Informatica® Cloud
Spring 2017

SAP Connector Guide
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Preface

The Informatica Cloud SAP Connector Guide contains information about how to set up and use SAP Connector. The guide explains how organization administrators and business users can use SAP Connector to read from and write data to SAP.

Informatica Resources

Informatica Documentation

To get the latest documentation for your product, browse the Informatica Knowledge Base at https://kb.informatica.com/_layouts/ProductDocumentation/Page/ProductDocumentSearch.aspx.

If you have questions, comments, or ideas about this documentation, contact the Informatica Documentation team through email at infa_documentation@informatica.com.

Informatica Cloud Web Site

You can access the Informatica Cloud web site at http://www.informatica.com/cloud. This site contains information about Informatica Cloud editions and applications.

Informatica Cloud Communities

Use the Informatica Cloud Community to discuss and resolve technical issues in Informatica Cloud. You can also find technical tips, documentation updates, and answers to frequently asked questions.

Access the Informatica Cloud Community at:


To find resources on using Cloud Application Integration (the Informatica Cloud Real Time service), access the community at:

https://network.informatica.com/community/informatica-network/products/cloud-integration/cloud-application-integration/content

Developers can learn more and share tips at the Cloud Developer community:

Informatica Cloud Connector Documentation

You can access documentation for Informatica Cloud Connectors at the Informatica Cloud Community: [https://network.informatica.com/cloud/index.htm](https://network.informatica.com/cloud/index.htm)

You can also download individual connector guides: [https://network.informatica.com/docs/D0C-15333](https://network.informatica.com/docs/D0C-15333).

Informatica Knowledge Base

Use the Informatica Knowledge Base to search Informatica Network for product resources such as documentation, how-to articles, best practices, and PAMs.

To access the Knowledge Base, visit [https://kb.informatica.com](https://kb.informatica.com). If you have questions, comments, or ideas about the Knowledge Base, contact the Informatica Knowledge Base team at [KB_Feedback@informatica.com](mailto:KB_Feedback@informatica.com).

Informatica Cloud Trust Site

You can access the Informatica Cloud trust site at [http://trust.informaticacloud.com](http://trust.informaticacloud.com). This site provides real time information about Informatica Cloud system availability, current and historical data about system performance, and details about Informatica Cloud security policies.

Informatica Global Customer Support

You can contact a Customer Support Center by telephone or online.

For online support, click Submit Support Request in the Informatica Cloud application. You can also use Online Support to log a case. Online Support requires a login. You can request a login at [https://network.informatica.com/welcome](https://network.informatica.com/welcome).

The telephone numbers for Informatica Global Customer Support are available from the Informatica web site at [https://www.informatica.com/services-and-training/support-services/contact-us.html](https://www.informatica.com/services-and-training/support-services/contact-us.html).
Part I: Introduction to SAP Connector

This part contains the following chapter:

- Introduction to SAP Connector, 11
CHAPTER 1

Introduction to SAP Connector

This chapter includes the following topics:

• SAP Connector Overview, 11
• Informatica Cloud and SAP Integration Methods, 11
• Communication Interfaces, 13
• SAP Metadata Utility, 13

SAP Connector Overview

You can use SAP Connector to integrate with SAP systems in batch, asynchronous, or synchronous modes based on your requirements.

Informatica Cloud supports ABAP, IDoc read, IDoc write, or BAPI/RFC functions to integrate with SAP systems. You can choose an SAP connection type to connect to SAP systems based on the interface requirements.

You can use the SAP connection in Data Synchronization tasks, mappings, and Mapping Configuration tasks. Create a Data Synchronization task to synchronize data between a source and target. Create a Mapping Configuration task to process data based on the data flow logic defined in a mapping or integration template.

Informatica Cloud and SAP Integration Methods

SAP is an application platform that integrates multiple business applications and solutions, such as Customer Relationship Management (CRM), Advanced Planner and Optimizer (APO), and Bank Analyzer. Developers can add business logic within SAP using Java 2 Enterprise Edition (J2EE) or Advanced Business Application Programming-Fourth Generation (ABAP/4 or ABAP), a language proprietary to SAP.

You can use the SAP Table, BAPI/RFC functions, and IDocs integration methods to extract data from or load data to SAP systems.

Use SAP Table for data-level integration, BAPI/RFC functions for object-level integration, and IDocs for message-level integration.

Data Integration using SAP Tables

You can integrate SAP data dictionary objects by creating an SAP Table connection.
You can use SAP Table connection to read data from SAP and write to any target. You can also write data from any source to custom tables in SAP. Contact Global Customer Support for information about using SAP Table connection to write data to SAP systems.

You can access all the objects in the SAP catalog including transparent tables, cluster tables, pool tables, and views. The Secure Agent accesses data through the application layer in SAP using ABAP. Data is streamed to the Secure Agent through HTTP (s) protocol. SAP Table connector supports joins and filters on the source tables.

To optimize performance when the Secure Agent and the SAP system are in different networks, you can enable data compression when you read data from SAP.

When you create a Data Synchronization task, mapping, or Mapping Configuration task, Informatica Cloud generates a dynamic ABAP query to read from SAP tables and write to custom SAP tables.

**Data Integration Using BAPI/RFC Functions**

Business Application Programming Interfaces (BAPI) provide a way for third-party applications to synchronously integrate with SAP at the object-level. You use BAPIs to read, create, change, or delete data in SAP.

BAPIs allow access to the SAP system objects through methods for the business object types. Together with the business object types, BAPIs define and document the interface standard at the business level.

You define BAPIs in the SAP Business Objects Repository. You can call BAPIs as an ABAP program within SAP or from any external application. SAP Connector uses RFC protocol to call BAPI/RFC functions outside of SAP.

You can import a BAPI/RFC function as a mapplet to Informatica Cloud. You can then use the mapplet in a mapping to read, create, change, or delete data in SAP. When you run the mapping or the Mapping Configuration task, Informatica Cloud makes the RFC function calls to SAP to process data synchronously.

You can view and test the BAPI interface definitions in SAP using transaction SE37.

**Data Integration Using IDocs**

Intermediate Documents (IDocs) electronically exchange data between SAP applications or between SAP applications and external programs. IDoc is a message-based integration interface that processes data asynchronously.

IDoc is a component of Application Link Enabling (ALE) module within SAP that can send and receive Intermediate Documents (IDocs) over RFC protocol.

**ALE Layers**

The message-based architecture of ALE comprises three layers:

- Application layer that provides ALE an interface to SAP to send or receive messages from external systems.
- Distribution layer that filters and converts messages to ensure that they are compatible between different SAP releases.
- Communications layer that enables ALE to support synchronous and asynchronous communication. You use IDocs for asynchronous communication.

The architecture of ALE provides a way to send IDocs as text files without connecting to a central database. Applications can communicate with each other without converting between formats to accommodate hardware or platform differences.
IDoc Record Types

IDocs contain three record types:

- Control record, which identifies the message type.
- Data records that contain the IDoc data in segments.
- Status records that describe the status of the IDoc. Status record names are the same for each IDoc type.

ALE Components

ALE has the following components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical System</td>
<td>All systems that need to communicate using ALE/IDoc must be setup as a Logical System within SAP. An SAP administrator can setup logical systems in transaction BD54.</td>
</tr>
<tr>
<td>Distribution Model</td>
<td>Defines an agreement between two logical systems on the messages that can be exchanged and identifies the sender and the receiver. An SAP administrator can setup distribution models in transaction BD64.</td>
</tr>
<tr>
<td>Partner Profile</td>
<td>Stores the IDoc type and processing logic related to the distribution model. An SAP administrator can setup partner profiles in transaction WE20.</td>
</tr>
<tr>
<td>RFC Destination</td>
<td>Defines the protocol and access to the logical system. An SAP administrator can setup RFC destinations in transaction SM59.</td>
</tr>
<tr>
<td>Message Type</td>
<td>Representation of a business object.</td>
</tr>
<tr>
<td>IDoc Type</td>
<td>Representation of a message type. SAP uses IDoc types to support backward compatibility across various SAP releases.</td>
</tr>
<tr>
<td>IDoc</td>
<td>An instance of an IDoc type that contains business data.</td>
</tr>
</tbody>
</table>

Communication Interfaces

SAP uses TCP/IP as the native communication interface to communicate with Informatica Cloud.

SAP also uses the Remote Function Call (RFC) communication protocol to communicate with Informatica Cloud. To execute remote calls from Informatica Cloud, SAP requires connection information, and the service name and gateway on the application server. The service and gateway parameters, and connection information is stored in a configuration file named sapwrfc.ini on the Secure Agent machine.

SAP Metadata Utility

You can use the SAP Metadata utility on the Windows operating system to import metadata from IDoc messages through Informatica Cloud mapplets.

The utility generates an Informatica Cloud mapplet XML file based on the API functionality that you specify. Import the mapplet to Informatica Cloud and use the mapplet in a mapping.
Use the utility to import one IDoc message at a time. After you import the metadata, you can stay connected to the same SAP system destination to import more than one IDoc in the same session. To import metadata from a different destination, end the session and launch the utility again.

By default, the utility writes the XML file to the `<Utility installation directory>/generatedMappings` folder. However, you can configure the location of the output file.

**Note:** You do not need to configure SAP or install SAP transports to use the SAP Metadata utility.
Part II: SAP Connector Administration

This part contains the following chapter:

- [SAP Connector Administration, 16]
SAP Connector Administration Overview

SAP Connector requires configuration on the machine that hosts the Secure Agent and also on the SAP systems. The administrators for each of these systems must perform the configuration tasks for their respective systems.

SAP Table Connector Administration

Before users can use an SAP table connection to process SAP table data, an SAP Administrator must perform the following tasks:

1. Verify if the required licences are enabled.
2. Download and install the Microsoft Visual C++ redistributable.
3. Download and configure the SAP libraries for SAP Table read and write.
5. Configure SAP user authorization.
6. Install transport files.
7. Configure HTTPS.

After the administrator has performed the configuration, users can set up and use an SAP table connection in Data Synchronization and Mapping Configuration tasks.
Step 1. Verifying if the Required Licences are Available for SAP Table Connector

You must verify if the required licences for SAP Table Connector are available before you create an SAP table connection and process SAP table data.

1. In the Informatica Cloud page, click the **Administer** tab.
2. Under **Connector Licences**, verify if the **SAP Table Connector** licence is enabled.

Step 2. Downloading and Installing the Microsoft Visual C++ Redistributable

If you do not have Microsoft Visual C++ (VC++) installed, download and install the Microsoft Visual C++ 2005 Service Pack 1 Redistributable Package on the Windows machine that hosts the Secure Agent. You can then run applications developed with VC++.

Perform the following steps to install the Microsoft Visual C++ 2005 Service Pack 1 Redistributable Package:

1. Click the following URL:
   ![URL](http://www.microsoft.com/technet/security/bulletin/MS09-035.mspx)
2. Scroll down and find the **Affected Software** section.
3. Download and install the package titled **Microsoft Visual C++ 2005 Service Pack 1 Redistributable Package (KB973544)**. Use the following URL to download the package:
   For more information, see the following SAP Notes: 1375494 and 1025361

Step 3. Downloading and Configuring the Libraries for Table Read and Write

Before you can use an SAP Table connection, download and configure the SAP libraries. Install and configure the SAP libraries on the Secure Agent machine.

The libraries that you use are based on whether you want to read from SAP tables or write to SAP tables.

**Downloading and Configuring Libraries to Read from SAP Tables**

To read data from SAP tables, you must download the SAP JCo libraries and configure them on the machine where the Secure Agent runs. Contact SAP Customer Support if you encounter any issues with downloading the libraries.

1. Go to the SAP Service Marketplace: ![URL](http://service.sap.com/connectors)
   
   **Note**: You will need SAP credentials to access the Service Marketplace.
2. Download the 64-bit SAP JCo libraries based on the operating system on which the Secure Agent runs:

<table>
<thead>
<tr>
<th>Secure Agent System</th>
<th>SAP File Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>sapjco3.jar; sapjco3.dll</td>
</tr>
<tr>
<td>Linux</td>
<td>sapjco3.jar; libsapjco3.so</td>
</tr>
</tbody>
</table>

Verify that you download the most recent version of the libraries.

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`<br>
   Create the `deploy_to_main\bin\rdtm-extra\tpl\sap` directory if it does not already exist.

   **Note:** If you upgrade from a 32-bit operating system, the Secure Agent copies the 32-bit SAP JCo libraries to the directory. You must replace the 32-bit JCo libraries with 64-bit JCo libraries. If you upgrade from a 64-bit operating system, you do not need to perform this step. The Secure Agent copies the 64-bit SAP JCo libraries to the directory.

4. Configure the JAVA_LIBS property in Informatica Cloud.

   1. Log in to Informatica Cloud.
   2. Click **Configure > Runtime Environments** to access the Runtime Environments page.
   3. To the left of the agent name, click **Edit Secure Agent**.
   4. From the **Service** list, select **Data Integration Server**.
   5. From the **Type** list, select **Tomcat JRE**.
   6. Enter the JAVA_LIBS value based on the operating system on which the Secure Agent runs.

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td><code>../bin/rdtm-extra$tpl/sap/sapjco3.jar;../bin/rdtm/javalib/sap/sap-adapter-common.jar</code></td>
</tr>
<tr>
<td>Linux</td>
<td><code>../bin/rdtm-extra$tpl/sap/sapjco3.jar;../bin/rdtm/javalib/sap/sap-adapter-common.jar</code></td>
</tr>
</tbody>
</table>

   7. Click **OK** to save the changes.
   8. Repeat steps 2 through 7 on every machine where you installed the Secure Agent.

5. Restart the Secure Agent.
Downloading and Configuring Libraries to Write to SAP Tables

Download and configure the SAP NetWeaver RFC SDK 7.20 libraries. Contact SAP Customer Support if you encounter any issues with downloading the libraries.

**Note:** If you performed this step for an SAP IDoc or RFC/BAPI connection, you do not need to do it again.

   **Note:** You must have SAP credentials to access the Service Marketplace.

2. Download Unicode SAP NetWeaver RFC SDK 7.20 libraries that are specific to the operating system that hosts the Secure Agent process.
   The following table lists the libraries corresponding to the different operating systems:

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Unicode SAP NetWeaver RFC SDK Libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux.64</td>
<td>- libicuuc.so.34</td>
</tr>
<tr>
<td></td>
<td>- libsapucum.so</td>
</tr>
<tr>
<td></td>
<td>- libicudata.so.34</td>
</tr>
<tr>
<td></td>
<td>- libicui18n.so.34</td>
</tr>
<tr>
<td></td>
<td>- libsapnwrfc.so</td>
</tr>
<tr>
<td></td>
<td>- libicudecnamber.so</td>
</tr>
<tr>
<td>Windows EM64T</td>
<td>- libsapucum.dll</td>
</tr>
<tr>
<td></td>
<td>- libicudecnamber.dll</td>
</tr>
<tr>
<td></td>
<td>- sapnwrfc.dll</td>
</tr>
<tr>
<td></td>
<td>- icuin34.dll</td>
</tr>
<tr>
<td></td>
<td>- icuuc34.dll</td>
</tr>
<tr>
<td></td>
<td>- icudt34.dll</td>
</tr>
</tbody>
</table>

3. Copy the SAP NetWeaver RFC SDK 7.20 libraries to the following directory:

   `<Informatica Secure Agent installation directory>\apps\Data_Integration_Server\ext\deploy_to_main\bin\rdtm`

   Create the `deploy_to_main\bin\rdtm` directory if it does not already exist.

