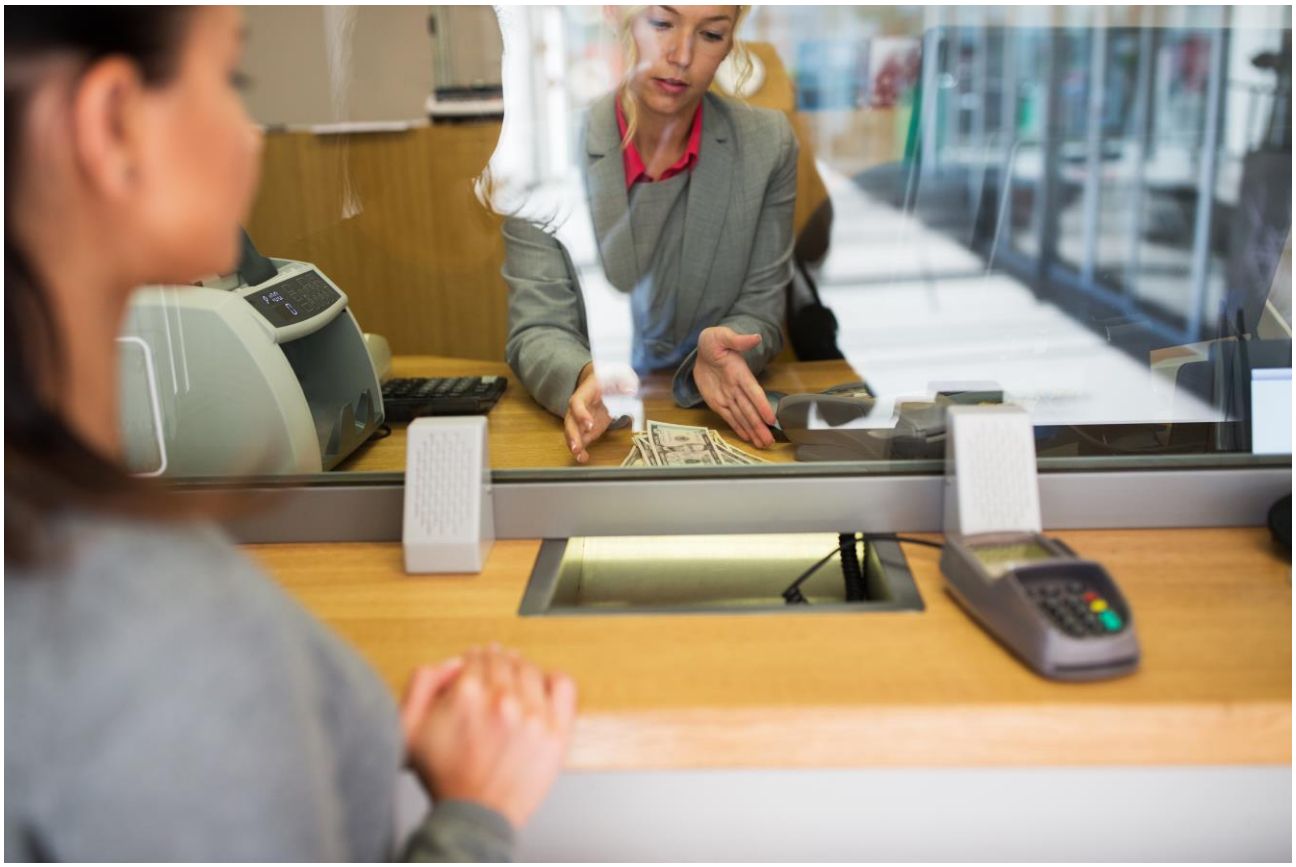


Integrate SAP S/4HANA Cloud with Third-Party Payroll System

Applies to:

SAP S/4HANA Cloud, SAP Cloud Platform Integration, Third-Party Payroll System

Summary

This document describes how payroll results can be transferred into SAP S/4HANA Cloud by integrating with any third-party payroll system via SAP Cloud Platform Integration (SCPI). Additionally, it describes which data must be replicated at least from SAP S/4HANA Cloud to the third-party payroll system and how to get the payroll results back via journal entries.

Table of Contents

Introduction

This guide gives an overview on how to post payroll results from any third-party payroll system to SAP S/4HANA Cloud via journal entries by using SAP Cloud Platform Integration (SCPI).

Business Scenario

The purpose of this guide is to get payroll results in SAP S/4HANA Cloud from any integrated third-party payroll system.

This integration scenario allows transferring necessary business objects from SAP S/4HANA Cloud to the third-party payroll system via public APIs and vice versa.

Please note that it must be checked carefully whether the interfaces and APIs listed below support your requirements sufficiently.

The **business process** looks as in the following figure:

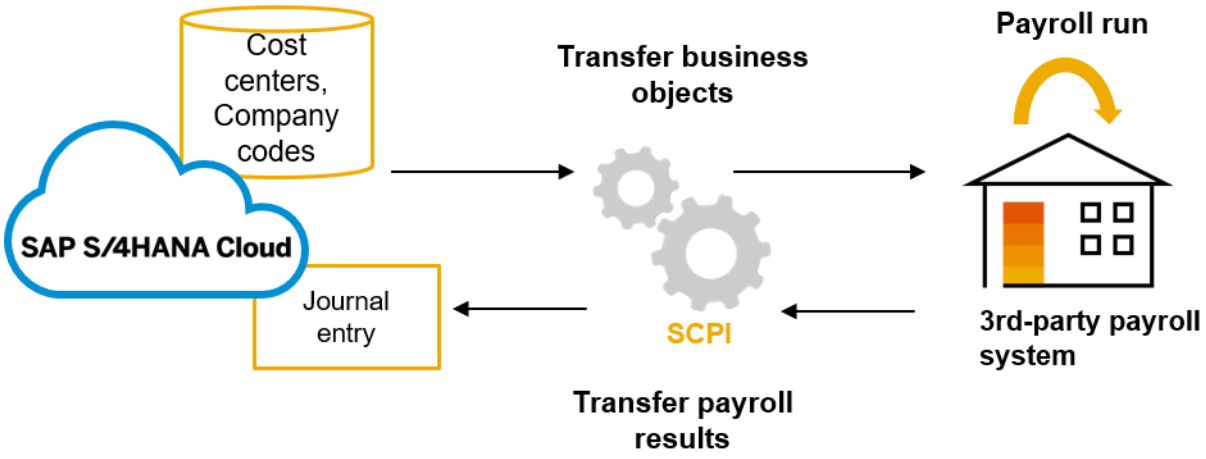


Figure 1: Business process

The **process diagram** looks as follow:

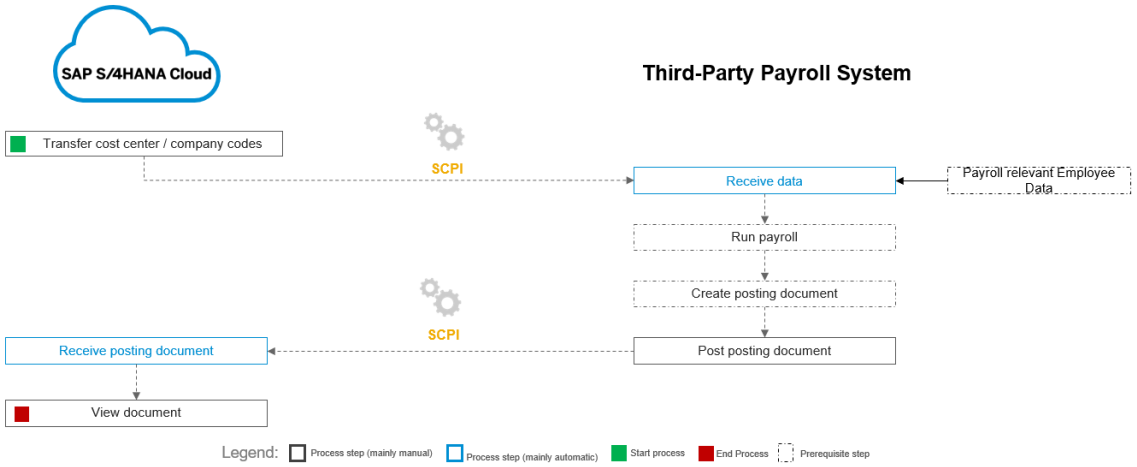


Figure 2: Process Diagram

Prerequisites

Before going through the step by step procedure there are some prerequisites which must be fulfilled, and which are listed below.

Systems and roles

Your ERP system must be **SAP S/4HANA Cloud** which is also your system of records for cost center data.

You should have access to your SAP S/4HANA Cloud tenant. This includes:

- Initial user and access information for your SAP S/4HANA Cloud system.

You should have access to the SAP Cloud Platform Integration (SCPI) System. This includes:

- Initial user and access information for your SCPI Tenant.
- SCPI Tenant Certificate.

In the App *Maintain Business User* in SAP S/4HANA Cloud assign a role that contains following business catalogs[1]:

Business catalogues / Roles	**Role description**	**System**
SAP_CORE_BC_COM	Enables setting up the communication arrangement	SAP S/4HANA Cloud
SAP_BR_ADMINISTRATOR_DATA_REPL	Enables replication of business objects	SAP S/4HANA Cloud
AuthGroup.IntegrationDeveloper	Enables an integration developer to connect to a cluster using Integration Designer and to display, download and deploy	SAP Cloud Platform Integration

[1] for more details visit SCPI help page and S/4 help page

	artifacts (for example, integration flows).	
Auth.Group.BusinessExpert	Enables a business expert to perform business tasks like, for example, examining the payload.	SAP Cloud Platform Integration

In order to enable a sender system to process messages on a tenant using HTTPS/basic authentication, you need to assign to the associated user the role *ESBmessaging.send*.

Additionally, to connect SAP S/4HANA Cloud with any third-party payroll system you would need an integration middleware[2]. In this guide the main focus lies on the integration between SAP S/4HANA Cloud and third-party payroll system via **SAP Cloud Platform Integration** as integration middleware.

Business conditions

Next to financial data it is a prerequisite to cover payroll relevant employee data in the third-party system which must be replicated from the used HCM system. This guide does not cover the part of how payroll relevant employee data will be replicated into the third-party payroll system.

Additional information

You are responsible for **owning and managing** your own mappings built in SCPI. Please keep in mind that you can take advantage of SAP's ecosystem of partners.

Step-by-Step Procedure

Step 1: Configuration in SAP S/4HANA Cloud

Define communication scenarios

At least company codes and cost center must be known to the third-party payroll system. Therefore, once, at the beginning of the whole process it must be defined which company codes and cost center data will be used for the payroll process.

The transfer of business objects from SAP S/4HANA Cloud to the third-party payroll system via SCPI must be ensured.

For this purpose, Communication arrangements need to be activated in the SAP S/4HANA Cloud for the communication with APIs.

At least the following communication arrangements for corresponding APIs need to be activated (by clicking on the API in the table you will be reached directly to the API in the SAP API Business Hub).

API	Communication Scenario	Description	Additional content
Send cost center data	Finance: Accounting Master Data Integration: SAP_COM_0179	Send cost center data from SAP S/4HANA Cloud via DRF	Business documentation

[2] It is recommended to use SAP Cloud Platform Integration.

Send company code data	Finance: Accounting Master Data Integration: SAP_COM_0179	Send company code data from SAP S/4HANA Cloud via DRF	Business documentation
Journal Entry - Post (synchronized)	Finance: Posting Integration SAP_COM_0002	Synchronous posting of journal entries from external systems to your S/4HANA Cloud system	Business documentation

For using the APIs, each communication scenario must be activated which is based on creating a communication user, a communication system and finally a communication arrangement.

