Syniti Solutions

SAP RFC Data Extraction using Syniti Replicate

Syniti
info@Syniti.com
www.Syniti.com

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Overview

Syniti Replicate version 10.0 and above supports the extraction of data from SAP ECC and S/4 HANA Systems through the application layer using Remote Function Calls (RFC). In order to use this capability, customers must have the necessary license applied to their Syniti Replicate installation. Supported data extraction objects are as follows: -

SAP ECC Systems

- Tables
- Cluster Tables
- Pooled Tables
- Long Texts
- Global & Local Queries

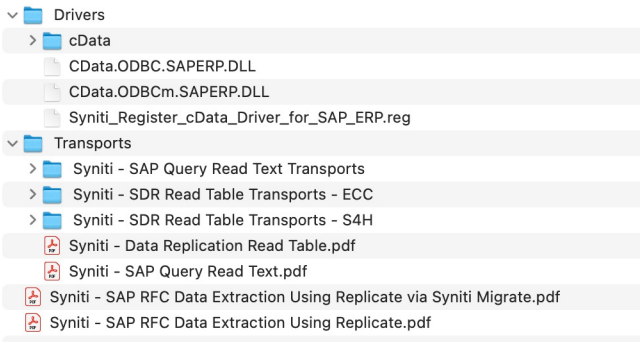
SAP S/4 HANA Systems

- Tables
- Views
- Long Texts
- Global & Local Queries

Customers that need to extract data from SAP ECC and S/4 HANA Systems using Syniti Replicate should raise a Syniti Support request for a SAP RFC Extraction for Syniti Replicate.

NOTE: You must be signed in to the Syniti Support site to submit a request.

Syniti support will provide a download link to the file 'SAP RFC Extraction for Syniti Replicate.zip'. This file includes the following artifacts:



1. SAP RFC Data Extraction Using Syniti Replicate User Guide (this document)
    i. Document Syniti - SAP RFC Data Extraction Using SDR.docx

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2. SAP ERP Driver Registration
    i. Windows Registry file Syniti_Register_cData_Driver_for_SAP_ERP.reg

3. Custom SAP Read Table Function
    i. Overview document Syniti - Data Replication Read Table.docx
    ii. Transport RD2K9A011P for SAP ECC6 SAP Basis 700 - 731
    iii. Transport DCSK900470 for SAP ECC6 SAP Basis 740 and higher
        a. Containing Function /BOA/SDR_READ_TABLE
    iv. Transport S4DK900435 for SAP S/4 HANA 1709 (S4CORE 102) and higher
        a. Containing Function /BS4/SDR_READ_TABLE
4. SAP Long Text Extract Query
    i. Overview document Syniti – SAP Query Read Text.docx
    ii. Install Transport DCSK900570 for SAP ECC6 SAP Basis 700 and higher & S/4 HANA 1709 (S4CORE 102) and higher
        a. Containing SAP Query BOAQ_READ_TEXT in User Group /BOA/QUERY

Commented [JG1]: @Andrew Lund I don't believe this is the correct name space for S/4

Prerequisites

Extracting data from SAP ECC and S/4 HANA Systems using Syniti Replicate requires software to be installed on the application server running Syniti Replicate and the SAP Application from which data is being extracted.

Syniti Replicate Windows Application Server

To use the Syniti Replicate SAP NetWeaver Extract database type, the SAP NetWeaver RFC SDK must be installed on the application server running Syniti Replicate. The following libraries from the RFC SDK must be available at run time:

- sapnwrfc.dll
- icudt30.dll
- icuin30.dll
- icuuc30.dll
- libicudecnumber.dll
- libsapucum.dll

NOTE: Details explaining how to download the SAP NetWeaver RFC SDK can be found at the following location:

https://support.sap.com/en/product/connectors/nwrfcsdk.html

NOTE: The Syniti Replicate Application Server **MUST** have .Net Framework 3.5 and Windows Visual Studio 2013 C++ installed.

NOTE: After installing the SAP NetWeaver RFC SDK, the installation location must be added to the PATH System Environment Variables.

NOTE: It is important that the above installations are all aligned to the correct 64 bit processing capability as SDR is a 64bit application and will rely on the .Net Framework, Windows Visual Studio 2013 C++ and SAP NetWeaver RFC SDK being aligned to 64bit. If not, then errors will occur when testing the connectivity either directly via 64 bit ODBC connections or via SDR.

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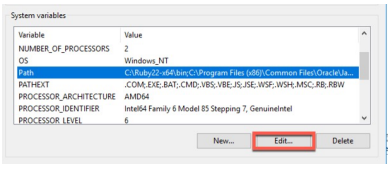
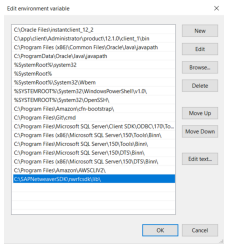
Example





Setup Steps to Extract Data from SAP Systems

1. Download zip file SAP RFC Extraction for Syniti Replicate.zip onto Syniti Replicate application server.
2. Install cData Driver for SAP ERP.
3. Register cData Driver for SAP ERP.
4. Install Custom Read Table Function on SAP Application.
5. Install SAP Query for Extracting Long Texts on SAP Application.

Download zip file SAP RFC Extraction for Syniti Replicate to Application Server

Download and unzip file SAP RFC Extract for Syniti Replicate.zip onto the Windows Server where Syniti Replicate is installed. Before unzipping the file, check the properties of the zip file to ensure it's not blocked. If it is, check the Unblock flag and click apply.

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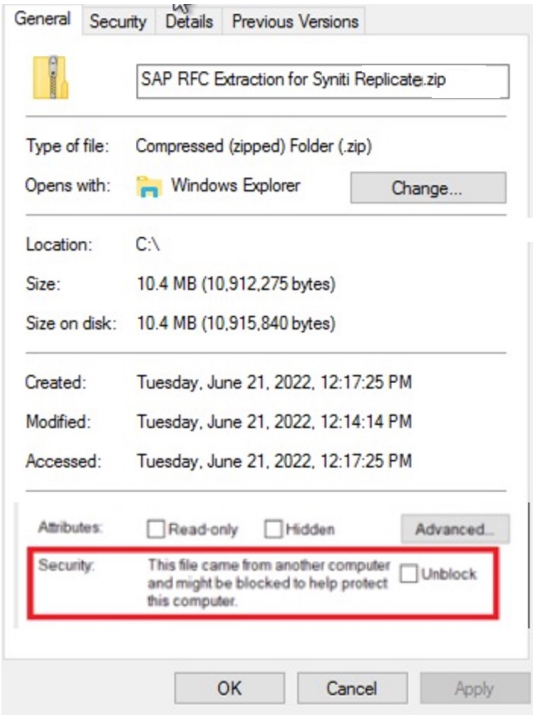

The folder structure of the unzipped file should look as follows:

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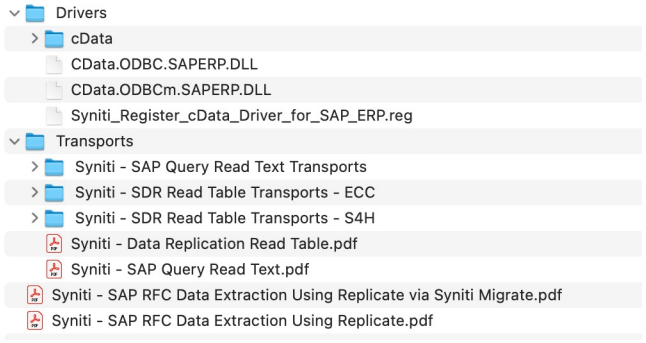
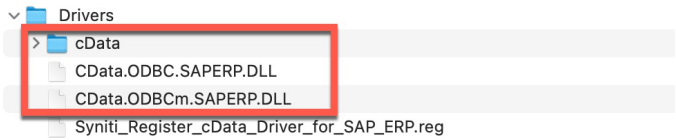


Install CData Driver for SAP ERP

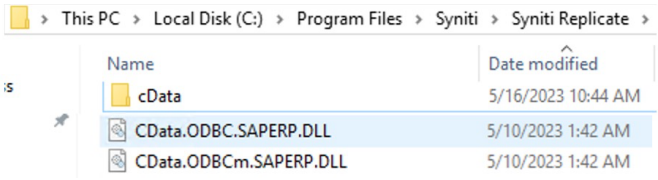
To install the CData Driver for SAP ERP:

1. Copy folder CData and 2 CData DLLs highlighted below from extracted folder 'SAP RFC Extraction for Syniti Replicate'.



2. Paste the folder into the location where Syniti Replicate was installed. By default, Syniti Replicate is installed in the following location: -

   C:/Program Files/Syniti/Syniti Replicate



Register CData Driver for SAP ERP

To register the CData Driver for SAP ERP:

1. A Windows Registry file Syniti_Register_cData_Driver_for_SAP_ERP.reg file is available in the zip file.

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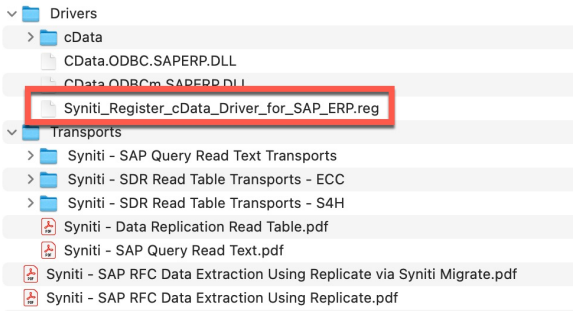
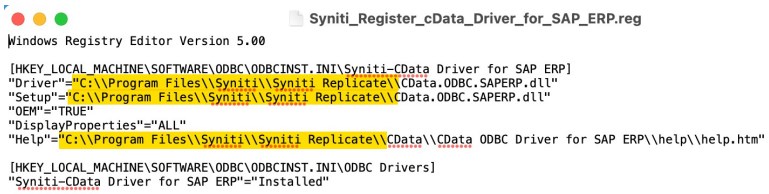
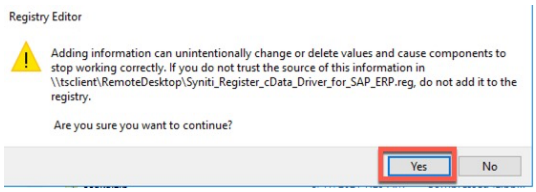


2. The Syniti_Register_cData_Driver_for_SAP_ERP.reg file expects that the driver files have be copied to the default Syniti Replicate installation location. If Syniti Replicate has been installed in a different location, then the highlighted file paths below will need to be modified.



