How-To Library

Informatica

How to Configure the SAP Secure Network Communication Protocol in Informatica Cloud Data Integration®

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Abstract

Secure Network Communication (SNC) is a software layer in the SAP system architecture that integrates third-party security products with SAP. Using the SNC protocol, you can secure communications between SAP and an external system. This article describes how to configure the SNC protocol to secure communications between Cloud Data Integration and SAP.

Supported Versions

- Cloud Data Integration

Table of Contents

SNC Implementation for SAP Connector in Cloud Data Integration

You can use the Secure Network Communication (SNC) protocol to secure communications between SAP and an external system. The SNC protocol is implemented by using a third-party security product.

In Cloud Data Integration, the SNC protocol is implemented by using the SAP Cryptographic Library. The SAP Cryptographic Library is a security product from SAP that is used to implement security features through SNC.

The installation package consists of the following files:

- `libsapcrypto.so`. The library file that is used for the run-time implementation of SNC on Linux-based systems.
- `sapcrypto.dll`. The library file that is used for the run-time implementation of SNC on Windows-based systems.
- `sapgenpse.exe`. The configuration tool that is used to generate the security certificates for the SAP server and the machine on which the Secure Agent is installed.
- `ticket`. The license ticket file to implement SNC.

You can configure the SAP Secure Network Communication Protocol to secure communications for the following SAP connections:

- SAP ADSO Writer connection
- SAP BAPI connection

- SAP BAPI/RFC Interface connection
- SAP BW Reader connection
- SAP ODP Extractor connection
- SAP Table connection

Configuration Steps for Secure Network Communication

To secure communications between Cloud Data Integration and SAP by using the SNC protocol, you must complete configuration steps in both Cloud Data Integration and in the SAP system.

1. Download and install the SAP Cryptographic Library on the SAP server.
2. Create a Personal Security Environment (PSE) for the SAP server.
3. Install the SAP Cryptographic Library on the machine on which the Secure Agent is installed.
4. Create a PSE for the machine on which the Secure Agent is installed and export it.
5. Inform the SAP administrator to import the PSE certificate from the SAP system and add it to the SAP server trusted certificates list. This ensures that the SAP system can recognize Cloud Data Integration as an SNC-enabled communication partner. The SAP administrator must then export the SAP server PSE certificate.
6. Import the SAP server PSE certificate in Cloud Data Integration. This establishes two-way SNC-enabled communication between Cloud Data Integration and the SAP system.
7. Grant SNC permissions to the operating system user who starts the Secure Agent.
8. Grant SNC permissions to the SAP user.
9. Configure the `sapnwrfc.ini` file to enable the SNC protocol.

Installing the SAP Cryptographic Library on the SAP Server

Download the SAP Cryptographic Library for the SAP server from the SAP web site. Extract the contents of the installation package and download the `libsapcrypto.so` or `sapcrypto.dll` library file, ticket file, and the `sapgenpse.exe` configuration tool. Set the environment variable SECUDIR to the directory where the ticket file is stored.

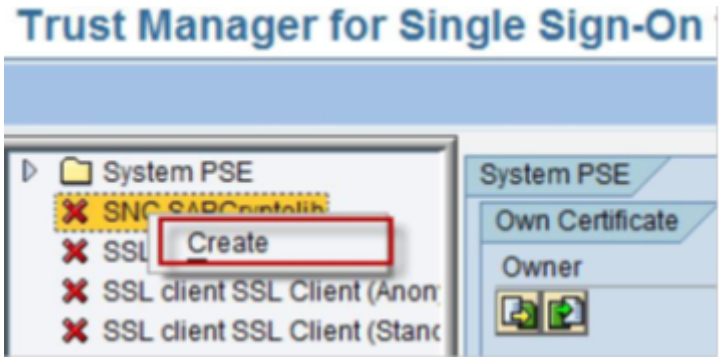
For more information about installing the SAP Cryptographic Library, see the SAP documentation.

Creating the Personal Security Environment for the SAP Server

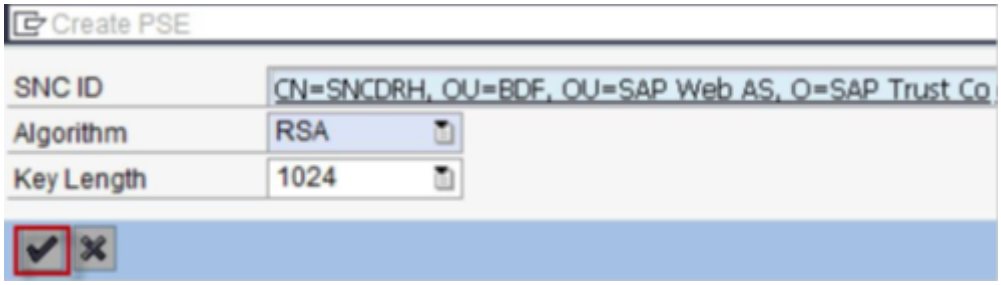
1. Go to transaction RZ10 and select the instance profile that is used by the SAP server for start-up.
2. Add the instance parameter snc/identity/as and set it to the specific name of the SAP server.

   For example, set snc/identity/as to p:CN=<x>, OU=<x>, O=<x>, C=<x> where CN = common name, OU = organizational unit, O = organization, C = country.
3. Restart the SAP server to apply the changes.
4. Go to STRUST transaction to create the SNC PSE.

