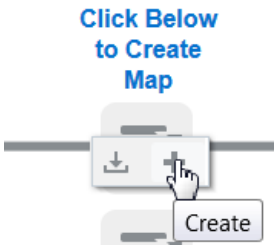
- Creating Mappings
- Repeating a Target Element to Map to Different Sources
- Automatically Creating for-each Statements
- Deleting Individual Mappings
- Finding Data Fields
- Browsing and Filtering the Source or Target Data Structure
- Mapping Multiple Source Structures to a Target Structure
- Testing Your Mappings

Creating Mappings

You can map fields directly from the source data structure to the target data structure in the mapper.

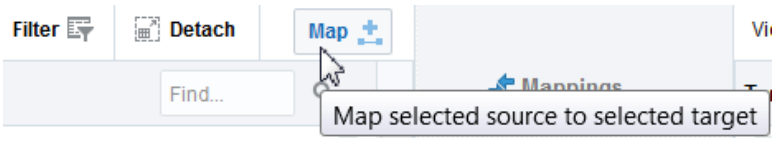
To create mappings:

1. In the middle of the integration, click the **Mapper** icon for the request, response, or fault map to edit.
2. Click **Create**.

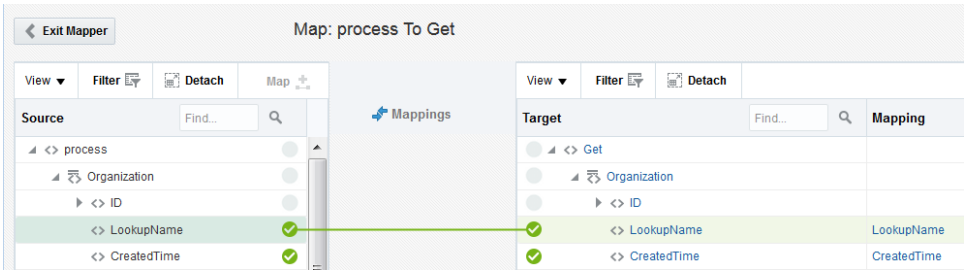


3. To map fields directly, perform one of the following steps:
   a. Click a field in the source and drag it to the corresponding field in the target.

b. Click the source and the target fields, and then click **Map+**.



The name of the source field appears in the target Mapping column, and a green check mark icon appears next to both fields. The most recently mapped fields are connected by a green line. Click the green check mark of other sources and targets to see their current mappings. You cannot drag and drop onto a target that is already mapped.



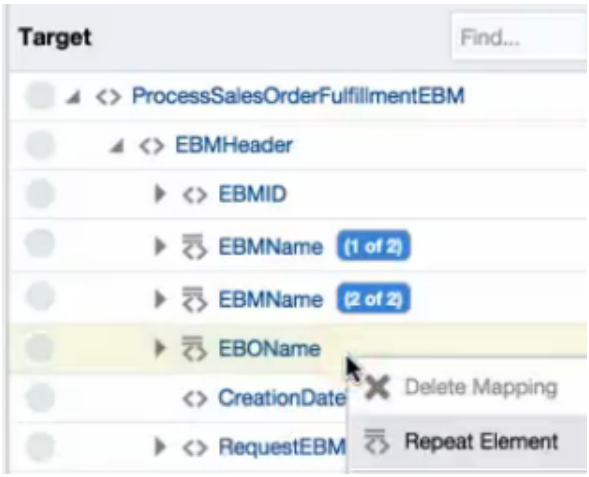
Note: In the mapping summary, the full names of extended elements are not displayed.

Repeating a Target Element to Map to Different Sources

You can repeat a target element in the mapper. This enables you to map different sources to the same target element. Elements defined in the target schema with the `maxOccurs` attribute set to a value greater than one can be repeated.

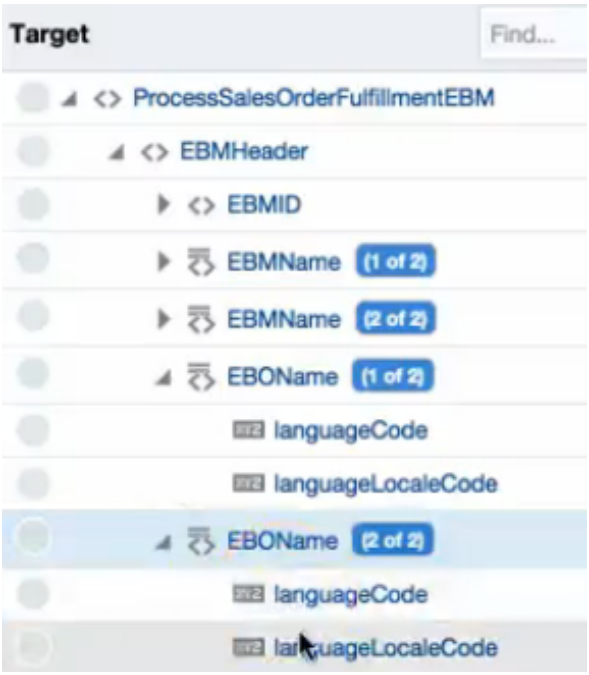
To repeat a target element to map to different sources:

1. In the target data structure, right-click the element to repeat, and select **Repeat Element**. Elements that can be repeated are identified by a special icon with two bars to the left of the name. When you place your cursor over these elements, the words **Repeating Element** are displayed.



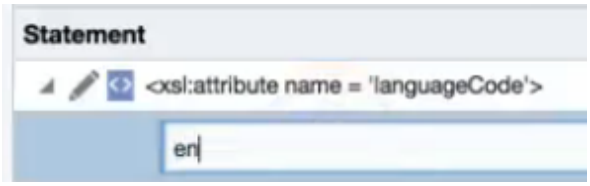
The element is repeated and displayed below the existing element. Elements that are repeated show the count (for example, **(1 of 2)** for the existing element and **(2 of 2)** for the repeated element. You can repeat an element multiple times.

2. Expand the existing and repeated elements to see that the attributes in each element are repeated.



3. Click the child attribute of the existing element (for this example, named **languageCode** under **EBOName (1 of 2)** to access the Mapping Builder.

4. Replace **Drag and Drop or Type here** with a value (for this example, `en` is entered for English).



5. Click **Save**, then click **Close**.
6. Click the child attribute of the repeated element (for this example, named **languageCode** under **EBOName (2 of 2)** to access the Mapping Builder.
7. Replace **Drag and Drop or Type here** with a value (for this example, `fr` is entered for French).
8. Click **Save**, then click **Close**.

   The assigned values are displayed in the **Mapper** column.

Note: If you create a repeatable element in which you do not do any mapping, then click **Save** and **Exit Mapper**, the empty element is not saved.