To register the CData Driver for SAP ERP:

3. Double-click the Syniti_Register_cData_Driver_for_SAP_ERP.reg file
4. When prompted, confirm that you want to update the registry.



Install Custom Read Table Function on SAP Application

To efficiently extract table / view data from SAP ECC and S/4HANA Systems using Syniti Replicate, custom read table function SDR_READ_TABLE must be installed on the SAP system.

Transport RD2K9A011P contains the version of the function for SAP ECC6 SAP Basis 700 – 731.

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Transport DCSK900470 contains the version of the function for SAP ECC6 SAP Basis 740 and higher.
Transport S4DK900435 contains the version of the function for SAP S/4HANA 1709 (S4CORE 102) or higher.

Install the required version of the function using the standard SAP Transport import process.

Document Syniti - Data Replication Read Table.docx provides an overview of the contents of the specified SAP Transports.

Install SAP Query for Extracting Long Texts on SAP Application

To extract long text data from SAP ECC and S/4HANA Systems using Syniti Replicate, install SAP Query BOAQ_READ_TEXT in User Group /BS4/QUERY on the SAP system.

Transport DCSK900570 contains the SAP Query that is compatible with SAP ECC & S/4HANA.

Document Syniti – SAP Query Read Text.docx provides an overview of the contents of the specified SAP Transports.

Extracting Data using SAP NetWeaver Extract Database Type

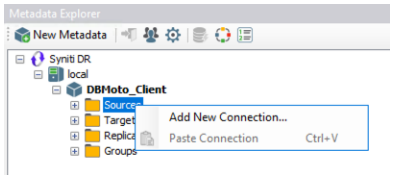
This section of the document provides detailed steps to:

1. Set Up a Connection to an SAP Application
2. Extract Data from a Single Table
3. Extract Data from Multiple Tables
4. Extract Long Texts

Set Up a Connection to an SAP Application

To set up the connection:

1. Right-click the **Sources** folder as shown below and choose **Add New Connection**.



NOTE: The Add Source Connection Wizard opens.

2. Click **Next.**

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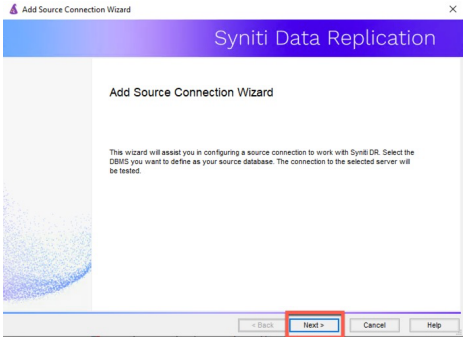
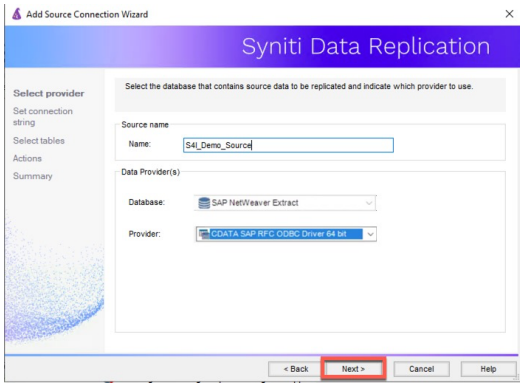


3. Enter a **Name** for the Source Connection.
4. Select **SAP NetWeaver Extract** from the **Database** list box.
5. Select **CData SAP RFC ODBC Driver 6.4 bit** from the **Provider** list box.
6. Click **Next**.



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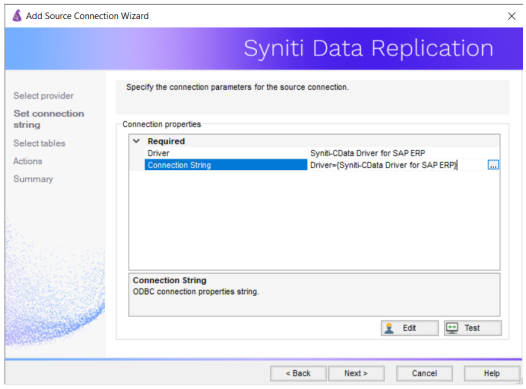
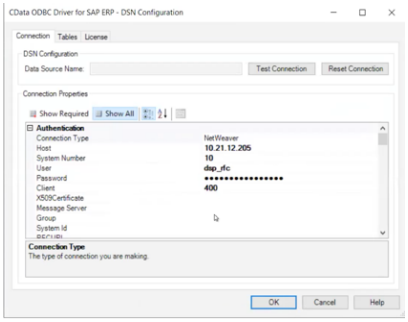


7. Click the connection properties and configure the connection.

The CData ODBC Driver for SAP ERP DSN configurator opens.



The table below defines the available CData ODBC SAP ERP driver connection properties along with recommended values to be used for particular properties.

YELLOW = Syniti recommended changes to default values
GREEN = SAP connection information that may or may not need to be populated based upon requirements

Group	Property	Recommended Value
Authentication	ConnectionType	NetWeaver
Authentication	Host	{Enter SAP Host or Message Server}
Authentication	SystemNumber	{Enter SAP System Number}

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Group	Property	Recommended Value
Authentication	User	{Enter SAP RFC Username}
Authentication	Password	{Enter SAP RFC User Password}
Authentication	Client	{Enter SAP Client}
Authentication	X509Certificate	
Authentication	MessageServer	{Enter SAP Host or Message Server}
Authentication	Group	{Enter Group if using Message Server}
Authentication	SystemId	{Enter SAP System ID}
Authentication	RFCURL	
Authentication	MessageServerService	
Caching	AutoCache	FALSE
Caching	CacheProvider	
Caching	CacheConnection	
Caching	CacheLocation	%APPDATA%\CData\SAPERP Data Provider
Caching	CacheTolerance	600
Caching	Offline	FALSE
Caching	CacheMetadata	FALSE
Firewall	FirewallType	NONE
Firewall	FirewallServer	
Firewall	FirewallPort	0
Firewall	FirewallUser	
Firewall	FirewallPassword	
Logging	Logfile	
Logging	Verbosity	1
Logging	LogModules	
Logging	MaxLogFileSize	100MB
Logging	MaxLogFileCount	-1
Misc	Charset	
Misc	Destination	
Misc	EndianType	Auto

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Group	Property	Recommended Value
Misc	GatewayHost	{Populate if SAP Gateway is used}
Misc	GatewayService	{Populate if SAP Gateway is used}
Misc	GenerateSchemaFiles	Never
Misc	InitialValueMode	InitialValue
Misc	Language	EN
Misc	Location	
Misc	MaxRows	-1
Misc	Other	{Populate with TrimStrings property to change the way leading and trailing spaces are handled – see appendix for further details}
Misc	Pagesize	25000
Misc	PseudoColumns	*=*
Misc	QueryMode	Global
Misc	ReadTableFunction	/BOA/SDR_READ_TABLE (SAP ECC Systems) /BS4/SDR_READ_TABLE (SAP S/4 HANA Systems)
Misc	RTK	
Misc	StoredProcedureFilter	BAPI*
Misc	SupportEnhancedSQL	TRUE
Misc	TableMode	(NOT TABNAME LIKE '%/%' AND (TABCLASS = 'TRANSP' OR TABCLASS = 'POOL' OR TABCLASS = 'CLUSTER') AND CONTFLAG <> 'L')
Misc	Timeout	60
Misc	UseLabels	FALSE
Misc	UseUnicodeRFC	TRUE
Misc	UseSimpleNames	FALSE
Misc	DefaultDomain	
Misc	EnableForeignKeyDetection	FALSE
Misc	IncludeDualTable	FALSE
Misc	LimitKeySize	255
Misc	MapBigintToVarchar	FALSE
Misc	MapToInt	FALSE

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Group	Property	Recommended Value
Misc	MapToLongVarchar	-1
Misc	MapToWVarchar	TRUE
Misc	MaximumColumnSize	16000
Misc	UpperCaseIdentifiers	FALSE
Proxy	ProxyAutoDetect	TRUE
Proxy	ProxyServer	
Proxy	ProxyPort	80
Proxy	ProxyAuthScheme	BASIC
Proxy	ProxyUser	
Proxy	ProxyPassword	
Proxy	ProxySSLType	Auto
Proxy	ProxyExceptions	
Schema	BrowsableSchemas	
Schema	Tables	
Schema	Views	
Security	SNCMode	{Set to True if SNC Used} {See Appendix 3}
Security	SNCName	{Populate if SNC is used}
Security	SNCQop	{Populate if SNC is used}
Security	SNCPartnerName	{Populate if SNC is used}
Security	SNCLibPath	{Populate if SNC is used}
SSL	SSLServerCert	

See **Appendix 1** for further details regarding connection properties.
See **Appendix 3** for further details regarding SNC connectivity setup.