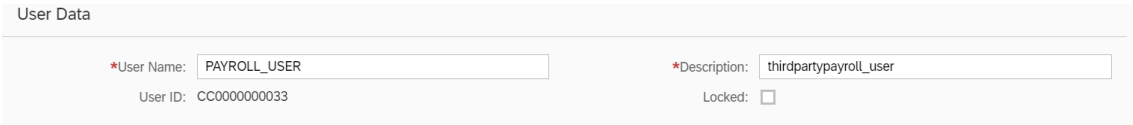
Please ensure that the catalog role ID *SAP_CORE_BC_COM* is assigned in SAP S/4HANA Cloud system.

Create Communication User

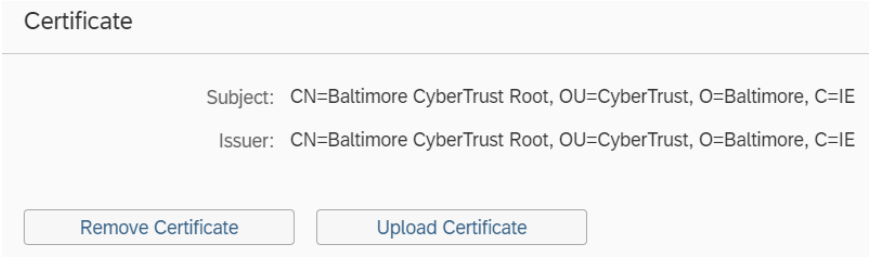
The communication user defined in the SAP S/4HANA Cloud system is used for inbound communication and processing messages in the system. Technically, the user is used to call services in SAP S/4HANA Cloud from SCPI.

Procedure:

1. Access the *S/4 Cloud Fiori UI* and log in as an SAP *S/4HANA Cloud Administrator.*
2. Choose *Maintain Communication Users* from the *Communication Management* tile.
3. Choose *New*.
4. On the next screen, create the following settings and choose *Create*:
   - *User Name*: *user name*, for example *thirdparty_user*
   - *Description*: *thirdpartypayroll_user*
   - *Password*: *Enter a password*



5. If you want to use the certificate-based authentication in the direction of SCPI to SAP S/4HANA Cloud (inbound communication messages to S/4HANA), choose *Upload Certificate* and upload the SCPI Client certificate here (Please download the certificate in the SCPI in *key store* in section *Monitor;* chapter Setup the certificate of SCPI in SAP S/4HANA Cloud).



Note: Basic authentication instead of certificate is also possible. This is described in the documentation of SAP Cloud Platform Integration on the SAP Help Portal.

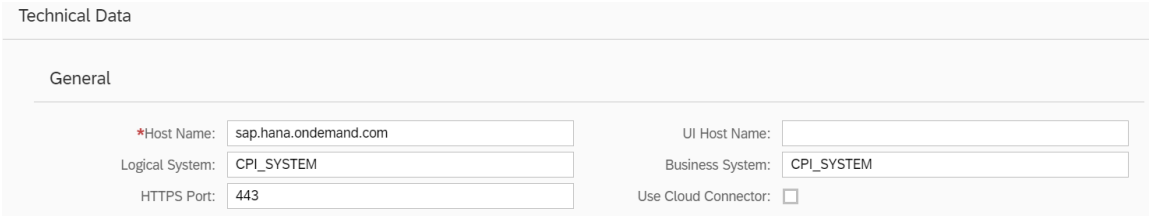
6. Click *Create*.

Create Communication System

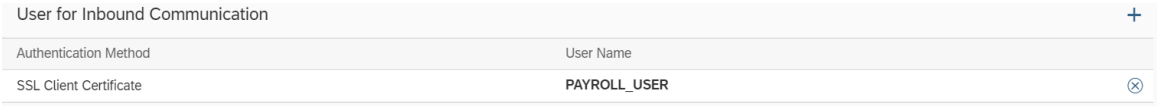
A communication system represents an external system which is used for application integration.

Procedure:

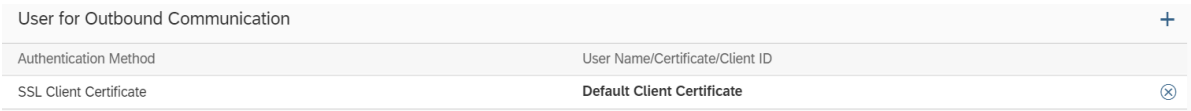
1. Access the *S/4 Cloud Fiori UI* and log in as an *S/4HANA Cloud Administrator.*
2. Choose *Communication System* from the *Communication Management* tile.
3. Choose *New*.
4. Enter the ID as required, for example, *CPI_System*. Enter a descriptive name in the *System Name* field.
5. Choose *Create*.
6. In the *Technical Data* section, in the *Host Name* field, enter the URL of the SCPI, for example in the following format *sap.hana.ondemand.com*. (Please skip this step until the URL will be generated by SCPI explained in chapter *Retrieve the endpoint of the iFlow*. After created URL, fill in this field with the URL in the format described. Please fill in any name in this field as a placeholder until the URL is generated in SCPI, for example *placeholder_host*).
7. Enter any name in the *Logical System* field, for example, *CPI_System.*
8. Enter any name in the *Business System* field, for example, *CPI_System.*



9. Under the User for Inbound Communication, choose *Add*.
10. If you want to use certificate-based authentication between SCPI and SAP S/4HANA Cloud, choose *SSL Client Certificate* as authentication method. Select the *User Name* to which you have associated the SCPI Client Certificate.



11. Choose *OK*.
12. Under *User for Outbound Authentication*, choose *Add*.
13. Choose:
    - *Authentication Method*: *SSL Client Certificate*
    - *Certificate Type*: *Default Client Certificate*
    -The certificate can be uploaded to SCPI system (The step where to upload the certificate is described in chapter *Setup the Certificate-to-User-Mappings*).



