Informatica®

Informatica® Cloud Data Integration

Concur V2 Connector

Informatica Cloud Data Integration Concur V2 Connector
October 2023

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Preface

Use *Concur V2 Connector* to learn how to read from or write to Concur by using Cloud Data Integration. Learn to create a Concur V2 connection, develop mappings, and run mapping tasks in Cloud Data Integration.

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The telephone numbers for Informatica Global Customer Support are available from the Informatica web site at https://www.informatica.com/services-and-training/support-services/contact-us.html.

CHAPTER 1

Concur V2 Connector

Concur V2 Connector is a hierarchical connector that interacts with the Concur service through the REST API to perform operations on non-relational hierarchical data.

You can use Concur V2 Connector to perform read, create, update, or delete operations on objects in Concur. For example, you can read expense object data through the GET or GET by ID operation associated with the object.

Create a Concur V2 connection to connect to Concur from Data Integration and interact with the Concur service to perform operations on non-relational hierarchical data. You can use the Concur V2 connection in mappings and mapping tasks.

You can switch mappings to advanced mode to include transformations and functions that enable advanced functionality.

Create a mapping task to process data based on the data flow logic defined in a mapping. Concur V2 Connector has the following features:

- You can use the request message XML editor to specify the request parameters to perform a specific operation in Concur.
- When you run a mapping task, the Secure Agent interacts with the Concur service through the REST API to perform operations on non-relational hierarchical data and converts the data into relational groups.
- You can parameterize the connection and XML request attributes in a mapping.
- Concur V2 Connector uses version 3.0 of Concur API.

When you set up a Concur V2 connection, you can specify a hybrid OAuth 2 or a new OAuth 2 connection.

Example
You are an operation manager and you want to archive the travel and list of expense details of employees who have been traveling across the globe in the past one year. You can find the travel and list of expense details in Concur based on the employee ID, retrieve data through the Get operation on the GetAllLists object, and then write the details to an Oracle database target. With Concur V2 Connector, you retrieve the employee data in an XML structure and then define a corresponding relational structure to write to the relational target.

Concur V2 Connector Task and Object Types

The following table lists the Concur V2 transformation types that you can include in Data Integration tasks:

Task Type	Transformation Type
Synchronization	-
Mapping Configuration	Source and Target
PowerCenter	-

If a mapping or mapping task fails, the error messages are logged in the session log file located in the following directory:

```
<Secure Agent installation directory>/apps/Data_Integration_Server/logs
```

Administration of Concur V2 Connector

As a user, you can use Concur V2 Connector after an organization administrator performs the following tasks:

- Installs the Secure Agent on a 64-bit machine.
- Ensures that the machine hosting the Secure Agent has a minimum memory size of 2048 MB.

Register Partner Application

Concur uses the OAuth authorization protocol to enable applications to access web services in Concur. Register a partner application with Concur to receive the authorization keys to make web service calls in Concur.

1. Log in to the **Concur Solutions** web page.
2. Select **Administration** > **Company** > **Web Services**.

   The **Partner Application Administration** page appears.
3. Click **Register Partner Application**.

   The **Application Registration** page appears.
4. Click **New**.

   The **New Partner Application** dialog box appears.
5. Enter a name and description of the partner application.
6. Select **Active**.
7. Select one or more APIs that you want to include for the partner application.
8. The company domain, key, and secret appear in the **Application Authorization** section.

   Make a note of the key to specify the consumer key value when you create a Concur V2 connection.
9. Optionally, click **New Secret** if you want to change the secret.
10. Click **OK**.

The partner application appears in the **Application Registration** page.

CHAPTER 2

Concur V2 Connections

Concur V2 connections enable you to perform operations on Concur V2 objects.

You create a Concur V2 connection on the Connections page. You specify the user credentials to log in to Concur and the authorization key required to access web services in Concur. A Concur V2 connection connects to a single API object.

Concur V2 connection properties

When you set up a Concur V2 connection, you can specify a hybrid OAuth 2 or OAuth 2 connection to authenticate users and authorize access to Concur data. Informatica recommends that you use the OAuth 2 connection type.

The following table describes the Concur V2 connection properties for a hybrid OAuth 2 connection type:

Connection property	Description
Runtime Environment	The name of the runtime environment where you want to run the tasks. You can specify a Secure Agent, Hosted Agent, or serverless runtime environment.
Authentication	The Secure Agent uses OAuth 2 to authenticate users and authorize access to Concur data.
User name	The user name to log in to the Concur web page.
Password	The password associated with the user name.
Consumer Key	The key that is generated when a Concur administrator registers a partner application for your organization. **Note:** Informatica intends to drop consumer key authentication support in a future release. Informatica requests you to transition to use OAuth authentication before the consumer key authentication is dropped.
Folder	The relative path to the objects that you want to access from Concur. For example, if the URL for API invocation is `https://us-impl.api.concursolutions.com` and the absolute path to invoke the API to retrieve the expense reports from Concur is `https://us-impl.api.concursolutions.com/api/expense/report`, enter the following relative path: */expense/report*

The following table describes the connection properties for the OAuth 2 connection type:

Connection property	Description
Runtime Environment	The name of the runtime environment where you want to run the tasks. You can specify a Secure Agent, Hosted Agent, or serverless runtime environment.
Authentication	The Secure Agent uses OAuth 2 to authenticate users and authorize access to Concur data.
Username	The user name to log in to the Concur web page.
Password	The password associated with the user name.
Use OAuth 2	The Secure Agent uses OAuth 2 to authenticate users and authorize access to Concur data. Contact SAP Concur to get the new OAuth 2 credentials. If you do not specify to use OAuth 2, hybrid OAuth 2 connection type is used.
Base URL for authentication	The URL for authentication that you received from Concur when you created your account. The base URL for authentication is derived from the authorization URL. For example, if the authorization URL is `https://us-impl.api.concursolutions.com/oauth2/v0/token`, the base URL for authentication is `https://us-impl.api.concursolutions.com`.
Base URL for API Invocation	The URL for API invocation that you received from Concur when you created your account.
Client ID	The unique ID of your application to complete the OAuth Authentication in the Active Directory.
Secret ID	The password of your application to complete the OAuth Authentication in the Active Directory.
Folder	The relative path to the objects that you want to access from Concur. For example, if the URL for API invocation is `https://us-impl.api.concursolutions.com` and the absolute path to invoke the API to retrieve the expense reports from Concur is `https://us-impl.api.concursolutions.com/api/expense/report`, enter the following relative path: */expense/report*

CHAPTER 3

Concur V2 Operations

Concur exposes the web service API that the Secure Agent uses to perform integration tasks through the REST protocol.