NOTE: Typically, Syniti Replicate runs a Select 1 Count(*) from {Table} before running a replication. This allows the replication to track the % completion. When extracting from the SAP application layer, this is an expensive operation as this query can't be pushed down to the database. Therefore, this functionality should be disabled. To disable the functionality:

8. Right-click the SAP Source Connection and select **Connection Properties**.

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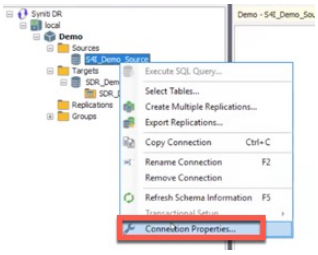
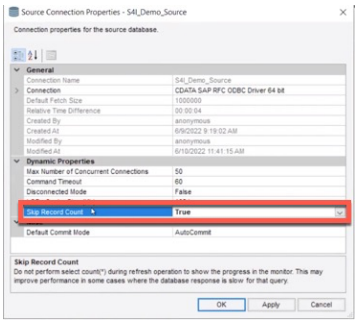


9. Set the **Skip Record Count** property to **True**.



Extracting Data from a Single Table

To extract data from a single table, follow these steps:

1. Import Table Metadata into Syniti Replicate
2. Create Table in Target Data Source
3. Create Replication for Single Table

Step 1: Import Table Metadata into Syniti Replicate

1. Right-click the Source Connection that represents the SAP System where data is being extracted and choose **Select Tables**.

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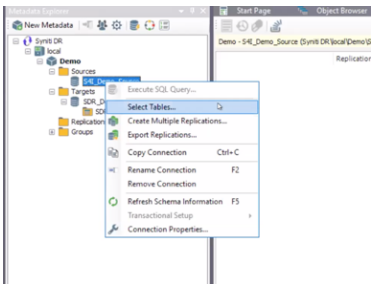
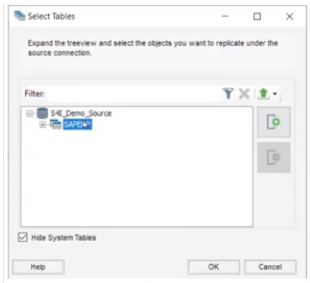


2. In the Select Tables dialog box, expand the Source navigation tree (S4I_Demo_Source) and then click the schema called **SAPERP**.

Tip: Avoid expanding the navigation tree below the SAPERP schema. If you expand it, the system attempts to load all the tables defined by the 'TableMode' connection property and could take a few minutes to complete**.**



3. Select the specific table that needs to be extracted by entering the name in the **Filter** field and then clicking the **Apply Filter** icon.

Tip: Append % to the first characters of a table to retrieve a list of tables that begin with specific characters.

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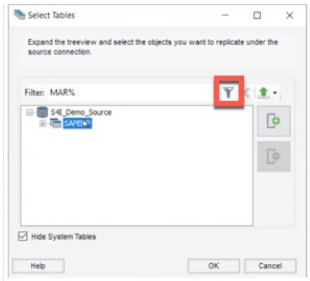
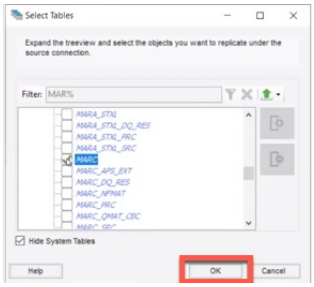


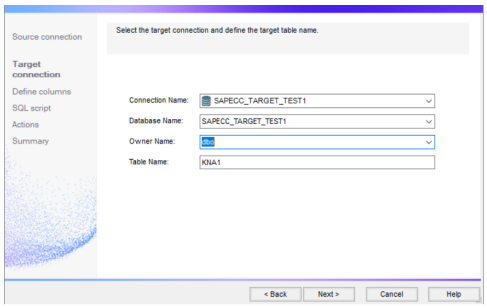
4. Select the table(s) that need to be imported into the Source Connection table metadata store and click **OK**.



NOTE: This action may take 10 – 15 seconds to complete.

Step 2: Create Table in Target Data Source

1. Drag the source table to the target to open the Create Target Wizard.



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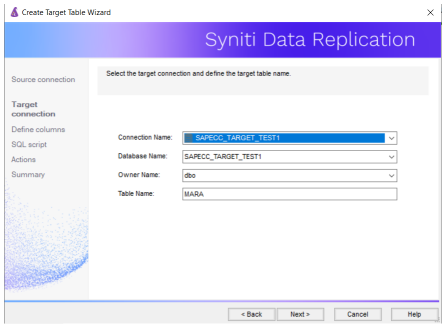
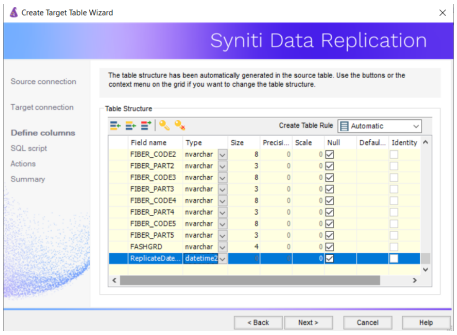
2. Click **Next** twice to reach the Target Connection Details form, and populate the **Database Name**, **Owner Name** and **Table Name** and click **Next**.



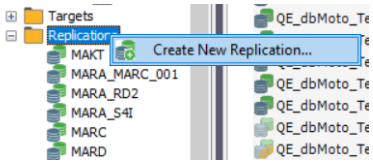
3. In the Table Structure form, scroll to the bottom to assign the **datetime2** Type to the **ReplicateDateTime** field and click **Next**:



4. Click **Next** twice and then click **Finish**.

Step 3: Create Replication for Single Table

1. Right-click the Replication folder to select the **Create New Replication** option.



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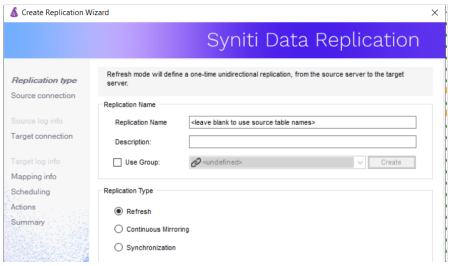
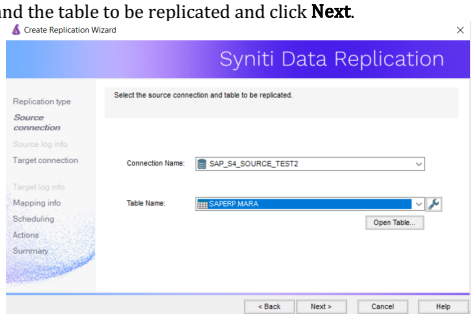
2. Select a replication name or leave it blank. If the name is blank, the System assigns the name of the table as the replication name or adds a counter to it if that name already exists.
3. Leave the **Replication Type** as **Refresh.**

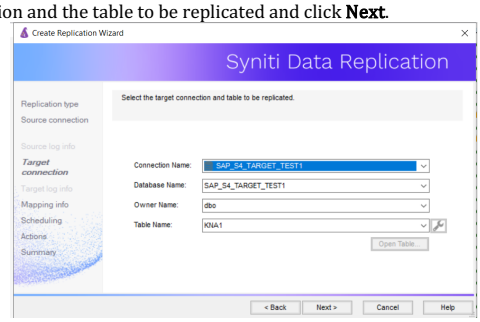


4. Select the source connection and the table to be replicated and click **Next**.



1.

5. Select the target connection and the table to be replicated and click **Next**.



6. Click **Next** in the Mapping form to map all the fields from the source into the target.

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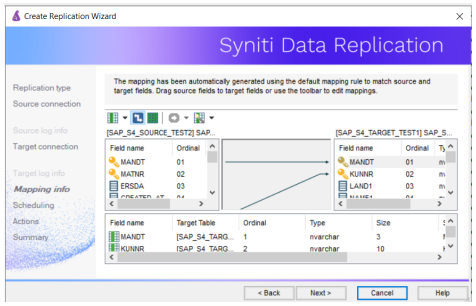
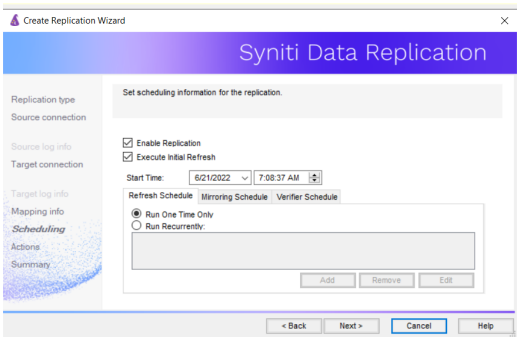


7. Click **Next** to launch the replication immediately.



8. Click **Next** again and **Finish**.

Extracting Data from Multiple Tables

To extract data from multiple tables:

1. Bulk Import Table Metadata into Syniti Replicate
2. Create Replications for Multiple Tables

Step 1: Bulk Import Table Metadata into Syniti Replicate

1. Right-click the Source Connection that represents the SAP System where data is being extracted and choose **Select Tables**.

