Informatica®

Informatica® Cloud Data Integration

SAP BW Connector

Informatica Cloud Data Integration SAP BW Connector
July 2024

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Preface

Use SAP BW Connector to learn how to read from SAP BW by using Data Integration. Learn to create an SAP BW Connector connection, develop and run synchronization tasks, mappings, mapping tasks, and data transfer tasks in Data Integration.

Informatica Resources

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CHAPTER 1

Introduction to SAP BW Connector

You can use SAP BW Connector to connect to SAP BW from Data Integration.

You can use an SAP BW connection to read data from the following SAP BW objects:

- InfoCubes
- InfoSets
- MultiProviders
- DataStore

Use the SAP BW connection in synchronization tasks, mappings, mapping tasks, and data transfer tasks. You can switch mappings to advanced mode to include transformations and functions that enable advanced functionality.

SAP BW Connector assets

Create assets in Data Integration to integrate data using SAP BW Connector.

When you use SAP BW Connector, you can include the following Data Integration assets:

- Data transfer task
- Mapping
- Mapping task
- Synchronization task

For more information about configuring assets and transformations, see *Mappings*, *Transformations*, and *Tasks* in the Data Integration documentation.

CHAPTER 2

Connections for SAP BW Connector

Create an SAP BW Connector connection to securely read data from SAP BW objects. You can use an SAP BW connection in synchronization tasks, mappings, mapping tasks, and data transfer tasks.

You can use an SAP BW connection to read data from the following objects:

- InfoCubes
- InfoSets
- MultiProviders
- DataStore

Prerequisites

Before you use an SAP BW connection, the SAP administrator needs to perform certain prerequisite tasks to configure the Secure Agent machine and SAP system.

To process data through SAP, you also need to verify if the required licenses are enabled for the SAP system.

Download and configure the SAP libraries

To read data from SAP BW objects, you need to download and configure the SAP JCo libraries on the Secure Agent machine. If you encounter any issues while you download libraries, contact SAP Customer Support.

1. Go to the SAP Support Portal, and then click **Software Downloads**.

   Note: You need to have SAP credentials to access **Software Downloads** from the SAP Support Portal.
2. Download the latest version of the 64-bit SAP JCo libraries based on the operating system on which the Secure Agent runs.

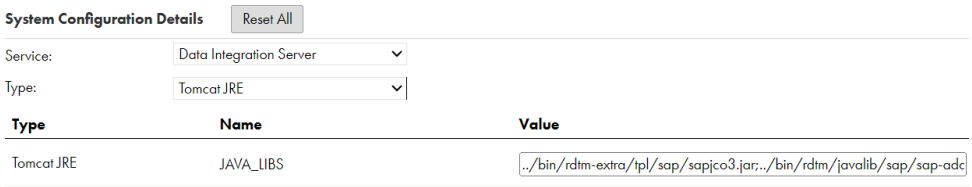
Operating System	SAP JCo Libraries
Windows	- sapjco3.jar - sapjco3.dll
Linux	- sapjco3.jar - libsapjco3.so

3. Copy the JCo libraries to the following directory:
   `<Informatica Secure Agent installation directory>\apps\Data_Integration_Server\ext\deploy_to_main\bin\rdtm-extra\tpl\sap`

   Create the `deploy_to_main\bin\rdtm-extra\tpl\sap` directory if it does not already exist.
4. Log in to Informatica Intelligent Cloud Services and configure the JAVA_LIBS property for the Secure Agent.
   a. Select **Administrator** > **Runtime Environments**.
   b. Click **Runtime Environments** to access the **Runtime Environments** page.
   c. To the left of the agent name, click **Edit Secure Agent**.
   d. From the **Service** list, select **Data Integration Server**.
   e. From the **Type** list, select **Tomcat JRE**.
   f. Enter the JAVA_LIBS value based on the operating system on which the Secure Agent runs.

Operating System	Value
Windows	..\bin\rdtm-extra\tpl\sap\sapjco3.jar;..\bin\rdtm\javalib\sap\sap-adapter-common.jar
Linux	../bin/rdtm-extra/tpl/sap/sapjco3.jar:../bin/rdtm/javalib/sap/sap-adapter-common.jar

   Warning: If you copy the value directly from the table, the hyphens (-) in the value might be incorrectly copied. Copy the value to a text editor and make sure that the value you copied is not corrupted.



   g. Click **Save**.
5. After you save the JAVA_LIBS value, configure the JVMClassPath property for the Secure Agent.
   a. From the **Service** list, select **Data Integration Server**.
   b. From the **Type** list, select **DTM**.
   c. Enter the JVMClassPath value based on the operating system on which the Secure Agent runs.