When you create a mapping, you can associate a Concur V2 connection and an operation. The Secure Agent connects to the web service to access, transform, or deliver data. The request and response are REST messages. The REST request and response messages contain hierarchical data, where the data follows an XML schema. If you want to write data to a relational target, the Secure Agent converts the hierarchical data fetched from Concur to relational data.

The UI does not differentiate between read and write operations. All operations are displayed as a part of source and target.

Concur V2 Objects and Operations

The following table lists the supported Concur V2 objects and operations:

Concur Object	Operation Name	Relative Path to the Object
Allocations	GET	/expense/allocations
Allocations	GET BY ID	/expense/allocations/{id}
Attendee Types	GET, POST	/expense/attendeetypes
Attendee Types	GET BY ID, PUT, DELETE	/expense/attendeetypes/{id}
Attendees	GET, POST	/expense/attendees
Attendees	GET BY ID, PUT	/expense/attendees/{id}
Entries	GET, POST	/expense/entries
Entries	GET BY ID, PUT, DELETE	/expense/entries/{id}
Expense Group Configurations	GET	/expense/expensegroupconfigurations
Expense Group Configurations	GET BY ID	/expense/ expensegroupconfigurations/{id}

Concur Object	Operation Name	Relative Path to the Object
Itemizations	GET, POST	/expense/itemizations
Itemizations	GET BY ID, PUT, DELETE	/expense/itemizations/{id}
List Items	GET, POST	/common/listitems
List Items	GET BY ID, PUT, DELETE	/common/listitems/{id}
Lists	GET, POST	/common/lists
Lists	GET BY ID, PUT	/common/lists/{id}
Opportunities	GET	/insights/opportunities
Reports	GET, POST	/expense/reports
Reports	GET BY ID, PUT	/expense/reports/{id}

When you use the Get operation, you can read maximum of 65,000 characters in a single call. If you face error while reading the records, reduce the limit specified for the Get operation and try again. For information about the operations, see the Concur API documentation.

Concur V2 Source Operations

Create a Source transformation in the Mapping Designer to read data from Concur.

When you select a Concur V2 connection for a Source transformation in a mapping to read data from Concur, you can select an operation based on version 3.0 of Concur API.

After you specify the configured connection, specify **Operations** on the **Source** tab of the Source transformation. The Secure Agent displays operations applicable to the object configured in the connection. You can select the operation that you want to perform.

Select the operation you require, configure the request message in XML from the sample template provided, and configure the advanced properties for the operation. If you want to write to a relational target, define a relational structure for the source data by mapping the incoming fields that is in hierarchical format to the output fields in relational format. When you run the mapping, the Secure Agent retrieves data for the specified operation from Concur.

Configuring a Request Using Request Message Editor

When you create a Source transformation, configure an XML request message for the operation that you want to perform in Concur.

Use the Request Message Editor to create a request message. The request message is in XML format and contains request parameters exposed by Concur API for a specific operation. You can use the default request message for the operation and then customize the request message to specify the data that you want to enter into the data flow.

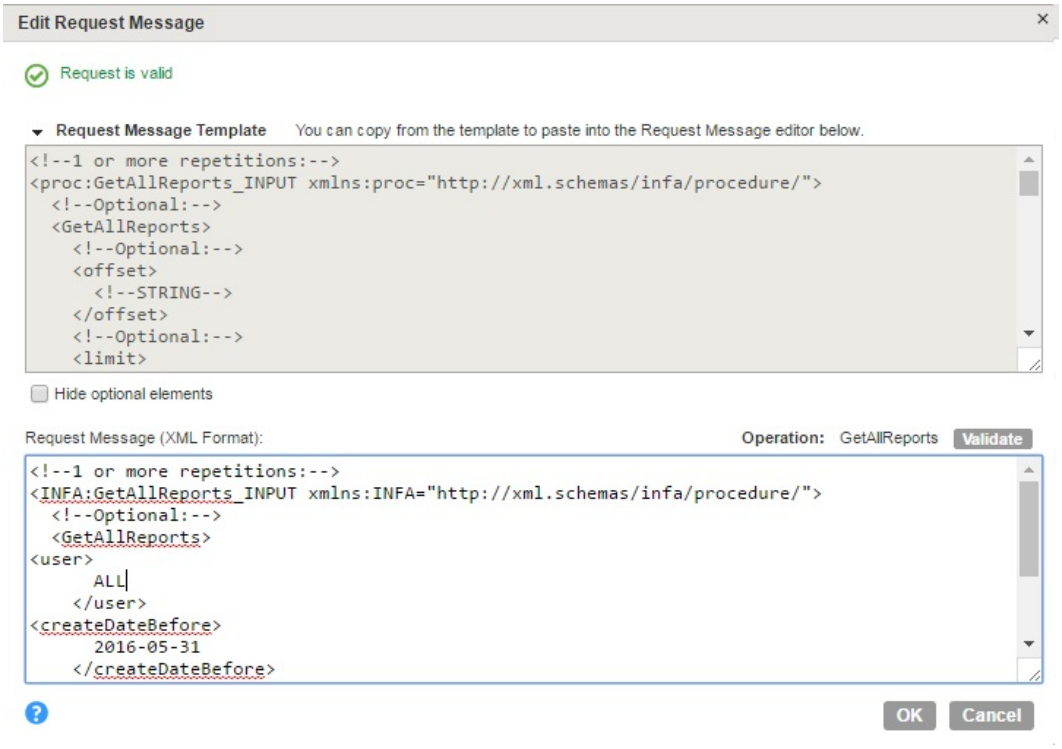
To customize your request, copy the request message from the sample template to the Request Message Editor pane where you can edit the XML message and add the attributes for the request. Remove unnecessary and empty tags from the request message to avoid operation failure.

For example, you want to perform an operation GetAllReports_INPUT using Concur V2 Connector to retrieve reports created between 1 January 2016 and 31 May 2016 for all users in a single call.