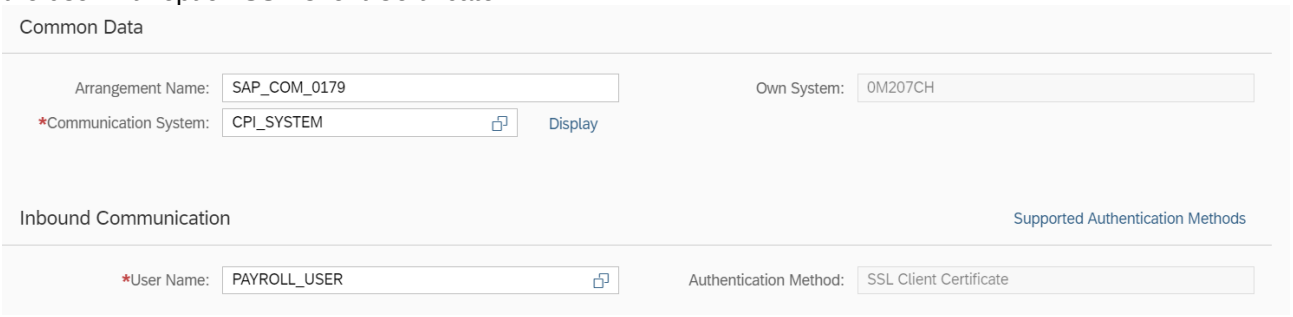
Create Communication Arrangement

The communication arrangement in the SAP S/4HANA Cloud system defines all relevant information for the communication with SCPI. For example, it contains the communication system, inbound and outbound authentication.

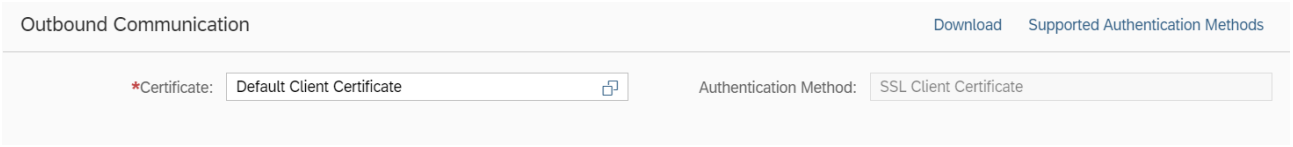
Procedure for **SAP_COM_0179** is as follow:

1. Access the SAP *S/4HANA Cloud Fiori UI* and log in as an SAP *S/4HANA Cloud Administrator.*
2. Choose *Communication Arrangement* from the *Communication Management* tile.
3. Select communication scenario SAP_COM_0179 and choose *Create*.
4. Under *Common Data* section, check the arrangement name. This is filled automatically with the communication scenario name.

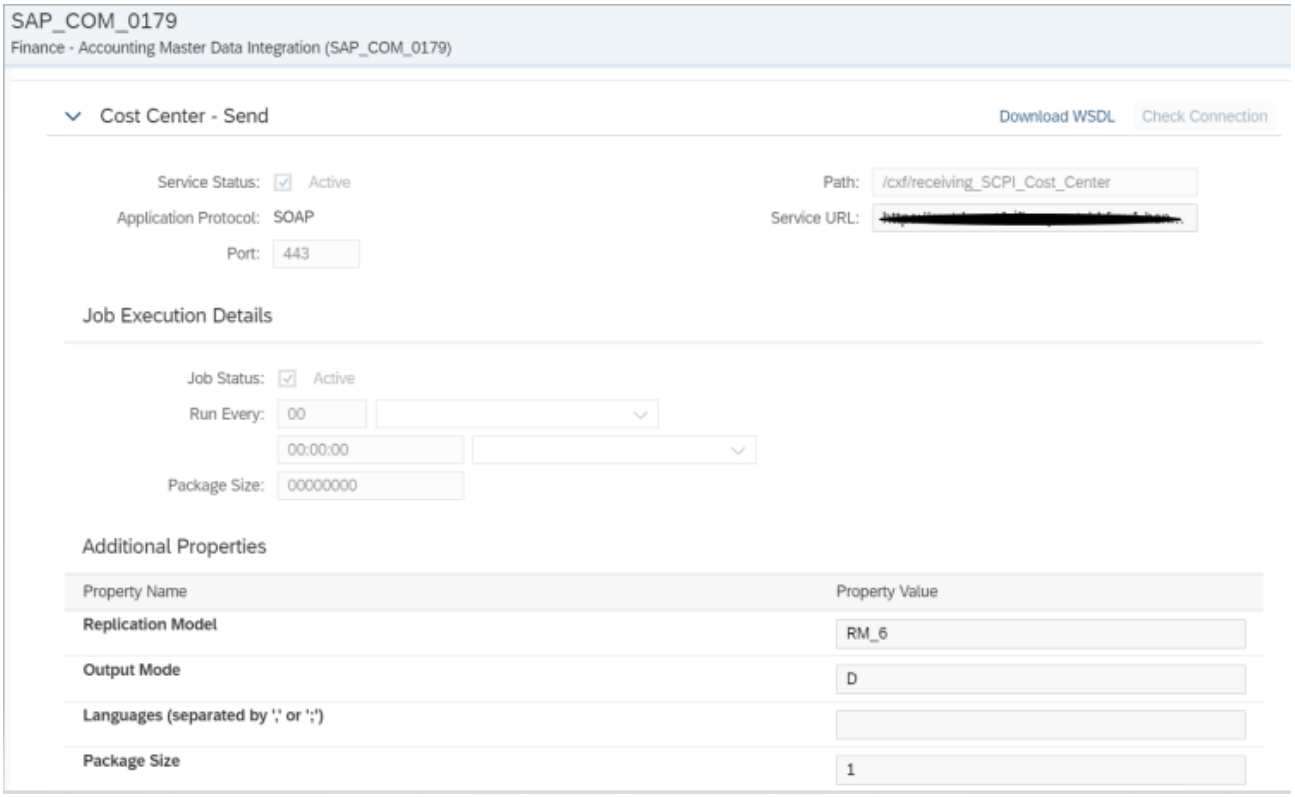
5. Choose *Communication System ID* from the value help. You need to choose the ID which you have created in chapter Create Communication System.
6. Under *Inbound Communication*, in the *User Name* field, enter a user using the value help. By default, the user who is associated with the communication system will be displayed in the value help. Select the user with option SSL Client Certificate.