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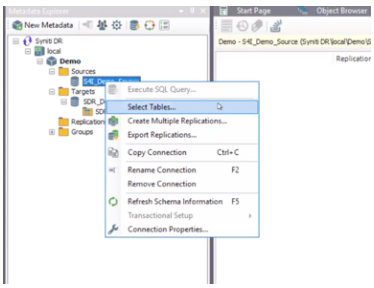
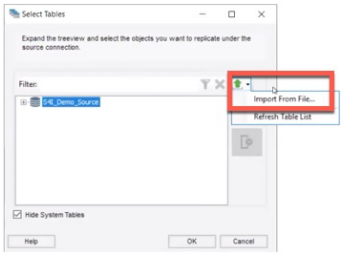
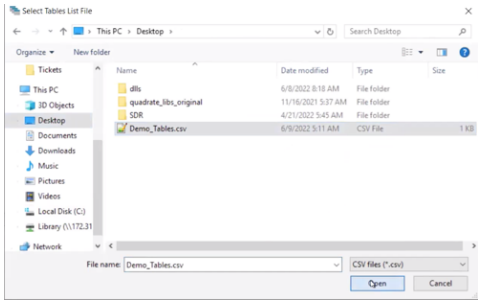


2. On the Select Tables dialog box, click the **Load Tables List** icon and then select **Import from File.**



3. On the Select Table List File dialog box. choose the file that contains the list of comma separate tables to extract.



NOTE: The file being used to import the tables must be in a CSV format as shown in the screenshot below:

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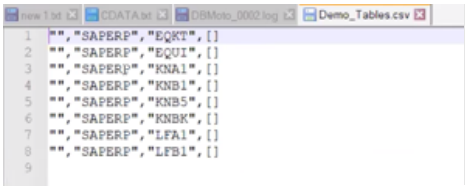
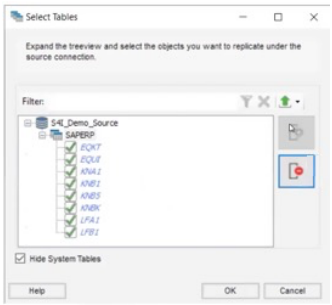


4. Once the file import has been completed, expand the list of tables beneath the SAPERP schema and check that these correspond to the tables in the upload file.

5. Click the **OK** button.



The table metadata will then be imported into Syniti Replicate.

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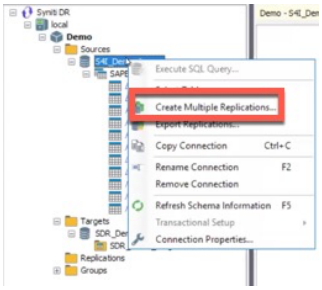
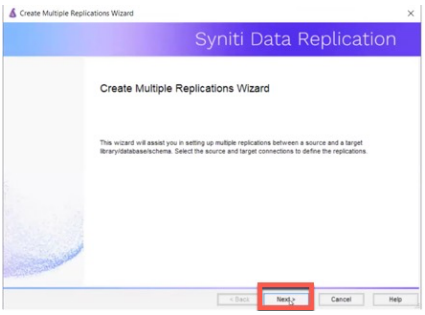
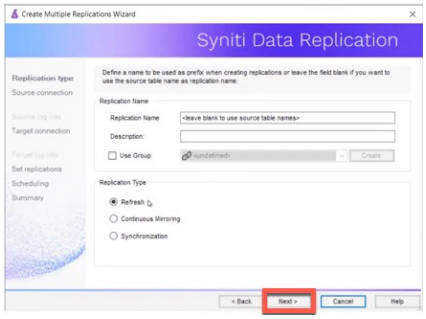
Step 2: Create Replications for Multiple Tables



1. Click **Next**.



2. Click **Next**.



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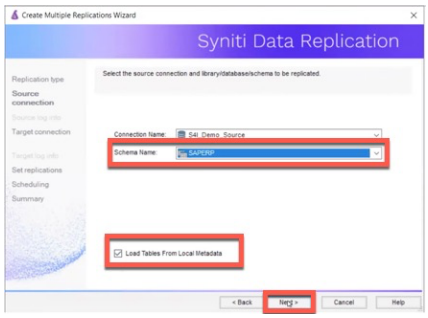
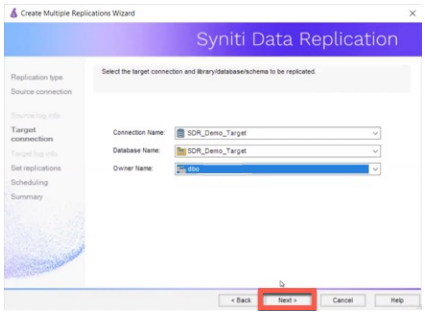
3. Select Schema Name **SAPERP**.
4. Check **Load Table** from **Local Metadata** flag.

IMPORTANT! Checking the Load Table from Local Metadata flag ensures that only the tables for the tables imported from the file in the previous step are available for selection. If you do not check this box, Syniti Replicate browses all the tables in the SAP system.

5. Click **Next**.



6. Select **Connection Name** of **Target Connection**.
7. Select **Database Name** in the **Target Connection**.
8. Select **Owner Name** of **Target Database**.
9. Click **Next**.



10. By default, all the tables in the Source are selected. Choose the items for which a new replication should be created.
11. Click **Next**.

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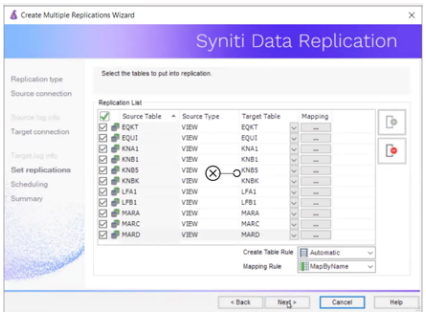
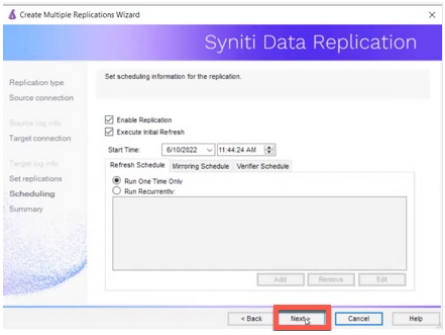


12. Check the **Enable Replication** Flag.
13. Check the **Execute Initial Refresh** Flag.

NOTE: These settings cause the replications to be created and then immediately run.

14. Click **Next**.



15. Click **Start**.

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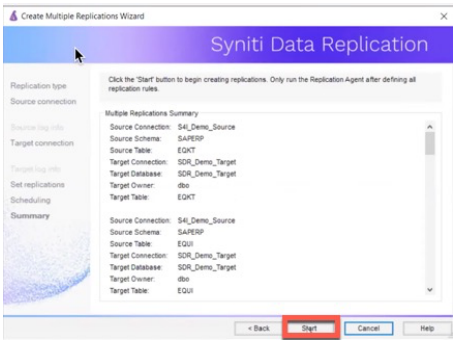
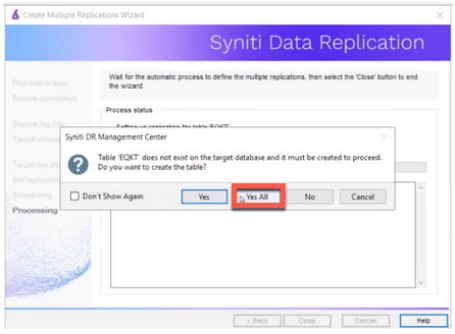


16. If one of the tables selected does not exist in the target database, Syniti Replicate is able to create it automatically. When prompted, it's recommended to select **Yes All.**



The target tables is then created in the target database and the replications are created in Syniti Replicate.

17. Click **Close.**

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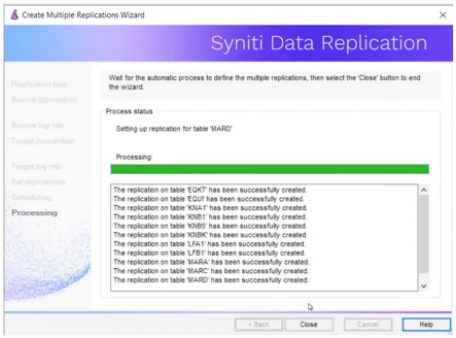
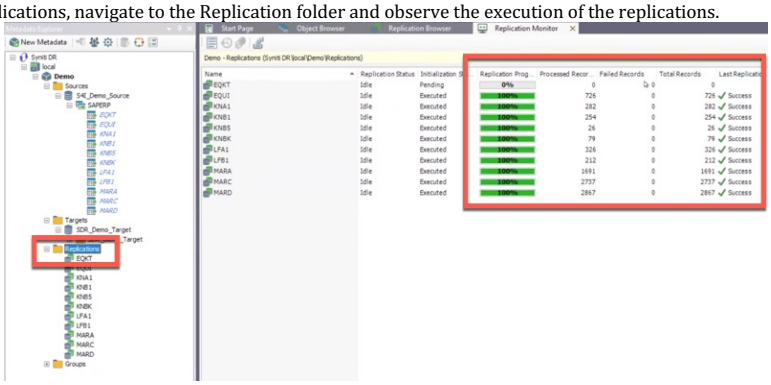


To view the replications, navigate to the Replication folder and observe the execution of the replications.



Extracting Long Texts

To extract long texts:

1. Import Table Metadata into Syniti Replicate
2. Create Long Text Table in Target Data Source
3. Create Long Text Replication

Step 1: Import Table Metadata into Syniti Replicate

1. Right-click the Source Connection that represents the SAP System where data is being extracted and choose **Select Tables**.

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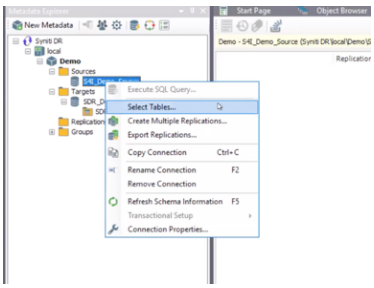
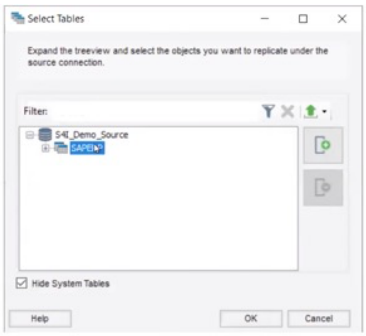


2. On the Select Tables dialog box, expand the Source navigation tree (S4I_Demo_Source) and then click the schema called **SAPERP**.