The following XML sample shows the filters used for the GetAllReports_INPUT operation:

```
<!--1 or more repetitions:-->
<INFA:GetAllReports_INPUT xmlns:INFA="http://xml.schemas/infa/procedure/">
  <!--Optional:-->
  <GetAllReports>
<user>
      ALL
    </user>
<createDateBefore>
      2016-05-31
    </createDateBefore>
    <!--Optional:-->
    <createDateAfter>
      2016-01-01
    </createDateAfter>
</GetAllReports>
</INFA:GetAllReports_INPUT>
```

The following image shows the validated request message in a GetAllReports_INPUT operation in the Mapping Designer:



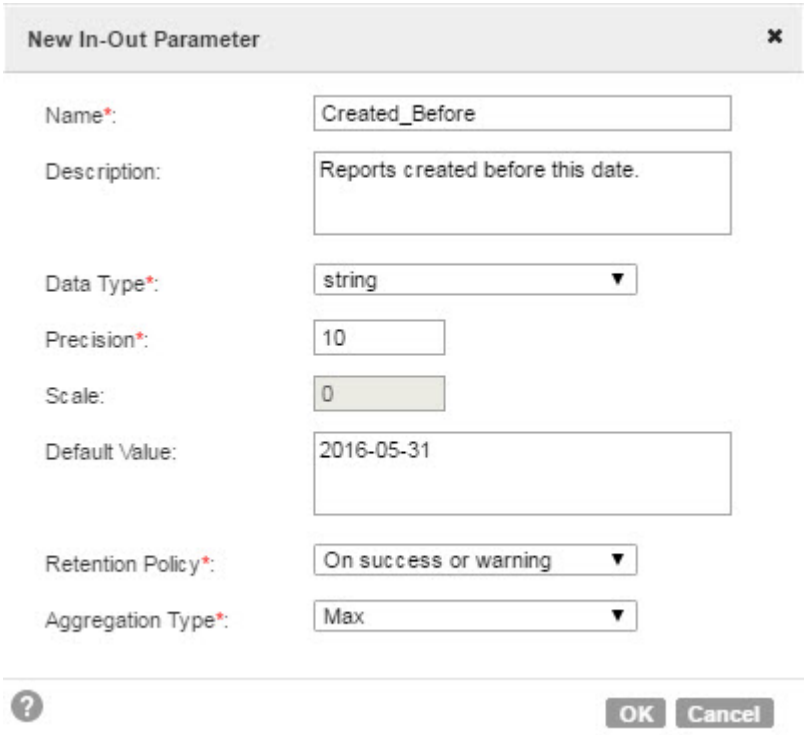
The request message format in Concur V2 Connector follows the service request definition in Concur. Ensure that you use well-formed XML formatting in the request message. You can verify if the XML request is valid to ensure that the XML matches the structure expected by the operation.

Parameterizing the Input Values in a Request Message

You can use in-out parameters to represent input values in a request XML.

Configure the in-out parameters in the Mapping Designer. From the Mapping Design page, you open the parameters panel and configure an in-out parameter.

The following image shows a configured Created_Before in-out parameter value:



After you configure a parameter, use the parameter name in the following format, $$Name, in a request message. The XML uses the fields from the parameterized object.

For example, you want to use parameterized Created_Before and Created_After values in an XML request for a GetAllUsers_INPUT operation.

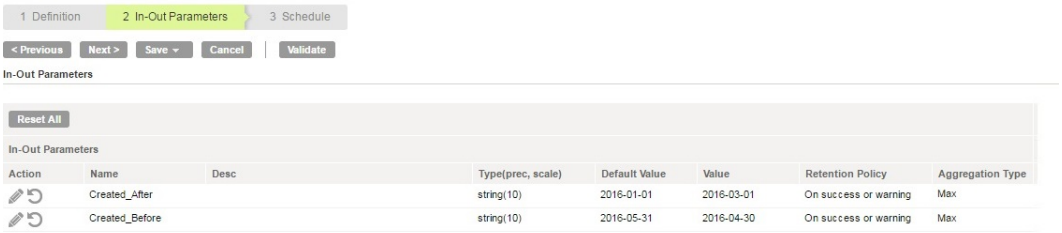
The following sample request shows the parameterized values that you can specify in an XML request:

```
<!--1 or more repetitions:-->
<INFA:GetAllReports_INPUT xmlns:INFA="http://xml.schemas/infa/procedure/">
  <!--Optional:-->
  <GetAllReports>
<user>
      ALL
    </user>
<createDateBefore>
      $$Created_Before
    </createDateBefore>
<createDateAfter>
      $$Created_After
    </createDateAfter>
</GetAllReports>
</INFA:GetAllReports_INPUT>
```

Configuring In-Out Parameters in a Mapping

When you deploy the mapping in a mapping task, you can configure the mapping to run according to a schedule. When the task runs, the Secure Agent replaces the in-out parameter values based on the specified parameters in the expression.

The following image shows a configured parameter used in a mapping task:



In the example, the task overrides the default values and reads reports created between 1 March 2016 to 30 April 2016.

Field Mapping in a Source Transformation

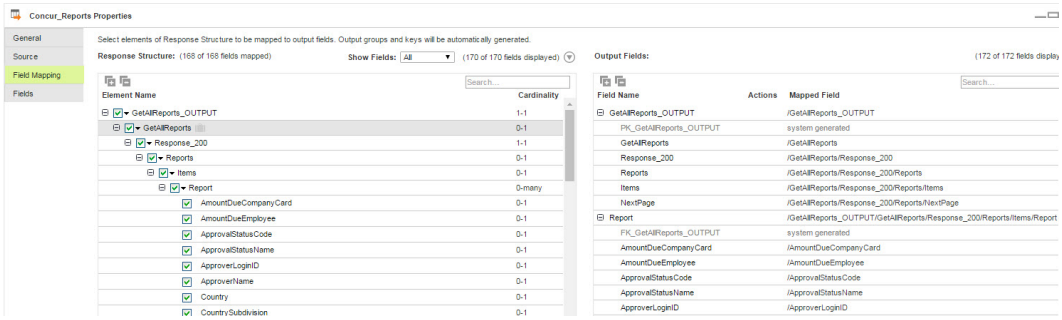
The response message format follows the service response definition in Concur. You can map response fields from a hierarchical to a relational structure of output groups and fields.