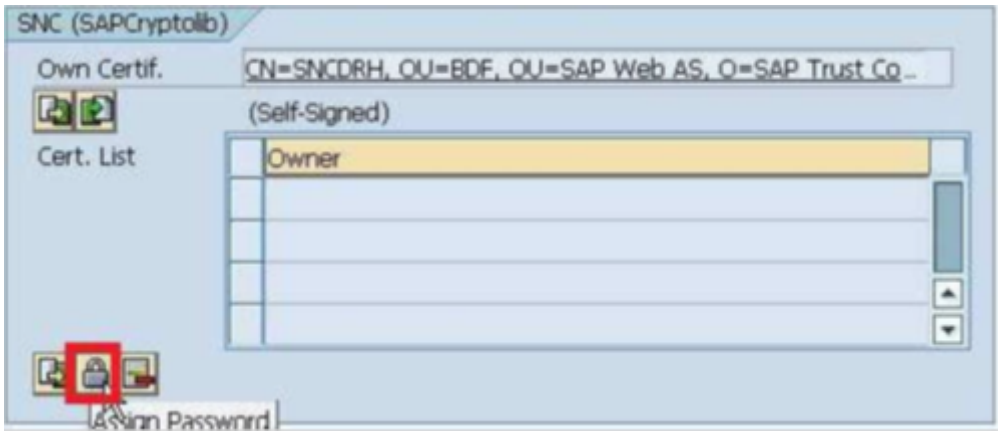
5. Right-click **SNC (SAPCryptolib)** and click **Create**.



The SNC identity specified in the transaction RZ10 appears.

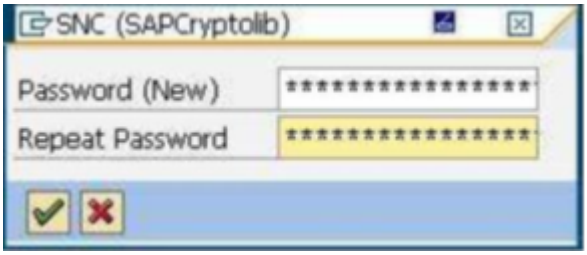


6. Click **OK**.
7. Double-click **SNC (SAPCryptolib)** and click the **Assign Password** icon to assign a password for the SNC (SAPCryptolib) PSE.



8. Enter a password for the SNC (SAPCryptolib) PSE. Each time you view or change the PSE, you will be prompted to enter the password.

The password can contain both letters and numbers.



9. Save the changes.
10. Set the snc/enable parameter to 1 in the transaction RZ10 for the SNC instance profile.

    Note: If you want to allow users who are not authorized for SNC to access the SAP server, set the following parameters in the transaction RZ10 for the SNC instance profile:

Parameter	Value
snc/accept_insecure_rfc	1
snc/accept_insecure_r3int_rfc	1
snc/accept_insecure_gui	1
snc/accept_insecure_cpic	1
snc/permit_insecure_start	1
snc/data_protection/min	1
snc/data_protection/max	3
snc/extid_login_diag	1
snc/extid_login_rfc	1

    For more information about these parameters, see the SAP documentation.

11. Restart the SAP instance to apply the changes.

Installing the SAP Cryptographic Library on the Secure Agent Machine

1. Download the SAP Cryptographic Library from the SAP web site.
2. Connect to the Secure Agent machine with the ID of the user who starts the Secure Agent.
3. Extract the contents of the SAP Cryptographic Library installation package.
4. Copy the library file, `sapgenpse.exe` file, and ticket file to the following directory:

   `<Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin`
5. Add the following information in the profile of the user who starts the Secure Agent:

```
SNC_LIB=<Secure Agent installation directory>/apps/Data_Integration_Server/ext/
deploy_to_main/bin/<library_file_name>; export SNC_LIB
SECUDIR=<Secure Agent installation directory>/apps/Data_Integration_Server/ext/
```

```
deploy_to_main/bin; export SECUDIR
USER=<Name of the user who starts the Secure Agent>; export USER
```

Set the library path to the following directory:

```
<Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin
```

For example, on an HP-UX operating system, set the library path as follows:

```
SHLIB_PATH=<Secure Agent installation directory>/apps/Data_Integration_Server/ext/
deploy_to_main/bin:$ORACLE_HOME/lib; export SHLIB_PATH
```

This step defines where the SNC library file and ticket file are stored, and the name of the user who will execute the SNC functions.

6. Restart the Secure Agent to apply the changes.

Creating the PSE for the Secure Agent and Exporting it to the SAP System

1. Connect to the machine on which the Secure Agent is installed with the ID of the user who starts the Secure Agent.
2. Navigate to the following directory:

   ```
   <Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin
   ```

3. Run the following command to generate the PSE for the machine on which the Secure Agent is installed:

   ```
   sapgenpse get_pse <additional_options> [-p <PSE_name>][DN]
   ```

   You will be prompted to enter a PIN and a distinguished name.

4. Enter a PIN and a distinguished name.

   The PIN is a unique identification value for the PSE.

   The distinguished name is the name of the machine that is registered in the SAP system and the machine on which the Secure Agent is installed. Enter the distinguished name as CN=<x>, OU=<x>, where CN = common name, and OU = organizational unit. For example, enter the distinguished name as: CN=INFACONTNT, OU=BDF.

   The PSE is generated under the following directory:

   ```
   <Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin
   ```

5. Run the `chmod` command and assign read, write, and execute permissions to the generated PSE.
6. Navigate to the following directory:

   ```
   <Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin
   ```

7. Run the following command to export the PSE certificate for the machine on which the Secure Agent is installed:

   ```
   sapgenpse export_own_cert -v -p <Name of the PSE created on the machine on which the Secure
   Agent is installed> -o <Name of the .crt certificate created on the machine on which the
   Secure Agent is installed and exported to the SAP server>
   ```

   The PSE certificate is generated under the following directory:

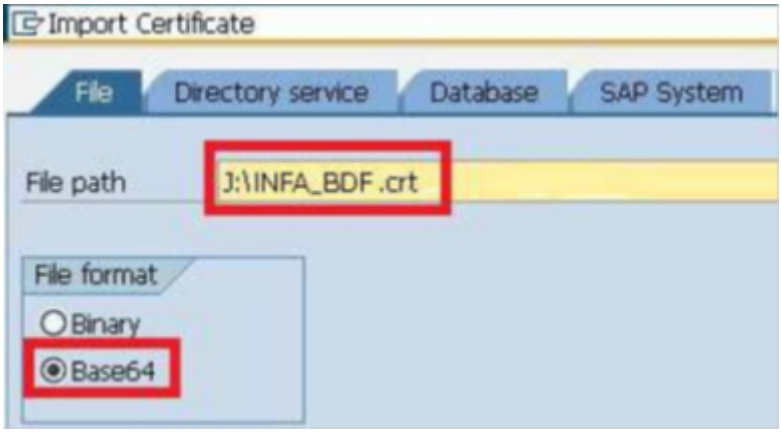
   ```
   <Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin
   ```

8. Run the `chmod` command and assign read, write, and execute permissions to the generated PSE certificate.
9. Send the PSE certificate to the SAP administrator.