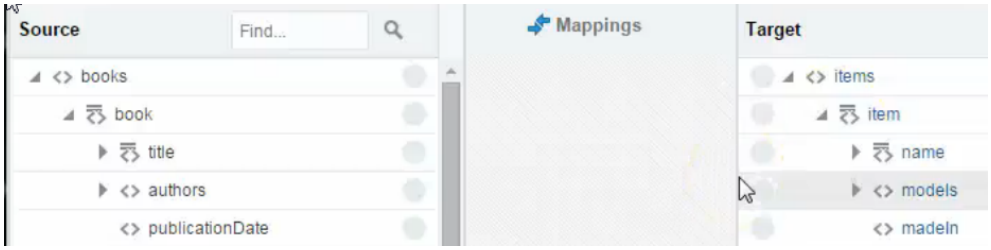
For more information about repeatable elements, see Automatically Creating for-each Statements.

Automatically Creating for-each Statements

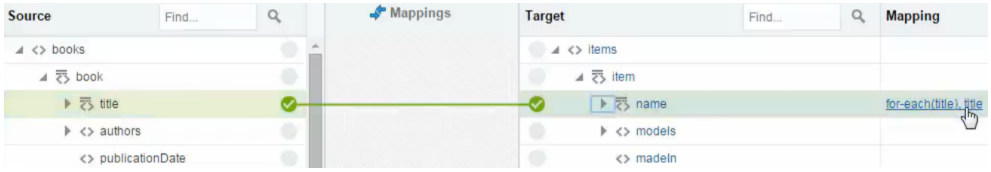
You can automatically create for-each statements when mapping between repeatable source and target elements in the mapper.

To automatically create for-each statements:

1. In the **Source** panel, identify the repeatable source and target elements to which to map. A repeatable element is identified by a special icon with two bars to the left of the name. When you place your cursor over these elements, the words **Repeating Element** are displayed. For this example, there are parent and child **book** and **title** repeatable elements in the **Source** panel and parent and child **item** and **name** repeatable elements in the **Target** panel.



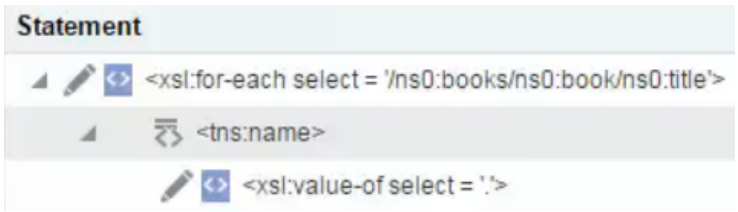
2. In the **Source** panel, map the *child* repeatable element to the *child* target repeatable element (for this example, the source repeatable element **title** is mapped to the target repeatable element **name**).



In the **Mapping** column of the **Target** panel, a **for-each** statement is automatically created with a selectable value (for this example, named **title**).

3. Click the **for-each** statement to access the Mapping Builder.

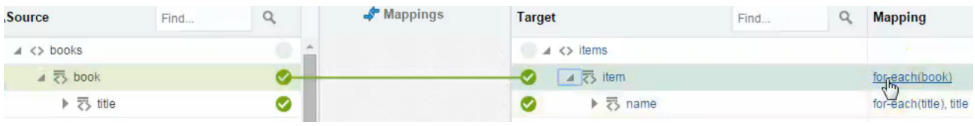
A **for-each** statement with an absolute path is displayed.



4. Click **Close** to exit the Mapping Builder.

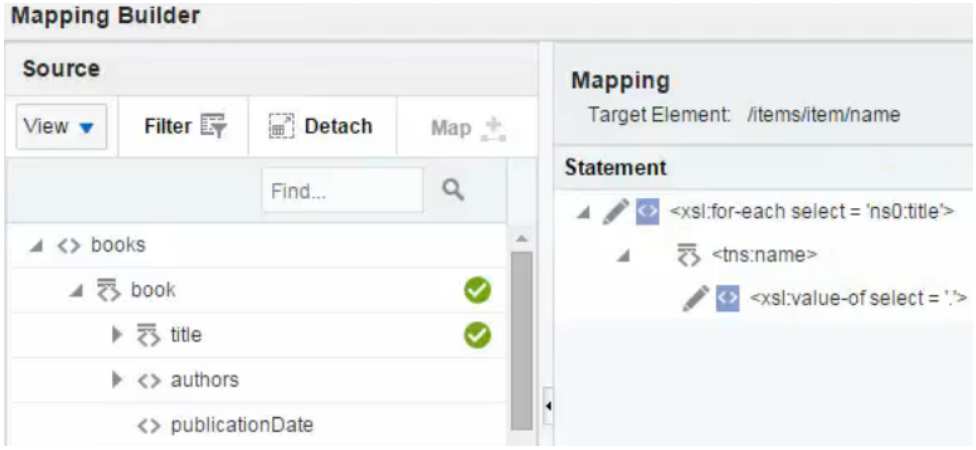
5. In the **Source** panel, identify the *parent* repeatable source and target elements to which to map (for this example, **book** and **item**).

6. In the source data structure, map the *parent* repeatable element to the *parent* target repeatable element (for this example, the source repeatable element **book** is mapped to the target repeatable element **item**).



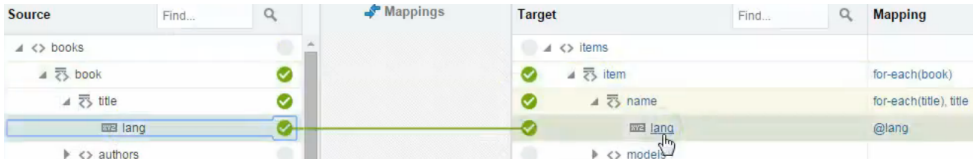
The mapper creates a second **for-each** statement to loop through the **book** element and place the mapping into the **item** element. This statement does not include a value to select because parent elements do not typically contain attributes to map.

7. Click the **for-each** function to access the Mapping Builder. The **for-each** statement is displayed. Note that the absolute path of the mapping is converted to a relative path.



8. Click **Close** to exit the Mapping Builder.

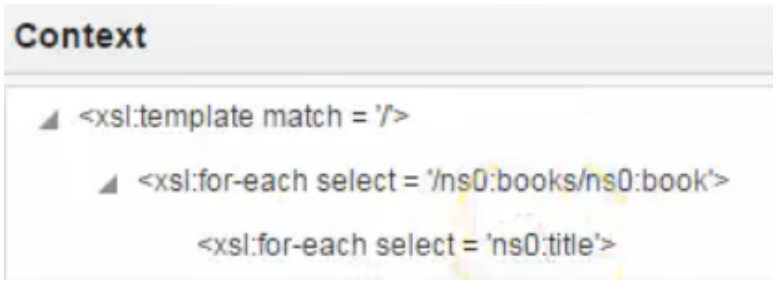
9. Map the source attribute to the target attribute (for this example, **lang** is mapped to **lang**).