After you configure an operation for a source and specify the request message, create the relational format from the hierarchical data to include groups and fields that you want in the output.

To do this, select the elements in the response structure that you want to include as output fields. The Secure Agent converts the XML response in the hierarchical structure to relational groups at run time.

The output groups along with the primary and foreign keys are generated. You can pause on the output field to view the XPath expression, which indicates which field the output field is mapped to in the response structure of the hierarchy tree.

The following image shows an example hierarchical response structure generated from the request XML for the GetAllUsers_INPUT operation and the corresponding relational output fields for the response:



You can edit the data type, precision, and scale for the groups and fields after mapping the fields.

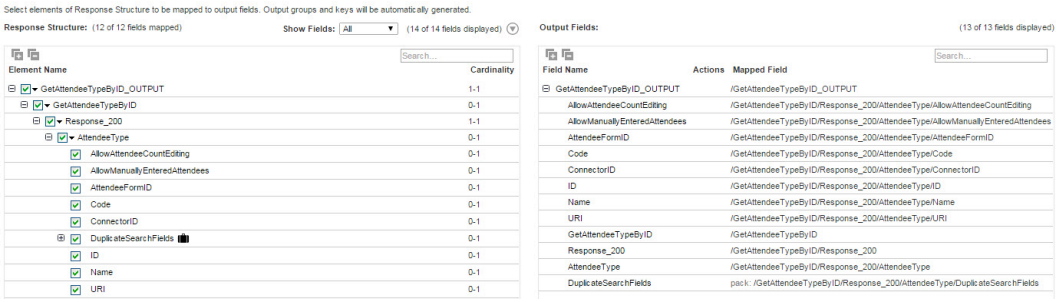
Creating Packed Fields in a Field Mapping

You can reduce the number of output groups for a complex request message by marking fields that you want to pack when you configure the field mapping.

You can pack multiple instances of a single element or a hierarchy of elements into one field. A packed icon displays next to elements marked to be packed, indicating that you can pack the entire element into one output field when you check that element.

Fields can come from the source that are marked for packing. You can unpack fields by clicking the pack icon. You cannot select fields that are descendants of packed fields.

The following image shows the packed DuplicateSearchFields element:



When you run the mapping, the agent packs the element and its descendants into a single XML string. You can view the following packed DuplicateSearchFields in the target file.

```
<infa_packed><DuplicateSearchFields>
<DuplicateSearchField>Title</DuplicateSearchField>
<DuplicateSearchField>Company</DuplicateSearchField>
</DuplicateSearchFields>
</infa_packed>"
```

Concur V2 Target Operations

Create a Target transformation in the Mapping Designer to write data to Concur. When you select a Concur V2 connection for a Target transformation in a mapping, you can select an operation based on the object configured in the connection. When you want to write data that is in relational format to Concur, the Secure Agent converts the relational data to a hierarchical format before writing to Concur.

When you configure a Concur V2 target, you can select **Operations** on the **Target** tab to display the list of valid operations. The Secure Agent creates target fields based on the request message structure of the operation you select on the **Target** tab.

When you write data to Concur, the Secure Agent includes all the incoming fields from the source, by default. You can exclude the incoming fields, if required. You can add multiple input sources to write data to Concur V2 target object and define the primary and foreign key relationships between the input sources before you run the mapping. Each input source appears as separate group in the Field Mapping tab in the target transformation. You can define key relationships in the Field Mapping tab.

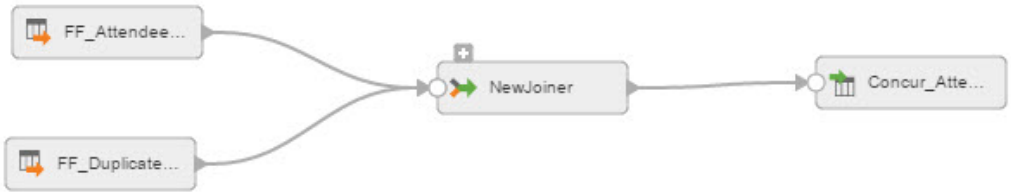
File Preparation for Target Transformation

To write data to Concur, the source file must include the container with the processing options and the wrapper referential elements to perform the specified operation in Concur.

For information about the required business process parameters and the wrapper elements, see the request elements for the specified operation in the Concur web service directory. You need to prepare a file to include the wrapper elements along with the data that you want to update in Concur. You can add the processing options in an Expression transformation later when you write the data to Concur.

For example, if you have AttendeeType object data in two flat files, you need to create a single flat file before writing AttendeeType data in Concur.

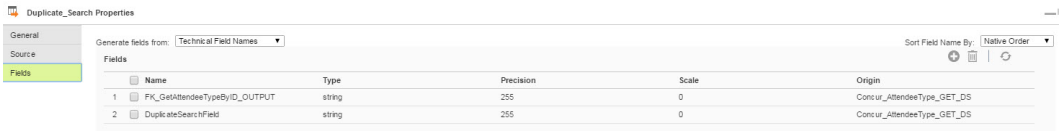
The following image shows the mapping configured to create one target .csv file that includes all information for AttendeeType:



The following image shows the fields from the FF_Attendee_Type_GET flat file object:

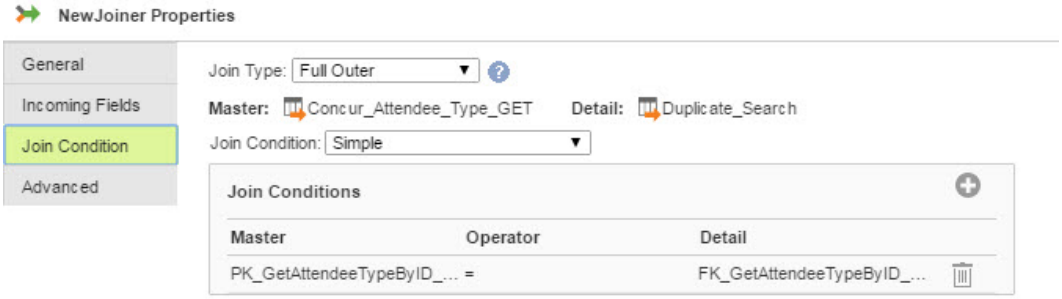


The following image shows the fields from the FF_Duplicate_Search flat file object:



Use Joiner transformations to join the data from the files.