7. Under *Outbound Communication*, in the *User Name/Certificate* field, enter a user using value help. By default, the user who is associated with the communication system will be displayed in the value help. Choose the same. The authentication method is prefilled with the same authentication method associated with this user.
8. Click on *Download* to download the Certificate.



9. Under *Outbound Services*
   - in *Service Status*, remove all checkmarks except ***Company Code – Send*** and ***Cost Center – Send***.
   -In the fields *Path* of ***Company Code – Send*** and ***Cost Center – Send***, please enter the last part of the URL you got from the SAP Cloud Platform Integration, for example */cxf/receiving_SCPI_Cost_Center* (Explained in the 4th step in section Retrieve the endpoint of the iFlow)
10. In the field *Replication Model*, please enter any name, for example *RM_6* (Note: every *business object* under the tab *Outbound Service* needs a different Replication model name).



11. Choose *Save*.
12. Errors may occur when you try to save in case configuration has not been completed for services. These services can be deactivated by deselecting the check box for *Service status* in the *Outbound Services* section.

Procedure for **SAP_COM_0002** is as follow:

1. Access the *S/4 Cloud Fiori UI* and log in as an SAP *S/4HANA Cloud Administrator.*
2. Choose *Communication Arrangement* from the *Communication Management* tile.
3. Select communication scenario SAP_COM_0002 and choose *Create*.
4. Under *Common Data* section, check the arrangement name. This is filled automatically with the communication scenario name.
5. Choose *Communication System* ID from the value help. You need to choose the ID which you have created in chapter Create Communication System.
6. Under *Inbound Communication*, in the *User Name* field, enter a user using the value help. By default, the user who is associated with the communication system will be displayed in the value help. Select the user with option SSL Client Certificate.
7. Choose *Save*.

Step 2: Configuration in SAP Cloud Platform Integration

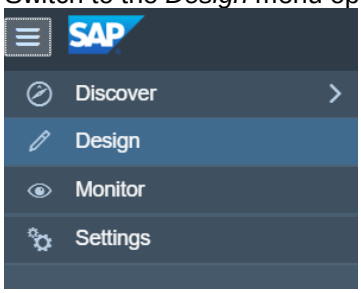
This section describes the configuration of the SAP Cloud Platform Integration to be able to post company codes and cost centers from SAP S/4HANA Cloud into SAP Cloud Platform Integration (**outbound**) and the configuration to post journal entries from SCPI into SAP S/4HANA Cloud (**inbound**).

Note: For getting more insight to connect a customer system to SAP Cloud Platform Integration, we recommend to look into the SCPI guide on the SAP Help Portal.

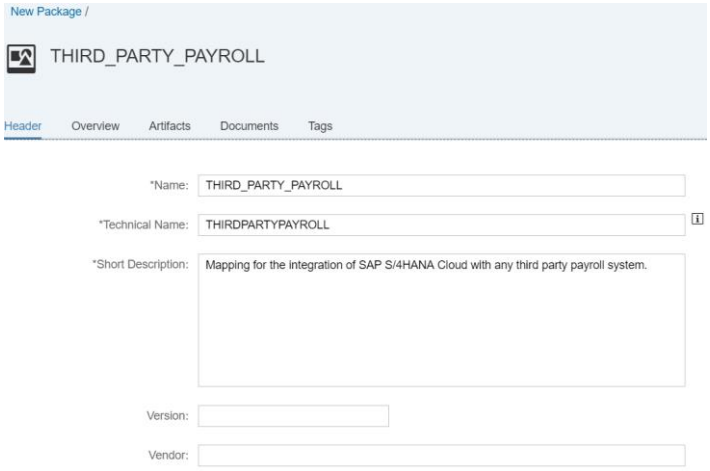
Configuration for outbound communication:

Procedure

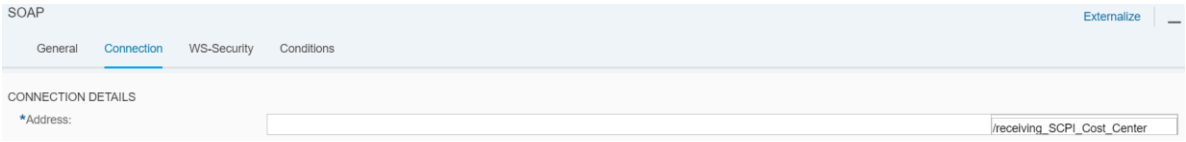
1. Logon to the *SCPI* with the appropriate user roles assigned.
2. Switch to the *Design* menu option in the main menu on the left.



3. *Click on Create* to create a package.
4. On the next screen in the *Header* tab:
   - Enter any name in the *Name* field, for example *THIRD_PARTY_PAYROLL*.
   - Enter any name in the *Technical Name* field, for example *THIRDPARTYPAYROLL*.
   - Enter any description in the S*hort Description* field.