10. In the **Mapping** column, click the attribute to access the Mapping Builder.

11. In the upper right corner, select **Actions** > **Show Content** to display the execution code.

    The first **for-each** selects the books and the second **for-each** selects the book titles.

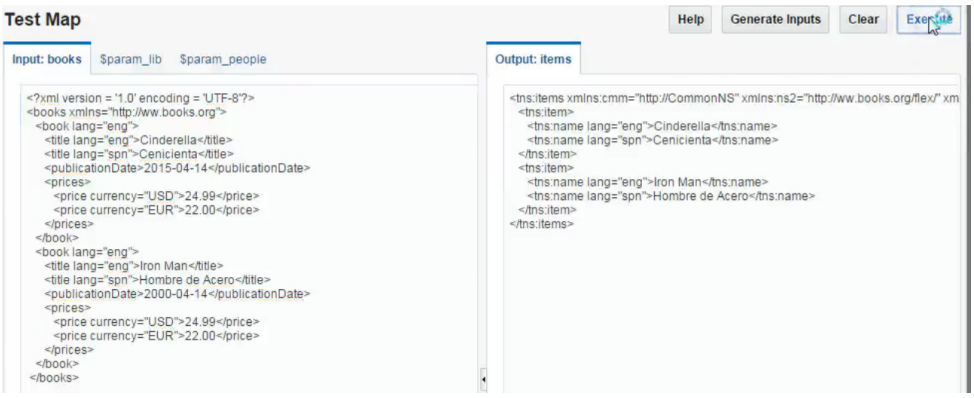


12. Click **Close** to exit the Mapping Builder.

13. Click **Test**.

14. Enter the source payload and click **Execute**. For this example, the payload includes two book titles. Each title is displayed in both English and Spanish.

The titles in English and Spanish for both books are displayed in the **Output** panel..



For more information about repeatable elements, see Repeating a Target Element to Map to Different Sources.

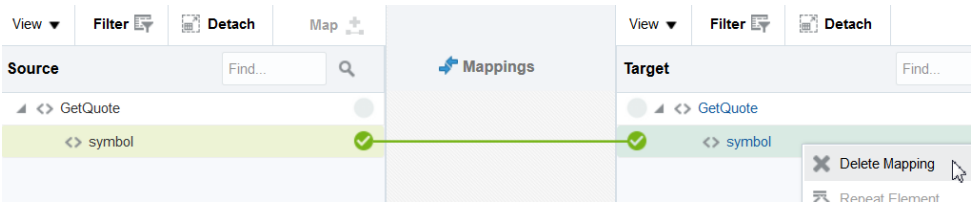
Deleting Individual Mappings

You can delete individual source-to-target mappings with the mapper.

To delete individual mappings:

> **Note:** You cannot delete a mapping by right-clicking the line between the source and target.

1. To remove a mapping, right-click the row of the target to which to remove and select **Delete Mapping**.



2. Click **Yes** when prompted to confirm.

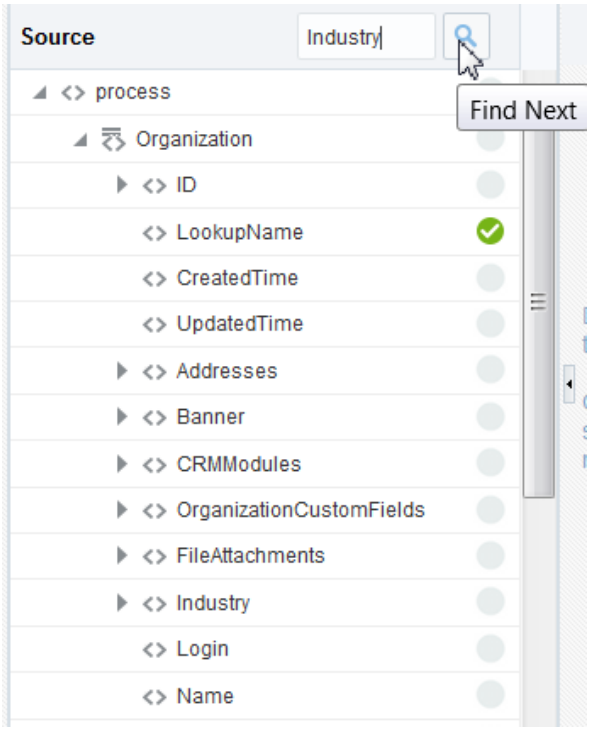
   If you attempt to delete a parent mapping that includes child mappings, you are prompted to confirm that you want to delete all the child mappings inside the parent mapping.

Finding Data Fields

The mapper displays the source data structure on the left and the target data structure on the right. You can search for specific field names in either structure.

To find data fields:

1. Type the full or partial name in the source or target data structure, and click the **Find** icon.



The tree scrolls to the first match.

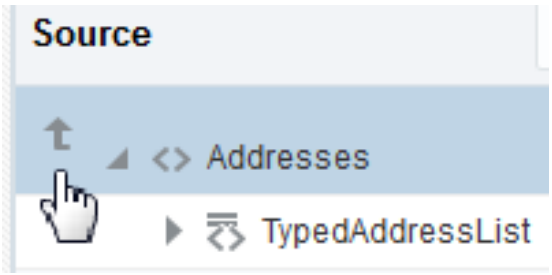
2. Click the **Find** icon again to scroll to the next match.

Browsing and Filtering the Source or Target Data Structure

The mapper displays the source data structure on the left and the target data structure on the right. You can filter the display of either structure.

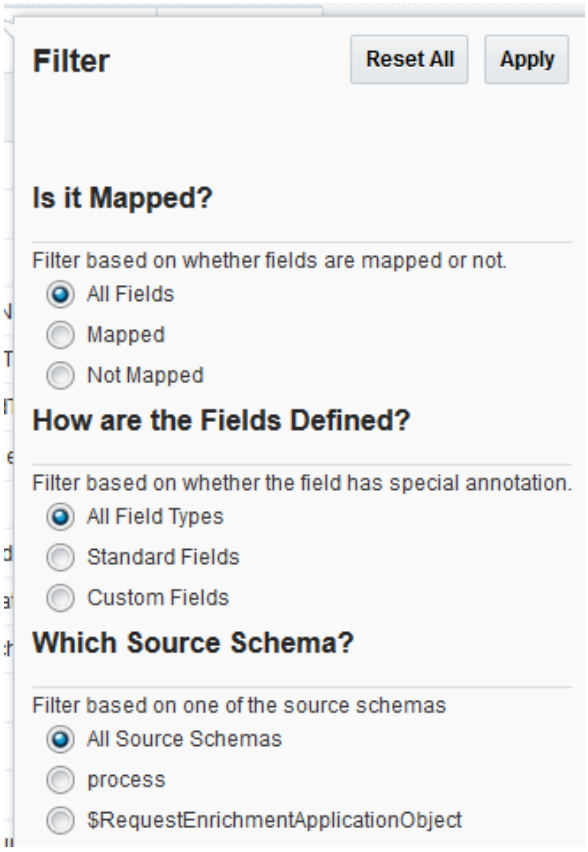
To browse and filter the source or target data structure:

1. To expand or collapse parent nodes one level at a time:
   a. Right-click the parent node and select **Expand** or **Collapse**.
   b. Click the **Expand** or **Collapse** icon to the left of the parent node.
2. To expand or collapse all nodes under a parent, right-click a row and select **Expand** or **Collapse All Below**.
3. To promote a node to the top, right-click a row and select **Show as Top**. To return to the original view, select the **Up** arrow in the first row, then select the data structure hierarchy to access.