The following image shows a configured Join condition to join the FF_Attendee_Type_GET and FF_Duplicate_Search data:



The following image shows the fields from the two sources that the target includes:



When you run the mapping, the Secure Agent writes data to a configured target .csv file. Later, use this file as a source from which you write data to Concur.

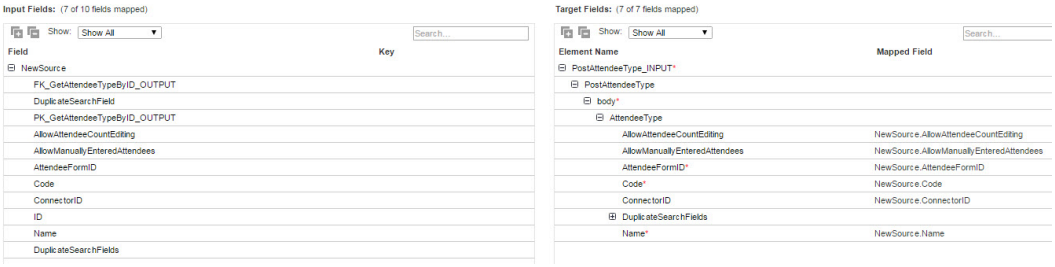
Field Mapping in a Target Transformation

You can map fields that are in a relational structure to the hierarchical structure used by a Concur V2 target.

On the **Field Mapping** tab for the Target transformation, the fields in the **Target Fields** appear in hierarchical format. The target fields are determined by the request message structure of the operation you select for the Target transformation.

Each source object displays as a group in the **Input Fields** area. You can select fields in the **Input Fields** area to map the fields to the request. If the input fields include multiple input groups, map the groups to the corresponding nodes in the request. Be sure to map all of the fields that you require in the request.

The following image shows an example of mapped input fields from the source file with the Concur V2 target in an operation for updating the Attendee Types:



CHAPTER 4

Mappings and Mapping tasks with Concur V2

Use the Data Integration Mapping Designer to create a mapping. When you create a mapping, you configure a source or target to represent the object.

In advanced mode, the Mapping Designer updates the mapping canvas to include transformations and functions that enable advanced functionality.

Concur V2 Source Transformation in Mappings

When you configure a Source transformation, select the Concur V2 connection and choose an operation to represent a Concur V2 source. You can parameterize a Concur V2 connection.

You can select an operation for the source through the connection. Configure the request message using the request message template. You can parameterize the input values in the request XML. Configure the advanced properties to set the tracing level and the cache size for the web service response.

You can view the response structure in the field mapping. When you map the elements from the response structure to the output fields, the Secure Agent creates the output groups, along with the primary and foreign keys for the field names. When you deploy the mapping in a mapping task and run the task, the Secure Agent reads the data from Concur.

Source Transformation Properties

You can use one or more source transformations in a mapping. Use a Joiner transformation to join data from two sources.

When you select a source, the **Properties** panel displays the following areas and information:

- **General**. Configure the name and a description for the source.
- **Source**. Select the connection and the operation, and to configure the request options, and advanced source properties.
- **Field Mapping**. Map elements of the response structure with the output fields.
- **Fields**. Edit the metadata source field metadata that you want to use in the mapping.

Advanced Source Properties

In a mapping, you can configure a source to represent a Concur V2 source. For Concur V2 source connections used in mapping tasks, you can configure advanced properties in the Source page of the Mapping Task wizard.

The following table describes the advanced properties that you can configure in a source:

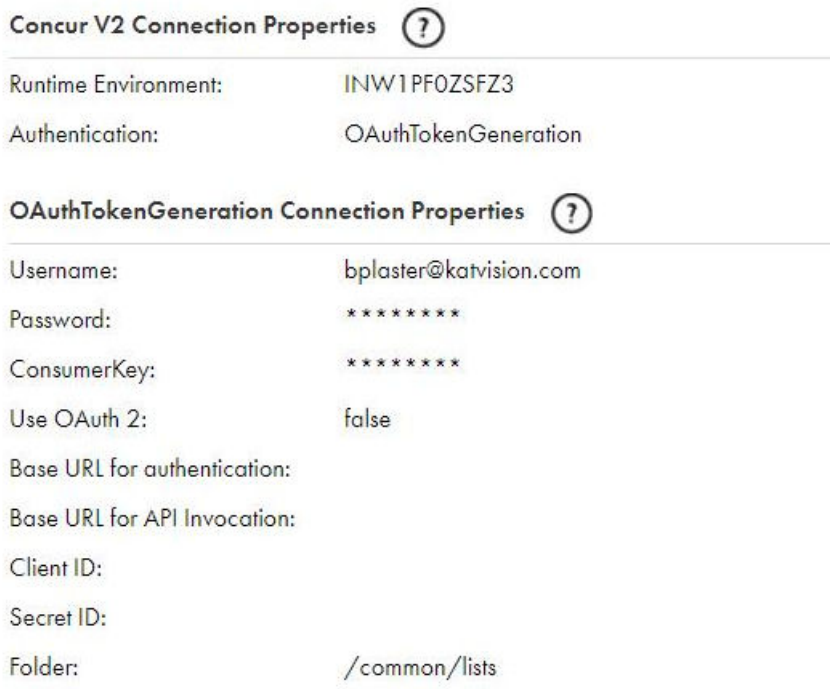
Property	Description
Tracing Level	Amount of detail that appears in the log for the source. Use the following tracing levels: - Terse - Normal - Verbose Initialization - Verbose Default is normal.
Cache Size for Web Service Response (KB)	Memory available for the web service response. If the web service response contains many rows or columns, you might want to increase the cache size. Default is 100 KB.