Operating System	Value
Windows	pmserversdk.jar;..\..\bin\rdtm-extra\tpl\sap\sapjco3.jar;..\..\bin\rdtm\javalib\sap\sap-adapter-common.jar
Linux	pmserversdk.jar:../../bin/rdtm-extra/tpl/sap/sapjco3.jar:../../bin/rdtm/javalib/sap/sap-adapter-common.jar

Warning: If you copy the value directly from the table, the hyphens (-) in the value might be incorrectly copied. Copy the value to a text editor and make sure that the value you copied is not corrupted.



d. Click **Save**.

e. Repeat steps 2 through 5 on every machine where you installed the Secure Agent.

6. Restart the Secure Agent.

Configure SAP user authorization

Configure the SAP user account in the SAP system to process SAP BW objects such as InfoCubes, InfoSets, MultiProviders, and DataStore objects.

For more information about how to configure SAP user authorization in the SAP system, see SAP user authorizations.

The following table describes the required authorization to read from SAP BW:

Authorization Object	Field	Value
S_RFC	RFC_TYPE	FUNC, FUGR
	RFC_NAME	/INFADI/BWRDR, /INFADI/ZTEST_COMMUNICATION, BAPI_CUBE_GETLIST, DDIF_FIELDINFO_GET, BAPI_IOBJ_GETDETAIL, RFCPING, RFC_GET_FUNCTION_INTERFACE, RSAB, SYST
	ACTVT	16
S_BTCH_JOB	JOBACTION	RELE
	JOBGROUP	*
S_RS_ADMWB	RSADMWBOBJ	Provide the Administrator Workbench Object name from which you want to read data based on the requirements. For more information about Administrator Workbench Objects, see the SAP documentation.
	ACTVT	3
S_RS_ICUBE	RSINFOAREA	Provide the InfoArea names that you want to access based on the requirements. For more information about InfoAreas, see the SAP documentation.
	RSINFOCUBE	Provide the InfoCube object names that you want to access based on the requirements. For more information about InfoCubes, see the SAP documentation.

Authorization Object	Field	Value
	RSIRSICUBEOBJ	DEFINITION, DATA, UPDATERULE
	ACTVT	3

You can also add the following authorization objects based on the requirements of the SAP BW tasks that you run from Data Integration:

- The S_RFC authorization object with the BAPI_ODSO_GETLIST and BAPI_ISET_GETLIST optional RFC objects.
- The S_RS_ISET and S_RS_ODSO authorization objects with the activity value ACTVT=3.

Install transport files for SAP BW

To read data from SAP BW objects from a Unicode SAP system, install the SAP BW transport files from the Secure Agent directory to the SAP system.

Ensure that the transport files you install on the SAP machines are the latest. Get the latest transport files from the following directory:

```
<Informatica Secure Agent installation directory>\downloads\package-bwreader.<Latest version>
\package\rdtm\sap-transport\SAPBWReader
```

Prerequisites to install the transport files

Before you install the SAP BW transports, you need to perform the prerequisite tasks.

- The transport files are applicable for SAP NetWeaver BW version 7.x.
- Before you install the transports on your production system, install and test the transports in a development system.

Installing transport files

To install the SAP BW transport files, perform the following steps:

1. Find the transport files in the following directory on the Secure Agent machine:
   `<Informatica Secure Agent installation directory>\downloads\package-bwreader.<Latest version>\package\rdtm\sap-transport\SAPBWReader`
2. Copy the cofile transport file to the `Cofile` directory in the SAP transport management directory on each SAP machine that you want to access.
   The cofile transport file uses the following naming convention: `RUN_BWRDR_K<number>.g00`
3. Remove "RUN_BWRDR_" from the file name to rename the cofile. For example, for a cofile transport file named `RUN_BWRDR_K900723.g00`, rename the file to `K900723.g00`.
4. Copy the data transport file to the `Data` directory in the SAP transport management directory on each SAP machine that you want to access.
   The data transport file uses the following naming convention: `RUN_BWRDR_R<number>.g00`
5. Remove "RUN_BWRDR_" from the file name to rename the file.
   For example, for a data transport file named `RUN_BWRDR_R900723.g00`, rename the file to `R900723.g00`.
6. To import the transports to SAP, in the STMS, click **Extras** > **Other Requests** > **Add** and add the transport request to the system queue.

7. In the **Add Transport Request to Import Queue** dialog box, enter the request number for the cofile transport.
   The request number inverts the order of the renamed cofile as follows: `g00K<number>`

   For example, for a cofile transport file renamed as `K900723.g00`, enter the request number as `g00K900723`.
8. In the Request area of the import queue, select the transport request number that you added, and click **Import**.