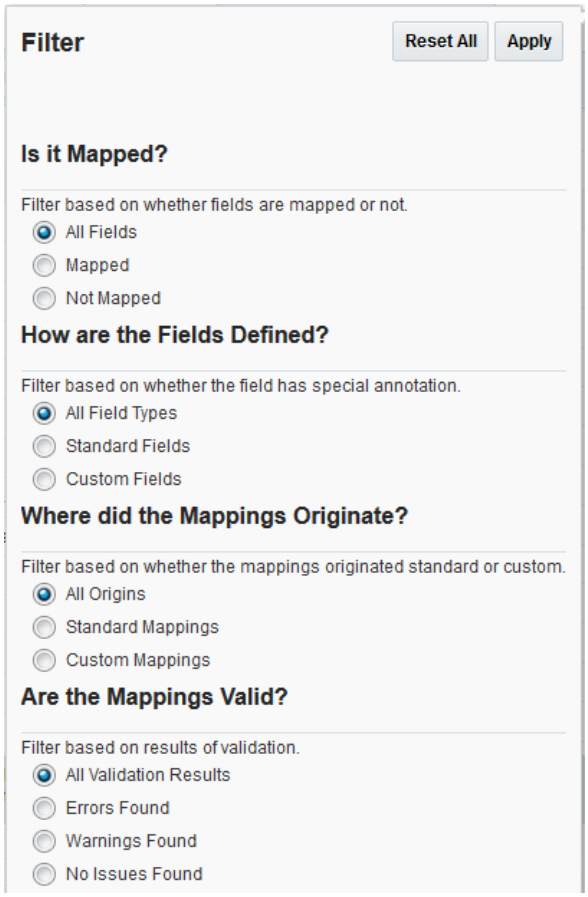
4. To filter the source side, click **Filter** to specify map filtering options based on the following criteria, then click **Apply**. You can select one option from each section. When the **Filter** icon is displayed in blue, this indicates that the filter has been modified from its default settings and is active. To reset the filter option to its default values, click **Reset All**.

   - Current field status (show all fields, mapped fields (applies to target nodes to which a source, variable, or function has been mapped), or unmapped fields). If you select **Not Mapped**, it shows all parent nodes of the unmapped elements – even if the parent nodes are only mapped.
   - Whether fields have special annotations (all fields, standard fields delivered out-of-the-box as part of a prebuilt Oracle integration, or custom fields you created in a prebuilt Oracle integration that was edited in customization mode).
   - The source data structures in the integration. This option is only displayed if there are multiple source data structures in this mapper.



5. On the target side, click **Filter** to specify map filtering options based on the following criteria, then click **Apply**. You can select one option from each section. When the **Filter** icon is displayed in blue, this indicates that the filter has been modified from its default settings and is active. To reset the filter option to its default values, click **Reset All**

- Current field status (show all fields, mapped fields (applies to target nodes to which a source, variable, or function has been mapped), or unmapped fields). If you select **Not Mapped**, it shows all parent nodes of the unmapped elements – even if the parent nodes are only mapped).
- Whether fields have special annotations (all fields, standard fields delivered out-of-the-box as part of a prebuilt Oracle integration, or custom fields you created in a prebuilt Oracle integration that was edited in customization mode).
- The origin of mappings (all, standard, or custom).
- Whether the mappings are valid.



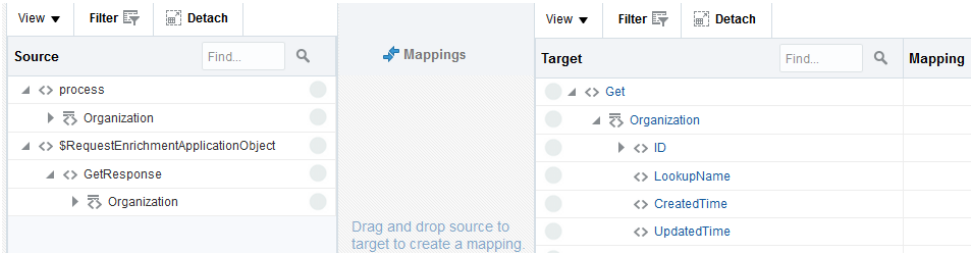
Mapping Multiple Source Structures to a Target Structure

You can map fields from multiple source structures to a single target structure in certain parts of integrations (for example, integrations in which message enrichment points have been added or integrations with a response mapping). This action applies to the creation of new maps.

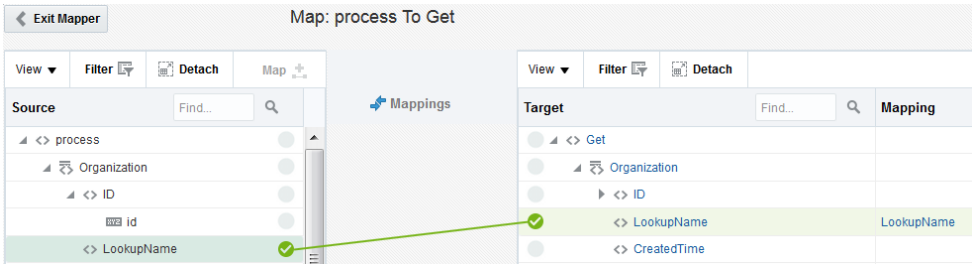
To map multiple source structures to a target structure:

1. In the mapper, note that two source structures are displayed:
   - The initial request mapping source (**process**)

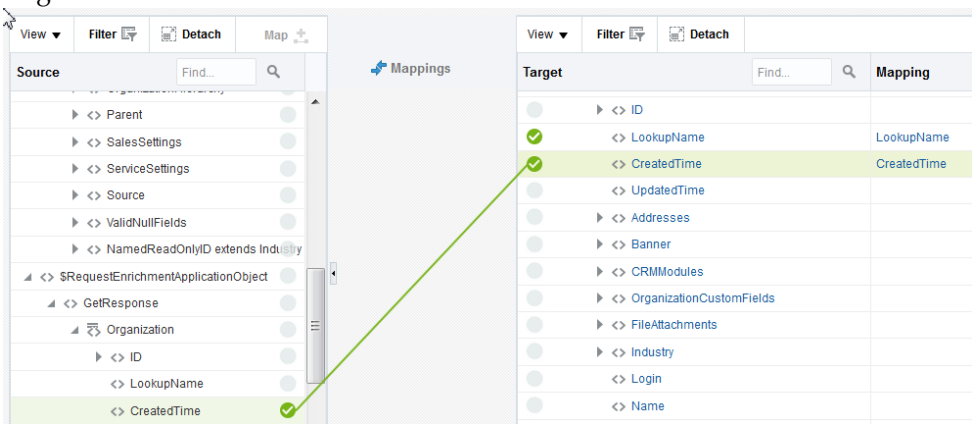
- The secondary request enrichment mapping source (**$RequestEnrichmentApplicationObject**)



2. Expand the initial source data structure and drag appropriate source fields to target fields.



Expand the secondary source data structure and drag appropriate source fields to target fields.