Concur V2 Source Mapping Example

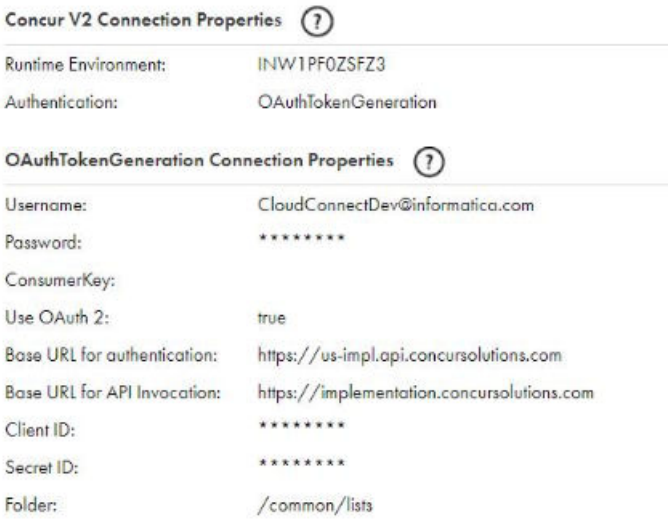
You are a payroll administrator and you want to extract the list of expense details for all employees from Concur to a flat file.

To read data from Concur and write to a flat file, perform the following tasks:

1. Create a Concur V2 connection. Verify that you select relative path to the GetAllLists object in the connection properties.
   The following image shows the configured Concur V2 connection for the hybrid OAuth 2 connection type:



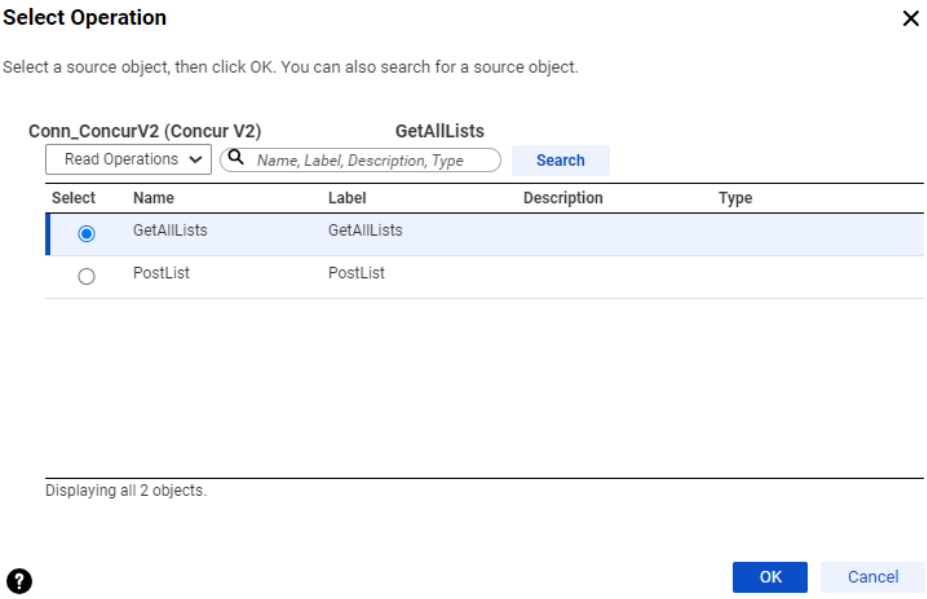
   The following image shows the configured Concur V2 connection for the OAuth 2 connection type:



2. Create a flat file connection to write data to the flat file.
3. Create a Concur V2 mapping.
   The following image shows the Concur V2 mapping:



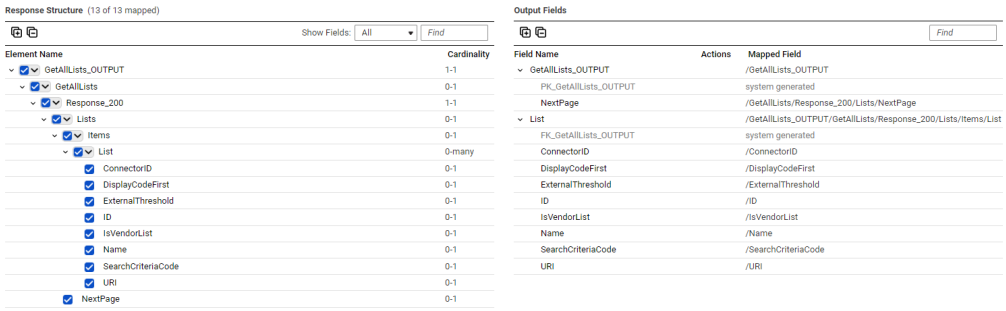
4. Add a Source transformation. Specify a name and description in the general properties.
5. On the **Source** tab, perform the following steps:
   a. In the **Connection** field, select the configured Concur V2 connection to connect to Concur.
   b. In the **Operation** field, select GetAllLists as the operation.
   The following image shows the GetAllLists operations:



   c. In the **Request Options** section, configure the request message in the following XML format, specify the attributes in the message, and validate the message:

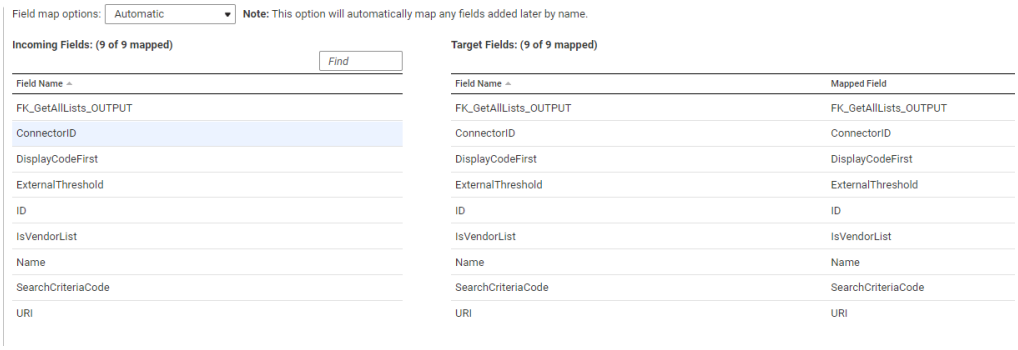
```
<!--1 or more repetitions:-->
<proc:GetAllLists_INPUT xmlns:proc="http://xml.schemas/infa/procedure/">
<!--Optional:-->
<GetAllLists>
<!--Optional:-->
</GetAllLists>
</proc:GetAllLists_INPUT>
```

   The request message specifies the criteria to include the list of expense details for all employees.
   d. In the **Advanced Properties** section, set the tracing level to Normal, and use the default cache size of 1024.
6. On the **Field Mapping** tab, select the elements, such as ConnectorID, DisplayCodeFirst, and ID in the response structure that you want to map to the output fields.
   The following image shows the response structure on the left pane in a hierarchical format and the output groups on the right pane in a relational format:



The Secure Agent creates two output groups, GetAllLists_OUTPUT and GetAllLists, which results in two relational output files. Primary and foreign keys are auto-generated.