Connect to SAP BW

Let's configure the SAP BW Connector connection properties to connect to SAP BW.

Before you begin

Before you get started, you'll need to configure the Secure Agent machine and SAP system to establish an SAP BW connection.

Check out "Prerequisites" on page 8 to learn more about these tasks.

Connection details

The following table describes the basic connection properties:

Property	Description
Connection Name	Name of the connection. Each connection name must be unique within the organization. Connection names can contain alphanumeric characters, spaces, and the following special characters: _ . + -, Maximum length is 255 characters.
Description	Description of the connection. Maximum length is 4000 characters.
Type	SAP BW Connector
Runtime Environment	The name of the runtime environment where you want to run tasks. Select a Secure Agent.
Username	The user name with the appropriate user authorization to connect to the SAP BW account.
Password	The password to connect to the SAP BW account.

Property	Description
Connection type	Type of connection that you want to create when you read SAP BW data. Select one of the following connection types from the list: - Application. Create an application connection when you want to connect to a specific SAP BW server. - Load balancing. Create a load balancing connection when you want to connect to the SAP BW server with the least load at run time. If you select the **Load balancing** option, you need to enter values in the dedicated connection fields along with the **Message host name**, **R3 name/SysID**, and **Group** fields in the **Advanced Settings** section. Default is Application.
Host name	The host name or IP address of the SAP BW server to which you want to connect.
System number	The system number of the SAP BW server. Get the required system number from the SAP system to which you want to connect.
Client	The client number of the SAP BW server. Get the required client number from the SAP system to which you want to connect.
Language	Language code that corresponds to the SAP language. Get the required language code from the SAP system to which you want to connect.

Advanced settings

The following table describes the advanced connection properties:

Property	Description
Message host name	The host name of the SAP message server. This property is required only when you create a load balancing connection.
R3 name/ SysID	The system ID of the SAP message Server. This property is required only when you create a load balancing connection.
Group	The name of the SAP logon group through which you want to connect. This property is required only when you create a load balancing connection.
Trace	Determines whether to track the JCo calls that the SAP system makes. Enter one of the values between 0 and 8. By default, SAP doesn't store information about the JCo calls in a trace file. Default is 0. For more information about trace level values, see Setting up an SAP Java Connector (SAP JCo) and Related Traces. You can access the trace files from the following directories: - Design time information: `<Informatica Secure Agent installation directory>\apps\Data_Integration_Server\<Latest version>\ICS\main\tomcat` - Run-time information: `<Informatica Secure Agent installation directory>\apps\Data_Integration_Server\<Latest version>\ICS\main\bin\rdtm`

Property	Description

Additional parameters	Additional JCo connection parameters that you can use when you read SAP BW data.
	You can enter multiple JCo connection parameters, separated by semicolon, in the following format:
	`<parameter name1>=<value1>;<parameter name2>=<value2>;<parameter name3>=<value3>....`
	For example, if you want to create an SAP SNC connection, enter the following additional parameters:
	`SNC_MODE=1;SNC_QOP=3;SNC_MYNAME=p:CN=<Common name>, OU=<Organizational unit>, O=<Organization>, C=<Country>;SNC_PARTNERNAME=p:CN=<Common name>, OU=<Organizational unit>, O=<Organization>, C=<Country>;SNC_LIB=C:\SNC_11\sapcrypto.dll;TRACE=1`

Port Range	HTTP port range. The SAP BW connection uses the specified port numbers to connect to SAP BW using the HTTP protocol. Default range is 10000-65535. Enter a range in the default range, for example, 10000-20000. When a range is outside the default range, the connection uses the default range.
Use HTTPS	Connects to SAP through HTTPS protocol. To successfully connect to SAP through HTTPS, verify that your administrator has configured the Secure Agent machine and the SAP system. For more information about how to connect to SAP through HTTPS, see "Configure HTTPS to connect to SAP" on page 15.
Keystore location	The path and file name of the keystore file to connect to SAP. Enter both the path and file name in the following format: `<Directory>/<Keystore file name>.jks`
Keystore password	The password to access the keystore file.

Property	Description
Private Key password	The export password to access the .P12 file.

SAP Additional Parameters	Additional SAP properties that the Secure Agent uses to connect to the SAP system as an RFC client.
	Specify the required RFC-specific parameters and connection information that enable the Secure Agent to connect to SAP.
	For example, you can specify the SNC connection parameters as additional arguments listed in the following sample:
	
	`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 Secure Agent machine.`
	`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=<X509 certificate>`
	
	For more information, see How to configure the SAP Secure Network Communication protocol Informatica How-To Library article.
	If you specify a parameter in both the **SAP Additional Parameters** and **Additional parameters** fields, the value specified in the **SAP Additional Parameters** field takes precedence.
	For more information about RFC-specific parameters, see the SAP documentation.