3. To test the mappings, see Testing Your Mappings.

4. When complete, click **Save**, then click **Exit Mapper**.

Testing Your Mappings

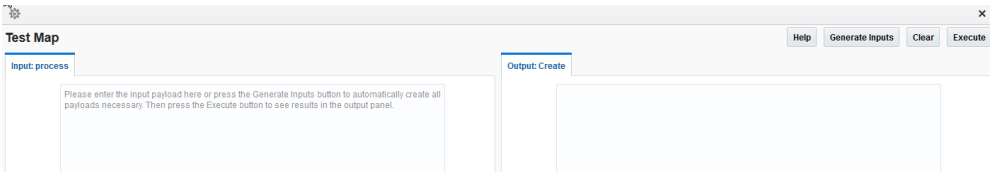
Once you complete designing your mappings, you can test it by entering sample content of the message to process in the mapping tester. When you execute the test, the output is generated from the sample content.

To test a mapping:

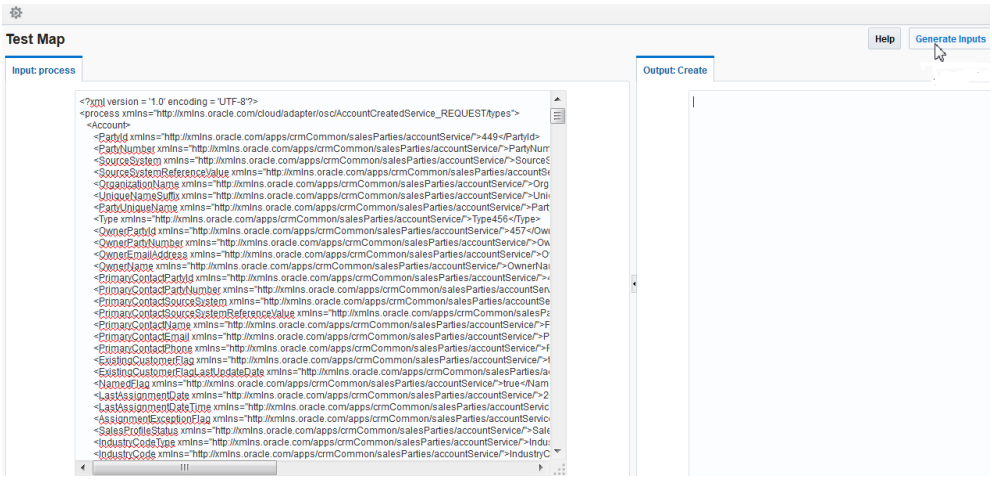
1. In the mapper toolbar, click **Test**.

   The mapping tester appears. The names of the source and target data structures for your mapping are displayed at the top. If your mapping includes multiple source data structures, both names are displayed. The primary source is displayed first,

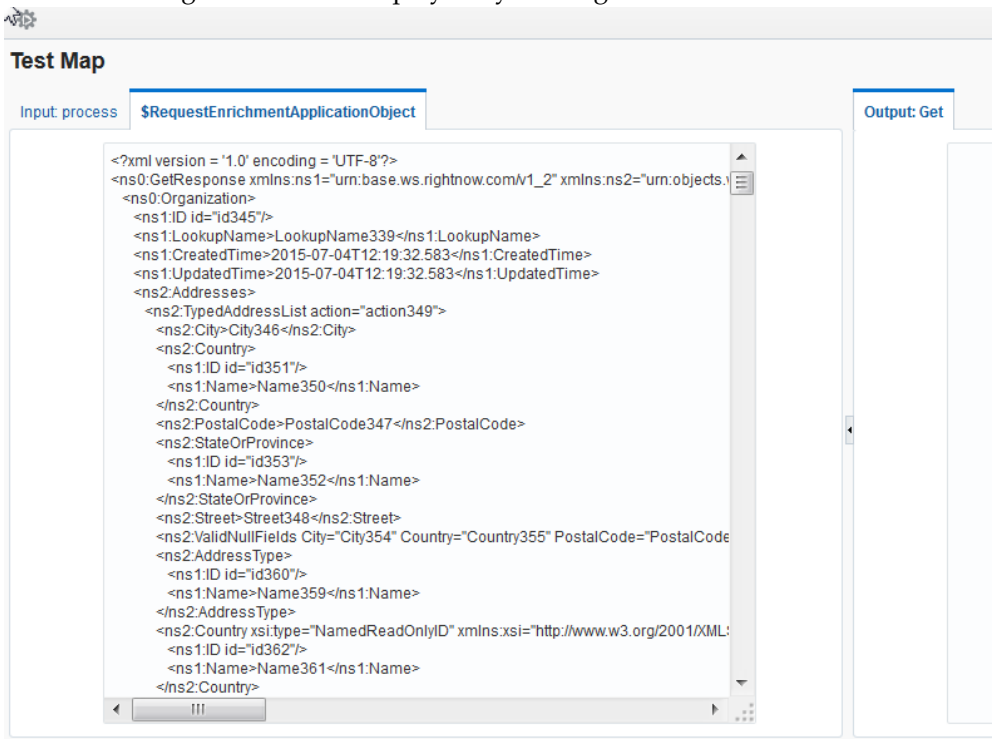
followed by the secondary source. Two instances are also generated and displayed for repeating nodes.



2. In the **Input** panel, enter the payload you want to test. You can manually enter the payload, copy and paste the payload, or click **Generate Inputs** to automatically generate the payload.



If your mapping includes multiple source data structures, payloads for both sources can be generated and displayed by clicking the source name.