7. Select a flat file connection for the target transformations to write GetAllLists data to the ConcurGetAllLists.txt flat file.
8. On the **Field Mapping** tab, select the automatic field map option.
The following image shows the target field mapping when you select the automatic field map option:



9. Save and run the mapping.

Concur V2 Target Transformation in Mappings

When you select a Concur V2 connection for a target, you can select an operation based on version 3.0 of Concur API.

You can add multiple input groups into the Concur V2 target and define the primary and foreign key relationships between the multiple input groups before the mapping.

Target Transformation Properties

You can configure target properties, such as target details and advanced properties, based on the connection type you select. Configure target transformation properties on the **Target** tab of the Properties panel.

When you select a target, the **Properties** panel displays the following areas and information:

- **General**. Defines the transformation name and a description.
- **Incoming Fields**. Includes the field rules that define the data written to the target. Allows a preview of target fields.

- **Target**. Defines the target connection, operation, and advanced options.
- **Target Fields**. Not applicable for Web Service targets.
- **Field Mapping**. Defines the field mappings from the upstream transformation to the target.

Advanced Target Properties

In a mapping, you can configure a target to represent a Concur V2 target. For Concur V2 target connections used in mapping tasks, you can configure advanced properties in the Targets page of the Mapping task wizard.
The following table describes the advanced properties that you can configure in a Target transformation:

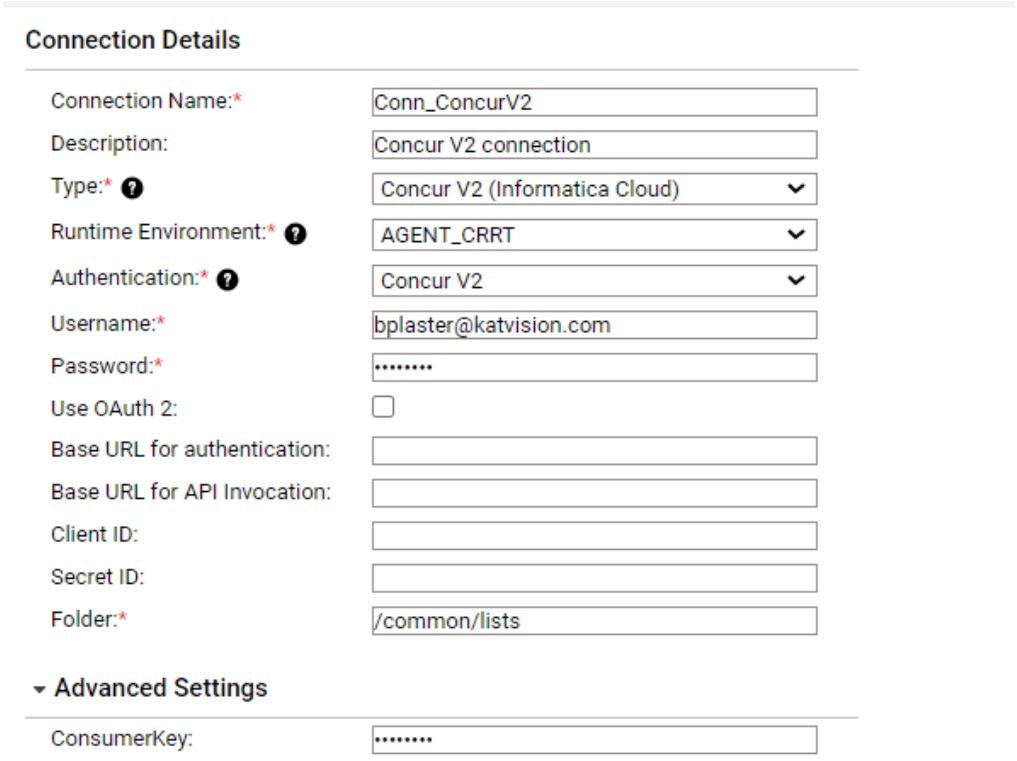
Property	Description
Cache Size for Web Service Request (KB)	Memory available for the web service request. If the web service request contains many rows or columns, you might want to increase the cache size. Default is 100 KB.
Transaction Commit Control	Control to commit or roll back transactions based on the set of rows that pass through the transformation. Use the transaction commit control if you have a large amount of data and you want to control how it is processed.

Target Transformation Mapping Example

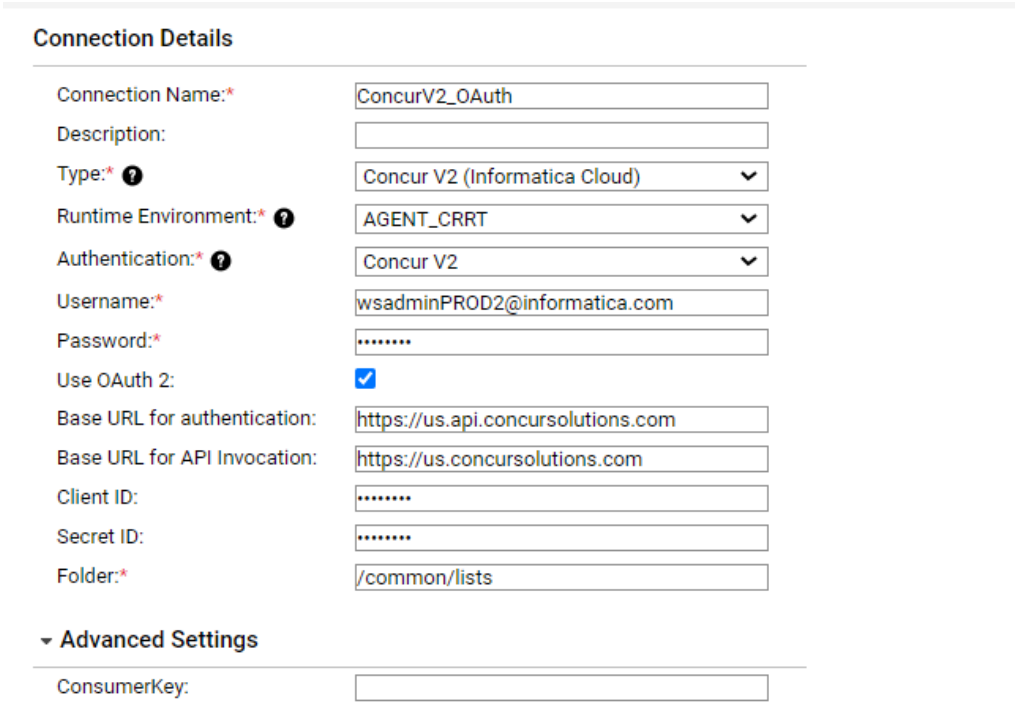
You are an operation administrator and you want to create an attendee type in Concur.