Configure HTTPS to connect to SAP

To connect to SAP through HTTPS and read SAP BW sources, you need the OpenSSL certificate in the Secure Agent machine and the Sap system.

Create an OpenSSL certificate in the Secure Agent machine. Then, import the created certificate in the PSE format to the SAP system truststore.

To enable HTTPS in an SAP BW connection, you also need to specify the generated keystore password and private key password of the keystore file in the SAP system from transaction code SAP ICM Monitor (SMICM).

Create an OpenSSL certificate

Before you create an OpenSSL certificate, you need to perform the prerequisite tasks.

- Download and install OpenSSL on the Secure Agent machine.
- Based on the operating system of the machine that hosts the Secure Agent and the SAP system, download the latest available patch of the SAPGENPSE Cryptography tool from the SAP Service Marketplace.
  Typically, the SAPGENPSE files are extracted to the `nt-x86_64` directory.

- Configure the following SAP parameters: `icm/server_port`, `ssl/ssl_lib`, `sec/libsapsecu`, `ssf/ssfapi_lib`, `ssf/name`, `icm/HTTPS/verify_client`, `ssl/client_pse`, and `wdisp/ssl_encrypt`. For more information, see the SAP documentation.

To create a self-signed certificate using OpenSSL, perform the following tasks:

1. From the command line, set the `OPENSSL_CONF` variable to the absolute path to the `openssl.cfg` file. For example, run the following command: `set OPENSSL_CONF= C:\OpenSSL-Win64\bin\openssl.cfg`
2. Navigate to the `<openSSL installation directory>\bin` directory.
3. To generate a 2048-bit RSA private key, run the following command:
   `openssl.exe req -new -newkey rsa:2048 -sha1 -keyout <RSAkey File_Name>.key -out <RSAkey File_Name>.csr`
4. When prompted, enter the following values:
   - Private key password (PEM pass phrase). Enter a phrase that you want to use to encrypt the secret key. Re-enter the password for verification.

     Important: Make a note of this PEM password. You need to keep this password handy while creating a self-signed key and PKCS#12 certificate.
   - Two-letter code for country name.
   - State or province name.
   - Locality name.
   - Organization name
   - Organization unit name.
   - Common name (CN). Mandatory.

     Important: Enter the fully qualified host name of the machine that hosts the Secure Agent.
   - Email address.
5. Optionally, enter the following attributes that you want to pass along with the certificate request:
   - Challenge password.
   - Optional company name.

   A RSA private key of 2048-bit size is created. The `<RSAkey File_Name>.key and <RSAkey File_Name>.csr` files are generated in the specified directory.
6. To generate a self-signed key using the RSA private key, run the following command:
   `openssl x509 -req -days 11499 -in <RSAkey File_Name>.csr -signkey <RSAkey File_Name>.key -out <Certificate File_Name>.crt`
7. When prompted, enter the PEM pass phrase for the RSA private key.
   The `<Certificate File_Name>.crt` file is generated in the specified directory.
8. To concatenate the contents of the `<Certificate File_Name>.crt` file and the `<RSAkey File_Name>.key` file to a `.pem` file, perform the following tasks:
   a. Open the `<Certificate File_Name>.crt` file and the `<RSAkey File_Name>.key` files in a Text editor.
   b. Create a file and save it as `<PEM File_Name>.pem`.
   c. Copy the contents of the `<Certificate File_Name>.crt` file and paste it in the `.pem` file.
   d. Copy the contents of the `<RSAKey_Name>.key` file and append it to the existing contents of the `.pem` file.
   e. Save the `<PEM file name>.pem` file.

9. To create a PKCS#12 certificate, run the following command from the command line:
   `openssl pkcs12 -export -in <PEM File_Name>.pem -out <P12 File_Name>.p12 -name "domain name"`
10. When prompted, enter the following details:
    - The PEM pass phrase for the `.pem` file.
    - An export password for the P12 file. Re-enter the password for verification.

      Important: Make a note of this export password for the P12 file. You need to keep this password handy while creating a Java keystore file to connect to SAP through HTTPS.

    The `<P12 File_Name>.p12` file is generated in the specified directory.
11. To create a Java keystore file, enter the following command:
    `keytool -v -importkeystore -srckeystore <P12 File_Name>.p12 -srcstoretype PKCS12 -destkeystore <JKS File_Name>.jks -deststoretype JKS -srcalias "source alias" -destalias "destination alias"`
12. When prompted, enter the following details:
    - Password for the destination keystore, the JKS file.

      Important: Make a note of this password. You need to keep this password handy while creating an SAP BW connection.
    - Password for the source keystore, the P12 file. Enter the Export password for the P12 file.

