eDocument: Electronic Invoicing for Peru

ERP SOAMANAGER and HCI Set-Up

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The communication part of the eDocument Full Solution for processing electronic documents in Peru is taken care of by HANA Cloud Integration (HCI). In order to get HCI working, there are some required steps on both the ERP system and the HCI tenant.
These steps are typically taken care by an HCI consulting team, who is responsible for configuring the ERP-HCI connection and maintaining the integration content and certificates/credentials on the HCI tenant.

1 PREREQUISITES

Before you start with the activities described in this document, ensure that the following prerequisites are met.

1) eDocument Peru Full Solution: All relevant notes are installed in the test and/or productive systems (see note 2031941 for an overview of which notes are required for the Basic and the Full Solutions).
2) Registration at SUNAT is completed and homologation documents are expected to be sent by you to SUNAT (see the *Manual de Homologación* from SUNAT for details). The following data is available:
    a. Certificate used for digital signature (private key + password).
    b. Certificates (for example *GeoTrust Global CA*) for connecting to the SUNAT web service deployed on the HCI tenants' keystores.
    c. SOL secondary key (*SUNAT Operaciones en Línea - Clave Secondaria*) registered with profile "Envio de documentos electronicos – Grandes emisores".
    d. Username and password belonging to the SOL secondary key.

    Note: In case there are any issues with SSL, you can open SUNAT's web service URL in a browser and check the certification path.
3) HCI test/productive tenants are setupsetup.
4) You have configured the connection from ERP to HCI. Please refer to the following document: http://www.sdn.sap.com/irj/scn/index?rid=/library/uuid/4037b5a5-47a5-3110-e891-f3d9dbafbe86.

2 GENERAL INFORMATION

The package *eDocument: Electronic Invoicing for Peru* contains the following six iFlows:

iFlow Name in WebUI	Project Names / Artifact Names
Generic Invoice	*com.sap.GS.Peru.GenericInvoice*
Get Status Invoice and Summary	*com.sap.GS.Peru.GetStatusInvoice*
Summary Documents	*com.sap.GS.Peru.SummaryDocuments*
Tax Certificate	*com.sap.GS.Peru.TaxCertificate*
Voided Documents	*com.sap.GS.Peru.VoidedDocuments*

2.1 iFlow Modes

Each iFlow in the package has four different ways of operating, the so called modes. A mode controls the logic of the iFlow and the endpoint to which the message is sent. For each iFlow, you set up a mode in the externalized parameter called *mode*. The following four modes exist:

1. *PROD* – Production:
    - Intended for use in the productive HCI tenant

- Connects to the SUNAT web service for production
- *Invoice, Credit Note and Debit Note:* Boletas are only signed, but not sent to SUNAT
- Available for all iFlows

2. *HMLG* – Homologation
   - Intended for use in the HCI tenant that is used for the homologation process
   - Connects to the SUNAT web service for homologation
   - Available for all iFlows

3. *TEST* – Test
   - Intended for use in the HCI test tenant
   - Connects to the SUNAT web service for testing
   - *Invoice, Credit Note and Debit Note:* Boletas are only signed, but not sent to SUNAT
   - Available for all iFlows

When you import the iFlows to the HCI tenant the first time, the mode *TEST* will be the standard setting. See section 3.2 for information on how to change the mode.

3 SETUP STEPS

Perform the following steps to set up the iFlows.

3.1 Deploy the certificates and the credentials to the HCI tenants

You use the same certificate for the digital signature for both the test and productive HCI tenants,.
The credentials (username + password) for the WS UsernameToken authentication differ depending on the endpoint of the iFlow which is determined by the mode. The credentials for mode *TEST* differ from the credentials of modes *HMLG* and *PROD*. Mode *SIGN* does not require credentials.
You must make sure that the certificates (digital signature + SSL) and the credentials are available and deploy the signature certificate (as private key with an alias) in the HCI tenants' *JAVA_KEYSTORE*. Deploy the credentials as a *CREDENTIALS* object (with an alias).
In order to allow the iFlows to be updated with minimal adaptation effort, the alias used for the private key and for the credential must be as follows:

- *Private Key alias:* **perusignaturekey**
- *HMLG/PROD Credentials alias:* **peruwstokencredentials**
- *TEST Credentials alias:* **peruwstokencredentials_test**

Note: The correct format for the username in the *HMLG/PROD* credentials is *<CompanyTaxCode><SOL Secondary Key Username>*.
For example: The company has Tax Code (RUC) 21544512515; SOL secondary key username is *USER1* and SOL secondary key password is *MYPASS*. The *HMLG/PROD* credentials will be:

- *Username:* **21544512515USER1**
- *Password:* **MYPASS**

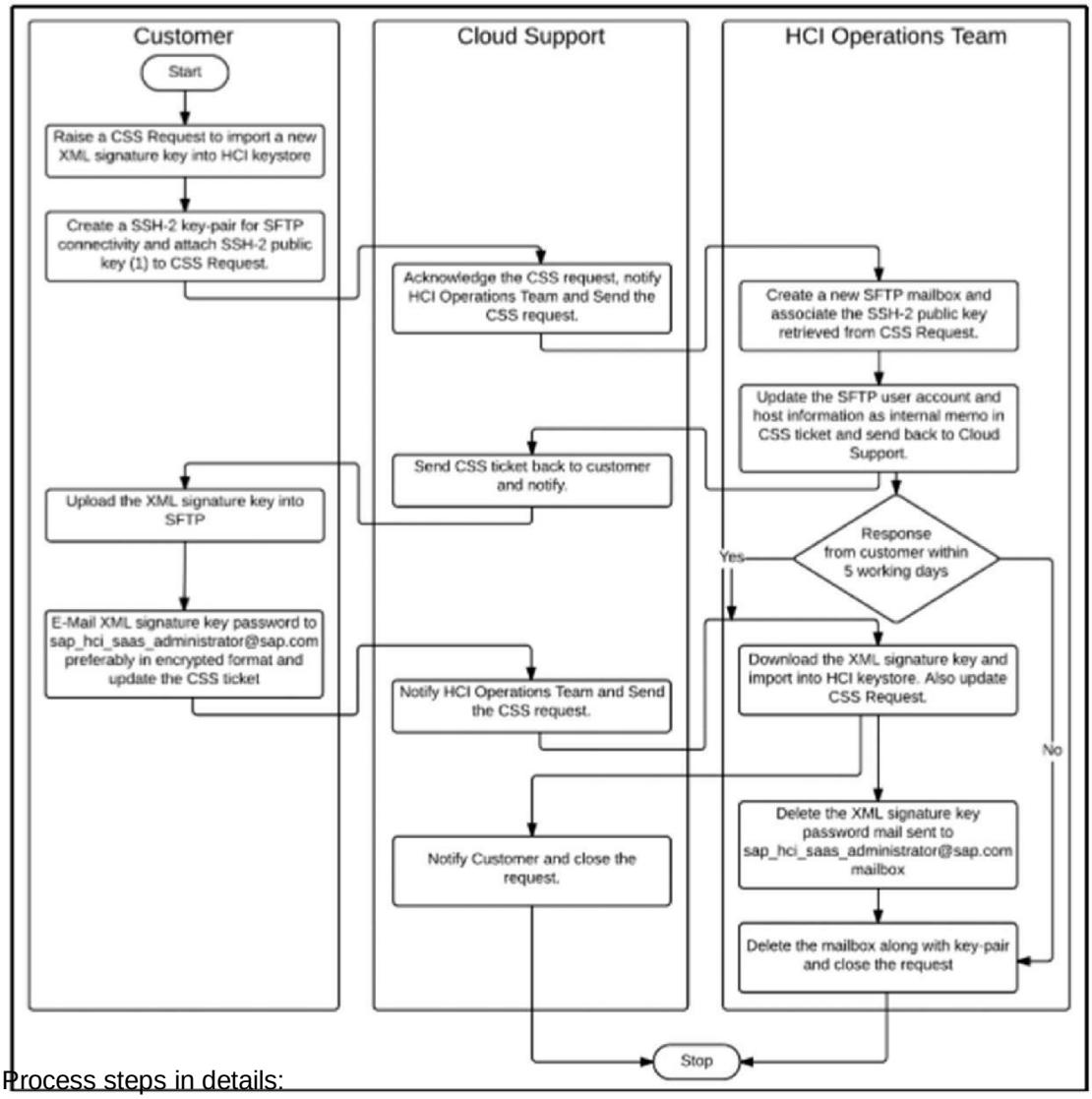
In the *TEST* environment, the credentials are independent from the SOL secondary key. The username is always *<CompanyTaxCode>MODDATOS*. The password is always *MODDATOS*.
For example: The company has Tax Code (RUC) 21544512515. The correct *TEST* credentials are:

- *Username:* **21544512515MODDATOS**
- *Password:* **MODDATOS**

Note: The credentials for both *HMLG/PROD* and *TEST* modes must be available at the same time on the HCI tenant, independently of the mode that you have configured for an iFlow. You have to ensure that both credentials *peruwstokencredentials* and *peruwstokencredentials_test* are available at any time. If you deploy only one of the credentials, the iFlows will not start but show an error in the *Runtime Status*.

3.1.1 Steps to deploy private key in the Keystore

To deploy the private key in the keystore, customer needs to raise an incident. The process is explained with the below flow diagram.



Process steps in details:

1. Customer or the implementation partner (requestor) who has to add the XML signature key to the tenant key store raises a ticket to the Cloud Operations support component. The XML signature key or the password to be used must not be added to the request.

2. Customer attaches the SSH2 public key generated from Key Generation Procedure. This public key will be used to enable the accessibility to the SFTP user account.

3. Cloud Support acknowledges the Request, notifies the Cloud Operations team and sends the request (if possible).

4. The Cloud Operations team member (processor) creates an SFTP user account in the SAP SFTP server. Also the public key attached in the request will be associated with this user account.