To create an Attendee Type object in Concur from a flat file, perform the following tasks:

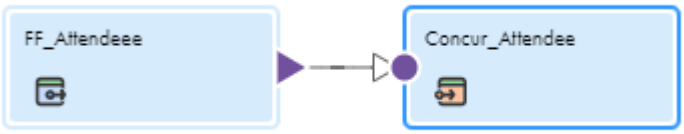
1. Create a flat file connection to read data from the flat file.
2. Create a Concur V2 connection to write data to Concur. Verify that you select the relative path to the Attendee Types object in the connection properties.
   The following image shows the configured Concur V2 connection for a hybrid OAuth 2 connection type:



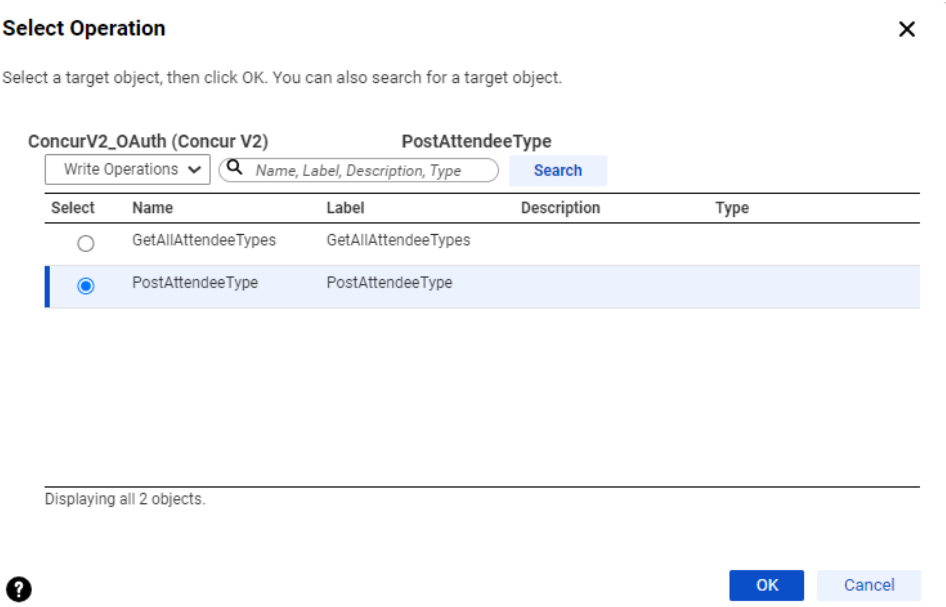
The following image shows the configured Concur V2 connection for the OAuth 2 connection type:



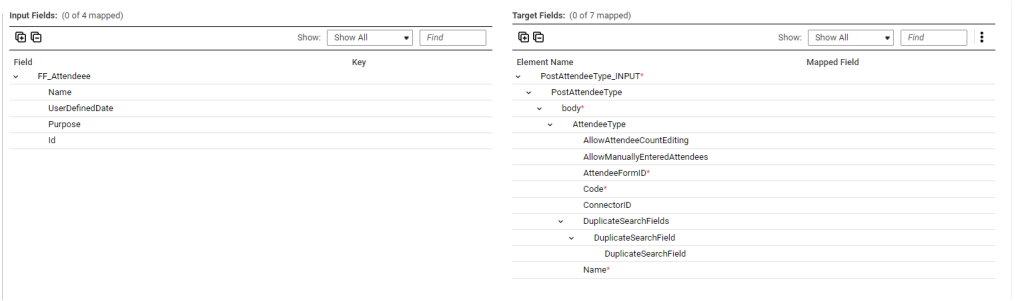
3. Create a Concur V2 mapping.
   The following image shows the Concur V2 mapping:



4. Add a Source transformation to include the flat file object that contains the Attendee Types information. Add the flat file connection.
5. Add a Target transformation to write the Attendee Types data to Concur. Perform the following tasks on the **Target** tab:
   a. In the **Connection** field, select the Concur V2 connection to connect to Concur.
   b. In the **Operation** field, select PostAttendeeType as the operation.
      The following image shows the PostAttendeeType in the list of write operations:



   c. In the **Advanced Properties** section, set the cache size and the transaction commit interval.
6. On the **Field Mapping** tab, select the input elements to map to the target fields.
   The following image shows all the mapped fields between the input file and the Concur V2 target:



7. When you save and run the mapping in a mapping task, the Secure Agent creates the Attendee Types in Concur.

APPENDIX A

Concur Data Type Reference

Concur exposes the web service API that the Secure Agent uses to perform integration tasks through the REST protocol.

When you create a mapping, you can associate a Concur V2 connection and an operation. The Secure Agent connects to the web service to access, transform, or deliver data. The request and response are REST messages. The REST request and response messages contain hierarchical data, where the data follows an XML schema. If you want to write data to a relational target, the Secure Agent converts the hierarchical data fetched from Concur to relational data.

The UI does not differentiate between read and write operations. All operations are displayed as a part of source and target.

Concur and Transformation Data Types

The following table lists the Concur data types that Data Integration supports and the corresponding transformation data types:

Concur Data Type	Transformation Data Type	Description
boolean	string	1 to 65536 characters
double	decimal	Precision 31, scale 10
float	decimal	Precision 31, scale 10
integer	integer	-2,147,483,648 to 2,147,483,647 Precision 12, scale 0
string	string	1 to 65536 characters. In Concur, string data type handles date/time values.

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