Tip: Avoid expanding the navigation tree below the SAPERP schema as doing this causes the system to attempt to load all the tables defined by the 'TableMode' connection property and could take a few minutes to complete.



3. Select the specific table to be extracted by entering the name in the **Filter** input field and then click the **Apply Filter** icon.

Tip: Append % to the first characters of a table to retrieve a list of tables that begin with specific characters.

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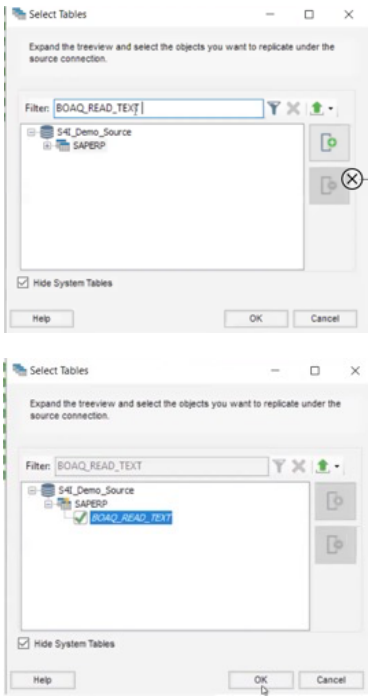

Step 2: Create Long Text Table in Target Data Source

To create a new Long Text table in the target database:

1. Drag and drop the **BOAQ_READ_TABLE** source table onto the target data source.

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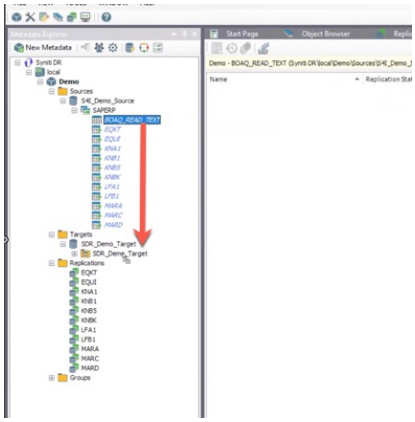
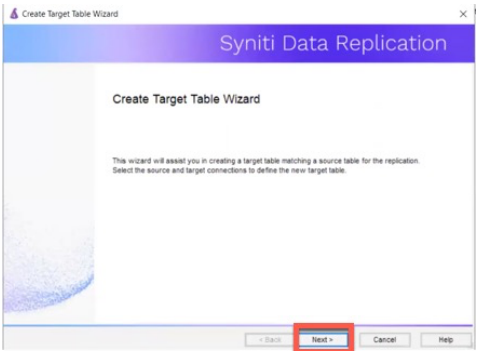


2.On the 'Create Target Table Wizard', click **Next.**



3. Confirm that the source connection name and source table name are correct.
4. Click **Next**.

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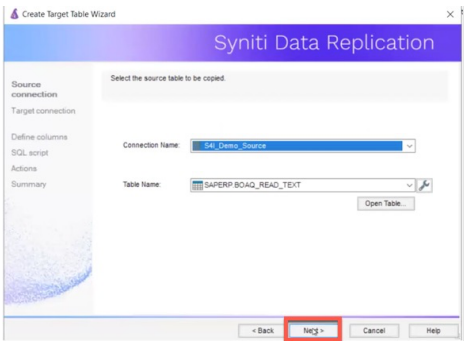
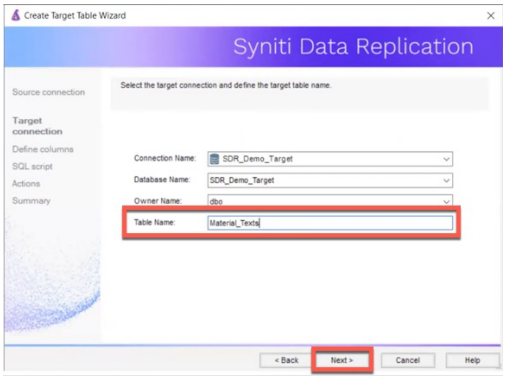


3. Confirm that the target connection name, database name and owner name are correct.
4. By default, the target table name will be BOAQ_READ_TEXT. It's recommended that this table name is changed to something that represents the specific long texts being extracted.

NOTE: It's likely that several different long text extracts will be needed for different data objects.

5. Click **Next.**



The details of the table to be created display.

6. Click **Next.**

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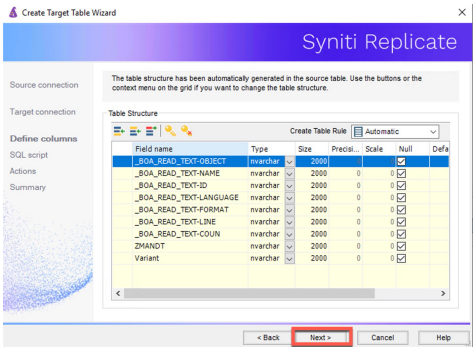
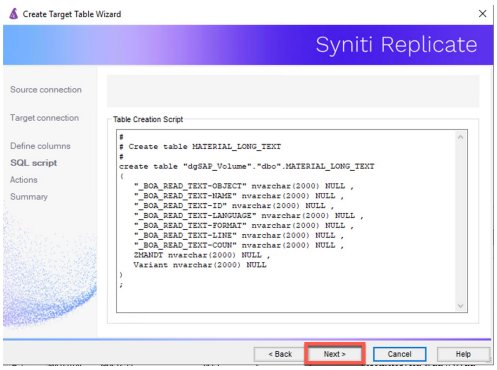


The create table SQL statement displays.

7. Click **Next.**



The long text table is created in the target database specified.

Step 3: Create Long Text Replication

To create the replication:

1. Right-click the Replication folder and select **Create New Replication**.

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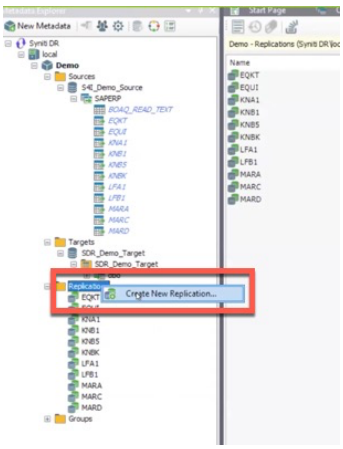
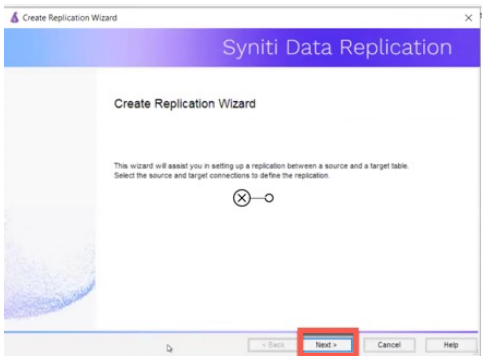


2. Click **Next**.



3. Enter the **Replication Name**
4. Click **Next**.

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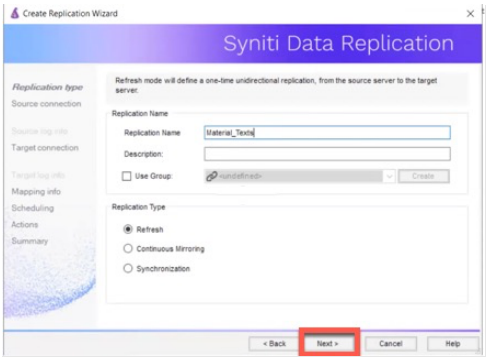
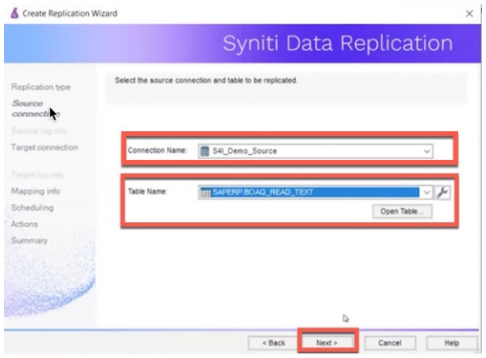


5. Select the Source **Connection Name**
6. Select **Table Name** BOAQ_READ_TEXT
7. Click **Next**.



8. Select the Target **Connection Name** into which the long text data is to be replicated
9. Select **Database Name** into which the long text data is to be replicated
10. Select Schema **Owner Name** into which the long text data is to be replicated
11. Select **Table Name** into which the long text data is to be replicated
12. Click **Next**.