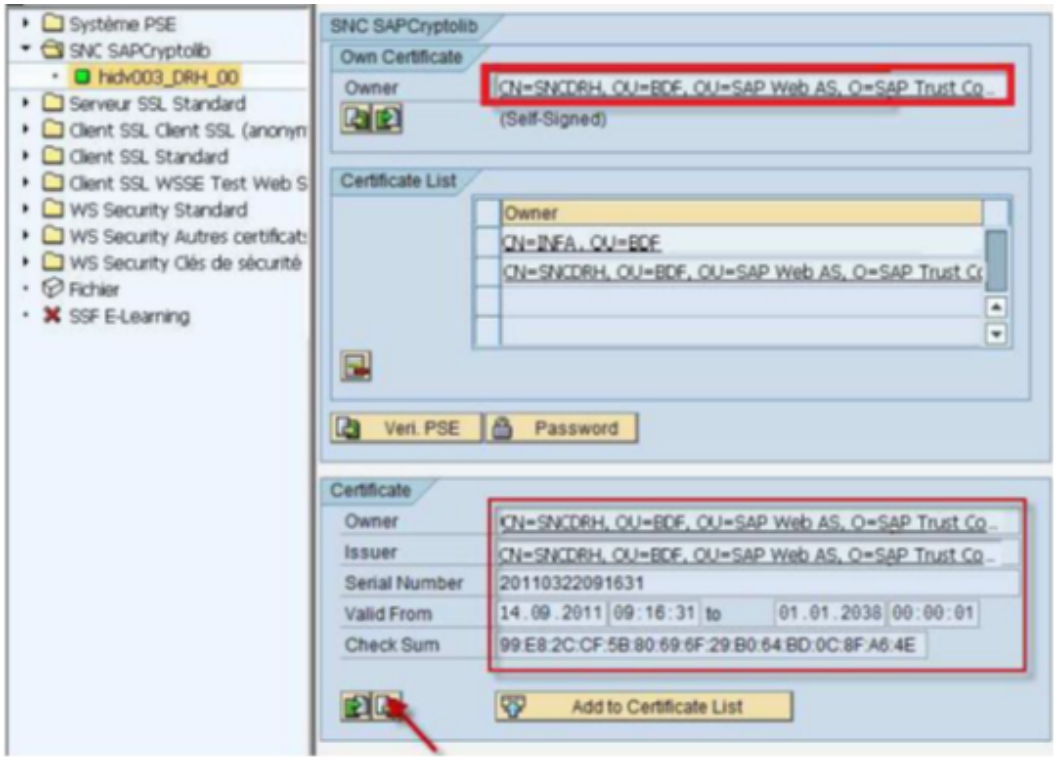
Importing the PSE Certificate in SAP and Exporting the SAP Server PSE Certificate

1. Connect to the SAP system.

2. Go to transaction STRUST to import the PSE certificate that was created on the machine on which the Secure Agent is installed.
3. Browse and select the `.crt` certificate that you created. Click the **Import Certificate** icon.
4. Select the **Base64** option and load the PSE certificate that was created on the machine on which the Secure Agent is installed.



5. Click **Add to Certificate List** to add the PSE certificate to the SAP server trusted list of certificates.
6. Go to transaction STRUST to export the SAP server PSE certificate.
7. Double-click the SAP server PSE certificate and click the **Export Certificate** icon.



8. Save the SAP server PSE certificate under the following directory:

```
<Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin
```

Importing the SAP Server PSE Certificate in Cloud Data Integration

1. Copy the SAP server PSE certificate under the following directory:

   ```
   <Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin
   ```

2. Run the `chmod` command and assign read, write, and execute permissions to the SAP server PSE certificate.
3. Connect to the machine on which the Secure Agent is installed and run the following command to add the SAP server PSE certificate from SAP:

   ```
   sapgenpse maintain_pk -v -a <Name of the SAP server PSE certificate> -p <Name of the PSE certificate that was created on the machine on which the Secure Agent is installed>
   ```

   The SAP server PSE certificate is added to the Informatica trusted list of certificates.

Granting SNC Permissions to the Operating System User who Starts the Secure Agent

1. Navigate to the following directory:

   ```
   <Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin
   ```

2. Run the following command:

   ```
   sapgenpse seclogin -p <Name of the PSE certificate that was created on the machine on which the Secure Agent is installed> -O <Name of the operating system user who starts the Secure Agent>
   ```

   A credentials file for the operating system user who starts the Secure Agent is generated under the following directory:

   ```
   <Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin
   ```

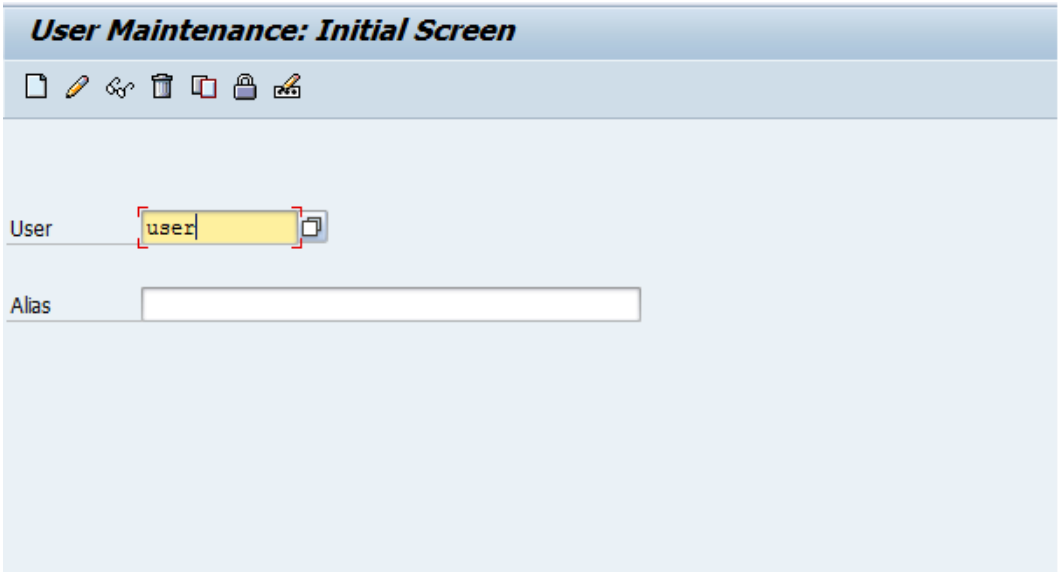
   The credentials file defines the SNC permissions to be assigned to the operating system user who starts the Secure Agent.

3. Restart the Secure Agent.

Granting SNC Permissions to the SAP User

1. Go to transaction SU01.

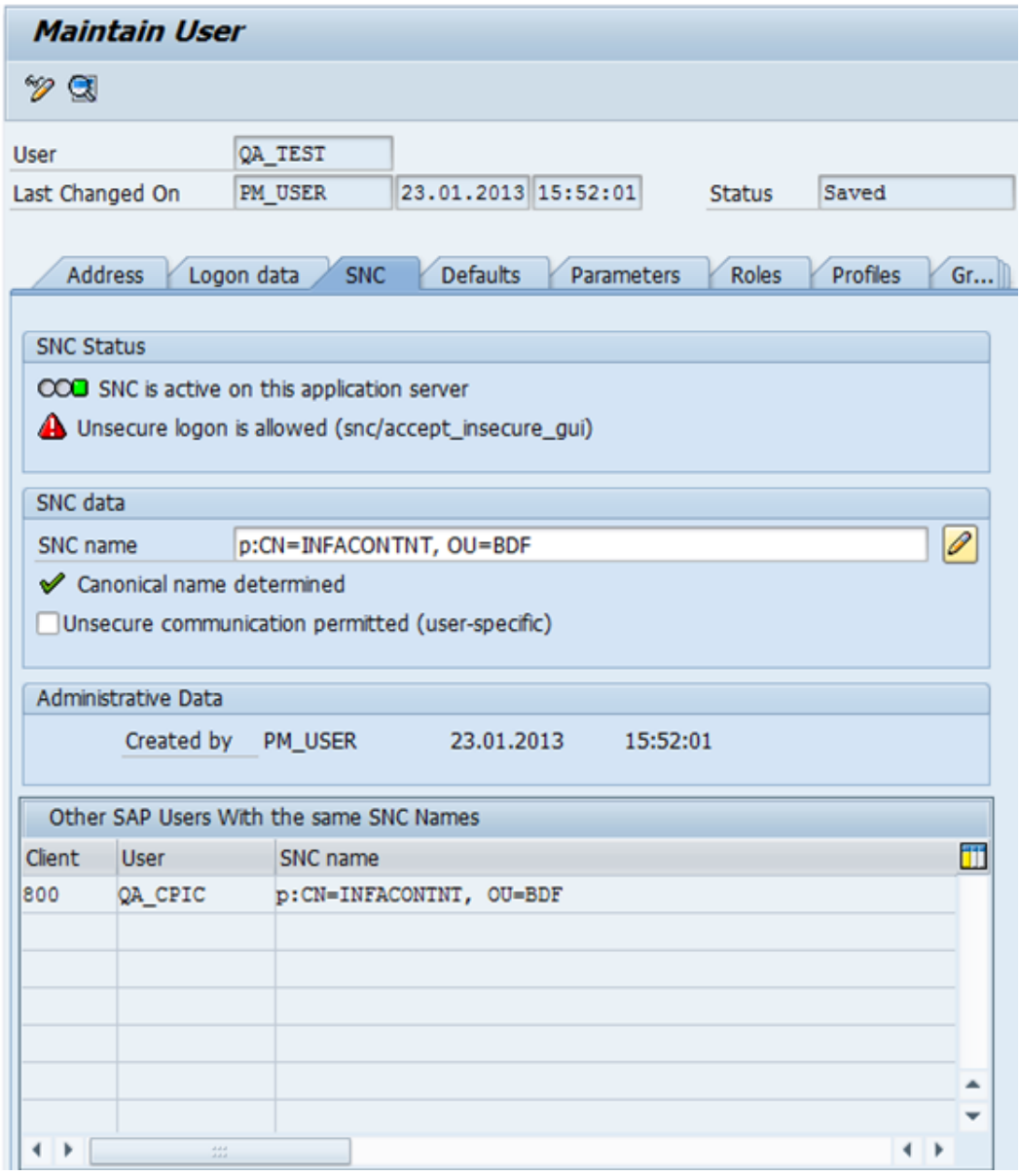
2. In the **User** field, enter the SAP user name to which you want to grant permissions to execute the SNC functions.



3. Click the **Change** icon.

   The **Maintain User** screen appears.
4. Click the **SNC** tab.
5. In the **SNC name** field, enter the following value: p:CN=<common name>, OU=<organizational unit>
6. Click **OK**.

A message appears stating that the canonical name is determined.