5. Click on *Save*.
6. Click on *ARTIFACTS*.
7. Click on *Edit*.
8. Under the tab *Add*, search for *Integration Flow* (iFlow) and click on it to create one.
   - Enter any name in the *Name* field, for example *Consume_Cost_Center*.
   - Enter any name in the *ID* field, for example *Consume_Cost_Center*.
   - Click on *OK*.
9. A new blank page with the boxes *Sender*, *Integration Process* (within a *Start* and *End event*) and *Receiver* opens.
10. Click on *Edit*.
11. On the left side, click on the arrow (*connectors*) and draw a message flow between *Sender* and the *Start Message* event to connect them.
12. Select *SOAP* as adapter type and *SOAP 1.X*.
13. Open the *message flow settings* by clicking on it and open the *Connection* tab:
    - Enter a desired Address for your endpoint on the SCPI, for example */cxf/receiving_SCPI_Cost_Center*



14. Finally click on *deploy*.
15. Click on *Save as version*.

Retrieve the endpoint of the iFlow

This step describes where to find the endpoint URL of your recently deployed integration flow. Both information will be needed during the setup of the Communication Arrangement in the SAP S/4HANA Cloud system.

1. Switch to the *Monitor* menu option in the main menu on the left.
2. Navigate to the *Manage Integration Content* section.
3. Select the saved *Integration Flow* in the *Integration Content* navigation pane.
4. Copy the URL displayed in the Endpoints tab. (mandatory step for the setup of SAP S/4HANA Cloud in chapter *Create Communication System* (step 6). The URL consist of the host name and the specific path of the iFlow.
   For example, the URL in the browser looks like this:
   https://sap.hana.ondemand.com:443/receiving_SCPI_Cost_Center.
   ➔ Note down the first part of the URL without https://, for example *payroll-live.ondemand.com* to use it in the configuration part of SAP S/4HANA Cloud (chapter Create Communication System; Step 6). The rest of the URL, for example */receiving_SCPI_Cost_Center*, must be used in Chapter Create Communication Arrangement – Step 9 in the section for SAP_COM_0179.

Setup the Certificate-to-User-Mappings

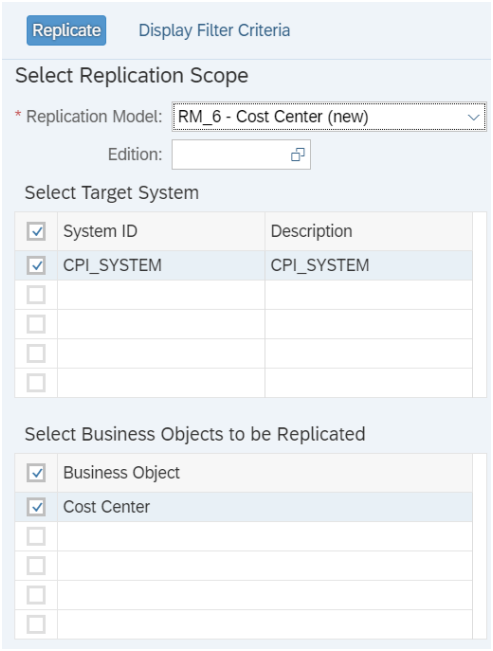
To enable the communication between the SAP S/4HANA Cloud system and the SCPI system the authentication certificate of the SAP S/4HANA Cloud system must be uploaded into the SCPI.

1. Switch to the *Monitor* menu option in the main menu on the left.
2. Click on *Certificate-to-User Mappings* App in the Monitor Dashboard.
3. Enter the SCPI user name and choose the certificate of the SAP S/4HANA Cloud system downloaded during the setup of the Communication Arrangement.
4. Certificate uploaded.

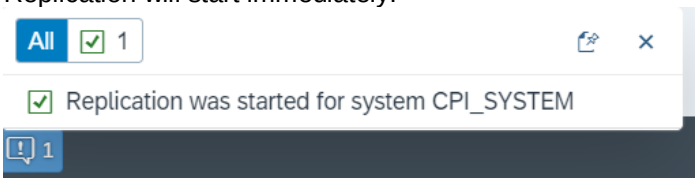
Configuration of Data Replication Framework (DRF)

After finalizing the configuration of both systems, DRF for replication of the cost centers and company codes can be used as follow:

1. Logon to the *SAP S/4HANA Cloud* with the appropriate user roles assigned.
2. Choose *Replicate by Replication Model* from the *Data Replication* tile.
3. Choose the *Replication Model* which was defined before in the communication arrangement (for example *RM_6* and click on *Replicate*.

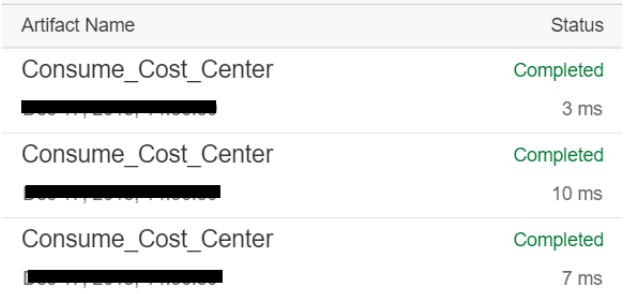


4. Replication will start immediately.



Check for successful replication

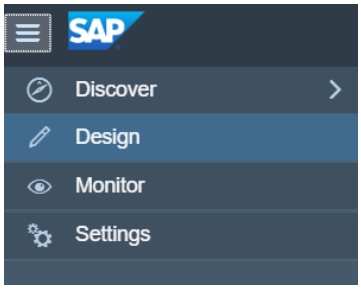
1. Logon to the *SCPI* with the appropriate user roles assigned.
2. Switch to the *Monitor* menu option in the main menu on the left.
3. Under *Manage Security* click on *All Integration Flows*.
4. The replicated business objects will be shown.