    The `<JKS File_Name>.jks` file is generated in the specified directory.

    While enabling HTTPS in an SAP BW connection, specify the name and location of this keystore file. You also need to specify the destination keystore password as the Keystore Password and the source keystore password as the Private Key Password.

Convert an OpenSSL certificate to PSE format

After you create an OpenSSL certificate, you need to convert the OpenSSL certificate to PSE format using the SAPGENPSE tool.

1. From the command line, navigate to the `<SAPGENPSE Extraction Directory>` directory.
2. To generate a PSE file, run the following command:
   `sapgenpse import_p12 -p <PSE_Directory>\<PSE File_Name>.pse <P12 Certificate_Directory>\<P12 File_Name>.p12`
3. When prompted, enter the following details:
    - Password for the P12 file. Enter the Export password for the P12 file.
    - Personal identification number (PIN) to protect the PSE file. Re-enter the PIN for verification.

    The `<PSE File_Name>.pse` file is generated in the specified directory.
4. To generate the certificate based on the PSE format, run the following command:
   `sapgenpse export_own_cert -p <PSE File_Directory>\<PSE File_Name>.pse -o <Certificate_Name>.crt`
5. When prompted, enter the PSE PIN number.
   The `<Certificate_Name>.crt` file is generated in the specified directory. Import this certificate file to the SAP system trust store.

Enable the HTTPS service on the SAP system

To configure HTTPS to connect to an SAP system, you need to enable the HTTPS service from the transaction code SAP ICM Monitor (SMICM) in the SAP system

For more information about how to enable the HTTPS service on the SAP system, see the SAP documentation.

Import the certificate to the SAP system truststore

You need to import the certificate in PSE format to the SAP system trust store to connect to SAP through HTTPS.

1. Log in to SAP and go to the STRUST transaction.
2. Select SSL Client (Standard) and specify the password.
   In the **Import Certificate** dialog, you need to select Base64 format as the certificate file format.
3. Click the **Import** icon, and select the `<Certificate_Name>.crt` file in PSE format.

   Note: If a user is on a different SAP network, you might need to add a DNS entry of the agent host on the SAP app server.
4. Click **Add to Certificate List**.
5. Restart the Internet Communication Manager (ICM).

CHAPTER 3

Mappings and Mapping tasks with SAP BW

Use a mapping to define data flow logic that is not available in synchronization tasks, such as specific ordering of logic. Use the Data Integration Mapping Designer to configure mappings.

You can create a mapping to read data from an SAP BW source. You cannot perform a lookup on an SAP BW object. In advanced mode, the Mapping Designer updates the mapping canvas to include transformations and functions that enable advanced functionality.

When you configure a mapping to describe the flow of data from a source to a target, you can also add transformations to transform data. A transformation includes field rules to define incoming fields. Links visually represent how data moves through the data flow.

After you create a mapping, you can run the mapping or you can deploy the mapping in a mapping task. You can use the Mapping application to process data based on the data flow logic that you defined in the mapping.

Use the Mapping Task wizard to create a mapping task. When you create a mapping task, you can select the mapping based on which you want to create the task.

If you configured parameters, which are placeholders for information, in a mapping, you can define the parameters in the mapping task. You can define parameters for additional flexibility and to use the same mapping in multiple mapping tasks. For example, you can use a parameter for a source connection in a mapping, and then define the source connection when you configure the mapping task.

When you create a mapping task, you can associate the task with a schedule to run it at specified times or at regular intervals. Or, you can run it manually. You can also configure advanced session properties. You can monitor tasks and view details about completed tasks.

SAP BW sources in mappings

To read data from an SAP BW source, configure an SAP BW object as the Source transformation in a mapping.

Specify the name and description of the SAP BW source. Configure the source and advanced properties for the source object.

The following table describes the SAP BW source properties that you can configure in a Source transformation:

Property	Description
Connection	SAP BW Reader connection that you want to use to read data.
Source Type	Source type. Select one of the following types: - Single. Select to specify a single SAP BW object. - Parameter. Select to specify a parameter name. You can configure the source object in a mapping task associated with a mapping that uses this source transformation.
Object	SAP BW source object from which you want to read data.

The following table describes the SAP BW advanced source properties:

Property	Description
Packet Size in MB	Size of the HTTP packet that SAP sends to the Secure Agent. The unit is MB. Default is 10 MB.
Package Size in ABAP in Rows	Number of rows that are read and buffered in SAP at a time. Default is 1000 rows.
Enable Compression	When selected, the ABAP program compresses the data in the gzip format before it sends the data to the Secure Agent. If the Secure Agent and the SAP system are not on the same network, you might want to enable the compression option to optimize performance. Default is not selected.
Tracing Level	Amount of detail that appears in the log file. You can select one of the following options: - Terse - Normal - Verbose Initialization - Verbose Data Default is normal.