Note: If the payload is very large, it is not automatically generated and you receive the following error message:

```
Payload could not be generated for the ''$SourceApplicationObject'' schema
due to excessive size and a lack of system memory
```

---

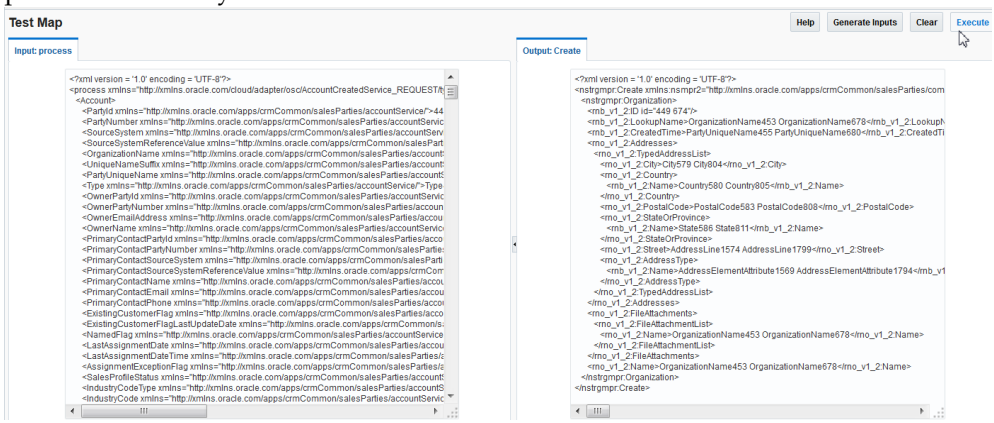
3. Expand the display of the input payload by dragging the splitter in the middle of the page to the right. You can also click the splitter to toggle between the input and output payloads.

4. Scroll through the input payload and note the following details:

   - Unbounded, repeating elements are displayed multiple times.
   - Schemas of up to 20 levels in depth can be displayed.

- Random values are automatically generated for payload elements. Based on the data type of the element, the correct values (for example, numerical or string values) are generated.
- You can manually edit the randomly-generated values, as necessary.

5. Click **Execute** to generate results in the **Output** panel.
6. Review the results in the **Output** panel to ensure that your input payload was processed correctly.



7. Test your mapping and, as necessary, return to the mapper to make mapping changes and to the Mapping Builder to make mapping logic changes, such as changing the XSL elements or functions used.
8. To clear the **Input** and **Output** panels, click **Clear**.
9. When testing is complete, click **Close**.

3

Building Expressions

Use the Mapping Builder to create and modify advanced mappings. For example, you can loop through repeating elements, create conditional statements, use XPath functions, and reference lookups.

Topics

- Building Mapping Statements
- Repeating Elements with the for-each Statement
- Conditional Mappings
- Using XPath Functions
- Referencing Lookups
- Deleting Mapping Statements

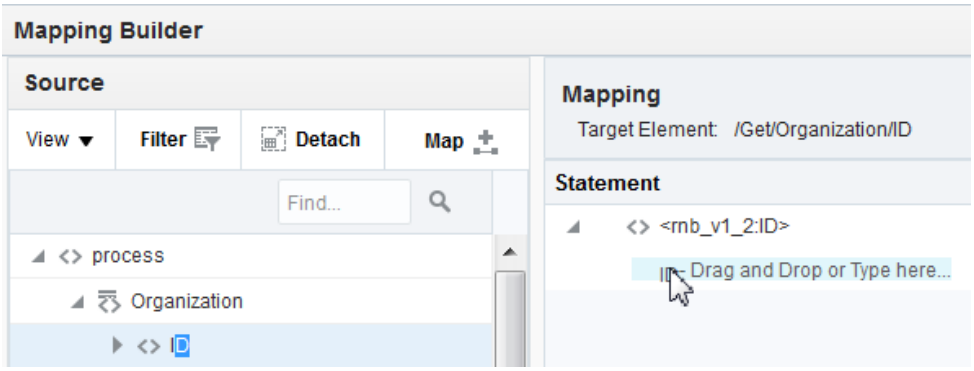
Building Mapping Statements

This section describes how to build mapping statements.

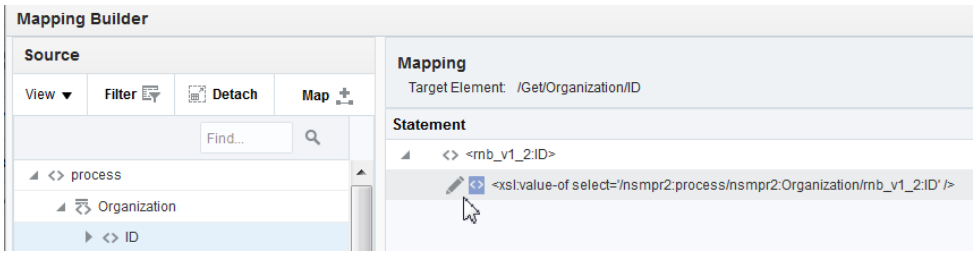
To build mapping statements:

1. Drag a source to a target to create a mapping.
2. Click the target node to launch the Mapping Builder.

   If the target is not mapped, you see two statements: the target tag and a new empty statement with the text **Drag and Drop or Type here…**.
3. Drag a source element onto the empty row.



The **value-of** mapping statement appears.



4. Click the **Edit** icon, or right click and select **Edit**.

   The statement expands to show the select and source statements.

5. Change the mapping as necessary by dragging a different source element onto the source statement.

6. Click **Save**.

Repeating Elements with the for-each Statement

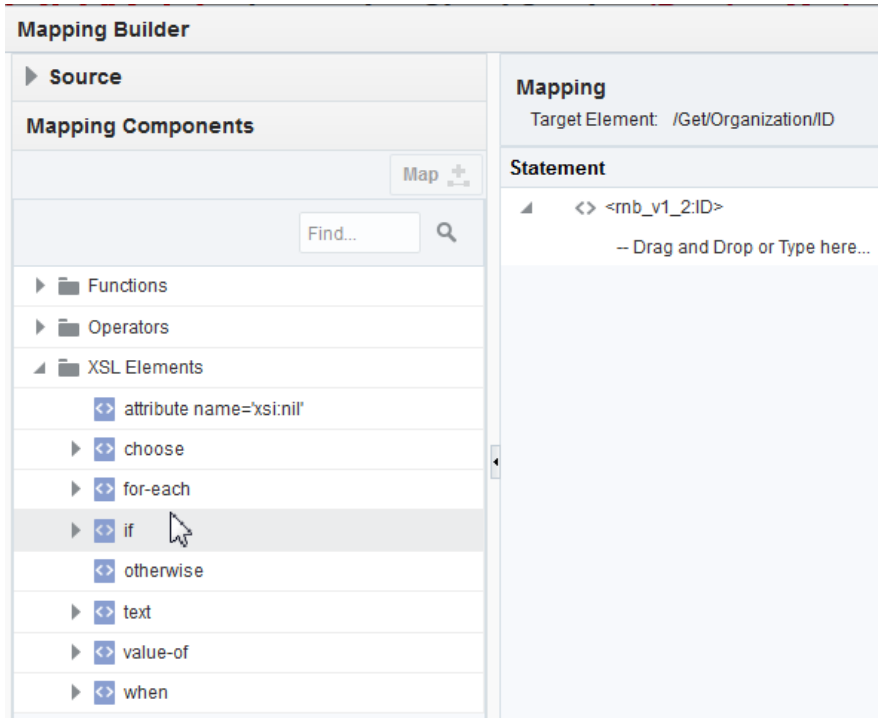
The for-each statement allows you to loop through repeating elements.