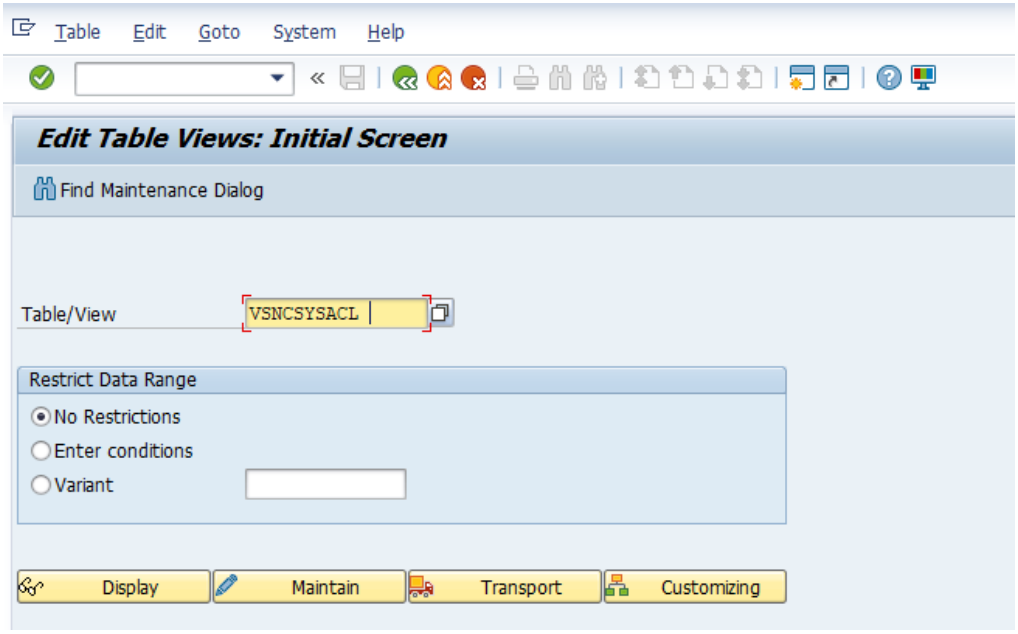
7. Click **Save** to save the changes.

Configuring additional SAP settings for X.509 certificate

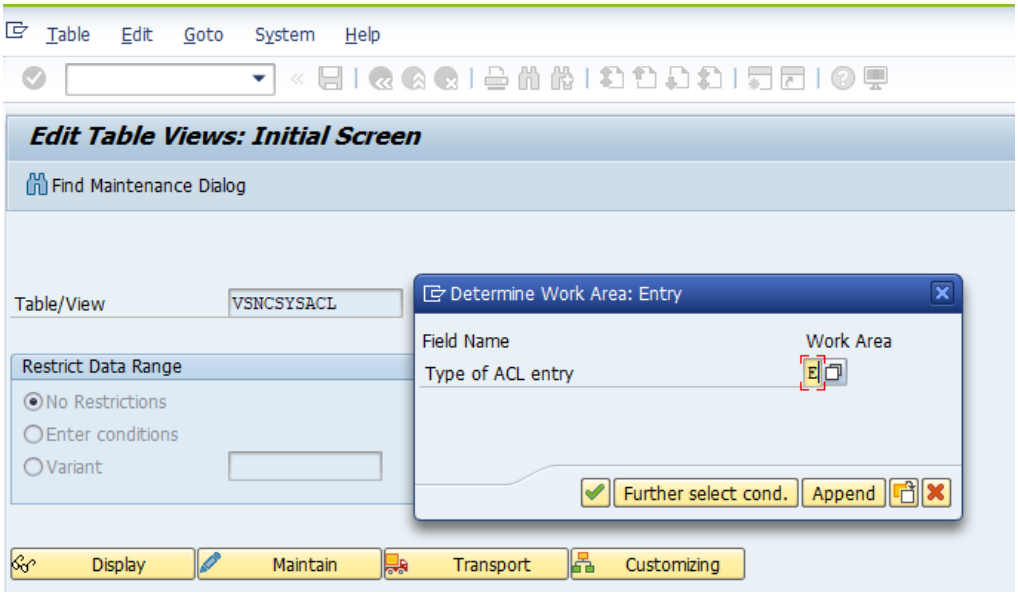
You can configure the SAP user for the X.509 SNC connection so that the client can have SNC without the need for the SAP user and password.

1. Log in to **SAP** > **open t-code SM30**.
2. Maintain two tables VSNCSYSACL and VUSREXTID.

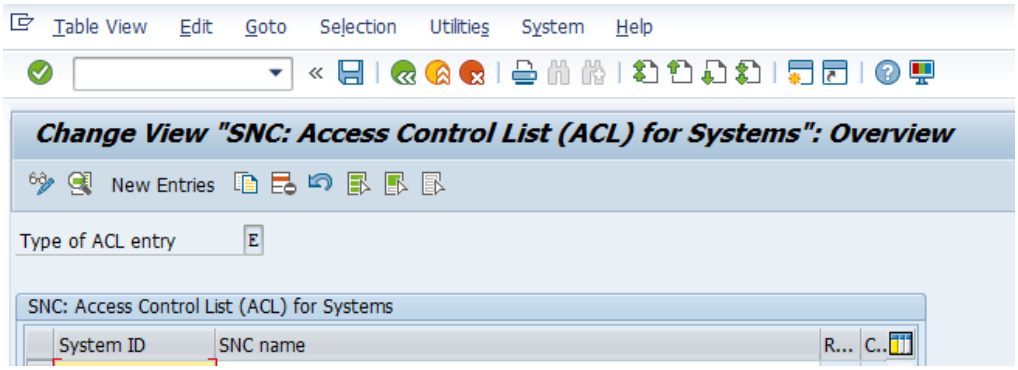
3. To maintain VSNCSYSACL, perform the following tasks:
   a. Open the table VSNCSYSACL for maintenance.