   **Note:** If you upgrade from a 32-bit operating system, the Secure Agent copies the 32-bit SAP NetWeaver RFC SDK 7.20 libraries to the directory. You must replace the 32-bit libraries with 64-bit libraries. If you upgrade from a 64-bit operating system, you do not need to perform this step. The Secure Agent copies the 64-bit SAP NetWeaver RFC SDK 7.20 libraries to the directory.

4. Set the following permissions for each NetWeaver RFC SDK library:
   - Read, write, and execute permissions for the current user.
   - Read and execute permissions for all other users.

5. Download the 64-bit SAP JCo libraries based on the operating system on which the Secure Agent runs:

<table>
<thead>
<tr>
<th>Secure Agent System</th>
<th>SAP File Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>sapjco3.jar</td>
</tr>
<tr>
<td></td>
<td>sapjco3.dll</td>
</tr>
<tr>
<td>Linux</td>
<td>sapjco3.jar</td>
</tr>
<tr>
<td></td>
<td>libsapjco3.so</td>
</tr>
</tbody>
</table>
Verify that you download the most recent version of the libraries.

6. 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.

   **Note:** If you upgrade from a 32-bit operating system, the Secure Agent copies the 32-bit SAP JCo libraries to the directory. You must replace the 32-bit JCo libraries with 64-bit JCo libraries. If you upgrade from a 64-bit operating system, you do not need to perform this step. The Secure Agent copies the 64-bit SAP JCo libraries to the directory.

7. Configure the JAVA_LIBS property in Informatica Cloud.
   
   1. Log in to Informatica Cloud.
   2. Click **Configure > Runtime Environments** to access the **Runtime Environments** page.
   3. To the left of the agent name, click **Edit Secure Agent**.
   4. From the **Service** list, select **Data Integration Server**.
   5. From the **Type** list, select **Tomcat JRE**.
   6. Enter the JAVA_LIBS value based on the operating system on which the Secure Agent runs.

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td><code>../bin/rdtm-extra/tpl/sap/sapjco3.jar;../bin/javalib/sap/sap-adapter-common.jar</code></td>
</tr>
<tr>
<td>Linux</td>
<td><code>../bin/rdtm-extra/tpl/sap/sapjco3.jar;../bin/javalib/sap/sap-adapter-common.jar</code></td>
</tr>
</tbody>
</table>

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

   8. Repeat steps 2 through 7 on every machine where you installed the Secure Agent.

8. Restart the Secure Agent.

### Step 4. Configuring sapnwrfc.ini

SAP uses the communications protocol, Remote Function Call (RFC), to communicate with other systems. SAP stores RFC-specific parameters and connection information in a file named `sapnwrfc.ini`. To enable the Secure Agent to connect to the SAP system as an RFC client, create and configure the `sapnwrfc.ini` file on the machines that host the Secure Agent.

When you read data from SAP tables, if you define the path and file name of the `saprfc.ini` file in the SAP connection, the Secure Agent will use the `saprfc.ini` file. However, if you define only the path of the `saprfc.ini` file in the connection, the Secure Agent will first verify if an `sapnwrfc.ini` file exists in the specified path. If the `sapnwrfc.ini` file exists, the Secure Agent will use the `sapnwrfc.ini` file. Else, it will use the `saprfc.ini` file.

**Note:** Informatica will deprecate the `saprfc.ini` file in a future release. Therefore, Informatica recommends that you create and use an `sapnwrfc.ini` file instead of the `saprfc.ini` file.

To process data through RFC/BAPIs, read IDocs, write IDocs, and write data to SAP tables, you cannot use the `saprfc.ini` file. You must create and configure the `sapnwrfc.ini` file.
Use a DOS editor or WordPad to configure the `sapnwrfc.ini` file. Notepad can introduce errors to the `sapnwrfc.ini` file.

After you create the `sapnwrfc.ini` file, copy the file to the following directory and restart the Secure Agent:

```
<Informatica Secure Agent installation directory>/apps/Data_Integration_Server/ext
deploy_to_main/bin\rdtm\n```

Create the `deploy_to_main/bin\rdtm` directory if it does not already exist.

Note: If you are upgrading from an earlier version, you do not need to perform this step. The Secure Agent copies the `sapnwrfc.ini` file to the directory.

**Configure the Connection Entries in the sapnwrfc.ini File**

Use the `sapnwrfc.ini` file to configure the connections that you want to use.

You can configure the following types of connections in the `sapnwrfc.ini` file:

**Connection to a specific SAP application server**

Create this connection to enable communication between an RFC client and an SAP system. Each connection entry specifies one application server and one SAP system.

The following sample shows a connection entry for a specific SAP application server in the `sapnwrfc.ini` file:

```ini
DEST=sapr3
ASHOST=sapr3
SYSNR=00
```

**Connection to use SAP load balancing**

Create this connection to enable SAP to create an RFC connection to the application server with the least load at run time. Use this connection when you want to use SAP load balancing.

The following sample shows a connection entry for SAP load balancing in the `sapnwrfc.ini` file:

```ini
DEST=sapr3
R3NAME=ABV
MSGHOST=infamessageserver.informatica.com
GROUP=INFADEV
```

**Connection to an RFC server program registered at an SAP gateway**

Create this connection to connect to an SAP system from which you want to receive outbound IDocs.

The following sample shows a connection entry for an RFC server program registered at an SAP gateway in the `sapnwrfc.ini` file:

```ini
DEST=sapr346CLSQA
PROGRAM_ID=PID_LSRECEIVE
GWHOST=sapr346c
GWSERV=sapgw00
```
**sapnwrfc.ini Parameters**

The following table describes the parameters that you can define for various connection types in the sapnwrfc.ini file.

<table>
<thead>
<tr>
<th>sapnwrfc.ini Parameter</th>
<th>Description</th>
<th>Applicable Connection Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEST</td>
<td>Logical name of the SAP system for the connection. All DEST entries must be</td>
<td>Use this parameter for the following types of connections:</td>
</tr>
<tr>
<td></td>
<td>unique. You must have only one DEST entry for each SAP system. For SAP</td>
<td>- Connection to a specific SAP application server</td>
</tr>
<tr>
<td></td>
<td>versions 4.6C and later, use up to 32 characters. For earlier versions, use</td>
<td>- Connection to use load balancing</td>
</tr>
<tr>
<td></td>
<td>up to eight characters.</td>
<td>- Connection to an RFC server program registered at an SAP gateway</td>
</tr>
<tr>
<td>ASHOST</td>
<td>Host name or IP address of the SAP application. The Secure Agent uses this</td>
<td>Use this parameter to create a connection to a specific SAP application server.</td>
</tr>
<tr>
<td></td>
<td>entry to attach to the application server.</td>
<td></td>
</tr>
<tr>
<td>SYSNR</td>
<td>SAP system number.</td>
<td>Use this parameter to create a connection to a specific SAP application server.</td>
</tr>
<tr>
<td>R3NAME</td>
<td>Name of the SAP system.</td>
<td>Use this parameter to create a connection to use SAP load balancing.</td>
</tr>
<tr>
<td>MSHOST</td>
<td>Host name of the SAP message server.</td>
<td>Use this parameter to create a connection to use SAP load balancing.</td>
</tr>
<tr>
<td>GROUP</td>
<td>Group name of the SAP application server.</td>
<td>Use this parameter to create a connection to use SAP load balancing.</td>
</tr>
<tr>
<td>PROGRAM_ID</td>
<td>Program ID. The Program ID must be the same as the Program ID for the</td>
<td>Use this parameter to create a connection to an RFC server program registered at an SAP</td>
</tr>
<tr>
<td></td>
<td>logical system that you define in the SAP system to send or receive IDocs.</td>
<td>gateway.</td>
</tr>
<tr>
<td>GWHOST</td>
<td>Host name of the SAP gateway.</td>
<td>Use this parameter to create a connection to an RFC server program registered at an SAP</td>
</tr>
<tr>
<td>GWSERV</td>
<td>Server name of the SAP gateway.</td>
<td>gateway.</td>
</tr>
<tr>
<td>TRACE</td>
<td>Debugs RFC connection-related problems. Set one of the following values</td>
<td>Use this parameter for the following types of connections:</td>
</tr>
<tr>
<td></td>
<td>based on the level of detail that you want in the trace:</td>
<td>- Connection to a specific SAP application server</td>
</tr>
<tr>
<td></td>
<td>- Off</td>
<td>- Connection to use load balancing</td>
</tr>
<tr>
<td></td>
<td>- 1. Brief</td>
<td>- Connection to an RFC server program registered at an SAP gateway</td>
</tr>
<tr>
<td></td>
<td>- 2. Verbose</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 3. Full</td>
<td></td>
</tr>
</tbody>
</table>

**Sample sapnwrfc.ini File**

The following snippet shows a sample sapnwrfc.ini file:

```ini
/*--- Sample sapnwrfc.ini file */
[/PATH TO YOUR PROJECT]/sapnwrfc.ini
DEST = /PATH TO YOUR SAP SYSTEM
ASHOST = YOUR_APPLICATION_SERVER_HOST
```
Step 5. Configuring SAP User Authorization

Configure the SAP user account to process SAP table data.

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

<table>
<thead>
<tr>
<th>Read Object Name</th>
<th>Required Authorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>S_BTCH_JOB</td>
<td>DELE, LIST, PLAN, SHOW. Set Job Operation to RELE.</td>
</tr>
<tr>
<td>S_PROGRAM</td>
<td>BTCSUBMIT, SUBMIT</td>
</tr>
<tr>
<td>S_RFC</td>
<td>SYST, SDTX, SDIFRUNTIME, /INFADI/TBLRDR</td>
</tr>
<tr>
<td>S_TABU_DIS</td>
<td>&amp;_SAP_ALL</td>
</tr>
</tbody>
</table>

The following table describes the required authorization to write to SAP tables:

<table>
<thead>
<tr>
<th>Write Object Name</th>
<th>Required Authorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>S_RFC</td>
<td>/INFATRAN/ZPMW</td>
</tr>
<tr>
<td>S_TABU_DIS</td>
<td>&amp;_SAP_ALL</td>
</tr>
</tbody>
</table>

Step 6. Installing SAP Table Connection Transport Files

Install the SAP Table connection transport files on the SAP machines that you want to access. Before you install the transports on your production system, install and test the transports in a development system.

Install the following data file and cofile to read data from SAP tables:

- TABLE_READER_R900757.G00
- TABLE_READER_K900757.G00
Installing Transport Files

Install transport files from a Secure Agent directory to read from a Unicode or non-Unicode SAP system. The transport files are for SAP version ECC 5.0 or later. To install transport files to write to an SAP system, contact Informatica Global Customer Support.

1. Find the transport files in the following directory on the Secure Agent machine:
   <Informatica Secure Agent installation directory>\downloads\package=SAPConnector.32\package\rdtm\sap-transport\SAPTableReader

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: TABLE_READER_K<number>.G00.

3. Remove “TABLE_READER_” from the file name to rename the cofile.
   For example, for a cofile transport file named TABLE_READER_K900757.G00, rename the file to K900757.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: TABLE_READER_R<number>.G00.

5. Remove “TABLE_READER_” from the file name to rename the file.

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 K900757.G00, enter the request number as G00K900757.

8. In the Request area of the import queue, select the transport request number that you added, and click Import.

9. If you are upgrading from a previous version of the Informatica Transports, select the Overwrite Originals option.

Step 7: Configuring HTTPS

To connect to SAP through HTTPS and read SAP table sources, you must configure the machine that hosts the Secure Agent and the machine that hosts the SAP system. You must also enable HTTPS when you configure an SAP Table connection in Informatica Cloud.

Perform the following configuration tasks on the Secure agent and SAP systems:

HTTPS Configuration on the Secure Agent System

To configure HTTPS on the machine that hosts the Secure Agent, perform the following tasks:

1. Create a certificate using OpenSSL and JAVA KeyTool.
2. Convert the OpenSSL certificate (PKCS#12 certificate) to SAP specific format (PSE) using the SAPGENPSE tool.
   Currently, self-signed certificates are supported.
HTTPS Configuration on the SAP System

To configure HTTPS on the machine that hosts the SAP system, perform the following tasks:

1. Enable the HTTPS service on the SAP system.
2. Import the certificate in PSE format to the SAP system trust store.

Prerequisites

Before you create an OpenSSL certificate, verify the following prerequisites:

- 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, ssl/name, icm/HTTPS/verify_client, ssl/client_pse, and wdisp/ssl_encrypt. For more information, see the SAP documentation.

Create an OpenSSL Certificate

Create a self-signed certificate using OpenSSL.

1. At the command prompt, set the OPENSSL_CONF variable to the absolute path to the openssl.cfg file. For example, enter the following command: set OPENSSL_CONF= C:\OpenSSL-Win64\bin\openssl.cfg
2. Navigate the `<openSSL installation directory>`\bin directory.
3. To generate a 2048-bit RSA private key, enter 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 specify this value in some of the following steps.
   - 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. Enter the following extra attributes you want to send 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 current location.
6. To generate a self-signed key using the RSA private key, enter 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 current location.

8. Concatenate the contents of the `<Certificate File_Name>.crt` file and the `<RSAkey File_Name>.key` file to a `.pem` file.
   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, enter the following command at the command prompt:
    `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 specify this value in some of the following steps and while creating the SAP Table connection in Informatica Cloud.
    The `<P12 File_Name>.p12` file is generated in the current location.

11. To create a Java keystore file, enter the following command:
    `keytool -v -importkeystore -srckeystore <P12 File_Name>.p12 -srckstoretype 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 specify this password while creating the SAP Table connection in Informatica Cloud.
    - 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 current location.
      **Important:** While enabling HTTPS in an SAP Table connection, you must specify the name and location of this keystore file. You must also 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

You can convert an OpenSSL certificate to PSE format using the SAPGENPSE tool.

1. At the command prompt, navigate to the `<SAPGENPSE Extraction Directory>`.
2. To generate a PSE file, enter 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, enter 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 current location. Import this certificate file to the SAP system trust store.

Enable the HTTPS Service on SAP System
Enable the HTTPS service from the SMICM transaction.

Import a Certificate to SAP System Trust Store

1. Login to SAP and go to the STRUST transaction.
2. Select SSL Client (Standard) and specify the password. In the Import Certificate dialog, you may 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:** You may need to add a DNS entry of the agent host on the SAP app server if a user is on a different network.
4. Click Add to Certificate List.
5. Restart the ICM.

Step 8: Configuring the Secure Agent as a Whitelisted Host in SAP (Optional)
When you read SAP table data, you can configure the Secure Agent as a whitelisted host in the SAP system.
Perform the following steps to configure the Secure Agent as a whitelisted host in SAP:

1. Install the `TABLE_READER_R900757.G00` and `TABLE_READER_K900757.G00` transport files. For more information about installing the SAP Table Connector transport files, see "Installing Transport Files" on page 24.
2. In Informatica Cloud, configure the JVMOption property for the Secure Agent that you want to define as a whitelisted host in SAP. Set the value of the property to `-Dsap_whitelist_check=1` if you want SAP to validate the Secure Agent. You can specify the value in any JVMOption field.
3. In SAP, use transaction SE16 to create an entry for the Secure Agent in the SAP HTTP_Whitelist table. SAP stores whitelist information in the HTTP_Whitelist table.
   If you set the value of the JVMOption property to `-Dsap_whitelist_check=1`, when the Secure Agent runs a task or mapping to read SAP table data, SAP validates that a corresponding entry exists for the Secure Agent in the SAP HTTP_Whitelist table. If the entry exists, the task or mapping runs successfully. Otherwise, the task or mapping fails.
Configuring the JVMOption Property in Informatica Cloud

Configure the JVMOption property in Informatica Cloud to define the Secure Agent as a whitelisted host in the SAP system. You can specify the value in any JVMOption field.

1. Log in to Informatica Cloud.
2. Click Configure > Runtime Environments to access the Runtime Environments page.
3. To the left of the agent name, click Edit Secure Agent.
4. In the System Configuration Details section, from the Service list, select Data Integration Server.
5. Edit any JVMOption field to add the following value: -Dsap_whitelist_check=1
6. Repeat steps 2 through 5 for every Secure Agent that you want to define as a whitelisted host in SAP.

Creating an Entry for the Secure Agent in the SAP HTTP_Whitelist Table

SAP stores whitelist information in the HTTP_Whitelist table. Use transaction SE16 to create an entry for the Secure Agent in the SAP HTTP_Whitelist table and configure the Secure Agent as a whitelisted host in the SAP system.

1. Go to transaction SE16.
2. Configure properties to define the Secure Agent as a whitelisted host in SAP.

The following table describes the properties that you must configure:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANDT</td>
<td>Required. SAP client number.</td>
</tr>
<tr>
<td>ENTRY TYPE</td>
<td>Required. URL type to be compared with this entry. Enter 01 to indicate that the URL is a CSS theme URL.</td>
</tr>
<tr>
<td>SORT KEY</td>
<td>Required. Unique value to be used as the primary key. You can enter numbers and alphabets.</td>
</tr>
<tr>
<td>PROTOCOL</td>
<td>Protocol that SAP must validate. Enter HTTP or HTTPS. If you do not enter a value, SAP does not validate the protocol.</td>
</tr>
<tr>
<td>HOST</td>
<td>Host machine that SAP must validate. Enter the IP address of the machine that hosts the Secure Agent.</td>
</tr>
<tr>
<td>PORT</td>
<td>Port number that SAP must validate. Leave the Port field blank to indicate that SAP does not need to validate the port.</td>
</tr>
<tr>
<td>URL</td>
<td>URL that SAP must validate. Enter * to indicate that SAP does not need to validate the URL.</td>
</tr>
</tbody>
</table>

3. Repeat steps 1 and 2 for every Secure Agent that you want to configure as a whitelisted host in SAP.
SAP IDocs and RFCs/BAPI Connector Administration

Before you can use an SAP connection to process data through IDocs or RFCs/BAPIs, an SAP administrator must perform the following tasks:

1. Verify if the required licences are enabled.
2. Download and install the Microsoft Visual C++ Redistributable.
3. Download and configure the SAP libraries.
5. Define SAP Connector as an external logical system in SAP.
6. Configure SAP user authorization.
7. To process data through IDocs, install and configure the SAP Metadata utility.

After the administrator has performed the configuration, you can create and use SAP RFC/BAPI, IDoc Reader, and IDoc Writer connections in mappings.

Step 1. Verifying if the Required Licences are Available for SAP IDocs and RFCs/BAPI Connector

You must verify if the required licences for SAP IDocs and RFCs/BAPI Connector are available before you create an SAP connection and process data through IDocs or RFCs/BAPIs.

1. In the Informatica Cloud page, click the Administrate tab.
2. Under Connector Licences, verify if the SAP Table Connector licence is enabled.

Step 2. Downloading and Installing the Microsoft Visual C++ Redistributable

If you do not have Microsoft Visual C++ (VC++) installed, download and install the Microsoft Visual C++ 2005 Service Pack 1 Redistributable Package on the Windows machine that hosts the Secure Agent. You can then run applications developed with VC++.

Perform the following steps to install the Microsoft Visual C++ 2005 Service Pack 1 Redistributable Package:

1. Click the following URL:
   http://www.microsoft.com/technet/security/bulletin/MS09-035.mspx
2. Scroll down and find the Affected Software section.
3. Download and install the package titled Microsoft Visual C++ 2005 Service Pack 1 Redistributable Package (KB973544). Use the following URL to download the package:

For more information, see the following SAP Notes: 1375494 and 1025361
Step 3. Downloading and Configuring SAP Libraries for IDoc and BAPI/RFC

Download and configure the SAP NetWeaver RFC SDK libraries. Contact SAP Customer Support if you encounter any issues when you download the libraries.

Note: If you performed this step for an SAP table connection, you do not need to do it again.

   
   Note: You must have SAP credentials to access the Service Marketplace.

2. Download Unicode SAP NetWeaver RFC SDK 7.20 libraries that are specific to the operating system that hosts the Secure Agent process.
   
   The following table lists the libraries corresponding to the different operating systems:

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Unicode SAP NetWeaver RFC SDK Libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux.64</td>
<td>- libicuuc.so.34</td>
</tr>
<tr>
<td></td>
<td>- libsapum.so</td>
</tr>
<tr>
<td></td>
<td>- libicudata.so.34</td>
</tr>
<tr>
<td></td>
<td>- libicu18n.so.34</td>
</tr>
<tr>
<td></td>
<td>- libsapnwrfc.so</td>
</tr>
<tr>
<td></td>
<td>- libicudecimal.so.34</td>
</tr>
<tr>
<td>Windows EM64T</td>
<td>- libsapum.dll</td>
</tr>
<tr>
<td></td>
<td>- libicudecimal.dll</td>
</tr>
<tr>
<td></td>
<td>- sapnwrfc.dll</td>
</tr>
<tr>
<td></td>
<td>- icuin34.dll</td>
</tr>
<tr>
<td></td>
<td>- icuuc34.dll</td>
</tr>
<tr>
<td></td>
<td>- icudt34.dll</td>
</tr>
</tbody>
</table>

3. Copy the SAP NetWeaver RFC SDK 7.20 libraries to the following directory:
   
   `<Informatica Secure Agent installation directory>\apps\Data_Integration_Server\ext\deploy_to_main\bin\rdtm`
   
   Create the `deploy_to_main\bin\rdtm` directory if it does not already exist.
   
   Note: If you upgrade from a 32-bit operating system, the Secure Agent copies the 32-bit SAP NetWeaver RFC SDK 7.20 libraries to the directory. You must replace the 32-bit libraries with 64-bit libraries. If you upgrade from a 64-bit operating system, you do not need to perform this step. The Secure Agent copies the 64-bit SAP NetWeaver RFC SDK 7.20 libraries to the directory.

4. Set the following permissions for each NetWeaver RFC SDK library:
   
   - Read, write, and execute permissions for the current user.
   - Read and execute permissions for all other users.
5. Download the 64-bit SAP JCo libraries based on the operating system on which the Secure Agent runs:

<table>
<thead>
<tr>
<th>Secure Agent System</th>
<th>SAP File Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>sapjco3.jar, sapjco3.dll</td>
</tr>
<tr>
<td>Linux</td>
<td>sapjco3.jar, libsapjco3.so</td>
</tr>
</tbody>
</table>

Verify that you download the most recent version of the libraries.

6. 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.

   **Note:** If you upgrade from a 32-bit operating system, the Secure Agent copies the 32-bit SAP JCo libraries to the directory. You must replace the 32-bit JCo libraries with 64-bit JCo libraries. If you upgrade from a 64-bit operating system, you do not need to perform this step. The Secure Agent copies the 64-bit SAP JCo libraries to the directory.

7. Configure the JAVA_LIBS property in Informatica Cloud.

   1. Log in to Informatica Cloud.
   2. Click **Configure > Runtime Environments** to access the **Runtime Environments** page.
   3. To the left of the agent name, click **Edit Secure Agent**.
   4. From the **Service** list, select **Data Integration Server**.
   5. From the **Type** list, select **Tomcat JRE**.
   6. Enter the JAVA_LIBS value based on the operating system on which the Secure Agent runs.

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td><code>../bin/rdtm-extra/tpl/sap/sapjco3.jar;../bin/rdtm/javalib/sap/sap-adapter-common.jar</code></td>
</tr>
<tr>
<td>Linux</td>
<td><code>../bin/rdtm-extra/tpl/sap/sapjco3.jar;../bin/rdtm/javalib/sap/sap-adapter-common.jar</code></td>
</tr>
</tbody>
</table>

   7. Click **OK** to save the changes.
   8. Repeat steps 2 through 7 on every machine where you installed the Secure Agent.

8. Restart the Secure Agent.

**Step 4. Configuring sapnwrfc.ini**

SAP uses the communications protocol, Remote Function Call (RFC), to communicate with other systems. SAP stores RFC-specific parameters and connection information in a file named `sapnwrfc.ini`. To enable the
Secure Agent to connect to the SAP system as an RFC client, create and configure the sapnwrfc.ini file on
the machines that host the Secure Agent.

When you read data from SAP tables, if you define the path and file name of the saprfc.ini file in the SAP
connection, the Secure Agent will use the saprfc.ini file. However, if you define only the path of the
saprfc.ini file in the connection, the Secure Agent will first verify if an sapnwrfc.ini file exists in the
specified path. If the sapnwrfc.ini file exists, the Secure Agent will use the sapnwrfc.ini file. Else, it will
use the saprfc.ini file.

**Note:** Informatica will deprecate the saprfc.ini file in a future release. Therefore, Informatica recommends
that you create and use an sapnwrfc.ini file instead of the saprfc.ini file.

To process data through RFC/BAPIs, read IDocs, write IDocs, and write data to SAP tables, you cannot use
the saprfc.ini file. You must create and configure the sapnwrfc.ini file.

Use a DOS editor or WordPad to configure the sapnwrfc.ini file. Notepad can introduce errors to the
sapnwrfc.ini file.

After you create the sapnwrfc.ini file, copy the file to the following directory and restart the Secure Agent:

\<Informatica Secure Agent installation directory>\apps\Data_Integration_Server\ext\deploy_to_main\bin\rdtm\n
Create the deploy_to_main\bin\rdtm directory if it does not already exist.

**Note:** If you are upgrading from an earlier version, you do not need to perform this step. The Secure Agent
copies the sapnwrfc.ini file to the directory.

### Configure the Connection Entries in the sapnwrfc.ini File

Use the sapnwrfc.ini file to configure the connections that you want to use.

You can configure the following types of connections in the sapnwrfc.ini file:

**Connection to a specific SAP application server**

Create this connection to enable communication between an RFC client and an SAP system. Each
connection entry specifies one application server and one SAP system.

The following sample shows a connection entry for a specific SAP application server in the
sapnwrfc.ini file:

```
DEST=sapr3
ASHOST=sapr3
SYSNR=00
```

**Connection to use SAP load balancing**

Create this connection to enable SAP to create an RFC connection to the application server with the least
load at run time. Use this connection when you want to use SAP load balancing.

The following sample shows a connection entry for SAP load balancing in the sapnwrfc.ini file:

```
DEST=sapr3
R3NAME=ABV
MHOST=infamessageserver.informatica.com
GROUP=INFADEV
```

**Connection to an RFC server program registered at an SAP gateway**

Create this connection to connect to an SAP system from which you want to receive outbound IDocs.
The following sample shows a connection entry for an RFC server program registered at an SAP gateway in the `sapnwrfc.ini` file:

```
DEST=sapr346CLSQA
PROGRAM_ID=PID_LSRECEIVE
GWHOST=sapr346C
GWSENV=sapgw00
```

### sapnwrfc.ini Parameters

The following table describes the parameters that you can define for various connection types in the `sapnwrfc.ini` file.

<table>
<thead>
<tr>
<th>sapnwrfc.ini Parameter</th>
<th>Description</th>
<th>Applicable Connection Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEST</td>
<td>Logical name of the SAP system for the connection.</td>
<td>Use this parameter for the following types of connections:</td>
</tr>
<tr>
<td></td>
<td>All DEST entries must be unique. You must have only one DEST entry for each</td>
<td>· Connection to a specific SAP application server</td>
</tr>
<tr>
<td></td>
<td>SAP system.</td>
<td>· Connection to use load balancing</td>
</tr>
<tr>
<td></td>
<td>For SAP versions 4.6C and later, use up to 32 characters. For earlier</td>
<td>· Connection to an RFC server program registered at an SAP gateway</td>
</tr>
<tr>
<td></td>
<td>versions, use up to eight characters.</td>
<td></td>
</tr>
<tr>
<td>ASHOST</td>
<td>Host name or IP address of the SAP application. The Secure Agent uses this</td>
<td>Use this parameter to create a connection to a specific SAP application server.</td>
</tr>
<tr>
<td></td>
<td>entry to attach to the application server.</td>
<td></td>
</tr>
<tr>
<td>SYSNR</td>
<td>SAP system number.</td>
<td>Use this parameter to create a connection to a specific SAP application server.</td>
</tr>
<tr>
<td>R3NAME</td>
<td>Name of the SAP system.</td>
<td>Use this parameter to create a connection to use SAP load balancing.</td>
</tr>
<tr>
<td>MHOST</td>
<td>Host name of the SAP message server.</td>
<td>Use this parameter to create a connection to use SAP load balancing.</td>
</tr>
<tr>
<td>GROUP</td>
<td>Group name of the SAP application server.</td>
<td>Use this parameter to create a connection to use SAP load balancing.</td>
</tr>
<tr>
<td>PROGRAM_ID</td>
<td>Program ID. The Program ID must be the same as the Program ID for the</td>
<td>Use this parameter to create a connection to an RFC server program registered at an SAP</td>
</tr>
<tr>
<td></td>
<td>logical system that you define in the SAP system to send or receive IDocs.</td>
<td>gateway.</td>
</tr>
<tr>
<td>GWHOST</td>
<td>Host name of the SAP gateway.</td>
<td>Use this parameter to create a connection to an RFC server program registered at an SAP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gateway.</td>
</tr>
</tbody>
</table>
Create a logical system in SAP for SAP Connector.

**Step 5. Defining SAP Connector as a Logical System in SAP**

To use SAP Connector to send and receive IDocs from SAP, you must define SAP Connector as an external logical system in SAP.

Create a single logical system in SAP for IDoc ALE integration with SAP Connector. When you define SAP Connector as a logical system, SAP acknowledges SAP Connector as an external system that can receive outbound IDocs from SAP and send inbound IDocs to SAP.

Perform the following steps to define SAP Connector as a logical system:

1. Create a logical system in SAP for SAP Connector.
2. Create an RFC destination for SAP Connector.
3. Create a TRFC port for the RFC destination.
4. Create a partner profile for SAP Connector.
5. Create outbound and inbound parameters for the partner profile.

**Note:** These steps are based on SAP version 4.6C. The steps may differ if you use a different version. For complete instructions on creating a logical system in SAP, see the SAP documentation.

---

**Sample sapnwrfc.ini File**

The following snippet shows a sample `sapnwrfc.ini` file:

```ini
/*===================================================================*/
/*  Connection to an RFC server program registered at an SAP gateway */
/*===================================================================*/
DEST=<destination in RfcRegisterServer>
PROGRAM_ID=<program-ID, optional; default: destination>
GHOST=<host name of the SAP gateway>
GWSERV=<service name of the SAP gateway>
/*===================================================================*/
/*  Connection to a specific SAP application server */
/*===================================================================*/
DEST=<destination in RfcOpenConnection>
AHOST=<host name of the application server.>
SYSNR=<The back-end system number.>
/*===================================================================*/
/*  Connection to use SAP load balancing */
/* The application server will be determined at run time. */
/*===================================================================*/
DEST=<destination in RfcOpenConnection>
R3NAME=<name of SAP system, optional; default: destination>
MHOST=<host name of the message server>
GROUP=<group name of the application servers, optional; default: PUBLIC>
```
Step 1. Create a Logical System for SAP Connector

To uniquely identify SAP Connector as a client within a network, define SAP Connector as an external logical system in SAP.

1. Go to transaction SALE.
   The Display IMG window appears.
2. Expand the tree to navigate to the Application Link Enabling > Sending and Receiving Systems > Logical Systems > Define Logical System operation.
3. Click the IMG - Activity icon to run the Define Logical System operation.
   An informational dialog box appears.
4. Click Enter.
   The Change View Logical Systems window appears.
5. Click New Entries.
   The New Entries window appears.
6. Enter a name and description for the logical system entry for SAP Connector.

Step 2. Create an RFC Destination

Create an RFC destination and program ID for SAP Connector.

1. Go to transaction SM59.
   The Display and Maintain RFC Destinations window appears.
2. Click Create.
   The RFC Destination window appears.
3. Enter the name of the logical system you created as the RFC destination.
4. To create a TCP/IP connection, enter T as the connection type.
5. Enter a description for the RFC destination.
6. Click Save.
7. For Activation Type, click Registration.
8. For Program ID, enter the same name as the RFC destination name.
   Use the Program ID as the value for the PROGRAM_ID parameter in the sapnwrfc.ini file.
9. If the SAP system is an unicode system and the Secure Agent runs on AIX (64-bit), HP-UX IA64, Linux (32-bit), Solaris (64-bit), or Windows, click the Special Options tab, and select the Unicode option under Character Width in Target System.
   SAP provides unicode RFC libraries for these operating systems. When the Secure Agent runs on one of these operating systems, it uses the unicode RFC libraries to process unicode data.

Step 3. Create a tRFC Port for the RFC Destination

Create a tRFC port for the RFC destination you defined in SAP. SAP uses the tRFC port to communicate with SAP Connector.

1. Go to transaction WE21.
2. Click Ports > Transactional RFC.
3. Click Create.
The Ports in IDoc Processing dialog box appears.

4. Click Generate Port Name or Own Port Name and enter a name.

5. Click Enter.

6. Enter a description for the port.

7. Select the IDoc record version type.

8. Enter the name of the RFC destination you created.

Step 4. Create a Partner Profile for SAP Connector

Create a partner profile for the logical system you defined for SAP Connector. When SAP communicates with an external system, it uses the partner profile to identify the external system.

1. Go to transaction WE20.

2. Click Create.

3. Enter the following properties:

<table>
<thead>
<tr>
<th>Partner Profile Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner number</td>
<td>Name of the logical system you created for SAP Connector.</td>
</tr>
<tr>
<td>Partner type</td>
<td>Partner profile type. Enter LS for logical system for ALE distribution systems.</td>
</tr>
</tbody>
</table>

4. In the Post-processing tab, enter the following properties:

<table>
<thead>
<tr>
<th>Partner Profile Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>User type. Enter US for user.</td>
</tr>
<tr>
<td>Agent</td>
<td>The SAP user login name.</td>
</tr>
<tr>
<td>Lang</td>
<td>Language code that corresponds to the SAP language. Enter EN for English.</td>
</tr>
</tbody>
</table>

5. In the Classification tab, enter the following properties:

<table>
<thead>
<tr>
<th>Partner Profile Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner class</td>
<td>Enter ALE.</td>
</tr>
<tr>
<td>Partner status</td>
<td>Indicates the status of communication with the partner. To communicate with the partner, enter A for active.</td>
</tr>
</tbody>
</table>

Step 5. Create Outbound and Inbound Parameters for the Partner Profile

Outbound parameters define the IDoc message type, IDoc basic type, and port number for outbound IDocs. Inbound parameters define the IDoc message type for inbound IDocs.

SAP uses outbound parameters when it sends IDocs to SAP Connector. Create an outbound parameter for each IDoc message type that SAP sends to SAP Connector. SAP uses inbound parameters when it receives
IDocs from SAP Connector. Create an inbound parameter for each IDoc message type that SAP receives from SAP Connector.

1. From the partner profiles window, click Create Outbound Parameter.
   The Partner Profiles: Outbound Parameters window appears.
2. Enter the following properties:

<table>
<thead>
<tr>
<th>Outbound Parameter Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>The IDoc message type the SAP system sends to SAP Connector.</td>
</tr>
<tr>
<td>Receiver Port</td>
<td>The tRFC port number you defined.</td>
</tr>
<tr>
<td>IDoc Type</td>
<td>The IDoc basic type of the IDocs the SAP system sends to SAP Connector.</td>
</tr>
</tbody>
</table>

3. Click Save.
   The Packet Size property appears.
4. Enter a value between 10 and 200 IDocs as the packet size.
   The packet size determines the number of IDocs that SAP sends in one packet to SAP Connector.
5. Click Enter.
6. Repeat steps from 1 to 5 to create an outbound parameter for each IDoc message type that SAP sends to SAP Connector.
7. Click Create Inbound Parameter.
   The Partner Profiles: Inbound Parameters window appears.
8. For each inbound parameter, enter the following properties:

<table>
<thead>
<tr>
<th>Inbound Parameter Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>The IDoc message type the SAP system receives from SAP Connector.</td>
</tr>
<tr>
<td>Process Code</td>
<td>The process code. The SAP system uses the process code to call the appropriate function module to process the IDocs it receives.</td>
</tr>
</tbody>
</table>

9. Click Enter.
10. Repeat steps 7 through 9 to create an inbound parameter for each IDoc message type that SAP receives from SAP Connector.

**Step 6. Configuring SAP User Authorizations**

An SAP administrator needs to create a profile in the development, test, and production SAP system so that you can use the integration features. This profile name must include authorization for the objects and related activities. The profile on the test system should be the same as the profile on the production system.

The setup of the user and profiles is done within SAP using the SAP GUI. This activity is external to Informatica Cloud.
BAPI/RFC

The following table describes the authorization an SAP user requires to execute tasks using the BAPI/RFC functions:

<table>
<thead>
<tr>
<th>Authorization Object</th>
<th>Authorization Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>S_RFC</td>
<td>SYST, SDTX, SDIFRUNTIME, RFC1, RFC2</td>
</tr>
</tbody>
</table>

**Note:** In addition to the above authorization, the user needs access to any BAPI/RFC function that needs to be executed.

IDoc

The following table describes the authorization an SAP user requires to execute tasks with IDoc messages:

<table>
<thead>
<tr>
<th>Authorization Object</th>
<th>Authorization Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>S_RFC</td>
<td>SYST, SDTX, SDIFRUNTIME, RFC1, RFC2, EDIMEXT</td>
</tr>
</tbody>
</table>

**Note:** In addition to the above authorization, the user needs access to specific IDoc and underlying transactions that needs to be executed.

Step 7. Installing and Configuring the SAP IDocs Metadata Utility

To import IDoc metadata from SAP systems and generate mapplets, you need to install and configure the SAP Metadata utility.

**Prerequisites**

Before you use the SAP Metadata utility to process data through IDocs, verify the following prerequisites:

- Download and install the 32-bit SAP JCo libraries for your operating system. You can find the libraries on the SAP Service Marketplace: [http://service.sap.com](http://service.sap.com). Unzip the contents to a local directory.
- Add the location of the SAP JCo libraries to the PATH system environment variable.
- Verify that an SAP user has the authorization to browse and extract metadata.

**Installation and Configuration**

Install and configure the SAP Metadata utility to process data through IDocs on the machine that hosts the Secure Agent.

1. Download the SAP Metadata utility zip file, SapUtility.zip from the [Informatica Cloud Community](https://cloud.informatica.com).
2. Unzip the file to a local directory.
   - Avoid using spaces in the directory name because spaces can cause imports to fail.
3. Edit the `<SAP Metadata utility download directory>/SAPUtil.bat` file to define the CLASSPATH and JAVA_HOME variables.
   a. Enter the SAP JCo libraries directory and the `sapjco3.jar` file name in the CLASSPATH variable and remove “REM” from the following line:
      
      ```
      REM SET CLASSPATH=%CLASSPATH%;<Location of sapjco3.jar>	sapjco3.jar
      For example: SET CLASSPATH=C:\SAP\JCo\sapjco3.jar
      ```
   b. Enter the JAVA JRE directory in the JAVA_HOME variable and remove “REM” from the following line:
      
      ```
      REM SET JAVA_HOME=<JRE_LOCATION>
      For example: SET JAVA_HOME=C:\Program Files (x86)\Informatica Cloud Secure Agent\jre
      ```
      Use the JAVA JRE included with the Informatica Cloud Secure Agent.

4. Save and close the batch file.

**SAP BW Connector Administration**

Before users can use an SAP BW Reader connection to read SAP BW data, you must perform the following tasks:

1. Verify if the required licences are enabled.
2. Download and configure the SAP libraries to read SAP BW data.
3. Install transport files.
4. Configure HTTPS.
5. Configure SAP user authorizations.

**Step 1. Verifying if the Required Licences are Available for SAP BW Connector**

You must verify if the required licences for SAP BW Connector are available before you create an SAP BW reader connection and read data from SAP BW objects such as InfoCubes, InfoSets, MultiProviders, and DataStore objects.

1. In the Informatica Cloud page, click the **Administer** tab.
2. Under **Connector Licences**, verify if the SAP BW Connector licence is enabled.

**Step 2. Downloading and Configuring the Libraries for SAP BW Data Extraction**

Before you can use an SAP BW Reader connection, you must download the SAP JCo libraries from the SAP Service Marketplace and configure them on the machine where the Secure Agent runs.

Contact SAP Customer Support if you encounter any issues with downloading the libraries.

   
   **Note:** You will need SAP credentials to access the Service Marketplace.
2. Download the 64-bit SAP JCo libraries based on the operating system on which the Secure Agent runs:

<table>
<thead>
<tr>
<th>Secure Agent System</th>
<th>SAP File Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>sapjco3.jar, sapjco3.dll</td>
</tr>
<tr>
<td>Linux</td>
<td>sapjco3.jar, libsapjco3.so</td>
</tr>
</tbody>
</table>

Verify that you download the most recent version of the libraries.

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.

**Note:** If you upgrade from a 32-bit operating system, the Secure Agent copies the 32-bit SAP JCo libraries to the directory. You must replace the 32-bit JCo libraries with 64-bit JCo libraries. If you upgrade from a 64-bit operating system, you do not need to perform this step. The Secure Agent copies the 64-bit SAP JCo libraries to the directory.

4. Configure the JAVA_LIBS property in Informatica Cloud.

1. Log in to Informatica Cloud.
2. Click **Configure > Runtime Environments** to access the **Runtime Environments** page.
3. To the left of the agent name, click **Edit Secure Agent**.
4. From the **Service** list, select **Data Integration Server**.
5. From the **Type** list, select **Tomcat JRE**.
6. Enter the JAVA_LIBS value based on the operating system on which the Secure Agent runs.

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>../bin/rdtm-extra/tpl/sap/sapjco3.jar;../bin/rdtm/javalib/sap/sap-adapter-common.jar</td>
</tr>
<tr>
<td>Linux</td>
<td>../bin/rdtm-extra/tpl/sap/sapjco3.jar;../bin/rdtm/javalib/sap/sap-adapter-common.jar</td>
</tr>
</tbody>
</table>

7. Click **OK** to save the changes.
8. Repeat steps 2 through 7 on every machine where you installed the Secure Agent.

5. Restart the Secure Agent.

**Step 3. Installing SAP BW Reader Transport Files**

Install the SAP BW Reader transport files on the SAP machines that you want to connect to. Before you install the transports on the production system, install and test the transports in a development system.
Installing Transport Files

Install transport files from a Secure Agent directory to read data from a Unicode SAP system. The transport files are for SAP NetWeaver BW version 7.x.

1. Find the transport files in the following directory on the Secure Agent machine:

   <Informatica Secure Agent installation directory>\downloads\package-bwreader.4\package \rdm\sap-transport\SAPBWRreader

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.

Step 4: Configuring HTTPS

To connect to SAP through HTTPS and read data from SAP BW sources, you must configure the machine that hosts the Secure Agent and the machine that hosts the SAP system. You must also enable HTTPS when you configure an SAP BW Reader connection in Informatica Cloud.

Perform the following configuration tasks on the Secure Agent and SAP systems:

HTTPS Configuration on the Secure Agent System

To configure HTTPS on the machine that hosts the Secure Agent, perform the following tasks:

1. Create a certificate using OpenSSL and JAVA KeyTool.

2. Convert the OpenSSL certificate (PKCS#12 certificate) to SAP specific format (PSE) using the SAPGENPSE tool.

   Currently, self-signed certificates are supported.

HTTPS Configuration on the SAP System

To configure HTTPS on the machine that hosts the SAP system, perform the following tasks:

1. Enable the HTTPS service on the SAP system.

2. Import the certificate in PSE format to the SAP system trust store.
Step 5. Configuring SAP User Authorizations

An SAP administrator needs to create a profile in the development, test, and production SAP system so that you can use the integration features. This profile name must include authorization for the objects and related activities. The profile on the test system should be the same as the profile on the production system.

The setup of the user and profiles is done within SAP using the SAP GUI. This activity is external to Informatica Cloud.

The following table describes the authorization an SAP BW user requires to execute tasks with SAP BW Connector:

<table>
<thead>
<tr>
<th>Authorization Object</th>
<th>Authorization Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>S_RS_ADMWB</td>
<td>ACTVT=3 (DISPLAY)</td>
</tr>
<tr>
<td>S_RS_ICUBE</td>
<td>ACTVT=3 (DISPLAY)</td>
</tr>
<tr>
<td>S_RS_ISET</td>
<td>ACTVT=3 (DISPLAY)</td>
</tr>
<tr>
<td>S_RS_ODSO</td>
<td>ACTVT=3 (DISPLAY)</td>
</tr>
</tbody>
</table>

SAP BW BEx Query Connector Administration

Before you can use an SAP BW BEx Query connection to read BEx query data, you must perform the following tasks:

1. Verify if the required licences are enabled.
2. Download and configure the SAP JCo libraries to read BEx query data.

Step 1. Verifying if the Required Licences are Available for SAP BW BEx Query Connector

You must verify if the required licences for SAP BW BEx Query Connector are available before you create an SAP BW BEx query connection and read data from SAP BEx queries.

1. In the Informatica Cloud page, click the Administrator tab.
2. Under Connector Licences, verify if the SAP BW BEx Query Connector licence is enabled.
3. Under Packages, verify if the following packages are assigned:
   - DataTransformation
   - UDTforHierarchy
   - saas-xmetadata_read

   If any of the packages are missing, contact Informatica Global Customer Support to enable the missing license for these packages. When the required licenses are enabled, the packages appear in the Packages section.
Step 2. Downloading and Configuring the Libraries for SAP BW BEx Query Data Extraction

Before you can use an SAP BW BEx query connection, you must download the SAP JCo libraries from the SAP Service Marketplace and configure them on the machine where the Secure Agent runs.

Contact SAP Customer Support if you encounter any issues with downloading the libraries.

   
   Note: You will need SAP credentials to access the Service Marketplace.

2. Download the most recent version of the 64-bit SAP JCo libraries based on the operating system on which the Secure Agent runs:

   
<table>
<thead>
<tr>
<th>Secure Agent System</th>
<th>SAP File Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>sapjco3.jar</td>
</tr>
<tr>
<td></td>
<td>sapjco3.dll</td>
</tr>
<tr>
<td>Linux</td>
<td>sapjco3.jar</td>
</tr>
<tr>
<td></td>
<td>libsapjco3.so</td>
</tr>
</tbody>
</table>

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. Configure the JAVA_LIBS property in Informatica Cloud.
   
   1. Log in to Informatica Cloud.
   2. Click Configure > Runtime Environments to access the Runtime Environments page.
   3. To the left of the agent name, click Edit Secure Agent.
   4. From the Service list, select Data Integration Server.
   5. From the Type list, select Tomcat JRE.
   6. Enter the JAVA_LIBS value based on the operating system on which the Secure Agent runs.

   
<table>
<thead>
<tr>
<th>Operating System</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>../bin/rdtm-extra/tpl/sap/sapjco3.jar;./bin/rdtm/javalib/sap/sap-adapter-common.jar</td>
</tr>
<tr>
<td>Linux</td>
<td>../bin/rdtm-extra/tpl/sap/sapjco3.jar;../bin/rdtm/javalib/sap/sap-adapter-common.jar</td>
</tr>
</tbody>
</table>

7. Click OK to save the changes.

8. Repeat steps 2 through 7 on every machine where you installed the Secure Agent.

5. Restart the Secure Agent.
Part III: Connections

This part contains the following chapters:

- SAP Connections, 45
- Troubleshooting, 57
SAP Connections Overview

Use an SAP connection to read from and write data to SAP systems.

Informatica Cloud supports ABAP, IDocs, BAPI/RFC functions, and streaming to integrate with SAP systems. You can choose one of five SAP connection types to connect to SAP systems based on the interface requirements.

The following table describes the different SAP connections:

<table>
<thead>
<tr>
<th>SAP Connection Type</th>
<th>Use the connection to …</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP Connector</td>
<td>Read data from SAP and write to any target. You can also write data from any source to custom tables in SAP. Contact Global Customer Support for information about using the SAP Table connection to write data to SAP systems.</td>
</tr>
<tr>
<td>SAP RFC/BAPI Interface</td>
<td>Read and write data by using BAPI/RFC functions.</td>
</tr>
<tr>
<td>IDoc Reader</td>
<td>Read Intermediate Documents (IDocs) from SAP systems.</td>
</tr>
</tbody>
</table>
SAP Connection Type | Use the connection to …
--- | ---
IDoc Writer | Write IDocs to SAP systems.
SAP BW Reader | Read data from SAP BW objects such as InfoCubes, InfoSets, MultiProviders, and DataStore objects.

### SAP Table Connections

SAP Table connections enable you to access data directly from SAP tables. You can use the SAP Table connection type in Data Synchronization tasks, mappings, and Mapping Configuration tasks.