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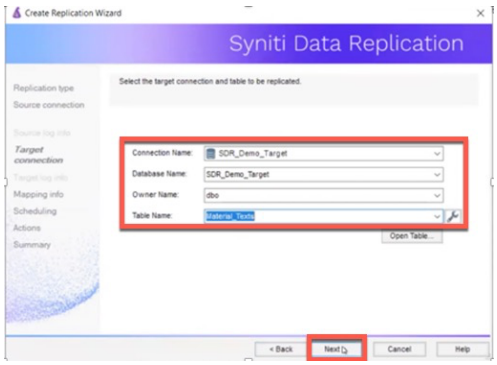
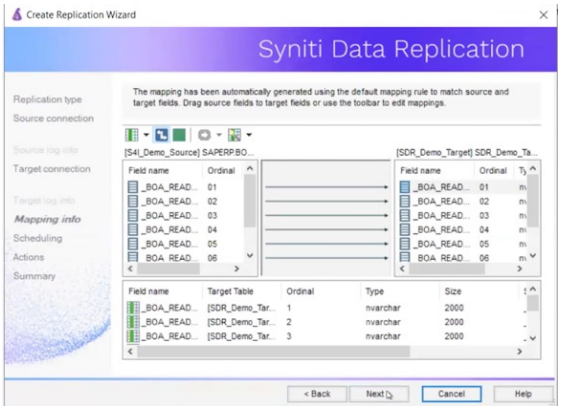


13. Review the mapping information and click **Next**.



Before running an initial extract, a replication where clause to restrict it to a subset of long text records should be added. Therefore, on the next step:

14. Deselect **Enable Replication**.
15. Deselect **Execute Initial Refresh**.
16. Click **Next**.

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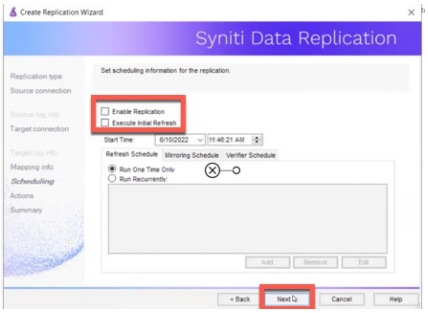
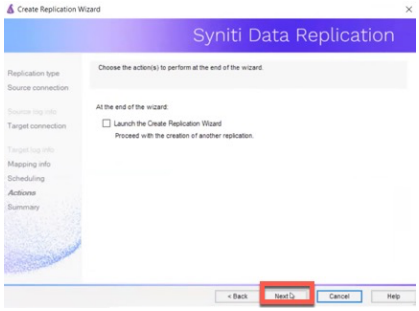
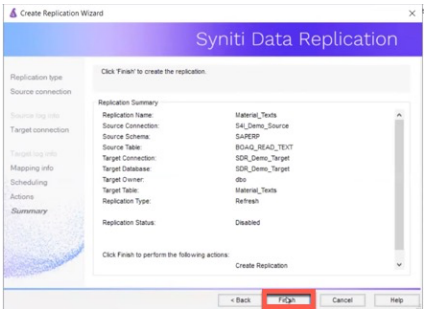


17. Click **Next**.



18. Click **Finish**.



The replication is created, however, its icon is dimmed because it's not enabled.

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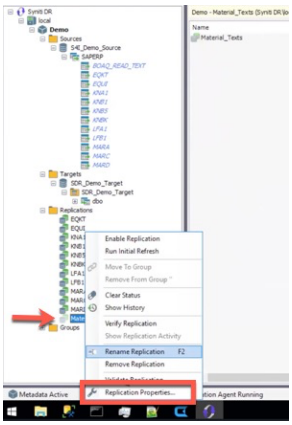
19. To add a where clause to the replication, right-click the replication and select **Replication Properties.**



On the 'Refresh' properties menu item, an extract where clause can be added to the attribute 'Refresh Filter Source'.

Long Text Data Filtering

Option 1: Using a 'where clause' to run a query with a specific Variant

To use this option, a Variant must be created for SAP Query 'BOAQ_READ_TEXT' in User Group /BOA/QUERY

Example Where Clause using a Variant

Variant = 'MY_VARIANT'

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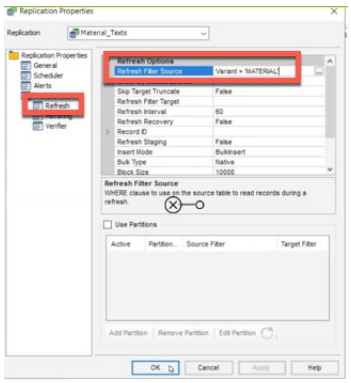

Option 2: Using a 'where clause' to pass in query selection parameters

SAP Query 'BOAQ_READ_TEXT' supports querying on the following selection parameters:

- Text Object: Field Name _BOA_READ_TEXT-OBJECT
- Text Name: Field Name _BOA_READ_TEXT-NAME
- Text ID: Field Name _BOA_READ_TEXT-ID
- Language: Field Name _BOA_READ_TEXT-LANGUAGE

Example Where Clause using Input Parameters

"_BOA_READ_TEXT-OBJECT" = 'MATERIAL' AND "_BOA_READ_TEXT-ID" = 'BEST'

NOTE: Double quotes need to be wrapped around the field names that are used in the where clause.

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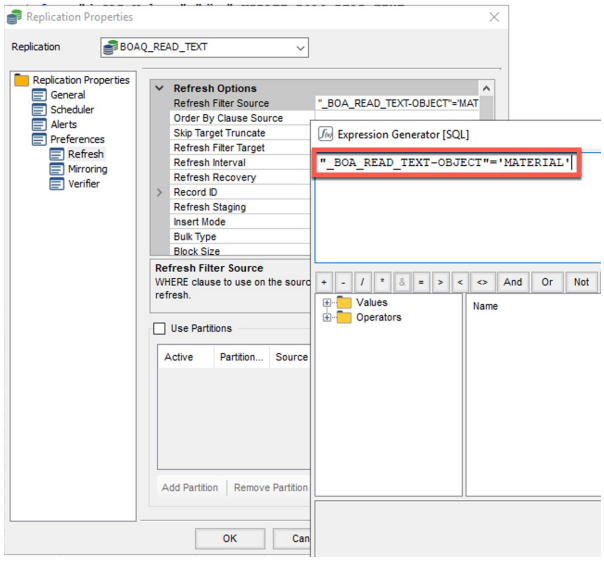

20. Run the long text replication by right-clicking the long text replication and selecting **Enable Replication**.
21. Right-click the long text replication and select **Run Initial Refresh**.

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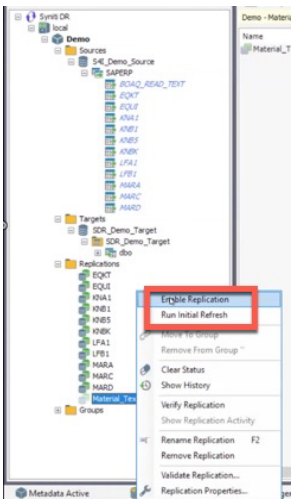
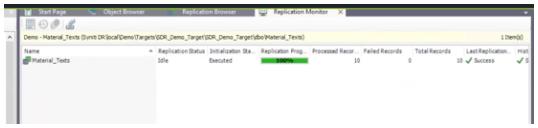


22. When prompted, click **Yes** to confirm that a full refresh should be performed.

The long extract starts to process.



Once the extract is complete, view the extracted long text data by right-clicking the Long Text table under the Target Data Source and choosing **Open Table.**

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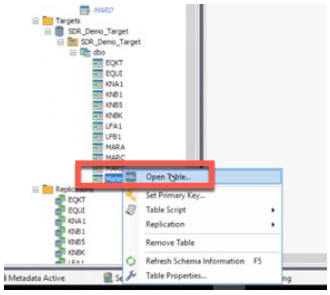

The data extracted should correspond to parameters passed in the where clause or the variant used in the where clause.

Results:

	_BOA_READ_TEXT-OBJ	_BOA_READ_TEXT-NAME	_BOA_READ_TEXT-ID	_BOA_READ_TEXT-LAN	_BOA_READ_TEXT-FORMA	_BOA_READ_TEXT-LINE	_BOA_READ_TEXT-COUN	ZMANDT	Variant
▶	MATERIAL	TKW_1002	BEST	E	*	Semi-Metallic Brake Pads del	1	400	(null)
	MATERIAL	TKW_1002	BEST	E	/	pack. See Contract for com	2	400	(null)
	MATERIAL	TKW_1002	BEST	E	/		3	400	(null)
	MATERIAL	MH80008	BEST	E	*	Long PO description for the	1	400	(null)
	MATERIAL	MH80008	BEST	E	/	all nursing units and many d	2	400	(null)
	MATERIAL	MH81008	BEST	E	*	Long PO Description for Forc	1	400	(null)
	MATERIAL	MH81008	BEST	E	/	contain more detailed inform	2	400	(null)
	MATERIAL	MHS1623	BEST	E	*	Zimmer, 4022-00-45, Zimme	1	400	(null)
	MATERIAL	MHS1623	BEST	E	/	Fenestrated Stem 45mm x 1	2	400	(null)
	MATERIAL	000000000000000183	GRUN	E	*	This is a test	1	400	(null)
	MATERIAL	000000000000014563	GRUN	E		Test	1	400	(null)

Appendix 1 – Important Connection Property Details

TableMode

The value entered here represents the filter criteria that is applied to SAP data dictionary table DD02L to extract the scope of tables available for extraction.

This statement can be altered to add some additional tables e.g., cluster / pooled or views e.g., (NOT TABNAME LIKE '%/%' AND TABCLASS = 'TRANSP' AND (CONTFLAG = 'A' OR CONTFLAG = 'C' OR CONTFLAG = 'G' OR CONTFLAG = 'E' OR CONTFLAG = 'S' OR CONTFLAG = 'W')) OR TABNAME = 'PAPPINSVH'

Using criteria that select more tables than recommended may cause performance issues when performing operations that browse the SAP metadata.

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PageSize

This property defines the number of records that will be extracted per RFC call. The recommended default value is 25000, however, this can be adjusted. Using a higher value may reduce extraction times, however, if the value is too large, then extracting tables with lots of columns may fail due to lack of temporary memory on the SAP application side.

QueryMode

The SAP Query to extract long text BOAQ_READ_TEXT is a global query, hence by default it's recommended to use value Global. However, if Local queries are created, then this value can be set to ALL.

NOTE: If there are queries with names that overlap with standard SAP tables or queries with the same name but in different User Groups then this may be problematic and hence should be avoided if possible.