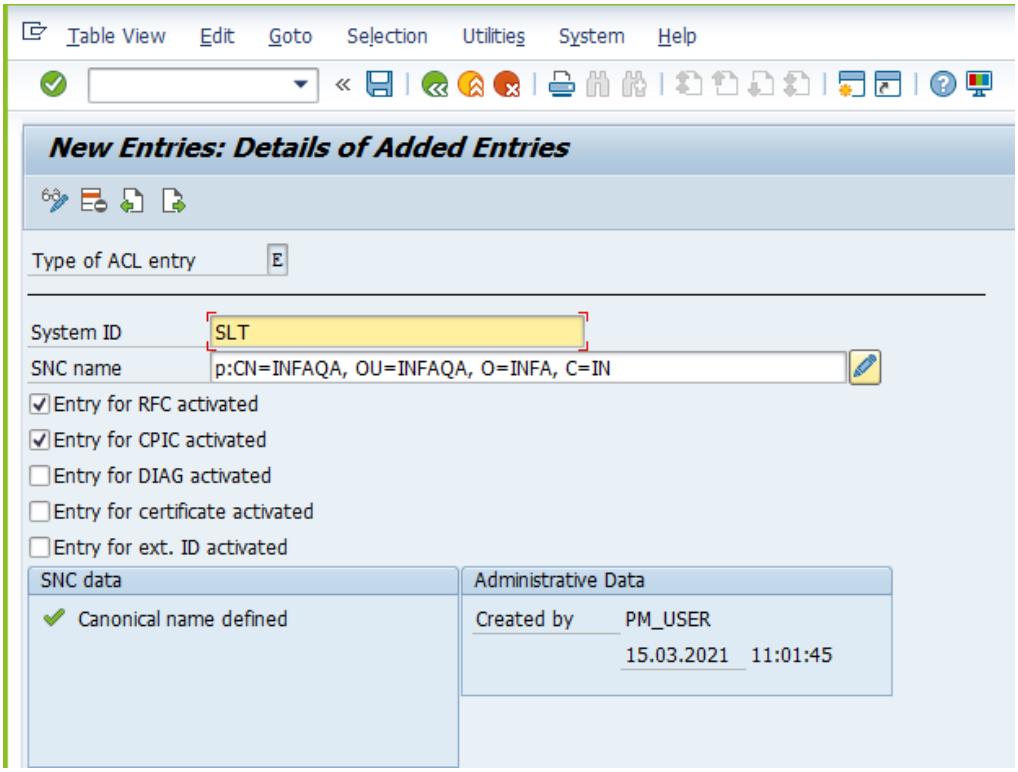
   b. Choose external type work area.



c. Select **New Entries**.

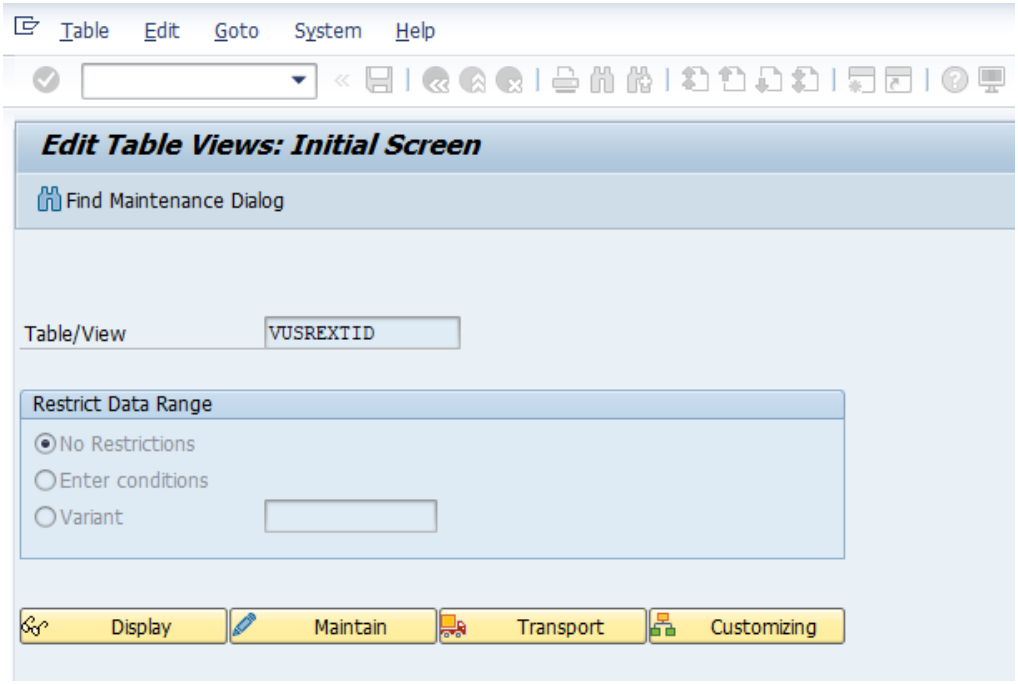


d. Enter the System ID and the SNC name.

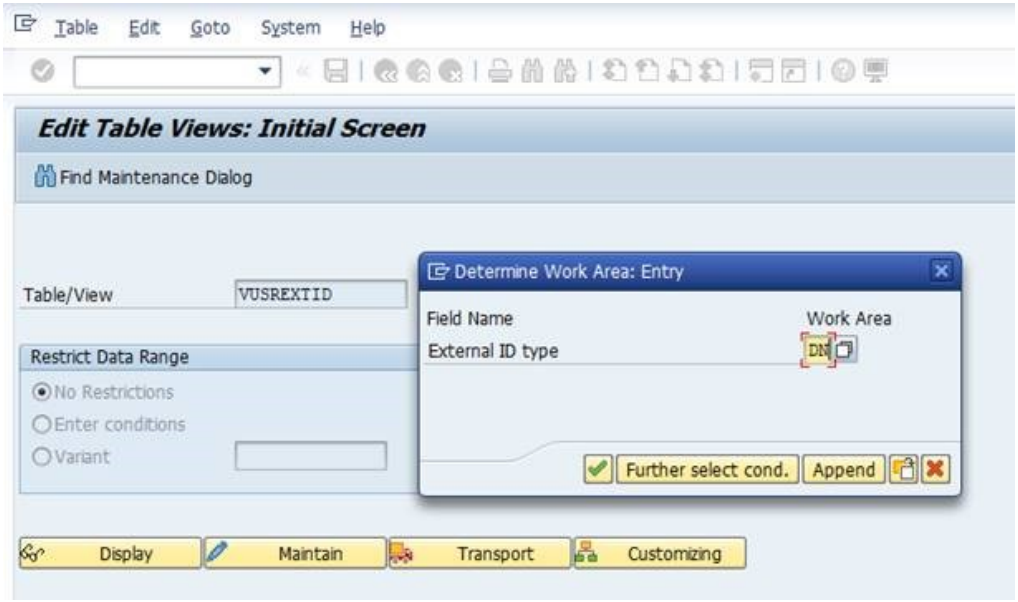


e. Save the data.