5. The Cloud Operations team member updates the SFTP user account and host name in Request and sends back the same to Cloud Support. NOTE: If the Cloud Operations team is not getting any response in the request from the customer or Cloud Support within 5 working days after update from Operations team, the mailbox will be deleted and the request will not be processed further.

SHARING PRIVATE KEYS

6. Cloud Support sends back the ticket to the customer and notifies regarding the update in Request.

7. The customer should follow the steps mentioned in Procedure to access SFTP user account to access the SFTP user account and then add the XML signature key to the 'inbox' folder.

8. The customer updates the Request accordingly and sends an encrypted (preferably) e-mail sap_hci_saas_administrator@sap.com with the password required to access the XML signature key.

9. Cloud Support notifies the Cloud Operations team and sends the request (if possible).

10. The Cloud Operations team member accesses the SFTP server and downloads the XML signature key from the user account and updates this in the tenant key store accordingly. Also the Cloud Operations team member updates the Request and sends it back to Cloud Support.

11. Cloud Support notifies the customer and closes the request.

12. Cloud Operations team member deletes the XML signature password mail sent to sap_hci_saas_administrator@sap.com. The team member will also delete the SFTP user account which results in the deletion of the XML signature keys added by the customer.

3.1.2 Steps to deploy Credentials

1. In your browser, go to the WebUI of the tenant (URL: <Tenant URL>/itspaces/#shell/catalog).
2. From the menu in the upper left corner, choose Monitor.
3. Click on tab Security Material, click on Add, select User Credentials.
4. Enter Name as peruwstokencredentials, enter the username and password provided by SUNAT.

3.2 Download integration flows into Tenant workspace and adapt them

Download all iFlows in the package *eDocument: Electronic Invoicing for Peru* to the target tenant as follows:

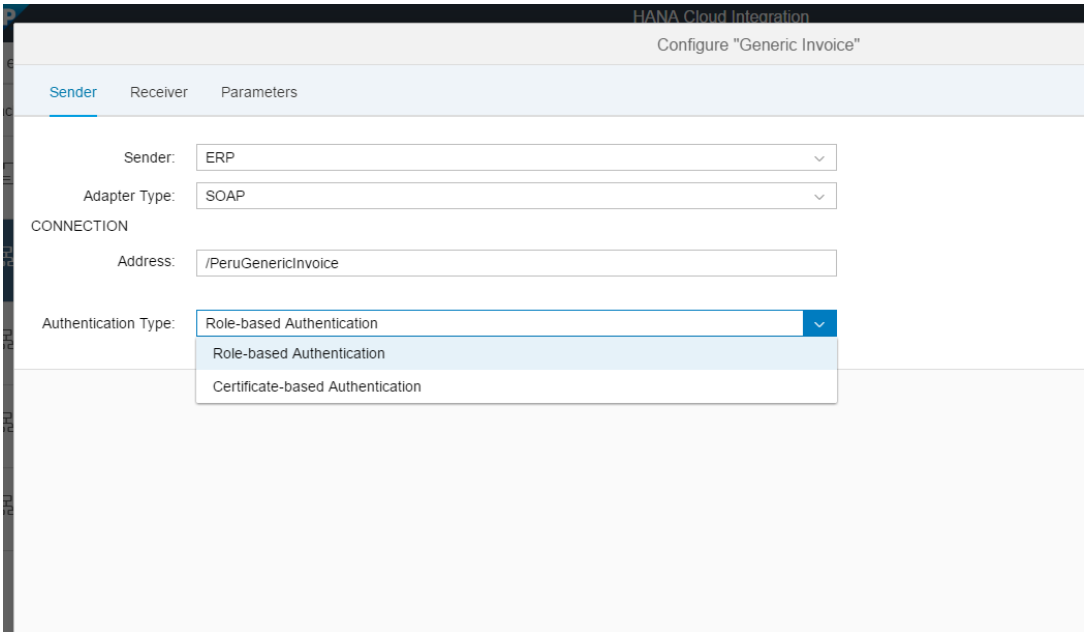
1. In your browser, go to the WebUI of the tenant (URL: <*Tenant URL>/itspaces/#shell/catalog*).
2. From the menu in the upper left corner, choose *Discover*.
3. Click on the *eDocument: Electronic Invoicing for Peru* package.
4. In the lower right corner, choose *Copy*. If package already exist, overwrite it.

There are several parameters on each iFlow which must be maintained. To change the parameters in the WebUI, do the following:

1. From the menu in the upper left corner, choose *Design.*
2. Click on the *eDocument: Electronic Invoicing for Peru* package and then on *Package Content*.
3. For the iFlow that you want to change, choose *Actions* > *Configure*.
4. After changing the parameters, choose *Save*.