You can use the SAP Table connection type to read data from transparent tables, cluster tables, pool tables, or views. You can also use the SAP Table connection type to write data to custom transparent tables.

To enable the Secure Agent to connect to SAP through HTTPS, you must enable HTTPS and specify the keystore details when you configure an SAP Table connection. To read SAP table sources through HTTPS, specify an SAP Table connection configured for HTTPS when you create Data Synchronization tasks, mappings, or Mapping Configuration tasks.

### SAP Table Connection Properties

To process SAP table data, select the **SAP Connector** connection type and configure the following properties:

<table>
<thead>
<tr>
<th>Connection Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runtime Environment</td>
<td>Runtime environment that contains the Secure Agent that you want to use to access SAP tables.</td>
</tr>
<tr>
<td>Username</td>
<td>SAP user name with the appropriate user authorization.</td>
</tr>
<tr>
<td>Password</td>
<td>SAP password.</td>
</tr>
<tr>
<td>Client</td>
<td>SAP client number.</td>
</tr>
<tr>
<td>Language</td>
<td>Language code that corresponds to the SAP language.</td>
</tr>
<tr>
<td>Saprfc.ini Path</td>
<td>Local directory to the <code>sapnwrfc.ini</code> file. To write to SAP tables, use the following directory: <code>&lt;Informatica Secure Agent installation directory&gt;/main/bin/rdtm</code></td>
</tr>
<tr>
<td>Destination</td>
<td>DEST entry that you specified in the <code>sapnwrfc.ini</code> file for the SAP application server. Destination is case sensitive. <strong>Note:</strong> Use all uppercase letters for the destination.</td>
</tr>
</tbody>
</table>
**Connection Property** | **Description**  
--- | ---  
Port Range | HTTP port range. The SAP Table connection uses the specified port numbers to connect to SAP tables using the HTTP protocol. Ensure that you specify valid numbers to prevent connection errors. Default: 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.  
Test Streaming | Tests the connection. When selected, tests the connection using both RFC and HTTP protocol. When not selected, tests connection using HTTP protocol.  
Https Connection | When selected, connects to SAP through HTTPS protocol. To successfully connect to SAP through HTTPS, verify that an administrator has configured the machines that host the Secure Agent and the SAP system.  
Keystore Location | The absolute path to the JKS keystore file.  
Keystore Password | The destination password specified for the .JKS file.  
Private Key Password | The export password specified for the .P12 file.  

**SAP Connection Rules and Guidelines**

The following SAP data types are not supported for the SAP table writer at this time:

- SSTRING
- STRING
- RAWSTRING

Tasks that include these data types for the SAP table writer might fail.

**SAP IDoc and BAPI/RFC Connections**

SAP connections enable you to access SAP data through the IDoc or BAPI/RFC interfaces. You can use the connections in mappings and Mapping Configuration tasks.

**SAP RFC/BAPI Interface Connection Properties**

The following table describes the properties:

<table>
<thead>
<tr>
<th>Connection Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Name</td>
<td>SAP user name with authorization on S_DATASET, S_TABU_DIS, S_PROGRAM, and B_BTCH_JOB objects.</td>
</tr>
<tr>
<td>Password</td>
<td>SAP password.</td>
</tr>
</tbody>
</table>
### SAP IDoc Reader Connection Properties

The following table describes the properties:

<table>
<thead>
<tr>
<th>Connection Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Destination Entry</strong></td>
<td>DEST entry that you specified in the sapnwrfc.ini file for the RFC server program registered at an SAP gateway. The Program ID for this destination entry must be the same as the Program ID for the logical system you defined in SAP to receive IDocs.</td>
</tr>
</tbody>
</table>
| **Code Page** | The code page compatible with the SAP source. Select one of the following code pages:  
- MS Windows Latin 1. Select for ISO 8859-1 Western European data.  
- UTF-8. Select for Unicode and non-Unicode data.  
- Shift-JIS. Select for double-byte character data.  
- ISO 8859-15 Latin 9 (Western European).  
- ISO 8859-2 Eastern European.  
- ISO 8859-3 Southeast European.  
- ISO 8859-5 Cyrillic.  
- ISO 8859-9 Latin 5 (Turkish).  
- IBM EBCDIC International Latin-1. |

### SAP IDoc Writer Connection Properties

The following table describes the properties:

<table>
<thead>
<tr>
<th>Connection Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>User Name</strong></td>
<td>SAP user name with authorization on S_DATASET, S_TABU_DIS, S_PROGRAM, and B_BTCH_JOB objects.</td>
</tr>
<tr>
<td><strong>Password</strong></td>
<td>SAP password.</td>
</tr>
</tbody>
</table>
SAP BW Reader Connections

You must create an SAP BW Reader connection to read data from SAP BW objects such as InfoCubes, InfoSets, MultiProviders, and DataStore objects. You can use the SAP BW Reader connection in Data Synchronization tasks, mappings, and Mapping Configuration tasks.

To enable the Secure Agent to connect to the SAP BW system through HTTPS, you must enable HTTPS and specify the keystore details in the SAP BW Reader connection. To read data from SAP BW objects through HTTPS, specify an SAP BW Reader connection configured for HTTPS when you create Data Synchronization tasks, mappings, or Mapping Configuration tasks.

SAP BW Reader Connection Properties

To read data from SAP BW objects, select the SAP BW Reader connection type and configure the following properties:

<table>
<thead>
<tr>
<th>Connection Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runtime Environment</td>
<td>Required. Runtime environment that contains the Secure Agent that you want to use to read data from SAP BW objects.</td>
</tr>
<tr>
<td>Username</td>
<td>Required. SAP user name with the appropriate user authorization.</td>
</tr>
<tr>
<td>Password</td>
<td>Required. SAP password.</td>
</tr>
<tr>
<td><strong>Connection Property</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Connection type</td>
<td>Required. Type of connection that you want to create. Select one of the following values: - 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 use SAP load balancing. Default is Application.</td>
</tr>
<tr>
<td>Host name</td>
<td>Required when you create an SAP application connection. Host name or IP address of the SAP BW server that you want to connect to.</td>
</tr>
<tr>
<td>System number</td>
<td>Required when you create an SAP application connection. SAP system number.</td>
</tr>
<tr>
<td>Message host name</td>
<td>Required when you create an SAP load balancing connection. Host name of the SAP message server.</td>
</tr>
<tr>
<td>R3 name/SysID</td>
<td>Required when you create an SAP load balancing connection. SAP system name.</td>
</tr>
<tr>
<td>Group</td>
<td>Required when you create an SAP load balancing connection. Group name of the SAP application server.</td>
</tr>
<tr>
<td>Client</td>
<td>Required. SAP client number.</td>
</tr>
<tr>
<td>Language</td>
<td>Language code that corresponds to the language used in the SAP system.</td>
</tr>
<tr>
<td>Trace</td>
<td>Use this option to track the JCo calls that the SAP system makes. Specify one of the following values: - 0. Off - 1. Full Default is 0. SAP stores information about the JCo calls in a trace file. You can access the trace files from the following directories: - Design-time information: <code>&lt;Informatica Secure Agent installation directory&gt;\main\comcat</code> - Run-time information: <code>&lt;Informatica Secure Agent installation directory&gt;\main\bin\rdtm</code></td>
</tr>
<tr>
<td>Additional parameters</td>
<td>Additional JCo connection parameters that you want to use. Use the following format: <code>&lt;parameter name1&gt;=&lt;value1&gt;, &lt;parameter name2&gt;=&lt;value2&gt;</code></td>
</tr>
<tr>
<td>Port Range</td>
<td>HTTP port range that the Secure Agent must use to read data from the SAP BW server in streaming mode. Enter the minimum and maximum port numbers with a hyphen as the separator. The minimum and maximum port number can range between 10000 and 65535. Default is 10000-65535.</td>
</tr>
<tr>
<td>Use HTTPS</td>
<td>Select this option to enable https streaming.</td>
</tr>
</tbody>
</table>
SAP BW BEx Query Connections

Create an SAP BW BEx Query connection to connect to the SAP BW system and read data from SAP BEx queries.

You can use the SAP BW BEx Query connections in mappings and Mapping Configuration tasks.

SAP BW BEx Query Connection Properties

To read data from SAP BEx queries, select the SAP BW BEx Query connection type and configure the following properties:

<table>
<thead>
<tr>
<th>Connection Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runtime Environment</td>
<td>Required. Runtime environment that contains the Secure Agent that you want to use to read data from SAP BEx queries.</td>
</tr>
<tr>
<td>Authentication</td>
<td>Required. Authentication method for the connection. Select SAP.</td>
</tr>
<tr>
<td>Username</td>
<td>Required. SAP user name with the appropriate user authorization.</td>
</tr>
<tr>
<td>Password</td>
<td>Required. SAP password.</td>
</tr>
<tr>
<td>Connection type</td>
<td>Required. Type of connection that you want to create. To read data from SAP BEx queries, you must select the Application connection type. Use the application connection type to connect to a specific SAP BW server. Default is Application.</td>
</tr>
<tr>
<td>Host name</td>
<td>Required. Host name or IP address of the SAP BW server that you want to connect to.</td>
</tr>
<tr>
<td>System number</td>
<td>Required. SAP system number.</td>
</tr>
<tr>
<td>Client</td>
<td>Required. SAP client number.</td>
</tr>
<tr>
<td>Language</td>
<td>Language code that corresponds to the language used in the SAP system.</td>
</tr>
</tbody>
</table>

Note: You can ignore the other connection properties because they are not relevant for SAP BW BEx Query Connector.
Creating an SAP Table Connection

1. Click **Configure > Connections**.
2. Click **New** in the **Connections** page.
   The **New Connection** page appears.
3. Enter a name for the SAP Table connection.
   Connection names can contain alphanumeric characters, spaces, and the following special characters: 
   _ . + -
   Connection names are not case sensitive.
4. Enter a description for the connection.
   The description can have a maximum length of 255 characters.
5. Select SAP Connector as the connection type.
   The SAP Connector Connection Properties appear.
6. Select the name of the runtime environment where you want to run the tasks.
7. Enter an SAP user name with the appropriate user authorization.
8. Enter the SAP password.
9. Enter the SAP client number.
10. Enter the language code that corresponds to the SAP language.
11. Enter the complete path to the sapnwfc.ini file.
12. Enter the destination entry that you specified in the sapnwfc.ini file for the SAP application server.
13. Enter a range of HTTP port numbers that you can use.
14. Select **Test Streaming**, to test the connection with both RFC and HTTP protocol. Clear the field to test the connection with HTTP protocol.
15. Select **Https Connection** to connect to SAP through HTTPS protocol.
16. Enter the absolute path to the JKS keystore file.
17. To specify the destination keystore password as the Keystore Password, type the destination password specified for the .JKS file while creating the OpenSSL certificate.
18. To specify the source keystore password as the Private Key Password, type the export password specified for the .P12 file while creating the OpenSSL certificate.
19. Click **Test** to test the SAP Table connection using HTTP protocol.
20. Click **OK** to save the connection.

Creating an SAP IDoc Reader Connection

1. Click **Configure > Connections**.
2. Click **New** in the **Connections** page.
   The **New Connection** page appears.
3. Enter a name for the SAP IDoc Reader connection.
Connection names can contain alphanumeric characters, spaces, and the following special characters: _ . + - 
Connection names are not case sensitive.

4. Enter a description for the connection.
The description can have a maximum length of 255 characters.

5. Select SAP as the connection type.
The SAP Connection Properties appear.

6. Select the name of the runtime environment where you want to run the tasks.

7. Select iDoc Reader as the SAP connection type.
The iDoc Reader Connection Properties appear.

8. Enter the destination entry that you specified in the sapwrfc.ini file for the RFC server program registered at an SAP gateway.
The Program ID for this destination entry must be the same as the Program ID for the logical system you defined in SAP to receive IDocs.

9. Select UTF-8 as the code page compatible with the SAP source.

10. Click OK to save the connection.

Creating an SAP IDoc Writer or SAP RFC/BAPI Interface Connection

1. Click Configure > Connections.

2. Click New in the Connections page.
The New Connection page appears.

3. Enter a name for the connection.
Connection names can contain alphanumeric characters, spaces, and the following special characters: _ . + - 
Connection names are not case sensitive.

4. Enter a description for the connection.
The description can have a maximum length of 255 characters.

5. Select SAP as the connection type.
The SAP Connection Properties appear.

6. Select the name of the runtime environment where you want to run the tasks.

7. Select the SAP connection type. You can choose one of the following options:
   • To create an iDoc Writer connection, select iDoc Writer.
   • To create a BAPI/RFC connection, select SAP RFC/BAPI Interface.
The connection properties appear.

8. Enter an SAP user name with the appropriate user authorization.

9. Enter the SAP password.

10. Enter the destination entry that you specified in the sapwrfc.ini file for the SAP application server.
11. Select the code page compatible with the SAP system.
12. Enter the language code that corresponds to the SAP language.
13. Enter the SAP client number.
14. Click OK to save the connection.

Creating an SAP BW Reader Connection

1. Click Configure > Connections.
   The Connections page appears.
2. Click New.
   The New Connection page appears.
3. Enter a name for the SAP BW Reader connection.
   Connection names are not case sensitive. Connection names can contain alphanumeric characters, spaces, and the following special characters:
   _ . + -
4. Enter a description for the connection.
   The description can have a maximum length of 255 characters.
5. Select SAP BW Reader as the connection type.
   The SAP BW Reader Connection Properties section appears.
6. Select the name of the runtime environment where you want to run the tasks.
7. Enter an SAP user name with the appropriate user authorization.
8. Enter the SAP password.
9. Select one of the following connection types:
   - Application. Create an application connection if you want to connect to a specific SAP BW server.
   - Load balancing. Create a load balancing connection if you want SAP to connect to the BW server with the least load at run time.
10. Enter the host name or IP address of the SAP BW server that you want to connect to.
11. Enter the SAP system number.
12. Enter the host name of the SAP message server.
13. Enter the SAP system name.
14. Enter the group name of the SAP BW server.
15. Enter the SAP client number.
16. Enter the language code that corresponds to the language used in the SAP system.
17. Enable the trace option to track the JCo calls that the SAP system makes.
   You can enter one of the following values:
   - 0. Off
   - 1. Full
   Default is 0.
SAP stores information about the JCo calls in a trace file. You can access the trace files from the following directories:

- **Design-time information:** `<Secure Agent installation directory>\main\tomcat`
- **Run-time information:** `<Secure Agent installation directory>\main\bin\rtdm`

18. Enter any additional JCo connection parameters that you want to use.
   Use the following format:
   `<parameter name1>=<value1>, <parameter name2>=<value2>`

19. Enter the HTTP port range that the Secure Agent must use to read data from the SAP BW server in streaming mode.
   Enter the minimum and maximum port numbers with a hyphen as the separator. The minimum and maximum port number can range between 10000 and 65535. When a range is outside the default range, the connection uses the default range. Ensure that you specify valid numbers to prevent connection errors.
   Default is 10000-65535.

20. Select the **Use HTTPS** option to enable https streaming.
   a. Enter the absolute path to the JKS keystore file.
   b. Enter the password for the .JKS file.
   c. Enter the export password for the .P12 file.

21. Click **OK** to save the connection.

22. Click **Test** to determine if the connection to the SAP BW system is successful.

---

## Creating an SAP BW BEx Query Connection

1. Click **Configure > Connections**.
   The **Connections** page appears.

2. Click **New**.
   The **New Connection** page appears.

3. Enter a name for the SAP BW BEx query connection.
   Connection names are not case sensitive. Connection names can contain alphanumeric characters, spaces, and the following special characters: `_ . + -`

4. Enter a description for the connection.
   The description can have a maximum length of 255 characters.

5. Select **SAP BW BEx Query** as the connection type.
   The **SAP BW BEx Query Connection Properties** section appears.

6. Select the name of the runtime environment where you want to run the tasks.

7. Select **SAP** as the authentication method.

8. Enter an SAP user name with the appropriate user authorization.

9. Enter the SAP password.
10. Select the **Application** connection type to read data from SAP BEx queries.
11. Enter the host name or IP address of the SAP BW server that you want to connect to.
12. Enter the SAP system number.
13. Enter the SAP client number.
14. Enter the language code that corresponds to the language used in the SAP system.
15. Click **OK** to save the connection.
16. Click **Test** to determine if the connection to the SAP BW system is successful.
CHAPTER 4

Troubleshooting

This chapter includes the following topics:

- Troubleshooting, 57
- SAP Table Connection Errors, 57

Troubleshooting

Use the following sections to troubleshoot errors in Informatica Cloud. For a list of common error messages and possible solutions, see the Informatica Cloud Community article, "Troubleshooting: Common Error Messages".

SAP Table Connection Errors

The following error displays when I test an SAP Table connection:

Test Connection Failed for <connection name>/sap/conn/jco/JCoException

Verify that the sapjco3.jar has been saved to the appropriate directories.

Restart the Secure Agent after you copy the sapjco3.jar.

The following error displays when I test an SAP Table connection or use the connection in a task:

Test Connection Failed for <connection name>. Error getting the version of the native layer: java.lang.UnsatisfiedLinkError: no sapjco3 in java.library.path.

Verify that the location of the sapjco3.dll file is in the to PATH variable for the Secure Agent machine.

The following error displays when I test an SAP Table connection or use the connection in a task:

Test Connection Failed for <connection name>. Error getting the version of the native layer: java.lang.UnsatisfiedLinkError: C:\Program Files\vikram\sapjco3- NTintel-3.0.9\sapjco3.dll: This application has failed to start because the application configuration is incorrect. Reinstalling the application may fix this problem.

The following error displays when I test an SAP Table connection or use the connection in a task:

Test Connection Failed for <connection name>. Error getting the version of the native layer: java.lang.UnsatisfiedLinkError: no sapjco3 in java.library.path.
Add the location of sapjco3.dll to PATH variable and restart the Secure Agent.

A task that reads from SAP tables fails with the following error:

Error occurred processing data from SAP : Unable to establish Http Communication between SAP server and agent! Shutting down reader.

The HTTP port is not open or the incoming request is being blocked by Windows Firewall. To resolve the issue, in Windows Firewall, use the advanced settings to create a new incoming rule. Apply the rule to TCP and all ports, and choose the HTTP-In protocol.

The following error message displays when I select an SAP table as a source object in a Data Synchronization task.

Field QUERYRESULT not a member of TABLES

Install the latest transport files and clear the browser cache.
Part IV: Data Integration Using SAP Table

This part contains the following chapters:

- SAP Table, 60
- Data Synchronization Tasks with SAP Table, 62
- Mappings and Mapping Configuration Tasks with SAP Table, 73
SAP Table

This chapter includes the following topics:

- SAP Tables and Views, 60
- Rules and Guidelines for SAP Sources and Targets, 60

SAP Tables and Views

You can connect to transparent, pool, and cluster tables using an SAP Table connection. You can also connect to SAP views. Informatica Cloud does not differentiate between tables and views. You extract data from views the same way you extract data from tables.

When you select a table, Informatica Cloud displays the table name followed by the business name in the Select Object dialog box. You can filter by table name or business name when you connect to the SAP system.

Informatica Cloud imports the following SAP table information:

- Source name
- Column names
- Business descriptions
- Data types, length, precision, and scale

Rules and Guidelines for SAP Sources and Targets

Use the following rules and guidelines when you configure SAP sources and targets:

- When you configure an SAP source, configure row limits using the advanced source properties available on the scheduling page of the task wizard. Row limits on the data filters page of the task wizard are not enabled for SAP sources.
- Do not use tables as SAP Table sources if the sources have circular primary key-foreign key relationships.
- When you use more than one SAP table in a Data Synchronization task, you can use one cluster table or one pool table. If you use more than one cluster or pool table, errors occur at run time. You can use the Object Search dialog box to see if a table is a cluster table or a pool table. You can use multiple transparent tables in a task.
• When you join a cluster table or pool table with a transparent table, include all key fields in the transparent table in the join condition. List the fields in the order that they appear in the SAP system.

• When you join a cluster table or pool table with a transparent table, use all of the source fields in the transparent table that you use in the joins and filters in the field mapping. Also, map at least one field from the cluster or pool table.

• Define relationships for multiple sources after the data preview displays the data. You can use the wizard in advanced mode to avoid waiting to preview data.

• Data sorting is not supported on cluster or pool table fields.

• You can use Informatica Cloud variables and ABAP variables in simple data filters for SAP tables. Do not use ABAP syntax in simple data filters for SAP tables.

• You can use ABAP variables and ABAP syntax in advanced data filters for SAP tables. Do not use Informatica Cloud variables in advanced data filters for SAP tables.

• Do not use the Is Null or Is Not Null operators in data filters for SAP cluster and pool tables.

• Do not use the Is Null or Is Not Null operators in data filters on SAP character fields.

• Due to an SAP limitation, tasks that require a read longer than 30 minutes can fail. You might use one or more of the following suggestions if you encounter this problem:
  - Use the SAP advanced source properties to limit the number of rows to be read.
  - Configure a data filter to reduce the number of rows to be read.
  - Reduce the number of output fields for the task.
  - Configure the SAP parameter rdisp/max_wprun_time to allow more time for the read. For more information, see the SAP documentation.
  - To increase the amount of records that the Secure Agent can retrieve at one time, you can increase the Java heap memory for the Secure Agent. In the System Configuration Details section, select DTM and set the JVMOption1 property to the following value: Xmx512m. Click OK to save the change and restart the Secure Agent. Adjust the value for the JVMOption1 property based on the amount of records you want to retrieve and the available memory on the Secure Agent machine.

• For a lookup on an SAP object, configure the lookup to return less than 20 rows. Tasks might fail if the lookup returns more than 20 rows.

• A lookup on an SAP object does not return matching rows if the lookup comparison value is NULL.

• When you define a reject file name for an SAP target, use the default name or the variable $ErrorFileName. The $ErrorFileName variable uses the following convention for reject file name:
  
  s_dss_<task name>_<run number>_error.csv.bad

• When you define a reject directory for an SAP target, use the variable $PMBadFileDir. When you use the $PMBadFileDir variable, the Data Synchronization task writes the reject file to the following Secure Agent directory:
  
  <SecureAgent_InstallDir>/main/rdtmDir/error
CHAPTER 6

Data Synchronization Tasks with SAP Table

This chapter includes the following topics:

- Data Synchronization Tasks with SAP Table Overview, 62
- SAP Table Sources in Data Synchronization Tasks, 62
- SAP Table Lookups in Data Synchronization Tasks, 64
- Configuring a Data Synchronization Task with a Single SAP Object as the Source, 64
- Configuring a Data Synchronization Task with Multiple SAP Objects as the Source, 66
- Monitoring a Data Synchronization Task, 67
- Data Synchronization Task Example, 68

Data Synchronization Tasks with SAP Table Overview

The Data Synchronization application allows you to synchronize data between a source and target.

You can configure a Data Synchronization task using the Data Synchronization Task wizard. You can use SAP Table objects as sources, targets, or lookup objects. You can use expressions to transform the data according to your business logic, use data filters to filter data before writing it to targets, sort data in ascending or descending order of multiple fields.

When you create a task, you can associate it with a schedule to run it at specified times or on regular intervals. Or, you can run it manually. You can monitor tasks that are currently running in the activity monitor and view logs about completed tasks in the activity log.

For more information about Data Synchronization tasks, see Deploy.

SAP Table Sources in Data Synchronization Tasks

When you configure a Data Synchronization task to use an SAP Table source, you can configure the source properties.

The source properties appear on the Source page of the Data Synchronization Task wizard when you specify an SAP Table connection.
The following table describes the SAP Table source properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>Name of the source connection.</td>
</tr>
</tbody>
</table>
| Source Type                       | Source type. Select one of the following types:  
|                                   |   - Single. Select to specify a single SAP Table object.  
|                                   |   - Multiple. Select to specify multiple SAP Table objects. When you specify multiple source objects, you must create relationships between the source objects. |
| Source Object                     | Source object for the task.                                                                                                                 |
| Add                               | Adds multiple source objects.                                                                                                                |
| Create Relationship               | Creates relationship between selected source object and related source object. Specify a join condition between a source object key field and a related source object key field. |
| Edit Relationship                 | Edits a join condition.                                                                                                                     |
| Display technical field names     | 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 Data Synchronization task. Advanced source properties appear on the **Schedule** page of the Data Synchronization Task wizard.

The following table describes the SAP Table advanced source properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of rows to be fetched</td>
<td>The number of rows that are randomly retrieved from the SAP Table. Default value of zero retrieves all the rows in the table.</td>
</tr>
<tr>
<td>Number of rows to be skipped</td>
<td>The number of rows to be skipped.</td>
</tr>
<tr>
<td>Packet size in MB</td>
<td>Packet size. Default is 10 MB.</td>
</tr>
<tr>
<td>Enable Compression</td>
<td>Enables compression. If the Secure Agent and the SAP System are not located in the same network, you may want to enable the compression option to optimize performance.</td>
</tr>
</tbody>
</table>
SAP Table Lookups in Data Synchronization Tasks

When you configure field mappings in a Data Synchronization task, you can create a lookup to an SAP Table object.

If you configure an uncached lookup, you can use only the = logical operator in the lookup condition.

When you use an SAP Table object as a lookup, you do not need to configure specific SAP Table properties. For more information, see Deploy.

Configuring a Data Synchronization Task with a Single SAP Object as the Source

1. Click Task Wizards > Data Synchronization.
   The Data Synchronization Task Wizard appears.
2. Enter a name for the Data Synchronization task.
   The names of Data Synchronization tasks must be unique within the organization. Data Synchronization task names can contain alphanumeric characters, spaces, and the following special characters: _ . + - . Data Synchronization task names are not case sensitive.
3. Enter a description for the Data Synchronization task.
   The description can have a maximum length of 255 characters.
4. Select the task operation that you can perform on the target. Select one of the following options: Insert, Update, Upsert, and Delete.
5. Click Next to enter the source details.
   a. Select an SAP Table connection.
   b. Select Single as the source type.
   c. Click Select to specify the SAP source object.
      The Select Source Object dialog box appears. The dialog box displays up to 200 objects. If the objects you want to use do not appear, enter a search string to search based on name and description.
   d. Click Select.
      The Data Preview area displays the first 10 rows of the first five columns in the SAP object and the total number of columns in the object. To preview all source columns in a file, click Preview All Columns.
6. To display technical names instead of business names, select Display technical field names instead of labels.
7. To display source fields in alphabetic order, click Display source fields in alphabetical order.
   By default, fields appear in the order returned by the source system.
8. Click Next to specify the target connection and target objects.
9. Click Next to specify any data filters or sort criteria.
   Note: Specify the row limit in the Advanced Source Properties section in the Schedule page.
10. Click New to create a data filter. You can choose to create a simple or advanced data filter.
To create a simple data filter, select a source object, source field, and operator. Enter the value you want to use and click OK.

To create an advanced data filter, click Advanced. Select a source object and enter the field expression you want to use and click OK. You can use parameters defined in a parameter file in the data filters. When you use a parameter in a data filter, start the data filter with the parameter.

11. Click New to configure the sort criteria.
   a. Select the source object, sort by field, and the sort direction.
   b. Click New to configure additional sort criteria or click Delete to remove a sort criteria.

12. 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 object.
   b. Click Add Mapplet to select a mapplet and optionally specify a connection for the mapplet.
   c. Click Automatch to match source and target fields with similar names.
   d. Click Refresh Fields to update the cache and view the latest field attributes.
   e. 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.
   f. 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.
   g. Click the Add or Edit Expression icon to define a field expression to transform data.
   h. Click the Add or Edit Lookup icon to create a lookup. Specify the lookup connection, object, source and lookup fields, output field, multiplicity, and lookup expression.
   i. Click Validate Mapping to validate all the field mappings.
   j. Click Clear Mapping to clear all the field mappings.

13. 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 you want to use.
   b. Configure the email notification options.
   c. Configure advanced options for the task.
   d. Configure the advanced source properties and advanced target properties.
   e. Specify the execution mode.

14. Save the Data Synchronization task. You can choose one of the following save options.
   • Click Save and Close to save the task and close the Data Synchronization task.
   • Click Save and Continue to save the task and continue with configuring the Data Synchronization task.
   • Click Save and Run to save and run the Data Synchronization task.
Configuring a Data Synchronization Task with Multiple SAP Objects as the Source

1. Click **Task Wizards > Data Synchronization**.
   The **Data Synchronization Task Wizard** appears.

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

3. Enter a description for the Data Synchronization task.
   The description can have a maximum length of 255 characters.

4. Select the task operation that you can perform on the target. Select one of the following options: Insert, Update, Upsert, and Delete.

5. Click **Next** to enter the source details.
   a. Select an SAP Table connection.
   b. Select **Multiple** as the source type.
   c. Click **Add** to specify an SAP source object.
      The **Select Source Object** dialog box appears. The dialog box displays up to 200 objects. If the objects you want to use do not appear, enter a search string to search based on name and description. To search for an object using the technical name, enclose the name in double quotes.
   d. Repeat the previous steps to add multiple SAP objects. To remove a selected object, click the **Delete** icon.

6. Create relationships between the multiple SAP objects.
   a. Select an SAP object and click **Create Relationship** to create the join conditions between the source and the related object.
      The **Create Relationship** dialog box appears.
   b. Specify the key field in the source SAP object, the type of join, the join operator, the related SAP object, and the key field in the related object.
   c. Click **OK** to create the relationship.
   d. Repeat the previous steps to create multiple relationships.

7. To display technical names instead of business names, select **Display technical field names instead of labels**.

8. To display source fields in alphabetic order, click **Display source fields in alphabetical order**.
   By default, fields appear in the order returned by the source system.

9. Click **Next** to specify the target connection and target objects.

10. Click **Next** to specify any data filters or sort criteria.
   **Note:** Specify the row limit in the **Advanced Source Properties** section in the **Schedule** page.

11. Click **New** to create a data filter. You can choose to create a simple or advanced data filter.
   - To create a simple data filter, select a source object, source field, and operator. Enter the value you want to use and click **OK**.
   - To create an advanced data filter, click **Advanced**. Select a source object and enter the field expression you want to use and click **OK**.
You can use parameters defined in a parameter file in data filters. When you use a parameter in a data filter, start the data filter with the parameter.

12. Click **New** to configure the sort criteria.
   a. Select the source object, sort by field, and the sort direction.
   b. Click **New** to configure additional sort criteria or click **Delete** to remove a sort criteria.

13. Click **Next** to configure the field mappings. Perform any of the following steps based on your requirements.
   a. In the Source column, select one of the SAP objects or All source objects to map the fields.
   b. Click **Edit Types** in the Source column to edit the precision and scale of the selected SAP object.
   c. Click **Add Mapplet** to select a mapplet and optionally specify a connection for the mapplet.
   d. Click **Automatch** to match source and target fields with similar names.
   e. Click **Refresh Fields** to update the cache and view the latest field attributes.
   f. 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.
   g. Select a source field and drag it to the target field to map the field. Repeat for all the fields that you want to map.
   h. Click the **Add or Edit Expression** icon to define a field expression to transform data.
   i. Click the **Add or Edit Lookup** icon to create a lookup. Specify the lookup connection, object, source and lookup fields, output field, multiplicity, and lookup expression.
   j. Click **Validate Mapping** to validate all the field mappings.
   k. Click **Clear Mapping** to clear all the field mappings.

14. 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 you want to use.
   b. Configure the email notification options.
   c. Configure advanced options for the task.
   d. Configure the advanced source properties and advanced target properties.
   e. Specify the execution mode.

15. Save the Data Synchronization task. You can choose one of the following save options.
   - Click **Save and Close** to save the task and close the Data Synchronization task.
   - Click **Save and Continue** to save the task and continue with configuring the Data Synchronization task.
   - Click **Save and Run** to save and run the Data Synchronization task.

### Monitoring a Data Synchronization Task

When you run a Data Synchronization task, you can view details about the task in the activity monitor. Select **Monitor** > **Activity Monitor** to view the tasks details.

After the job is completed, select **Monitor** > **Activity Log** to view the activity log. Select the name of the task to view the task details. Click the session log to view details about the completed task. In addition, you can view the ABAP statement associated with the task in the session log.
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 Informatica Cloud activity log is a higher value because it also includes time required to complete processing in Informatica Cloud.

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.

Data Synchronization Task Example

You can create a Data Synchronization task to read data from multiple SAP objects and write the data to a flat file object.

You can read General Ledger Accounting line items from the BKPF and BSEG tables in SAP. BSEG is an SAP Cluster table that is used to store Accounting Document Segment information. BKPF is a Transparent SAP Table that is used to store Accounting Document Header information. In this example, you can join the BKPF and BSEG tables and map the source object to a flat file target object.

In this example to write the accounting document details to a flat file object, perform the following steps:

1. Define the Data Synchronization task.
2. To configure the SAP Table sources, select an SAP Table connection, and select the BKPF transparent table and the BSEG cluster table as the source objects. Create join conditions between the source BKPF table and the related BSEG table.
3. To configure a flat file target for the task, select a flat file connection and specify a flat file object.