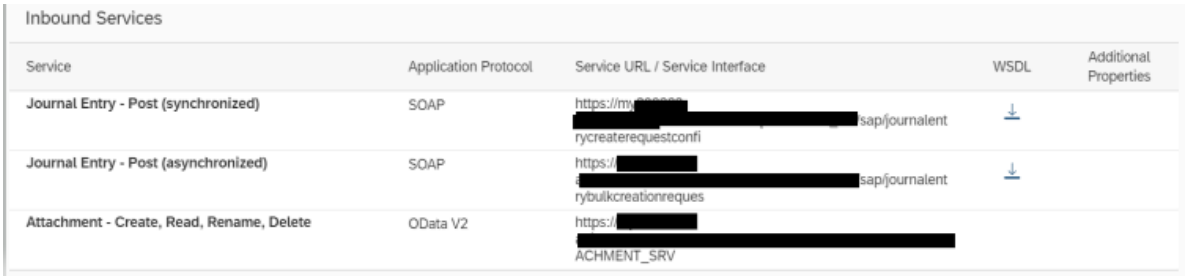
Configuration for inbound communication

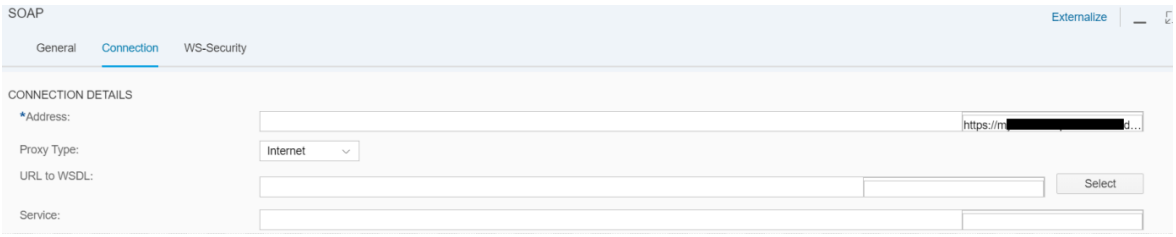
Procedure

1. Logon to the *SCPI* with the appropriate user roles assigned.
2. Switch to the *Design* menu option in the main menu on the left.



3. *Click* on package created before, *THIRD_PARTY_PAYROLL*.
4. On the next screen in the *Header* tab
5. Click on *ARTIFACTS*.
6. Click on *Edit*.
7. Under the tab *Add*, search for *Integration Flow* (iFlow) and click on it to create one.
    - Enter any name in the *Name* field, for example *Consume_Journal_Entry*.
    - The mandatory field *ID* is filled automatically.
    - Click on *OK*.
8. A new blank page with the boxes *Sender*, *Integration Process* (within a *Start* and *End event*) and *Receiver* opens.
9. Click on *Edit*.
10. On the left side, click on the arrow (*connectors*) and draw a message flow between *Sender* and the *Start Message* event to connect them.
    - In this case the sender would be the third-party payroll system which has to be configured with SCPI. Please ensure the connection between them.
11. On the left side, click on the arrow (*connectors*) and draw a message flow between *End Message* event and the *Receiver* to connect them
    - In this case the receiver would be SAP S/4HANA Cloud.
12. Select *SOAP* as adapter type and *SOAP 1.X*.
13. Open the *message flow settings* by clicking on it and open the *Connection* tab:
14. In the *Address* field, enter the Service URL of the *Journal Entry – Post (synchronized)* which is provided after creating the communication arrangement for SAP_COM_0002 under the tab *Inbound Services*.





15. In the field *Proxy Type* choose *Internet* from the drop-down list.
16. In the field *Authentication* choose *Client-Certificate* from the drop-down list.
    Note: Basic authentication instead of certificate based configuration is also possible. For this you would need to define user/pw in the the app "Manage Security Material" by adding new "user credentials".

17. In the field *Private Key Alias* enter the Alias you want to use.
    Note: For HTTPS based outbound communication with client certificate authentication, keys and certificates must be maintained in the receiver system (in this case the SAP S/4HANA Cloud system) and in the SCPI keystore. For more information how to setup outbound HTTP connections please click here.
18. Finally click on *deploy*.
19. Click on *Save as version*.

Step 3: Mapping

Use

The **mapping** of the interfaces used in SAP S/4HANA Cloud and the third-party payroll system must be ensured on the SCPI.

In the following we are focusing on the journal entry API and its parameters which are at least mandatory to be filled.

The journal entry API is an inbound service which enables synchronous posting of journal entries from external systems to the SAP S/4HANA Cloud system.

Service Structure

The request message contains a *MessageHeader* node and a *JournalEntryCreateRequest* node. The JournalEntryCreateRequest node can occur multiple times in the request message. This means that multiple journal entries can be created through a single Web service request. Additionally, it contains a MessageHeader node as well as a JournalEntry node element that contains the journal entry data to be created. The detailed structure of the JournalEntry node is explained in the following subsections.

The service *message header* contains information on the service, the involved sender and receiver as well as date and time.

The service nodes contain the business data of the service which are as follow:

Service node	Description	Mandatory/Optional
JournalEntry	Contains all general journal entry information such as the company code and posting date as well as item nodes.	Mandatory
Item	Line item on a G/L account or fixed asset account.	Mandatory
DebtorItem	Line item on a customer account.	Optional
CreditorItem	Line item on a vendor account.	Optional
ProductTaxItem	Line item on a tax account	Optional
WithholdingTaxItem	Line item on a Withholding Tax Account	Optional

As shown in the table above, at least *JournalEntry* and *Item* are mandatory service nodes. Depending on the payroll process, if needed, the service nodes DebtorItem, CreditorItem, ProductTaxItem as well WithholdingTaxItem can be used also. For this reason, the mandatory fields for *JournalEntry* and *Item* will be listed in the following[3]:

[3] For the whole list of available parameters (including optional ones) please look at the business documentation of the journal entry API.