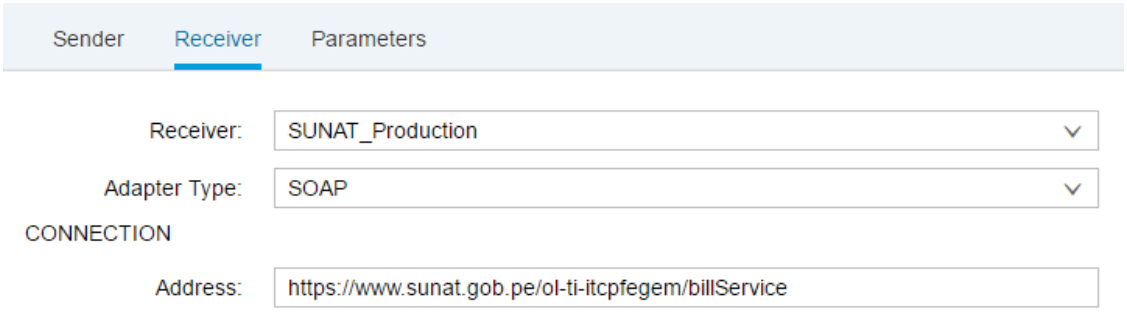
The following parameters must be configured:

- Sender tab
    - *Address: If you are deploying same iflow for multiple company codes, you need to change the Address for second company onwards to generate unique URL for each company code.*
    - Authentication Type: ***<Role-based Authentication | Certificate-based Authentication >***
    - For Certificate Based Authentication only: ***Subject DN*** and ***Issuer DN*** of client certificate(s)

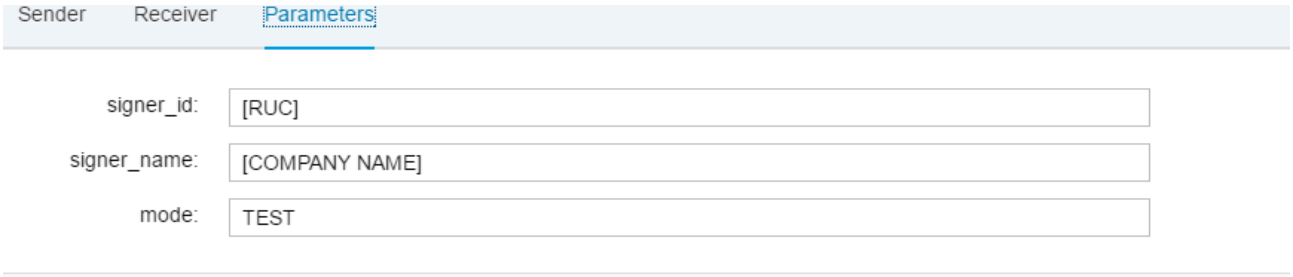


Receiver Tab

- Receiver *SUNAT_Production*: configure address of SUNAT productive endpoint
    - **Invoices** **:** Https://e-factura.sunat.gob.pe/ol-ti-it/pfegem/billService?wsdl
    - **WTC & CTC** **:** Https://www.sunat.gob.pe/ol-ti-itemision-otroscpe-gem/billService?wsdl (Retention and Perception Service)
    - **Get Status** : Https://www.sunat.gob.pe/ol-it-wsconscpegem/billConsultService?wsdl (Invoice, Boleta Summary & Void Get Status)
- Other receivers (Test, Homologation)
    - Homologation: **https://www.sunat.gob.pe/ol-ti-itcpgem-sqa/billService**
    - Test:
        - Invoices: **https://e-beta.sunat.gob.pe/ol-ti-itcpfegem-beta/billService**
        - WTC & CTC : Https://e-beta.sunat.gob.pe/ol-ti-itemision-otroscpe-gem-beta/billService?wsdl
        - Get Status : Only available for Production



- Parameters tab
    - *signer_id* = ***<RUC (Tax Code)>***
    - *signer_name* = ***<Name in the certificate used for the digital signature>***
    - *mode* = ***<Mode of the iFlow: PROD | HMLG | TEST | SIGN >***



Note:

- The iFlow *Get Status* Invoice and Summaries does not have the parameters *signer_id* and *signer_name*.

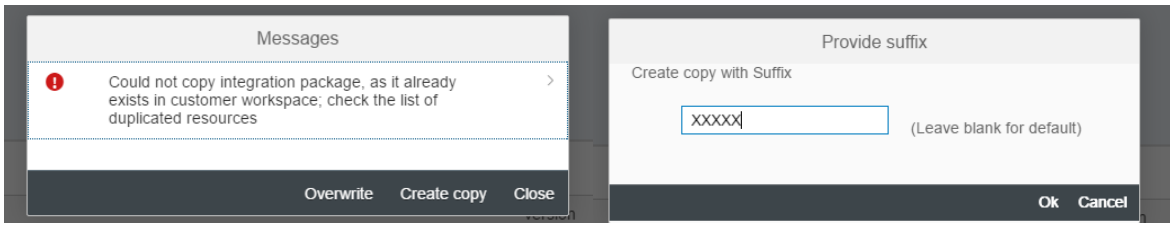
3.3 Multiple companies using same HCI tenant (Optional):

Note: The steps listed below must be followed only if you would like to support multiple companies in the same HCI tenant.

For supporting multiple companies in the same HCI tenant, multiple copies of the iFlows need to be created and the iFlows must be adapted to each company. You do the changes in the Eclipse tool.
Prerequisite:
The Eclipse tool has HCI software installed. The steps to setup the Eclipse tool is available at this link.