To repeat elements with the for-each statement:

1. Drag a source to a target to create a simple mapping.
2. Click the target node to launch the Mapping Builder.
3. Click **Mapping Components**.

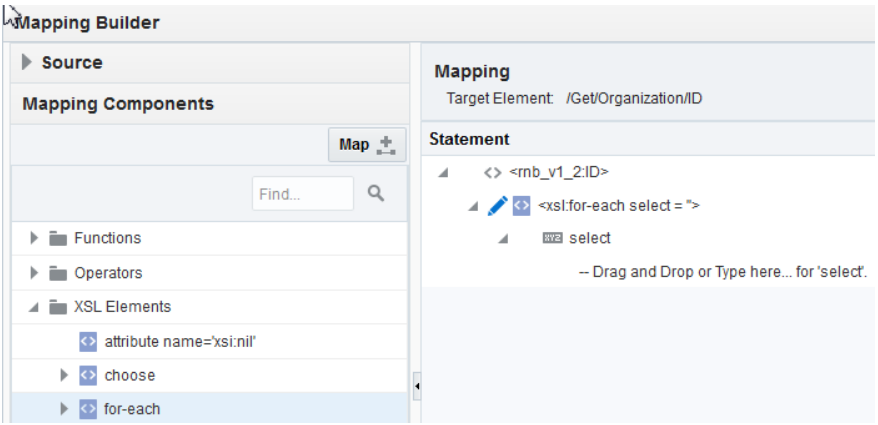
   You can either find or browse for the function.

   - To find the function, type `for-each` in the **Find** field and click **Find**.
   - To browse for the function, expand the **XSL Elements** folder and locate **for-each**.



4. Drag the **for-each** function onto the target tag statement.

   The **for-each** statement appears as a parent of the target tag. A new empty row is created with the text **Drag and Drop or Type here...**



.

5. Click **Source**.
6. Drag a repeating source element onto the empty row.

   This uses the source element as the basis for the loop.

7. Click **Save**.

Creating Conditional Mappings

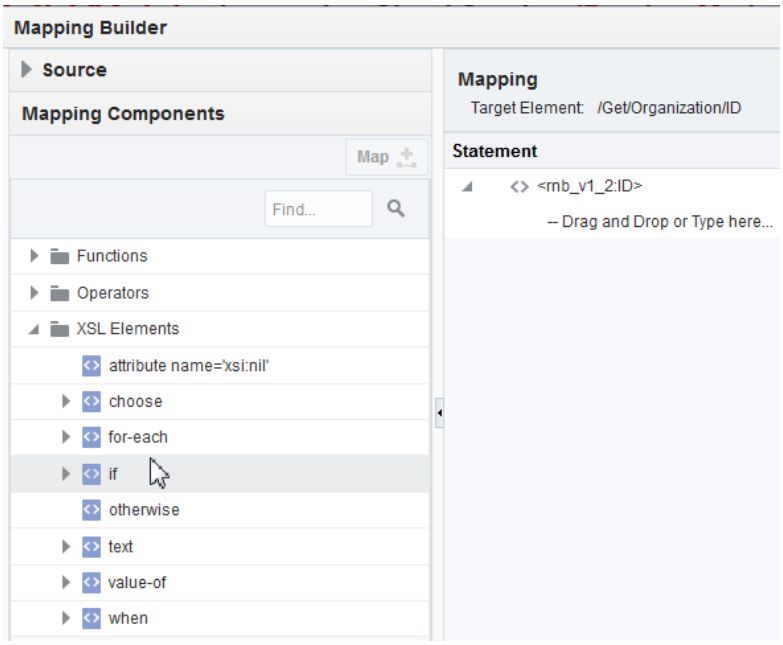
The if and choose statements are two ways to create conditions. If statements allow you to specify a single condition. Choose/when/otherwise statements allow you to specify multiple conditions, similar to if/then/else.

To create conditional mapping:

1. Drag a source to a target to create a mapping.
2. Click the target node to launch the Mapping Builder.
3. Click **Mapping Components**.

   You can either find or browse for the function.

   - To find the function, type `if` or `choose` in the **Find** field, and click **Find**.
   - To browse for the function, expand the **XSL Elements** folder and locate **if** or **choose**.



4. Drag the **if** or **choose** function onto the target tag statement.

   The statement appears as a parent of the target tag. A new empty row is created with the text **Drag and Drop or Type here...**.

5. Click **Source**. Then do one of the following:

   - Drag a source element onto the empty row to use a source element as the basis for the test condition.
   - Select an XPath function as the basis for the test condition.
   - Use a literal as the basis for the test condition by typing in the empty row.

6. For **choose**, you may specify additional **when** and **otherwise** conditions.
   a. Right-click the **choose** statement and select **Insert Child**.

      A new empty row is displayed with the text **Drag and Drop or Type here…**

   b. Drag and drop **when** or **otherwise** from the **Mapping Components** list.
7. Click **Save**.

Using XPath Functions

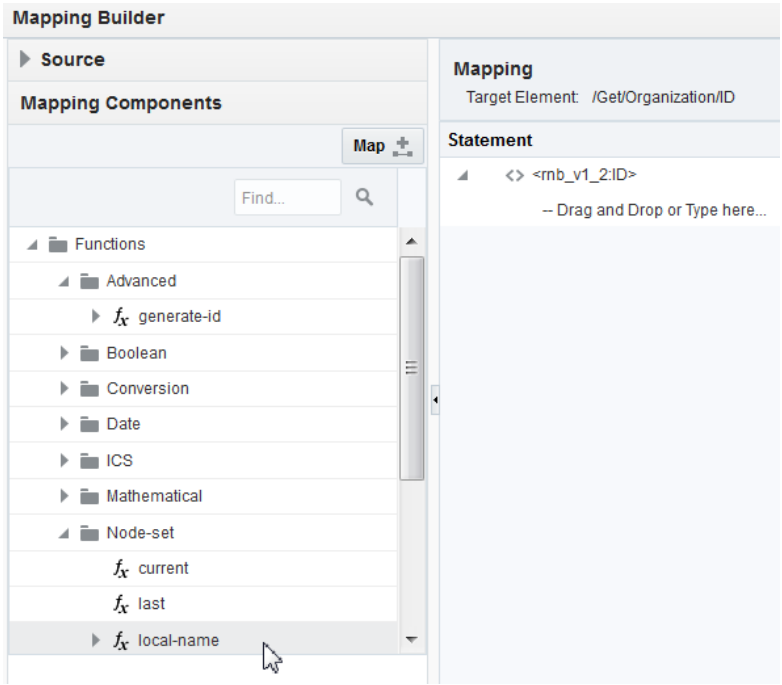
You can use a variety of XPath functions in your data mappings to transform the data you transfer between applications.