TrimStrings

This property provides control of how leading and trailing spaces are handled on extracted data. The options are: -

- TrimAll - Trim the leading and trailing spaces of the string value.
- TrimLeft - Trim the leading spaces of the string value.
- TrimRight - Trim the trailing spaces of the string value.
- None – Do not trim any spaces of the string value

The TrimStrings connection property is populated within the driver property 'Other' e.g. Other=TrimStrings=TrimRight. If no value is provided for this property, the default behavior is TrimAll - Trim the leading and trailing spaces of the string value.

InitialValue

This property controls how Blank versus NULL values are handled. By default, it's recommended that value InitialValue is used. This writes a <Blank> value to a table field with no data. This value can be changed to NULL if the value written should be NULL.

NOTE: If there are columns that are primary keys that have <Blank> values then using value NULL will cause the extract to fail.

Views

This property allows a subset of the tables returned by the TableMode criteria to be restricted in the metadata extract.

Appendix 2 – Troubleshooting

If there are data extraction errors that can't be resolved through the usual Syniti Replicate logs, it's possible to activate detailed logging in the CData Driver for SAP ERP. This can be done by setting the following connection properties:

- Logfile -> Enter the location and filename of the log file e.g. C:\SDR\Debuglog.txt
- Verbosity –> Enter value 3

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Logging	
Logfile	C:\SDR\Debuglog.txt
Verbosity	3

Known Issue 1: Maximum ODBC Connection String Exceeded

When creating a connection using the properties in SDR, there is a limit to maximum connection string length. This limit is 1032 characters. Therefore, deviating from the recommended property values may cause the character limit to be exceeded and hence cause problems.

To get around this issue it's possible to create a DSN record and then reference this DSN directly in the SDR connection.

Known Issue 2: Performance Problems when CData Ingests SAP Metadata

On some deployments we have found an issue where the Replicate Service memory consumption rises a very large amount (4 to 5GB +) at certain intervals when running SAP NetWeaver based replications using the CData connection type. The issue is caused by CData caching the SAP table and field metadata every hour based on the default settings of the driver. Once the caching is complete the performance and memory usage returns to the pre-caching levels. A side effect of the caching can be that replications look to be in a pending state until the caching is complete.

To resolve this issue, you can change the caching refresh period from 60 mins to 24 hours by adding the following parameter string to the **other** parameter under the advanced settings.

SchemaCacheDuration=86400

It is then recommended to schedule an SAP replication to run once every 24 hours so that the caching is performed once a day and won't be retriggered during the snapshot or replication window.

Appendix 3 – SNC Configuration

This section details the steps to configure a Secure Network Communications (SNC) connection between a Replicate Server installed on Windows and an SAP ECC or S/4HANA server. This is an advanced topic, and an experienced SAP Basis resource will be required.

The SAP side of the configuration is typically the responsibility of the SAP Basis team. The steps for configuring different versions of SAP may differ so the steps below are intended for guidance only.

NOTE: The SAP server must have SNC enabled.

Download and Extract the Files

To download and extract the files:

1. Retrieve the SAP Cryptographic Library files. The latest version can be downloaded from the SAP Marketplace. Download:
    - `SAPCAR.EXE`—Utility to uncompress `.SAR` files

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- SAPCRYPTOLIBP_<version number>.SAR - Compressed file with the SAP crypto library, for example `SAPCRYPTOLIBP_8536-20011729.SAR`.

2. On the Replicate server, create a folder for the Cryptographic Library, for example `C:\SAP_SNC`.

3. Copy the files downloaded in step 1 to this folder.
4. Extract the files from the `.SAR` file by executing the SAPCAR application. Open a command prompt with Administrator privileges.
5. Move to the `C:\SAP_SNC` folder and run the following command:

   ```
   sapcar -xvf SAPCRYPTOLIBP_8536-20011729.sar
   ```

   NOTE: Eight files are extracted, including the `sapcrypto.dll` and `sapgenpse.exe`.

Add System Environment Variables

You must be an Administrator on the Replicate server to perform this action.

To add the environment variables:

1. Add a System environment variable named `SECUDIR` with a value of the folder path where the SAP Cryptographic Library files have been extracted. The screenshot below shows an example where the files were extracted to `C:\SAP_SNC`.

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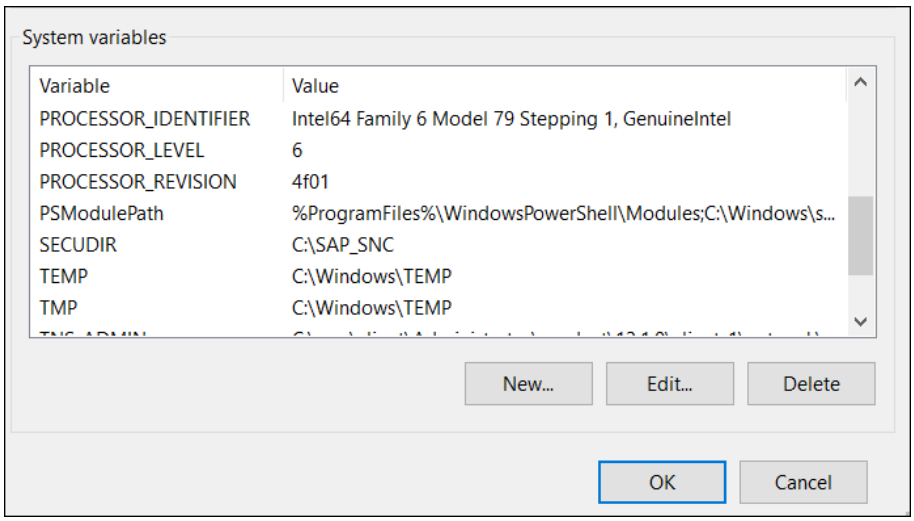

2. Add another System environment variable named `SNC_LIB` with a value of the SAP Cryptographic Library full path, for example `C:\SAP_SNC\sapcrypto.dll`.

3. If the Replicate services or applications were active during the creation of the environment variables, restart them to read the newly created variables.

Generate the Personal Security Environment and Certificate

A prerequisite to configuring an SAP NetWeaver connection, the Replicate application server must have a Personal Security Environment (PSE) with a certificate accepted by the SAP server.

To generate the PSE and the certificate:

1. At the command prompt, run the following command to generate the PSE on the SST server:

   ```
   sapgenpse gen_pse -v -p C:\SAP_SNC\RFC.pse
   ```

   NOTE: Replace `C:\SAP_SNC\` in the above command with your file path if it is different.

2. The process prompts you for a PIN code. A password is not required. Either:
   - Do not enter a PIN and press the Enter key.

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- Enter a PIN, and note it as it will be needed again.

3. The process prompts 'get_pse: Distinguished name of PSE owner'. Enter `CN=ServerName`

   where *ServerName* is a name to identify the SST server in SAP, for example `CN=RepProd`.

   NOTE: As a result of this command, an `RFC.pse` is created in the `SECUDIR` folder.

4. At the command prompt, run the following command to generate the SST server certificate:

   ```
   sapgenpse export_own_cert -v -p C:\SAP_SNC\RFC.pse -o C:\SAP_SNC\RFC.crt
   ```

   NOTE: Replace `C:\SAP_SNC\` in the above command with your file path if it is different.

   NOTE: As a result of this command, the `RFC.crt` certificate file is created.

Import the Certificate to the Server and Client PSEs

To continue setting up the SNC connection, import the certificate into the Server and the Client Personal Security Environments (PSEs).

To import the certificate into the Server PSE:

1. Navigate to the SAP System that Replicate should connect to via SNC.
2. Open the **STRUST** transaction.
3. Expand the **SNC SAPCryptolib** folder in the left panel and click the node below it.

   NOTE: You may be asked for a password to proceed.

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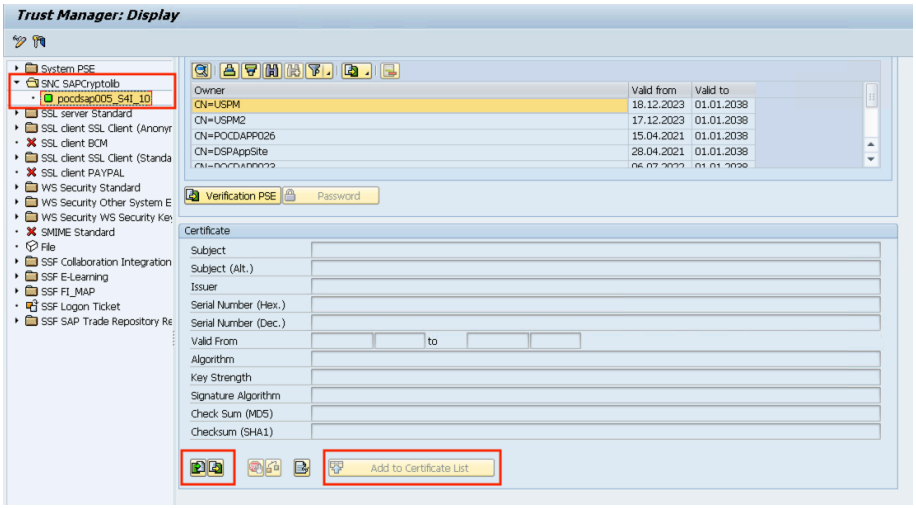

4. Click the Import Certificate button which is left of the Add to Certificate List button; a pop up opens.
5. Select your certificate file `RFC.crt` and click the Continue button. The certificate data displays.
6. Click the Add to Certificate List button. The certificate displays in the Certificate List.

   NOTE: If the Add to Certificate List button is disabled, click the Display <-> Change button in the upper left corner to review the settings
7. Click the Save button (Ctrl + S).

Next, import the Server Certificate to the Client PSE:

1. Still in the **STRUST** transaction on the **SNC SAPCrytpolib** folder, double-click the Own Certificate Subject in the upper part of the screen, as shown in the screenshot below.