Steps for copying the Integration package with alias name:

1. Repeat the steps mentioned in **3.2(from step 1 to step 3),** when it ask for overwrite/create copy, choose create copy option and enter company code.



XXXX – Company Code

2. In your browser, go to the WebUI of the tenant (URL: <*Tenant URL>/itspaces/#shell/catalog*).
3. From the menu in the upper left corner, choose *Design*.
4. Click on the *eDocument: Electronic Invoicing for Peru XXXX(copied with alias)* package and then on *Package Content*.
5. Select all artifacts, choose *Actions* > *Download*. Specify a local folder.
6. Open Eclipse in *Integration Designer* perspective.
7. In the Project explorer tab, right click and choose *import*. In the pop up, under General, choose *Existing Projects into Workspace.* Click *Next.*
8. Choose *Select archive file,* browse and select the earlier downloaded integration archive.
9. Repeat steps 6 and 7 to import all 6 iFlows.

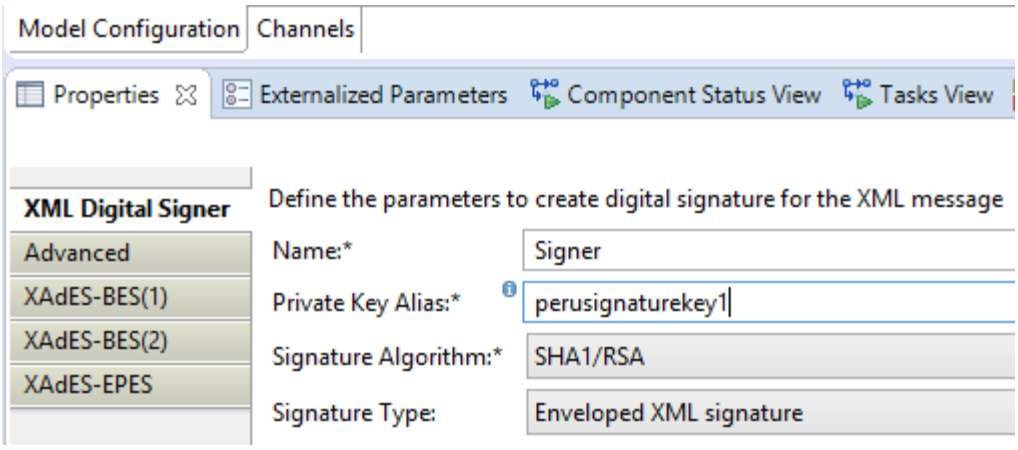
Steps to maintain parameters (To be repeated for every integration content copied in previous steps):

1. In Eclipse, go to Project Explorer tab and expand the integration content package. Further expand package src.main.resources.scenarioflows.integrationflow.
2. Double click on the iFlow file with extension .iflw.
3. Click on view Externalized Parameters and maintain the parameters.

Steps for changing the iFlows (To be repeated for every integration content copied in previous steps):

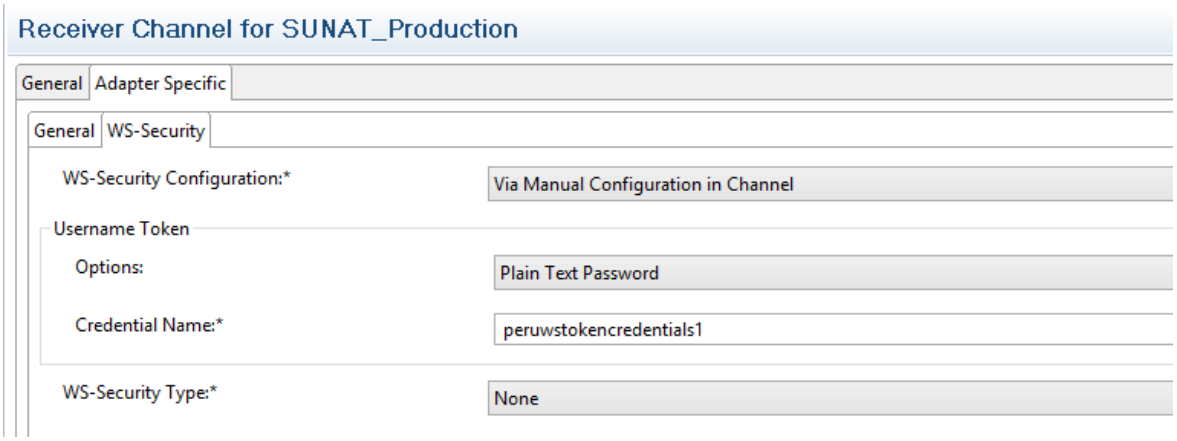
1. In Eclipse, in *Project Explorer* tab, expand the integration content package. Further expand package *src.main.resources.scenarioflows.integrationflow*.
2. Double click on the iFlow file with extension .iflw.
3. Double click on the *SOAP sender channel*, click on tab *Adapter Specific*.
4. Under *Connection Details* tab, in *Address field* add company name as suffix to the existing address. Example shown below.