To use an XPath function:

1. Drag a source to a target to create a mapping.
2. Click the target node to launch the Mapping Builder.
3. Click **Mapping Components**.

   You can either find or browse for the function:

   - To find the function, type the full or partial name of the function in the **Find** field, and click the **Find** icon.
   - To browse for the function, expand the **Functions** folder and subcategory folders to locate the function.



4. Drag the function onto the mapping statement.

   If the function has a single parameter, it automatically inserts the existing mapping expression into the parameter.

If the function has multiple parameters, it prompts you to select which parameter into which to insert the existing mapping expression.

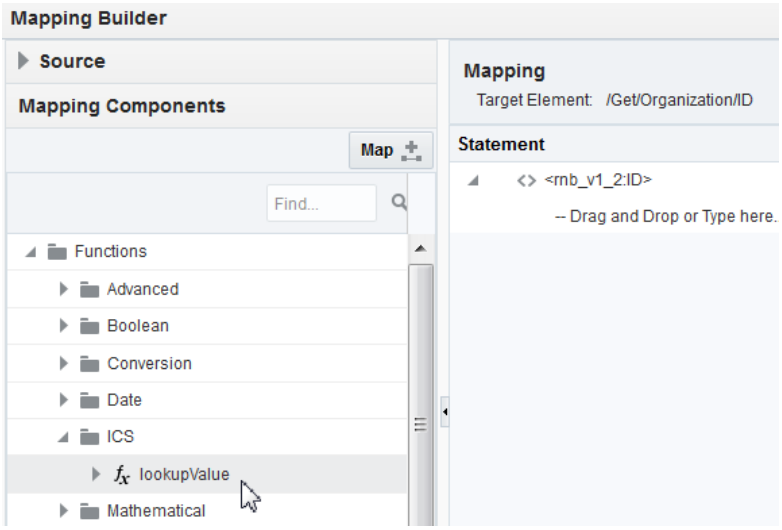
5. Select a parameter or **None** if you want to remove the existing mapping expression, and click **OK**.
6. Click **Save** and **Close**.

Referencing Lookups

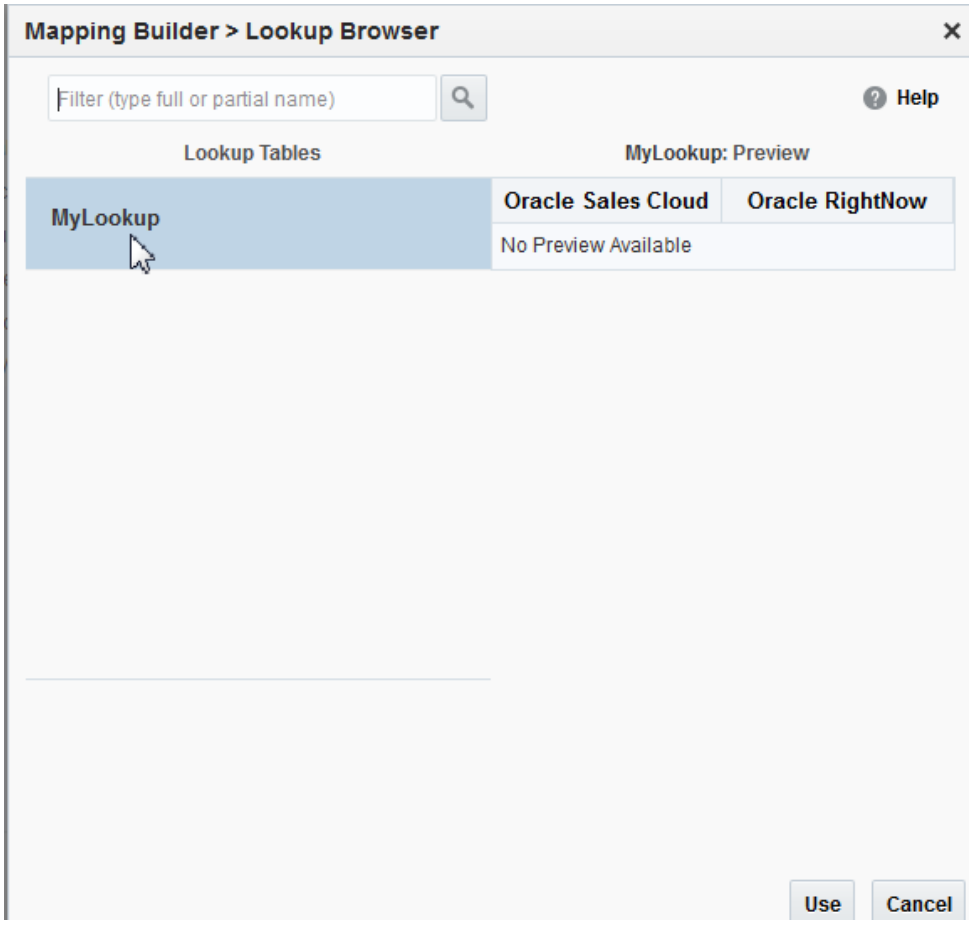
A special lookup function in the mapper enables you to call a lookup from a mapping to determine the value to populate into a field when transferring data between applications.

To reference a lookup from a data mapping:

1. Drag the source to a target to create a simple mapping.
2. Click the target node to launch the Mapping Builder.
3. In the Mapping Builder, click **Mapping Components**.
4. Type `lookupValue` in the **Find** field, and click **Find**.
5. Drag the function onto the mapping statement.



The mapper prompts you to select a previously created lookup.



6. Search by lookup name.

   When you select a lookup in the **Lookup Tables** column, you see preview data for that lookup on the right based on the connections you selected as the source and target.

7. Select a lookup and click **Use**.

8. The system automatically populates the following parameters in the lookup function:

   - `dvmLocation`: with the lookup name you selected
   - `srcColumn`: with the source application type
   - `srcValue`: with the existing mapping expression
   - `targetColumn`: with the target application type

9. Enter a `defaultValue` parameter. This is the value sent to the target if the lookup function is unable to find a match for the value passed from the source.

10. Click **Save** and **Close**.

Deleting Mapping Statements

You can delete one or all mapping statements from the **Actions** menu in the Mapper Builder.

To delete mapping statements:

1. Drag the source to a target to create a simple mapping.
2. Click the target node to launch the Mapping Builder.
3. To delete a single statement, right-click a statement or click the **Actions** menu and select **Delete**.
4. To delete all statements, click the **Actions** menu and select **Delete All**.