   The Own Certificate data displays.

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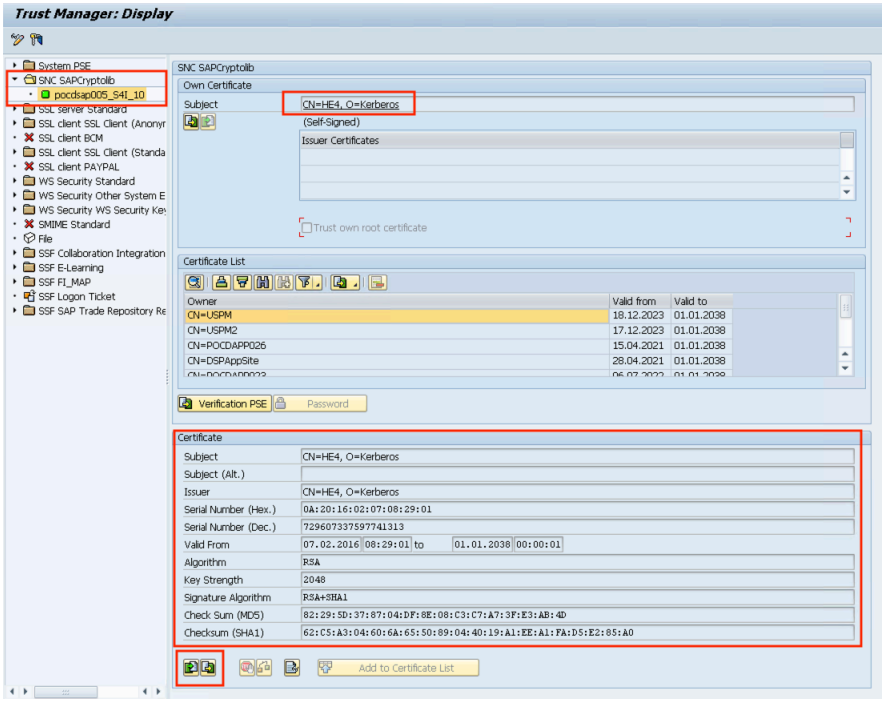

2. Click the Export Certificate button.
3. Assign a name to the exported certificate that identifies the SAP System where the certificate came from.
4. Select the Base64 option and click Continue (F8).

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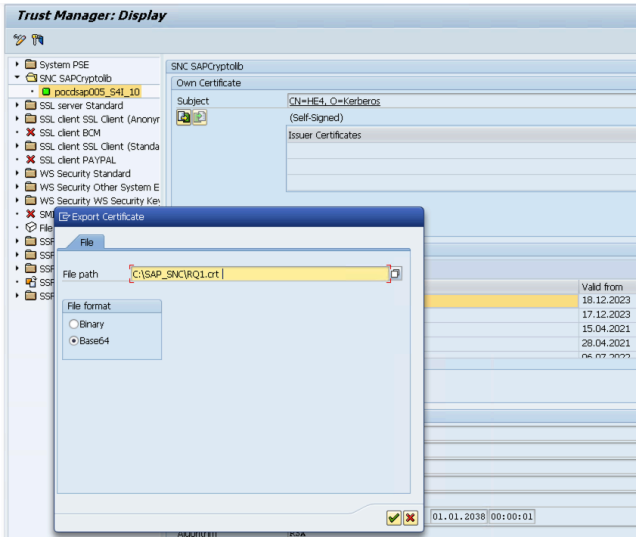

5. Open a command prompt, move to the `SECUDIR` folder, and execute the following commands:

   ```
   sapgenpse maintain_pk -v -a <full path and name of certificate> -p <full path and name of environment>
   ```

   For example:

   ```
   sapgenpse maintain_pk -v -a C:\SAP_SNC\RQ1.crt -p C:\SAP_SNC\RFC.pse
   ```

   A message similar to this one displays:

   Adding new certificate from file "[YourCertificate]"

   The certificate downloaded from SAP has been incorporated into your PSE environment.

Create the Credentials File

Using the commands in this section, you can create the `cred_v2` file that contains the secure credentials used in the SNC connections between Replicate and SAP. The `cred_v2` file must be created in the `SECUDIR` directory (to continue the example from above `C:\SAP_SNC`). The operating system users that run the Replicate Service and Application must have entries in the file.

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To generate the file and grant access to the users, the following command must be run from a command prompt with Administrator privileges:

```
sapgenpse seclogin -p RFC.pse -O <User>
```

The command must be run for each user that needs to have access. For example, if the Replicate services are run by the LocalAccount or NetworkServices, the following commands should be executed:

```
sapgenpse seclogin -p C:\SAP_SNC\RFC.pse -O Administrator
sapgenpse seclogin -p C:\SAP_SNC\RFC.pse -O System
sapgenpse seclogin -p C:\SAP_SNC\RFC.pse -O NetworkService
```

If Windows user *Bob* is running the Replicate Management Center he must also be added

```
sapgenpse seclogin -p C:\SAP_SNC\RFC.pse -O Bob
```

The tool will ensure a valid Windows user and the correct Domain and Username is added. Upon completion, this message displays:

```
D:\snc_lib>sapgenpse seclogin -p RFC.pse -O Bob
 running seclogin with USER="Bob"
 creating credentials for user "WIN-S4DMXYZ\Bob" (yourself)...
 Adjusting credentials and PSE ACLs to include " WIN-S4DMXYZ\Bob"...
   d:\snc_lib\cred_v2  ... ok.
   d:\snc_lib\RFC.pse  ... ok.
 Added SSO-credentials for PSE "d:\snc_lib\RFC.pse"
```

SNC Configuration in SAP

Using transaction **snc0** add an entry for the Replicate server. **System ID** is the Replicate server's hostname and **SNC Name** is the *Distinguished name of PSE owner* from the step *Generate the Personal Security Environment* above.

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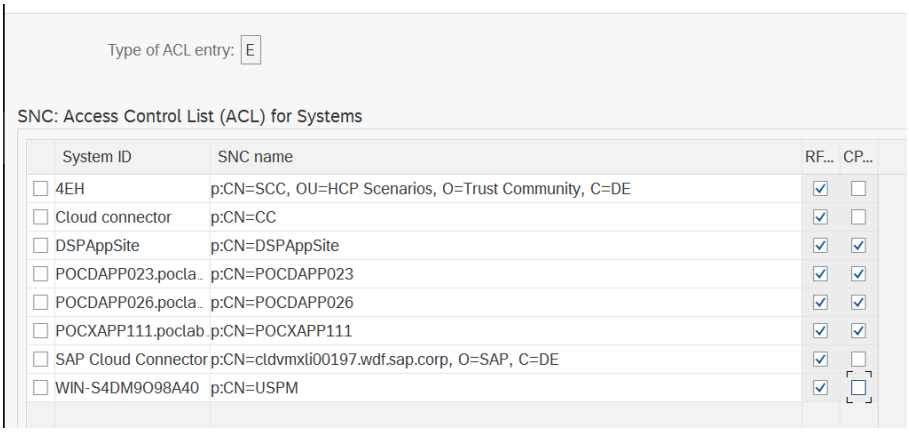
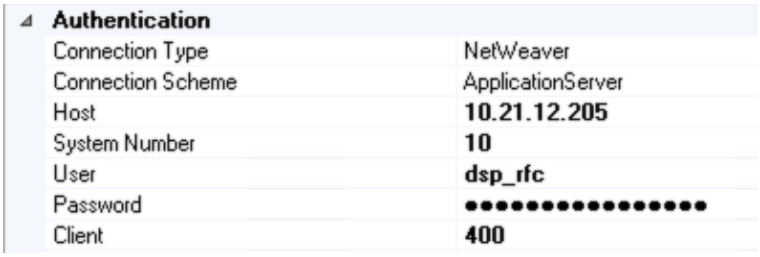


Configuring a NetWeaver Connection to use SNC

Follow the instructions here to create a NetWeaver connection.

A basic connection uses the following connection properties.



Under the Advanced -> Security section of the connection, SNC can be configured. In the basic example below **SNC Partner name** is obtained from the SAP system and prefixed with `p:`. If **SNC Name** is empty, **User** and **Password** are used.

Note that using **SNC Name** is an advanced option requiring additional SAP configuration. SNC Name is configured for SAP logons in the SAP system.

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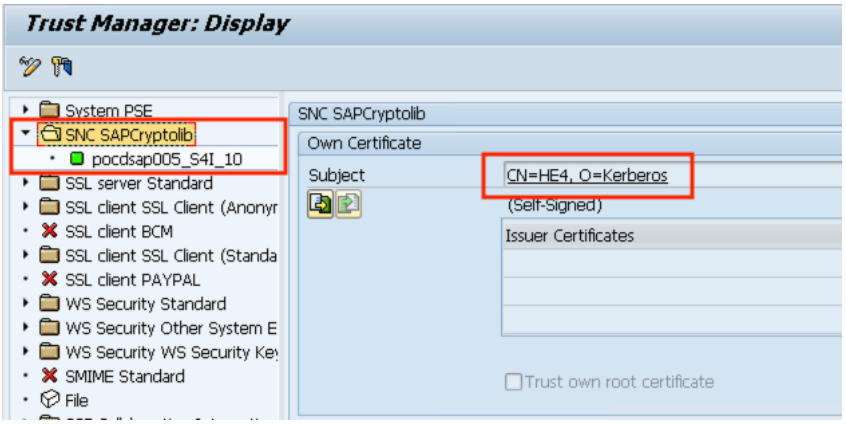
Security	
SNC Mode	True
SNC Name	
SNC Qop	9
SNC Partner Name	p:CN=HE4, O=Kerberos
SNC Lib Path	D:\snc_lib\sapcrypto.dll



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