Configuring a mapping with a single SAP BW source

Use the Data Integration Mapping Designer to configure a mapping.

1. To create a mapping, click **Data Integration** > **New** > **Mappings**. Select **Mapping** and click **Create**.
2. Enter a name and description for the mapping, and click **OK**.

   You can use alphanumeric characters and underscores (_) in the mapping name.
3. To configure an SAP BW source, on the **Transformation** palette, click **Source**.
4. In the **Properties** panel, on the **General** tab, enter a name and description for the SAP BW source.
5. Click the **Source** tab and configure the SAP BW source details.

6. Select an SAP BW Reader connection from the list or click **New Connection** to create a new SAP BW Reader connection.

   You can also parameterize the connection.
7. Specify the source type. You can choose one of the following options:
   - Select **Single Object** to select a single SAP BW object.
   - Select **Parameter** to configure the SAP BW source objects in a mapping task associated with this mapping.
8. Enter the SAP BW object name or click **Select** to search for an object based on its name, label, description, or type.
9. Select the SAP BW object from which you want to read data and click **OK**.
10. Click **Query Options** in the **Source** tab to specify data filters for the SAP BW object.

    You can specify a simple data filter based on key characteristic fields.

    Note: You cannot create an advanced data filter.
    a. Click **Configure** and then click the **+** icon to add a data filter.
    b. Select the source object, key characteristic source field, and operator.

       You can select one of the following operators for the filter condition:
       - Equals
       - Not Equals
       - Less Than
       - Less Than or Equals
       - Greater Than
       - Greater Than or Equals
    c. Enter the value that you want to use and click **OK**.

       You can also parameterize the filter condition.
11. Click **Advanced** to specify the advanced source properties.
12. To add or remove source fields, update field metadata, or synchronize fields with the source, click the **Fields** tab.
13. To add a transformation, on the **Transformation palette**, click the transformation name. Or, drag the transformation onto the mapping canvas.
    a. On the **General** tab, you can enter a name and description for the transformation.
    b. Draw a link to connect the previous transformation to the transformation.

       When you link transformations, the downstream transformation inherits the incoming fields from the previous transformation.
       For a Joiner transformation, draw a master link and a detail link.
    c. To preview fields, configure the field rules, or rename fields, click **Incoming Fields**.
    d. Configure additional transformation properties, as needed.

       The properties that you configure vary based on the type of transformation you create.
    e. To add another transformation, repeat these steps.
14. To add a Target transformation, on the **Transformation palette**, click **Target**.
    a. On the **General** tab, enter a name and description for the target.
    b. Draw a link to connect the previous transformation to the Target transformation.

c. Click the **Target** tab and configure target details. If necessary, configure the advanced target properties.

   Target details and advanced target properties appear based on the connection type. For more information, see *Transformations*.

d. To preview fields, configure the field rules, or rename fields, click **Incoming Fields**.

e. Click **Field Mapping** and map the fields that you want to write to the target.

f. To add another Target transformation, repeat these steps.

15. Save the mapping. You can choose one of the following save options:

- Click **Save and Close** to save and close the mapping.
- Click **Save and Run** to save and run the mapping immediately.
- Click **Save and New Mapping Task** to save and create a mapping task.

Creating a Mapping task

You can create a mapping task based on a valid mapping.

1. To create a mapping task, click **Data Integration** > **New** > **Tasks** and then complete one of the following steps:
   - To create a mapping task based on a mapping, select **Mapping Task** and click **Create**.
   - To create a mapping task using a template, expand the appropriate template category and select the template you want to use, and then click **Create**.

   To edit a mapping task, on the **Explore** page, navigate to the mapping task. In the row that contains the task, click **Actions** and select **Edit**.
2. Enter a name for the task.

   Task names must be unique within the organization. Task names are not case sensitive. Task names can contain alphanumeric characters, spaces, and the following special characters: _ . + -
3. Select the runtime environment that contains the Secure Agent that you want to use to access the SAP BW objects.
4. Select **Mapping** as the task based on which you want to create the mapping task.
5. Click **Select** to specify a mapping.

   The **Select a Mapping** dialog box appears.
6. Select a mapping. You can also search for a mapping based on its name and description.
7. Click **OK**.

   The image of the selected mapping appears.
8. Click **Next**.

   If you specified any parameters in the source or target details in the mapping, the **Source** or **Target** page appears. If not, the **Schedule** page appears.
9. Configure a schedule and advanced options. Perform any of the following steps based on your requirements:

   a. Click **Run this task on schedule** and specify the schedule that you want to use.

b. Configure the email notification options.
c. Configure advanced options for the task.
d. Specify the execution mode.