5. Click on *Model Configuration* and select the *Signer* box in the iFlow.
6. In Properties view, in field *Private Key Alias*, add a suffix number representing the company. The private key of the company needs to be stored in the keystore with same alias. For example, *perusignaturekey1* is the alias for storing the private key of company *Company1*.



7. Click on *Model Configuration*, double click on the *SOAP Receiver Channel* and click on tab *Adapter Specific*.
8. Click on Tab WS-Security, in field *Credential Name*, add a suffix number representing the company.

   Example:



9. Save the changes.
10. Deploy the private key perusignaturekey<company number> and security artifact peruwstokencredentials<company number> for each of the companies by repeating steps mentioned under section 3.1.

Deploy the copied iFlows:

1. In Eclipse, in *Node Explorer* tab, click on *Open Connection Preferences*, maintain the tenant management URL, username and Password. *Test Connection* and click on *OK*.
2. In *Project Explorer* tab, right click on the integration content and choose *Deploy Integration Content*.
3. Repeat step 2 for every newly copied iFlow from previous steps.

3.4 Set up the connection with ERP on test/productive tenants

If you are using basic authentication, the HCI tenant needs to have basic authorization enabled for the test user (SCN credentials). If you are using certificate-based authentication, you need to maintain the certificates properly on the HCI tenant keystore and on the iFlows.

To change the authentication type in the WebUI, do the following:

1. From the menu in the upper left corner, choose *Design.*
2. Click on the *eDocument: Electronic Invoicing for Peru* package and then on the iFlow that you want to change.
3. In the lower right corner, choose *Edit*.
4. On the sender side, click on *ERP.*

   Note: You have to click directly on the letters or on the icon on the left. 

5. In the *Authentication Type* dropdown box, select either *Basic Authentication* or *Certificate Based Authentication.* When you select *Certificate Based Authentication*, you have to upload a certificate. Choose *Add* to assign additional certificates.

3.5 Deploy integration flows on test/productive tenants

To deploy an iFlow in the WebUI, select it and choose *Deploy*. The iFlows should be deployed on the HCI test tenant with mode *TEST* or *HMLG*. On the productive HCI tenant, the iFlows should be deployed with mode *PROD*.
After all the iFlows are deployed, you should note down the URLs of the endpoints for each service.
To verify in the WebUI that the deployment was successful, choose *Run* from the menu in the upper left corner. The iFlows should be in state *DEPLOYED.*

3.6 Create the logical ports in ERP SOAMANAGER

There are six different proxies that need to be connected to the HCI tenant via logical port. In the ERP test system, the logical ports will be configured to connect to the test tenant. In the productive ERP system, the logical ports will be configured to connect to the productive HCI tenant correspondingly.
The following description is based on the assumption that one SAP ERP client connects to one SAP HCI tenant.
In the first scenario described below, the SAP ERP system sends all eDocuments to the same logical port independent of the Company Code. In the second scenario, the eDocuments are sent to different logical ports depending on the Company Code. This scenario is enabled with SAP Note 2170178. Please refer to that note for further configuration of the system.

3.6.1 Logical Ports are independent of Company Code

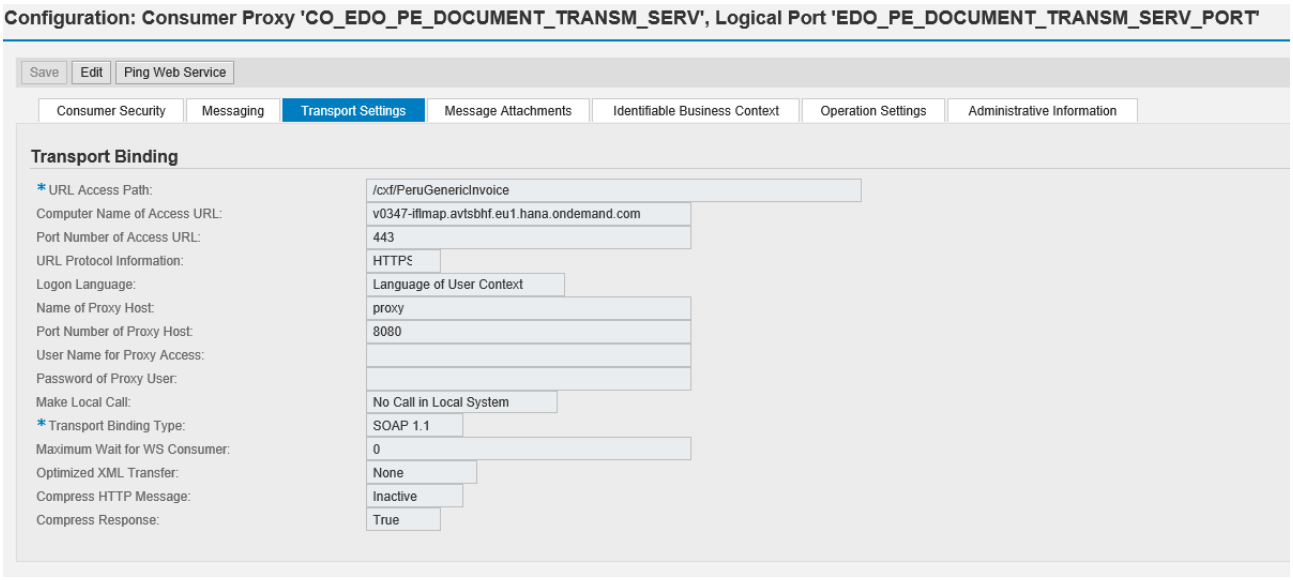
In your ERP system, go to transaction *SOAMANAGER*. The logical ports that should be created for each proxy and the related endpoints (configured in the iFlows) are:

Proxy Name	Logical Port Name	Endpoint URL (Customizable, refer 3.2 Sender tab->Address)
CO_EDO_PE_DOCUMENT_TRANSM_SERV	*EDO_PE_DOCUMENT_TRANSM_SERV_PORT*	*/cxf/PeruGenericInvoice*
CO_EDO_PE_DLY_SUMM_TRANSM_SERV	*EDO_PE_DLY_SUMM_TRANSM_SERV_PORT*	*/cxf/PeruSummaryDocumentsTransmission*
CO_EDO_PE_GET_STATUS_INV_SERV	*EDO_PE_GET_STATUS_SERV_PORT*	*/cxf/PeruGetStatusInv*
CO_EDO_PE_TAX_CERT_TRANS_SERV	*EDO_PE_TAX_CERT_TRANS_SERV_PORT*	*/cxf//PeruTaxCertificate*
CO_EDO_PE_VOID_DOC_TRANSM_SERV	*EDO_PE_VOID_DOC_TRANSM_SERV_PORT*	*/cxf/PeruVoidedDocumentsTransmission*

Add the following descriptions to the ports:

- EDO_PE_DOCUMENT_TRANSM_SERV_PORT: Peru eDocument – Invoice Credit and Debit Memo Transmission
- EDO_PE_DLY_SUMM_TRANSM_SERV_PORT: Peru eDocument – Daily Summary Transmission Service
- EDO_PE_GET_STATUS_INV_SERV_PORT: Peru eDocument – Get Status for Invoice and Summaries Service
- EDO_PE_TAX_CERT_TRANS_SERV_PORT: Peru eDocument – WTC & CTC Transmission Service
- EDO_PE_VOID_DOC_TRANSM_SERV_PORT: Peru eDocument – Voided Documents Transmission Service

The logical port should be configured as indicated in the example below, replacing the access URL with the HCI tenant URL and the proxy settings with the ones from the network where the ERP system is located:



In the test system, the access URL of the HCI test tenant should be used. In the productive system, the access URL of the HCI productive tenant should be used.

The *Consumer Security* tab page configuration depends on the security being used for the ERP-HCI communication (basic authentication or certificate-based).

Note: The iFlows in different modes have different logic. It is important that the URLs are maintained correctly in transaction *SOAMANAGER* in the test and the productive systems and that the modes are set correctly, as the iFlows will behave differently and contact different endpoints in the authority system (SUNAT).

Note: In our tests it was necessary to go to the *Messaging* tab page in transaction SOAMANAGER and set *Message ID Protocol* to *Suppress ID Transfer*.

3.6.2 Logical Ports are dependent on Company Code

The reason for this scenario could be that eDocuments from a different company code must be signed with a different signature in HCI and therefore must be sent to different instances of an iFlow. In your SAP ERP system, SAP Note 2170178 must be installed as a prerequisite.

In transaction *SOAMANAGER,* you must maintain the logical ports as described in section 3.6.1. for each set of iFlow instances. Only the *URL Access Path* field has to be changed, the rest of the fields remains the same.

For example: The two company codes *CC11* and *CC22* use different signatures, which means that eDocuments belonging to these company codes must be signed by different iFlows. In *SOAMANAGER*, you must maintain two logical ports for each ABAP proxy, i.e. one logical port per company code. One company (in this case CC11) will be the default and the other one needs to be explicitly differentiated by adding the company code to the technical names, as shown below:

Proxy Name	Logical Port Name	Endpoint URL
CO_EDO_PE_DOCUMENT_TRANSM_SERV	*EDO_PE_DOCUMENT_ TRANSM_SERV_ PORT*	*/cxf/PeruGenericInvoice*
	*EDO_PE_DOCUMENT_**CC22**_TRANSM_SERV _PORT*	*/cxf/PeruGenericInvoice_CC22 *)*
CO_EDO_PE_DLY_SUMM_TRANSM_SERV	*EDO_PE_DLY_SUMM_TRANSM_SERV_PORT*	*/cxf/PeruSummaryDocumentsTransmission*
	*EDO_PE_DLY_SUMM_**CC22**_TRANSM_SERV_PORT*	*/cxf/PeruSummaryDocumentsTransmission_CC22 *)*
CO_EDO_PE_GET_STATUS_INV_SERV	*EDO_PE_GET_STATUS_INV_SERV_PORT*	*/cxf/PeruGetStatusInv*
	*EDO_PE_GET_STATUS_INV_**CC22**_SERV_PORT*	*/cxf/PeruGetStatus_CC22 *)*
CO_EDO_PE_VOID_DOC_TRANSM_SERV	*EDO_PE_VOID_DOC_TRANSM_SERV_PORT*	*/cxf/PeruVoidedDocumentsTransmission*
	*EDO_PE_VOID_DOC_**CC22**_TRANSM_SERV_PORT*	*/cxf/PeruVoidedDocumentsTransmission_CC22 *)*

*) **Note:** These are example URLs and do not exist. In a real scenario, the URLs is defined by copying the iFlows and adapting the URL in the copied instance.