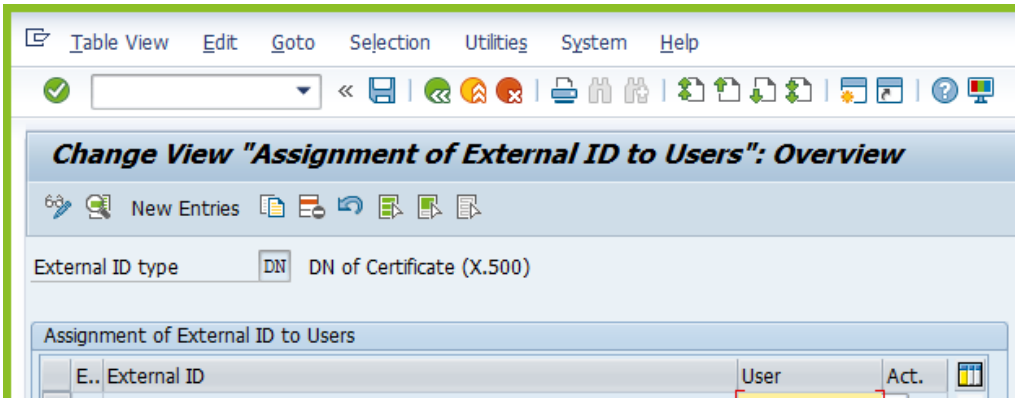
4. To maintain VUSREXTID, perform the following tasks:
   a. Open the table VUSREXTID for maintenance.



   b. Choose the work ID as DN.

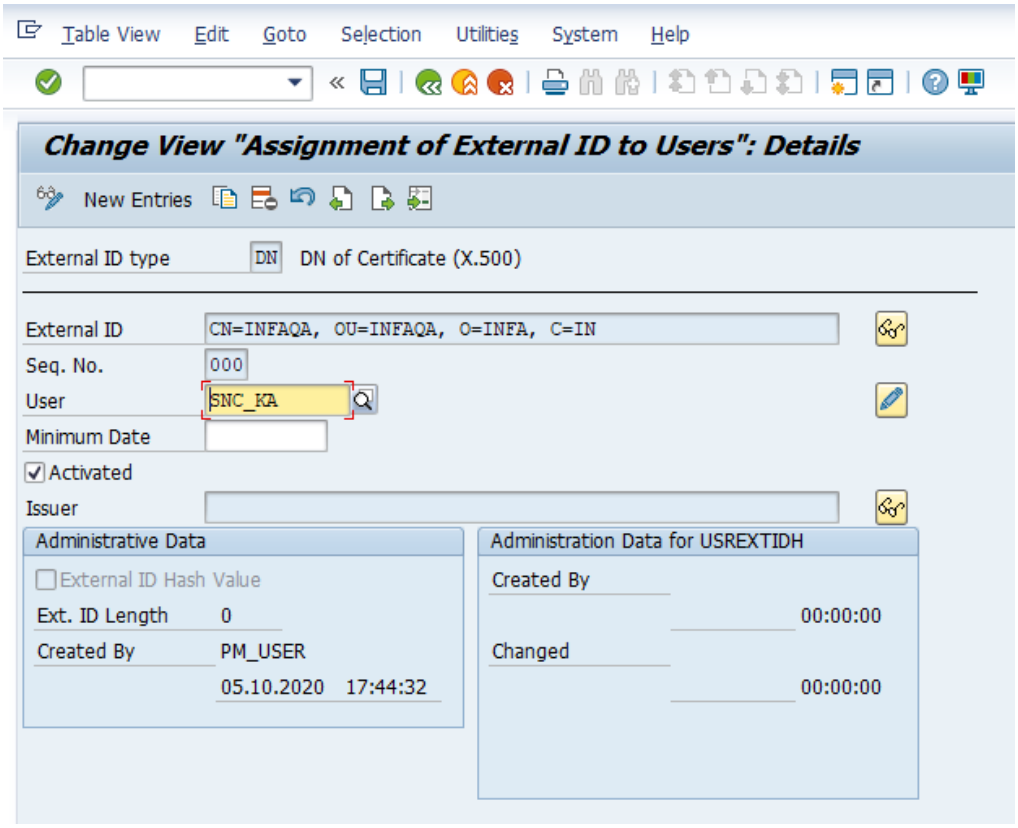


c. Select **New Entries**.



d. Enter the following details:

- **User**. The user that the client uses to connect to the SAP server.
- **Sequence Number**. The SAP client number.
- **SNC Name**. The DN associated with the client PSE.
- **Activated**. Select this option.



e. Save the data.

Configuring the SNC parameters for the connector

Configure the SNC parameters based on the connection type.

Configuring the SNC parameters in the sapnwrfc.ini file

For SAP BAPI/RFC Interface and SAP Table Connectors, configure the SNC parameters in the sapnwrfc.ini file.