10. Optionally, add advanced session properties.
    a. Click **Add**.
    b. Select a session property.
    c. Configure the value of the session property.
11. Save the mapping task. You can choose one of the following save options:
    - Click **Save and Close** to save and close the task.
    - Click **Save and Continue** to save the task and continue with configuring the task.
    - Click **Save and Run** to save and run the task immediately.

Monitoring a Mapping task

After you run a mapping task, you can monitor the task and view the logs.

In **Monitor**, you can monitor the status of the logs after you run the task.

You can also monitor the progress of the task by calling Transaction SM37 from SAP. You can view the actual job duration in SAP. The job duration listed in the Data Integration activity log is a higher value because it also includes time required to complete processing in Data Integration.

You can view the HTTP and HTTPS log files in the SMICM transaction. Optionally, you can increase trace level to 3 to view the detailed logs.

Rules and guidelines for SAP BW sources

Consider the following rules and guidelines when you configure the SAP BW sources:

- When you establish a communication from the SAP system with the Secure Agent using the IP address of the NAT gateway, you must include the DTM property named SapTableReaderNatIpAddress for the Secure Agent and specify the NAT IP address as the value.
- When you create a mapping that contains an InfoObject with the **Attribute Only** option selected, the mapping fails.

CHAPTER 4

Synchronization tasks with SAP BW

You can configure a synchronization task to synchronize data between an SAP BW source and a target. You can use the Synchronization Task wizard to configure the synchronization task.

You can use SAP BW objects as sources. You can read data from InfoCubes, InfoSets, MultiProviders, and DataStore objects. You can use expressions to transform the data according to your business logic and use data filters to filter data before writing it to targets.
Note: You cannot perform a lookup on an SAP BW object.

When you create a task, you can associate it with a schedule to run it at specified times or at regular intervals. You can also manually run a task. You can monitor tasks and view logs about completed tasks.

SAP BW sources in Synchronization tasks

When you configure a synchronization task to use an SAP BW source, you can configure the source properties. The source properties appear on the **Source** page of the Synchronization Task wizard.

The following table describes the SAP BW source properties:

Property	Description
Connection	SAP BW Reader connection that you want to use to read data.
Source Type	Source type. You can read data from a single SAP BW object. You cannot edit this field.
Source Object	SAP BW source object from which you want to read data.
Display technical field names instead of labels	When selected, displays technical names instead of business names of the fields in the specified source object.
Display source fields in alphabetical order	When selected, displays source fields in alphabetic order. By default, fields appear in the order returned by the source system.
Data Preview	Displays the first 10 rows of the first five columns in the object, and the total number of columns in the object.
Preview All Columns	Previews all source columns in a file.

You can also configure advanced source properties when you schedule the synchronization task. Advanced source properties appear on the **Schedule** page of the Synchronization Task wizard.

The following table describes the SAP BW advanced source properties:

Property	Description
Packet Size in MB	Size of the HTTP packet that SAP sends to the Secure Agent. The unit is MB. Default is 10 MB.
Package Size in ABAP in Rows	Number of rows that are read and buffered in SAP at a time. Default is 1000 rows.
Enable Compression	When selected, the ABAP program compresses the data in the gzip format before it sends the data to the Secure Agent. If the Secure Agent and the SAP system are not on the same network, you might want to enable the compression option to optimize performance. Default is not selected.

Configuring a Synchronization task with a single SAP BW object as the source

1. To create a synchronization task, click **Data Integration** > **New** > **Tasks**. Select **Synchronization Task** and click **Create**.
2. Enter a name for the synchronization task.

   The names of synchronization tasks must be unique within the organization. Synchronization task names are not case sensitive. Synchronization task names can contain alphanumeric characters, spaces, and the following special characters: `_ . + -`
3. Enter a description for the synchronization task.

   The description can have a maximum length of 255 characters.
4. Select the task operation that you can perform on the target.

   You can select one of the following options:

   - Insert
   - Update
   - Upsert
   - Delete
5. Click **Next** to enter the source details.
   a. Select an SAP BW Reader connection from the list or create a new SAP BW Reader connection.
   b. Select an SAP BW source object from the list or click **Select** to search for an SAP BW source object.

      The **Select Source Object** dialog box appears. The dialog box displays up to 200 objects. If the objects that you want to use do not appear, enter a search string to search for the object based on its name, label, description, or type, and then click **Search**.
   c. Select the SAP BW source object from which you want to read data, and then click **Select**.