JournalEntry

Parameter	Description
OriginalReferenceDocumentType	Reference to the business transaction document of the original business transaction. Type of this business transaction document. Currently, the only allowed value is BKPFF (accounting document direct input).
OriginalReferenceDocument	Reference to the business transaction document of the original business transaction. ID of this business transaction document. Note: The combination of the type, the ID, and this logical system must uniquely identify the business transaction.
OriginalReferenceDocumentLogicalSystem	Reference to the business transaction document of the original business transaction. Logical system of this business transaction document.
BusinessTransactionType	Business transaction type. Permitted values: RFBU (FI Posting) SD00 (Billing document) RMRP (Incoming invoice) RMWA (Goods Movement) RMWE (Goods receipt for purch. order) RMWF (Goods receipt for prodn. order) RMWI (Inventory difference) RMWL (Goods issue delivery) RMWQ (Goods movement for usage dec)
AccountingDocumentType	Document type of the accounting document.
CreatedByUser	ID of the user who created the item.
CompanyCode	Company code
DocumentDate	Document date
PostingDate	Posting date

Item

Parameter	Description
GLAccount	Reference to the business transaction document of the original business transaction. Type of this business transaction document. Currently, the only allowed value is BKPFF (accounting document direct input).
AmountInTransactionCurrency	Reference to the business transaction document of the original business transaction. ID of this business transaction document. Note: The combination of the type, the ID, and this logical system must uniquely identify the business transaction.

Sample Code of a Journal Entry for Payroll Posting

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:sfin="http://sap.com/xi/SAPSCORE/SFIN">
   <soapenv:Header/>
   <soapenv:Body>
      <sfin:JournalEntryBulkCreateRequest>
         <MessageHeader>
            <CreationDateTime>2018-01-01T01:01:01.1Z</CreationDateTime>
         </MessageHeader>
         <JournalEntryCreateRequest>
            <MessageHeader>
               <CreationDateTime>2018-01-01T01:01:01.1Z</CreationDateTime>
            </MessageHeader>
            <JournalEntry>
               <OriginalReferenceDocumentType>BKPFF</OriginalReferenceDocumentType>
               <OriginalReferenceDocument>0100000270F0012014</OriginalReferenceDocument>
               <OriginalReferenceDocumentLogicalSystem>THIRDPARTY</OriginalReferenceDocumentLogicalSystem>
               <BusinessTransactionType>RFBU</BusinessTransactionType>
               <AccountingDocumentType>AB</AccountingDocumentType>
               <DocumentHeaderText>PAYROLL POSTING</DocumentHeaderText>
               <CreatedByUser>Payroll User</CreatedByUser>
               <CompanyCode>1710</CompanyCode>
               <DocumentDate>2017-02-26</DocumentDate>
               <PostingDate>2018-06-25</PostingDate>
               <Item>
                  <AccountAssignment>
                  <CostCenter>0017101751</CostCenter>
                  </AccountAssignment>
                  <ReferenceDocumentItem>0000000001</ReferenceDocumentItem>
                  <GLAccount listID="">0061100000</GLAccount>
                  <AmountInTransactionCurrency currencyCode="USD">1650</AmountInTransactionCurrency>
                  <AmountInCompanyCodeCurrency currencyCode="USD">1650</AmountInCompanyCodeCurrency>
                  <DebitCreditCode>S</DebitCreditCode>
               </Item>
               <CreditorItem>
                  <ReferenceDocumentItem>0000000002</ReferenceDocumentItem>
                  <Creditor>0017401710</Creditor>
                  <AmountInTransactionCurrency currencyCode="USD">-1650</AmountInTransactionCurrency>
                  <AmountInCompanyCodeCurrency currencyCode="USD">-1650</AmountInCompanyCodeCurrency>
               </CreditorItem>
            </JournalEntry>
         </JournalEntryCreateRequest>
      </sfin:JournalEntryBulkCreateRequest>
   </soapenv:Body>
</soapenv:Envelope>
```

Receiving journal entry

Once a journal entry is posted from a third-party system into SAP S/4HANA Cloud, it will be available within the app *Manage Journal Entry* as in the following screenshot:

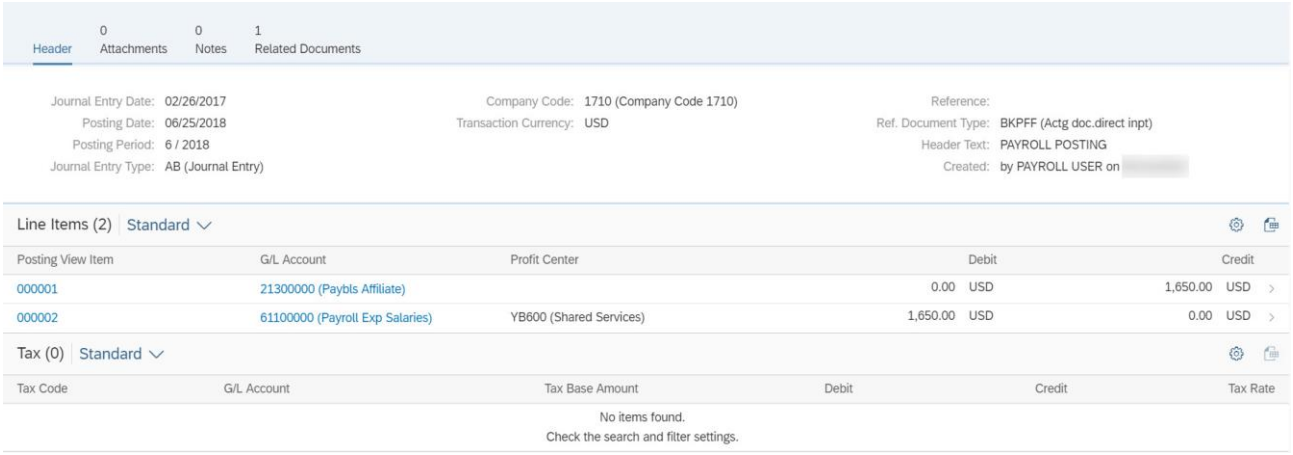


Figure 3: example journal entry in SAP S/4HANA Cloud

Instead of reading the posting document on the Fiori App it is also possible to use the OData Journal Entry API which enables to read journal entry items as well cost center and company codes.

Additionally, it enables filtering and selecting (e.g. calling journal entries with specific company code) on the appropriate properties. Click here for the business documentation. In case of needed further business objects, please check the API Business Hub.

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