In the SAP ERP system, the configuration in view *EDOSOASERV* could look as follows:

SOA Service Name	Company Code	Logical Port
PE_DOC_TRANSM	*CC11*	*EDO_PE_DOCUMENT_TRANSM_SERV_ PORT*
PE_DOC_TRANSM	*CC22*	*EDO_PE_DOCUMENT_**CC22**_TRANSM_SERV _PORT*
PE_DLY_SUMM_TRANSM	*CC11*	*EDO_PE_DLY_SUMM_TRANSM_SERV_PORT*
PE_DLY_SUMM_TRANSM	*CC22*	*EDO_PE_DLY_SUMM_**CC22**_TRANSM_SERV_PORT*
PE_GET_STATUS	*CC11*	*EDO_PE_GET_STATUS_INV_SERV_PORT*
PE_GET_STATUS	*CC22*	*EDO_PE_GET_STATUS_INV_**CC22**_SERV_PORT*
PE_VOID_DOC_TRANSM	*CC11*	*EDO_PE_VOID_DOC_TRANSM_SERV_PORT*
PE_VOID_DOC_TRANSM	*CC22*	*EDO_PE_VOID_DOC_**CC22**_TRANSM_SERV_PORT*

4 TESTING

In order to test the communication, the best way is to create and send an eDocument from ERP. How you can achieve this depends on how the system is configured to generate and send eDocuments. Follow these steps:

1) Check all the notes relevant to the Full Solution for Peru are installed and all the manual configuration steps were performed (see section 1).
2) Create a relevant document for eDocument for Peru (for example an invoice).
   Note: If the system is configured to generate an eDocument for the selected document type, an instance of the eDocument will be created as soon as the document is posted (for example when you save an SD Billing document).
3) Go to the eDocument cockpit by running the transaction *EDOC_COCKPIT*.
4) Enter the company code for the document that was posted. If necessary, enter additional selection parameters. When the selection is complete, run the report.
   Note: You should see a list of eDocuments based on your selection. Find the one that you just created and check the following:
   - If the *eDocument GUID* field of your entry is yellow, the eDocument was created but not submitted yet. In this case, select it and choose the *Submit* pushbutton to trigger the communication with HCI.
   - If the *eDocument GUID* field is green, the communication with HCI was triggered and was successful. You can double-check if the message went through on the HCI tenant; or you can use a trace from transaction *SRT_UTIL* to look at the XMLs transmitted via web services from ERP. *Note: the trace must be activated before you start the EDOC_COCKPIT transaction.*
   - You can double-click on the *Interface Message GUID* field to navigate to AIF and look at the log. Communication errors will be displayed there.

5 TROUBLESHOOTING

In this section, you can find useful information for solving errors that can occur during the communication with the web service from the tax authority in Peru (SUNAT).

5.1 Error Codes

When calling the web services, there are many error codes which indicate possible issues with the communication. These codes are provided by the tax authority in Peru (SUNAT) and can be found on the link below:
http://orientacion.sunat.gob.pe/index.php?option=com_content&view=article&id=1898:guias-y-manuales&catid=259:factura-electronica-desde-sistemas-contribuyente&Itemid=468
Since this is an external, country-specific document, the error list (*Codigos de Error*) is only available in Spanish. SAP SE or its affiliated companies are not responsible for its availability, content or accuracy.

5.2 Proxy Error in ERP

The error information are sent back by SUNAT as SOAP fault. When the ABAP Proxy in ERP receives the SOAP fault, the eDocument Cockpit shows the following error message:

Proxy Error GENERAL_ERROR Error during proxy processing (PART U: NKNOWN (NULL))

The actual error information can be seen in one of the following ways:

- In the payload trace of transaction *SRT_UTIL* in ERP

Note: The trace must be activated before you start the *EDOC_COCKPIT* transaction.

- In the payload trace of HCI
- In the Message Processing Log (MPL) of HCI

5.3 “Get Status” test Web Service not working (“ticket not found”)

At the time of the publishing of this document, the SUNAT test web service did not implement the “Get Status” service. Calling this service always returns “ticket not found”. In order to properly test this service, the customer needs to be in homologation mode (the web service works properly in homologation and production).

5.4 SOAP Fault “MustUnderstand Headers”

If you get this error when communicating with HCI, please check the configuration in SOAMANAGER. The issue is probably caused by forgetting to mark the checkbox “Message ID Protocol Suppress ID Transfer”.

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