The **Data Preview** area displays the first 10 rows of the first five columns in the SAP BW object, and the total number of columns in the object. To preview all source columns in a file, click **Preview All Columns**.

d. To display technical names instead of business names, select the **Display technical field names instead of labels** option.

e. To display source fields in alphabetic order, select the **Display source fields in alphabetical order** option.

By default, fields appear in the order returned by the source system.

6. Click **Next** to specify the target connection and target objects.
7. Click **Next** to specify the data filter criteria.
   a. Click **New** to create a data filter. You can specify a simple data filter based on key characteristics.

      Note: You cannot create an advanced data filter. You cannot specify a simple data filter based on key figures.

   b. Select the source object, key characteristic source field, and operator.

      You can select one of the following operators for the filter condition:

      - Equals
      - Not Equals
      - Less Than
      - Less Than or Equals
      - Greater Than
      - Greater Than or Equals

   c. Enter the value based on which you want to filter the data and click **OK**.
8. Click **Next** to configure the field mappings. Perform any of the following steps based on your requirements:
   a. Click **Edit Types** in the Source column to edit the precision and scale of the SAP BW object.
   b. Click **Automatch** to match source and target fields with similar names.
   c. Click **Refresh Fields** to update the cache and view the latest field attributes.
   d. Click **Edit Types** in the Target column to edit the data type, precision, and scale of the target object. Note that this option is not available for all target types.
   e. Select a source field and drag it to the target field to map the source and target fields. Repeat for all the fields that you want to map.
   f. Click the **Add or Edit Expression** icon to define a field expression to transform data.
   g. Click **Validate Mapping** to validate all the field mappings.
   h. Click **Clear Mapping** to clear all the field mappings.
9. Click **Next** to configure a schedule and advanced options. Perform any of the following steps based on your requirements:
   a. Click **Run this task on schedule** and specify the schedule that you want to use. Alternatively, you can click **Do not run this task on a schedule** to run the task manually.
   b. Configure the email notification options.
   c. Configure a parameter file, if needed.
   d. Configure the advanced source properties.

e. Specify the execution mode.

10. Save the synchronization task. You can choose one of the following save options:
    - Click **Save and Close** to save and close the task.
    - Click **Save and Continue** to save the task and continue with configuring the task.
    - Click **Save and Run** to save and run the task immediately.

Monitoring a Synchronization task

After you run a synchronization task, you can monitor the task and view the logs.

In **Monitor**, you can monitor the status of the logs after you run the task.

You can also monitor the progress of the task by calling Transaction SM37 from SAP. You can view the actual job duration in SAP. The job duration listed in the Data Integration activity log is a higher value because it also includes time required to complete processing in Data Integration.

You can view the HTTP and HTTPS log files in the SMICM transaction. Optionally, you can increase trace level to 3 to view the detailed logs.

CHAPTER 5

Data type reference

Data Integration uses the following data types in synchronization tasks, mappings, mapping tasks, and data transfer tasks with SAP:

SAP native data types

SAP data types appear in the **Fields** tab of the Source transformation when you choose to edit metadata for the fields. SAP performs any necessary conversion between the SAP data types and the native data types of the underlying source database tables.

Transformation data types

Set of data types that appear in the remaining transformations. They are internal data types based on ANSI SQL-92 generic data types, which Data Integration uses to move data across platforms. Transformation data types appear in all remaining transformations in a mapping or mapping task.

When Data Integration reads source data, it converts the native data types to the comparable transformation data types before transforming the data.

SAP BW and transformation data types

The following table lists the SAP data types that SAP BW Connector supports along with the corresponding transformation data types:

SAP Data Type	Transformation Data Type	Range for Transformation Data Type
CHAR	String	1 to 104,857,600 characters Fixed-length or varying-length string.
CUKY	String	1 to 104,857,600 characters Fixed-length or varying-length string.
CURR	Decimal	Precision 1 to 28 digits, scale 0 to 28
DATS	Date/time	Jan 1, 0001 A.D. to Dec 31, 9999 A.D. Precision to the nanosecond.
DEC	Double	Precision 1 to 28 digits, scale 0 to 28
FLTP	Double	Precision 15, scale 0
INT4	Integer	Precision 10, scale 0

SAP Data Type	Transformation Data Type	Range for Transformation Data Type
LANG	String	1 to 104,857,600 characters Fixed-length or varying-length string.
NUMC	String	1 to 104,857,600 characters Fixed-length or varying-length string.
QUAN	Decimal	Precision 1 to 28 digits, scale 0 to 28
TIMS	Date/time	Jan 1, 0001 A.D. to Dec 31, 9999 A.D. Precision to the nanosecond.
UNIT	String	1 to 104,857,600 characters Fixed-length or varying-length string.

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