1. Open the `sapnwrfc.ini` file.
2. Add the following parameters in the `sapnwrfc.ini` file to enable the SNC protocol and secure communications between Cloud Data Integration and SAP:
   - SNC_MODE = 1
   - SNC_QOP = 3
   - SNC_MYNAME = p:CN=<common name>, OU=<organizational unit>. This is the SNC name of the machine on which the Secure Agent is installed.
   - SNC_PARTNERNAME = p:CN=<common name>, OU=<organizational unit>, OU=SAP Web AS, O=<organization>, C=<country>. This is the SNC name of the SAP system.
   - SNC_LIB =`<Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin/<library_file_name>`
3. Add the following entry for the SAP gateway service that you want to use:

   ```
   sapgw <system number> <port number of gateway service>/tcp
   ```

Configuring the SNC parameters in the connection properties

For SAP BAPI and SAP BW Connectors, you must configure the SNC parameters in the connection properties.

You can configure SNC for the following logon types in both the application and load balancing connections:

- X.509 certificate: Log in with SNC encryption using the X.509 certificate.
- Single sign on: Log in using the SAP credentials. The SAP user must be configured for SSO in the SAP server. When you use this log in type, you are not required to provide the SAP user password in the SAP connection.

1. Open the connection.
2. To enable the SNC protocol and secure communications between Cloud Data Integration and SAP, specify the parameters based on the connection type:
   a. To use the application connection with SNC and single sign on, specify the following parameters:
      - SNC_MODE = 1
      - SNC_QOP=3
      - SNC_MYNAME = p:CN=<common name>, OU=<organizational unit>. This is the SNC name of the machine on which the Secure Agent is installed.
      - SNC_PARTNERNAME = p:CN=<common name>, OU=<organizational unit>, OU=SAP Web AS, O=<organization>, C=<country>. This is the SNC name of the SAP system.
      - SNC_LIB = <Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin/<libsapcrypto.so for Linux/sapcrypto.dll for Windows>

   b. To use the application connection with SNC and X.509 log on, specify the following parameters:
      - SNC_MODE = 1

- SNC_QOP=3
- SNC_MYNAME=p:CN=<common name>, OU=<organizational unit>, O=<organization>, C=<country> This is the SNC name of the machine on which the Secure Agent is installed.
- SNC_PARTNERNAME= p:CN=<common name>, OU=<organizational unit>, OU=SAP Web AS, O=<organization>, C=<country>. This is the SNC name of the SAP system.
- SNC_LIB =<Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin/<libsapcrypto.so for Linux/sapcrypto.dll for Windows>
- X509CERT=MIIC8TCCAdkCCAogIAkiCAhIMA0GCSqGSIb3DQ (…)

c. To use the load balancing connection with SNC and single sign on, specify the following parameters:

- MSHOST= <Message server hostname>
- GROUP=PUBLIC
- R3NAME=SLT
- SNC_MODE=1
- SNC_QOP=3
- SNC_MYNAME= p:CN=<common name>, OU=<organizational unit>, O=<organization>, C=<country> This is the SNC name of the machine on which the Secure Agent is installed.
- SNC_PARTNERNAME= p:CN=<common name>, OU=<organizational unit>, OU=SAP Web AS, O=<organization>, C=<country>. This is the SNC name of the SAP system.
- SNC_LIB =<Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin/<libsapcrypto.so for Linux/sapcrypto.dll for Windows>

d. To use the load balancing connection SNC and X.509 log on, specify the following parameters:

- MSHOST= <Message server hostname>
- GROUP=PUBLIC
- R3NAME=SLT
- SNC_MODE=1
- SNC_QOP=3
- SNC_MYNAME= p:CN=<common name>, OU=<organizational unit>, O=<organization>, C=<country> This is the SNC name of the machine on which the Secure Agent is installed.
- SNC_PARTNERNAME= p:CN=<common name>, OU=<organizational unit>, OU=SAP Web AS, O=<organization>, C=<country>. This is the SNC name of the SAP system.
- SNC_LIB =<Secure Agent installation directory>/apps/Data_Integration_Server/ext/deploy_to_main/bin/<libsapcrypto.so for Linux/sapcrypto.dll for Windows>
- X509CERT=MIIC8TCCAdkCCAogIAkiCAhIMA0GCSqGSIb3DQ (…)

3. Add the following entry for the SAP gateway service and message server that you want to use:

- `sapgw <system number> <port number of gateway service>/tcp`
- `Sapms <System SID> <port number of gateway service>/tcp`

Troubleshooting SNC connection errors

The following error displays when I test a connection configured with the SNC parameters in a task:

```
No suitable SAP user found for X.509-client certificate
```

In the VUSREXTID view of the SM30 transaction, configure a mapping between the SAP user and the SNC name that is provided in the X509 certificate. After you configure the mapping, choose the external ID type as DN.

The following error displays when I test a connection configured with the SNC parameters in a task:

```
SNC name of the partner system not in ACL system
```

In the VSNCSYSACL view, maintain the SNC names of the system from which the RFC and CPIC connections that need to be accepted for the ACL entry of External type.

The following error displays when I test a connection configured with the SNC parameters in a task:

```
Syntax error in received X.509 client certificate (Base64 encoding)
```

When you enter the value of the X509CERT parameter in the connection, ensure that the parameter value is in a single line.

Example:

X509CERT=MIIC5zCCAc8CCAogIQQEETRSMA0GCSqGSIb3DQEBCwUAMDYxCzAJBgNVBAYTAklO (…)

Note: Copy the parameter value to a text editor. In the text editor, arrange the characters of the value in a single line, and then copy the value from the text editor to enter for the X509CERT parameter.

The following error displays when I test a connection configured with the SNC parameters in a task:

```
No credentials were supplied Unable to establish the security context target (...)
```

Generate a credential file for the operating system user who starts the Secure Agent.

To generate a credential file in the Secure Agent, run the following command:

```
sapgenpse seclogin -p <Name of the PSE certificate that was created on the machine on which the Secure Agent is installed> -x <PIN that is generated with the PSE certificate for the operating system user> -O <Name of the operating system user who starts the Secure Agent>
```

Author

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