4. Configure the field mappings to define the data that the Data Synchronization task writes to the target.
5. Save and run the Data Synchronization task.

Step 1: Define the Data Synchronization Task

1. Click Task Wizards > Data Synchronization.
   The Data Synchronization Task Wizard appears.
2. Enter a name for the Data Synchronization task.
3. Enter a description for the Data Synchronization task.
4. Select the insert task operation for the target.
   The following image shows the Data Synchronization task definition page:

   ![Data Synchronization Task Wizard](image)

5. Click Next.
Step 2: Configure the SAP Table Source

1. Select an SAP Table connection.
2. Select **Multiple** as the source type.
3. Click **Add** to specify the SAP source object.
   The **Select Source Object** dialog box appears. Select the BKPF transparent table.
4. Click **Select**.
5. Click **Add** to select the BSEG cluster table.
   The following image shows the **Select Source Object** dialog box:

   ![Select Source Object Dialog Box]

6. Create relationships between the SAP tables.
   a. Select the BKPF SAP object and click **Create Relationship** to create the join conditions between the source BKPF table and the related BSEG table.
      The **Create Relationship** dialog box appears.
   b. Specify the key field in the source SAP object, the type of join, the join operator, the related SAP object, and the key field in the related object.
   c. Click **OK** to create the relationship.
d. Repeat the previous steps to create multiple relationships.

The following image shows the Create Relationship dialog box:

![Create Relationship dialog box](image)

7. Select a source object to preview the data. The Data Preview area displays the first 10 rows of the first five columns in the SAP object. You can also view the total number of columns in the object. To preview all source columns in a file, click **Preview All Columns**.

8. To display technical names instead of business names, select **Display technical field names instead of labels**.

9. To display source fields in alphabetic order, click **Display source fields in alphabetical order**.
By default, fields appear in the order returned by the source system.
The following image shows the join conditions for multiple SAP objects in the Data Synchronization task source details page:

10. Click **Next**.

**Step 3: Configure the Flat File Target**

1. Select a flat file connection and select a flat file object.
2. Select a target flat file object and click **OK**.
   
   The following image shows a flat file object in the Data Synchronization task target details page:

3. Click **Next** to specify any data filters or sort fields.
4. Click **Next**.
Step 4: Configure the Field Mapping

1. Map the source and target fields.
   You can select all source objects or one of the source objects to map with the target fields.
2. Click **Next** to configure a schedule and advanced options.
3. Save and run the Data Synchronization task.
Chapter 7

Mappings and Mapping Configuration Tasks with SAP Table

This chapter includes the following topics:

- **Mapping and Mapping Configuration Tasks with SAP Table Overview, 73**
- **SAP Table Sources in Mappings, 74**
- **SAP Table Lookups in Mappings, 75**
- **Configuring a Mapping with an SAP Table Source, 75**
- **Creating a Mapping Configuration Task, 76**
- **Mapping with an SAP Table Source Example, 77**

Mapping and Mapping Configuration Tasks with SAP Table Overview

Use a mapping to define data flow logic that is not available in Data Synchronization tasks, such as specific ordering of logic or joining sources from different systems. Use the Informatica Cloud Mapping Designer to configure mappings.

When you configure a mapping to describe the flow of data from source and 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 Configuration task. The Mapping Configuration application allows you to process data based on the data flow logic defined in a mapping or integration template.

Use the Mapping Configuration Task wizard to create a Mapping Configuration task. When you create a Mapping Configuration task, you select the mapping or integration template for the task to use.

If you configured parameters, which are placeholders for information, in a mapping, you can define the parameters in the Mapping Configuration task. Defining parameters provides additional flexibility and allows you to use the same mapping in multiple Mapping Configuration 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 Configuration task.
When you create a Mapping Configuration task, you can associate the task with a schedule to run it at specified times or on regular intervals. Or, you can run it manually. You can also configure advanced session properties. You can monitor tasks that are currently running in the activity monitor and view details about completed tasks in the activity log.

For more information, see Deploy.

SAP Table Sources in Mappings

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

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

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

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>Name of the source connection.</td>
</tr>
</tbody>
</table>
| Source Type | Select one of the following types:  
- Single. Select to specify a single SAP Table object.  
- Multiple. Select to specify multiple SAP Table objects. You can use custom relationships to join multiple source objects. When you create a custom relationship for SAP Table objects, you can select the type of join and the source fields to use.  
- Parameter. Select to specify a parameter name. You can configure the source object in a Mapping Configuration task associated with a mapping that uses this source transformation. |
| Object      | Source object. When you specify multiple source objects, you must create relationships between the source objects.                          |

The following table describes the SAP Table advanced source properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of rows to be fetched</td>
<td>The number of rows that are randomly retrieved from the SAP Table. Default value of zero retrieves all the rows in the table.</td>
</tr>
<tr>
<td>Number of rows to be skipped</td>
<td>The number of rows to be skipped.</td>
</tr>
<tr>
<td>Packet size in MB</td>
<td>Packet size. Default is 10 MB.</td>
</tr>
<tr>
<td>Enable Compression</td>
<td>Enables compression. If the Secure Agent and the SAP System are not located in the same network, you may want to enable the compression option to optimize performance.</td>
</tr>
<tr>
<td>Tracing Level</td>
<td>Sets the amount of detail that appears in the log file. You can choose terse, normal, verbose initialization or verbose data. Default is normal.</td>
</tr>
</tbody>
</table>
SAP Table Lookups in Mappings

In a mapping, you can configure a Lookup transformation to look up data from SAP Table objects. If you configure an uncached lookup, you can use only the `=` logical operator in the lookup condition. When you use an SAP Table object as a lookup, you do not need to configure specific SAP Table properties. For more information, see Deploy.

Configuring a Mapping with an SAP Table Source

Use the Informatica Cloud Mapping Designer to configure a mapping.

1. To create a mapping, click Design > Mappings, and then click New Mapping. The New Mapping dialog box appears.
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 a source, on the Transformation palette, click Source.
4. In the Properties panel, on the General tab, enter a name and description.
5. Click the Source tab and configure source details.
6. Specify the source type. You can choose one of the following options:
   - Select Single Object to select a single SAP object.
   - Select Multiple Objects to specify source object, related source object, and configure the relationship between the source objects. You can use custom relationships to join multiple source objects. When you create a custom relationship for SAP Table objects, you can select the type of join and the source fields to use.
   - Select Parameter to configure the source objects in a Mapping Configuration task associated with this mapping.
7. Click Query Options in the Source tab to specify any filter and sort options for the SAP object.
8. Click Advanced to specify the advanced source properties.
9. To add or remove source fields, to update field metadata, or to synchronize fields with the source, click the Fields tab.
10. 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.
To add another transformation, repeat these steps.

11. To add a Target transformation, on the **Transformation palette**, click **Target**.
   a. On the **General** tab, you can enter a name and description.
   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 the *Informatica Cloud Transformation Guide*.
   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.

12. Save and run the mapping or save and create a Mapping Configuration task.

## Creating a Mapping Configuration Task

You can create a Mapping Configuration task based on a valid mapping or integration template on the Mappings page.

1. Click **Task Wizards > Mapping Configuration**.
2. Click **New**.
   The **New Mapping Configuration Task** appears.
3. Enter a name for the task.
   Task names must be unique within the organization. Task names can contain alphanumeric characters, spaces, and the following special characters: _ . + - Task names are not case sensitive.
4. Select the runtime environment that contains the Secure Agent that you want to use to access the SAP tables.
5. Select **Mapping** as the task based on which you want to create the Mapping Configuration task.
6. Click **Select** to specify a mapping.
   The **Select a Mapping** dialog box appears.
7. Select a mapping or search for the required mapping and select **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. 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 you want to use.
   b. Configure the email notification options.
   c. Configure advanced options for the task.
   d. Configure the advanced source properties and advanced target properties.
Mapping with an SAP Table Source Example

You can create a Mapping Configuration to read data from a single SAP object and write the data to a target object.

You can read data from an SAP purchasing document header, the EKKO table, and write the purchasing details to any target.

In this example to read data the EKKO table and write the data to a flat file target object, perform the following steps:

1. Define the mapping.
2. To configure an SAP Table source, select an SAP Table connection and select the EKKO table.
3. To configure a flat file target, select a flat file connection, specify a flat file object, and map the source and target fields.
4. Save the mapping and create a Mapping Configuration task.

Step 1: Define the Mapping

1. To create a mapping, click Design > Mappings, and then click New Mapping.
2. Enter a name and description for the mapping.
3. Click OK.
Step 2: Configure the SAP Table Source

1. To configure an SAP source, on the Transformation palette, click Source.
2. In the Properties panel, on the General tab, enter a name and description.
3. Click the Source tab to configure source details.
4. Specify an SAP Table connection as the source object connection.
5. Specify the source type as Single Object and click Select.
6. In the Select Source Object dialog box, select the EKKO table,
7. Click Query Options in the Source tab to specify any filter and sort options for the SAP Table object.
8. Click Advanced to specify the advanced source properties.

The following image shows the source details page:

Step 3: Configure the Flat File Target

1. To add a flat file Target transformation, on the Transformation palette, click Target.
2. On the General tab, enter a name and description.
3. Draw a link to connect the Source transformation to the Target transformation.
4. Click the Target tab to configure the flat file target details.
5. Specify a flat file connection as the target connection.
6. Select the target type as Single Object and click Select.
7. Specify a flat file object.
   The following image shows the target details:

   ![SAP Table Mapping](image1)

8. To preview fields, click **Incoming Fields**.
   The following image shows the incoming field details:

   ![SAP Table Mapping](image2)
9. Click **Field Mapping** and map the fields that you want to write to the target.

   The following image shows the field mapping details:

   ![Field Mapping Image]

   **Step 4: Save the Mapping and Create a Mapping Configuration Task**

   1. Click **Save > Save and New Configuration Task**.

   The **New Mapping Configuration Task** page appears.

   2. Enter a name and description for the task.
3. Select the runtime environment that contains the Secure Agent you want to use to access SAP tables. The following image shows the Mapping Configuration task details:

![New Mapping Configuration Task](image)

4. Click **Next** to configure the schedule and advanced options.

5. Save and run the Mapping Configuration task.
Part V: Data Integration Using BAPI/RFC Functions

This part contains the following chapters:

- BAPI/RFC Mapplets, 83
- Mapping and Mapping Configuration Tasks Using BAPI/RFC Functions, 88
CHAPTER 8

BAPI/RFC Mapplets

This chapter includes the following topics:

- BAPI/RFC Mapplets Overview, 83
- BAPI/RFC Mapplet Parameters, 84
- Target Object for BAPI/RFC Error Output, 87
- Rules and Guidelines for BAPI/RFC Mapplets in Mappings, 87

BAPI/RFC Mapplets Overview

You can generate SAP BAPI/RFC mapplets in Informatica Cloud.

The BAPI/RFC mapplet includes a BAPI/RFC transformation. The BAPI/RFC transformation makes BAPI/RFC calls in SAP. BAPI/RFC calls include requests to the SAP system, such as creating, changing, or deleting data in SAP applications. To perform these tasks, BAPI/RFC functions use function parameter values.

Configuring SAP BAPI Connector as a Business Service

You can configure SAP BAPI Connector as a business service within a mapping or a Mapping Configuration task for SAP BAPI data integration.

For more information about configuring SAP BAPI Connector as a business service within a mapping or a Mapping Configuration task, see the Informatica How-To Library article "How to Configure SAP BAPI Connector as a Business Service for SAP BAPI Data Integration":

https://kb.informatica.com/h2l/HowTo%20Library/1/1075-HowToConfigureSAPBAPIClectorAsABusinessService-H2L.pdf
BAPI/RFC Mapplet Parameters

BAPI/RFC functions use function parameter values to perform tasks. A BAPI/RFC mapplet includes input and output groups based on the BAPI/RFC transformation.

Function Parameters

BAPI/RFC functions can have the following parameters:

<table>
<thead>
<tr>
<th>Function Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalar input parameters.</td>
<td>Scalar input values. Some BAPI functions require scalar input values to perform tasks such as changing data.</td>
</tr>
<tr>
<td>Scalar output parameters.</td>
<td>Scalar output values that a BAPI function returns after performing a task.</td>
</tr>
<tr>
<td>Table parameters.</td>
<td>SAP structures with more than one row. Table parameters can be input, output, or both. Input table parameters pass table input values to a BAPI/RFC function. For example, some BAPI/RFC functions require table inputs to change data.</td>
</tr>
</tbody>
</table>

Input and Output Groups

The BAPI/RFC transformation can contain the following groups:

<table>
<thead>
<tr>
<th>Group Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalar input</td>
<td>Input group for scalar parameters. Contains a field for each scalar input parameter. The group name is SCALAR_INPUT and the field names are SI_&lt;FieldName&gt;.</td>
</tr>
<tr>
<td>Table input</td>
<td>One group for each table parameter. The fields represent import structures. The group name is TABLE_INPUT_&lt;structure name&gt; and field names are TI_&lt;StructureName&gt;_&lt;FieldName&gt;.</td>
</tr>
<tr>
<td>Scalar output</td>
<td>Output group for scalar parameters. Contains a field for each scalar output parameter. The group name is SCALAR_OUTPUT and field names are SO_&lt;FieldName&gt;.</td>
</tr>
<tr>
<td>Table output</td>
<td>One group for each table parameter. The fields represent output structures. The group name is TABLE_OUTPUT_&lt;structure name&gt; and field names are TO_&lt;StructureName&gt;_&lt;FieldName&gt;.</td>
</tr>
<tr>
<td>Error output</td>
<td>Passes data from data conversion errors and invalid BAPI/RFC calls. Map the error output field to a target to see error messages about data conversion and BAPI/RFC calls.</td>
</tr>
</tbody>
</table>

BAPI/RFC Parameter Properties

When you generate a BAPI/RFC mapplet, you can view the parameter properties and return structures.

You can also change the direction of the BAPI/RFC table parameters. The direction of the table parameters determine which groups in the transformation are input groups and which are output groups.

If the BAPI return structure is custom, you can edit the return structure properties that you selected during import for reusable BAPI/RFC transformations. Otherwise, you can view the BAPI/RFC return structure parameters.
The following table describes the BAPI/RFC function parameter properties:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Name of the export, import, and table parameters and columns.</td>
</tr>
<tr>
<td>Associated Type</td>
<td>Definition of the parameter in SAP.</td>
</tr>
<tr>
<td>Short Description</td>
<td>Short description of the export, import, and table parameters and columns.</td>
</tr>
<tr>
<td>Optional</td>
<td>Indicates if the Secure Agent should pass a value to the parameter when it calls the BAPI.</td>
</tr>
<tr>
<td>Direction</td>
<td>Indicates if the parameter requires input or provides output. Values are: Input, Output, Both, or None.</td>
</tr>
<tr>
<td>Datatype</td>
<td>Object data type.</td>
</tr>
<tr>
<td>Precision</td>
<td>Object precision.</td>
</tr>
<tr>
<td>Scale</td>
<td>Object scale.</td>
</tr>
<tr>
<td>Default</td>
<td>Default value of the parameter in SAP, if any. SAP uses the default value when the Secure Agent does not pass a value to SAP.</td>
</tr>
</tbody>
</table>

The following table describes the parameter properties in the Return Structure tab:

<table>
<thead>
<tr>
<th>Return Structure Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return Structure</td>
<td>Return parameter name to determine the status of function calls. Value is RETURN if the BAPI contains a default return structure. If the BAPI does not contain a default return structure, select any table output parameter or scalar output parameter of type STRUCTURE. Default is None.</td>
</tr>
<tr>
<td>Status Field</td>
<td>Required if you select a value for the return structure. Select a field from the structure for status. If you select None for the return structure, this parameter is blank.</td>
</tr>
<tr>
<td>Text Field</td>
<td>Required if you select a value for the return structure. Select a field from the structure for status messages. If you select None for the return structure, this parameter is blank.</td>
</tr>
<tr>
<td>Status Indicator For Warning</td>
<td>Enter an indicator message for warning. If you select None for the return structure, the value is W. Default is W.</td>
</tr>
<tr>
<td>Status Indicator for Error</td>
<td>Enter an indicator message for error. If you select None for the return structure, the value is E. Default is E.</td>
</tr>
<tr>
<td>Status Indicator for Abort</td>
<td>Enter an indicator message for abort. If you select None for the return structure, the value is A. Default is A.</td>
</tr>
</tbody>
</table>

**BAPI/RFC Functions with Nested Structures**

You can import metadata for a BAPI/RFC functions with nested structures.

A BAPI/RFC transformation includes multiple groups. When a BAPI function contains a nested structure, ports for the input and output groups in a BAPI/RFC transformation use the following naming convention:

<group_name>_<parameter_name>_<field name>
For example:

```
SCALAR_INPUT_PARAM1FIELD1
```

If there are multiple input or output structures, the BAPI/RFC transformation includes each structure parameter name in the port names. For example, BAPI Z_TST2 has the parameter INPUT1, which is of the type ZTYPE1. ZTYPE1 has several components such as FIELD1 and FIELD2. FIELD2 is a component of the type structure. It contains field F1. The naming convention in the BAPI/RFC transformation for FIELD 1 is:

```
SCALAR_INPUT_INPUT1FIELD1
```

The naming convention in the BAPI/RFC transformation for the field F1 is:

```
SCALAR_INPUT_INPUT1FIELD2F1
```

**System Variables**

SAP uses system variables to set default values for some BAPI import parameters. The variables provide information, such as current date and time for the operating system on which SAP runs. System variables start with “SY-”. For example, SY-DATLO represents the local date of the SAP system.

The Secure Agent provides values for some system variables to define default input values for BAPI/RFC parameters. The Secure Agent uses the values as default input values for some ports of BAPI/RFC transformations. The Secure Agent uses the default values when there is no input for a port or when the port is not connected to an upstream transformation or source.

You can use the following system variables:

<table>
<thead>
<tr>
<th>System Variable Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SY-LANGU</td>
<td>Log in language from the SAP application connection properties.</td>
</tr>
<tr>
<td>SY-MODNO</td>
<td>RFC handle value.</td>
</tr>
<tr>
<td>SY-MANDT</td>
<td>Value taken from the SAP application connection properties.</td>
</tr>
<tr>
<td>SY-DATUM</td>
<td>Local date on the Security Agent machine processing the data.</td>
</tr>
<tr>
<td>SY-UZEIT</td>
<td>Local time on the Security Agent machine processing the data.</td>
</tr>
<tr>
<td>SY-UNAME</td>
<td>Logon user ID from the SAP application connection properties.</td>
</tr>
<tr>
<td>SY-HOST</td>
<td>SAP host name from the SAP application connection properties.</td>
</tr>
</tbody>
</table>

**Integration ID in BAPI/RFC Mapplet**

The Integration ID field is a key field in the BAPI mapplet. Each BAPI/RFC mapplet includes an Integration ID input field and output field.

When you run a mapping with a BAPI/RFC mapplet, the Secure Agent makes a BAPI/RFC call to SAP to process the data. When it reaches the end of file, the Secure Agent makes the BAPI/RFC call. Depending on the mapping configuration, the Secure Agent can also issue a commit.

The BAPI/RFC call is based on the input data of the Integration ID ports. The Secure Agent makes one call to SAP for each Integration ID. Pass a value to the Integration ID ports in the scalar input group and all mandatory table input groups of the BAPI/RFC mapplet.
Note: You must map the Integration ID input field even when a BAPI or RFC does not require other input fields.

If the BAPI/RFC call fails or if there is a data conversion error, SAP passes the data for the integration ID in comma-separated format to an error output group. If the mapping contains a target instance that is connected to the error output group, the Secure Agent writes the data to the target.

Target Object for BAPI/RFC Error Output

To receive input data from a BAPI/RFC function call or data conversion errors from SAP, you can map a target transformation to a BAPI/RFC mapplet.

Create a target transformation with a column of the String data type and precision of 65535. Connect the column in the target object to the Error Output Group in the BAPI/RFC mapplet. The Secure Agent writes the error output data up to 65,535 characters to the target in comma-delimited format. If the error output data is longer than 65,535 characters, the Secure Agent truncates the data.

Rules and Guidelines for BAPI/RFC Mapplets in Mappings

When you configure a mapping with a BAPI/RFC mapplet, use the following rules and guidelines:

• Pass a value to the Integration ID ports in the scalar input group and all mandatory table input groups of the BAPI/RFC transformation.

• Add a target object if you want to receive BAPI/RFC function call errors from the BAPI error group.

Use the following guidelines when passing data to BAPI/RFC function input parameters:

• When the function input parameter data type is INT1 or NUMC, provide positive values for the function input.

• When the source input data for a BAPI/RFC function is of the integer data type, do not use string data in the source transformation. Otherwise, the mapping fails.

• If the input data for a BAPI/RFC function mapping has a higher scale than the SAP metadata specification, the Secure Agent rounds the data to comply with the SAP metadata. When you run a mapping in high precision mode, the mapping can fail due to overflow if the round-off data cascades to the precision digits. For example, the data type and precision for a BAPI/RFC function parameter is DEC (6,5). The input data that you pass to the function parameter is 9.99999. When the Secure Agent processes the input data, it rounds the input data to 10, which is not compatible with the SAP metadata. The mapping fails.
CHAPTER 9

Mapping and Mapping Configuration Tasks Using BAPI/RFC Functions

This chapter includes the following topics:

- Mapping and Mapping Configuration Tasks Using BAPI/RFC Functions Overview, 88
- Generating a BAPI/RFC Mapplet, 89
- Configuring a Mapping with a BAPI/RFC Mapplet, 89
- Mappings with BAPI/RFC Function Example, 91

Mapping and Mapping Configuration Tasks Using BAPI/RFC Functions Overview

You can generate a BAPI/RFC mapplet in Informatica Cloud. You can then configure a mapping with the mapplet to manage data in SAP systems.

For example, to update sales order data in SAP, generate a BAPI/RFC mapplet from the BAPI_SALESORDER_CHANGE function and configure a mapping using the mapplet.

You can configure a mapping with a BAPI/RFC mapplet to pass input data to BAPI/RFC function input parameters.

To access the BAPI/RFC functionality through Informatica Cloud, perform the following tasks:

1. Generate a BAPI/RFC mapplet in Informatica Cloud.
2. Configure a mapping using the generated BAPI/RFC mapplet. Map the Integration ID field and other inputs and outputs. Save and run the mapping or create a Mapping Configuration task using this mapping.

For information about mappings and Mapping Configuration tasks, see Deploy.

Configuring SAP BAPI Connector as a Business Service

You can configure SAP BAPI Connector as a business service within a mapping or a Mapping Configuration task for SAP BAPI data integration.
Generating a BAPI/RFC Mapplet

You can generate a BAPI/RFC mapplet in Informatica Cloud and use the mapplet in a mapping. Perform the following steps to generate a BAPI/RFC mapplet:

2. Click New > New SAP Mapplet. The New SAP Mapplet page appears.
3. Enter a unique name for the BAPI/RFC mapplet.
4. Optionally, enter a description for the BAPI/RFC mapplet you want to generate.
5. Select the transformation type as BAPI.
6. Select the BAPI/RFC connection that you want to use.
7. Select the scope of the transformation.
   In real time, select the transformation option as Transaction. For batch processing and validating in non-production environment, select ALL INPUT as the transformation scope.
8. Enter the name of the BAPI/RFC function. Note: Verify that you enter the exact name of the BAPI/RFC function that you want to retrieve.
9. Click Get Objects. You can view the import, export, and table parameter details of the BAPI/RFC function.
10. Specify the direction for the tables to indicate if the table parameters in the BAPI are input, output, or both.
11. Click OK. The mapplet for the specified BAPI/RFC function is created. You can create a mapping for the generated mapplet.

Configuring a Mapping with a BAPI/RFC Mapplet

1. To create a mapping, click Design > Mappings, and then click New Mapping. The New Mapping dialog box appears.
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 a source, on the Transformation palette, click Source.
4. In the Properties panel, on the General tab, you can enter a name and description.

5. Click the Source tab and configure the source details.
   Source details and advanced source properties appear based on the connection type.

6. To add a BAPI/RFC mapplet transformation, on the Transformation palette, click Mapplet.
   a. On the General tab, enter a name and description for the mapplet.
   b. Draw a link to connect the previous transformation to the mapplet transformation.
   c. On the Mapplet tab, click Select.
      The Select Mapplet dialog box appears.
   d. Specify a BAPI/RFC mapplet that you generated in Informatica Cloud and click OK.
   e. Click Connection to specify an SAP RFC/BAPI Interface connection. You can create a connection, select a connection, or specify a parameter name for the connection.
   f. To preview fields, configure the field rules, or rename fields, click Incoming Fields.
   g. Click Field Mapping and map the incoming source fields with the Integration ID in the BAPI/RFC mapplet.

7. To add any other transformation, on the Transformation palette, click the transformation name. Or, drag the transformation onto the mapping canvas.
   a. On the General tab, 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.

8. To add a Target transformation, on the Transformation palette, click Target.
   a. On the General tab, you can enter a name and description.
   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.
   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.

9. Save and run the mapping or save and create a Mapping Configuration task.

For more information about transformations, see the Informatica Cloud Transformation Guide.
Mappings with BAPI/RFC Function Example

You can use the bapi_salesorder_createfromdat1 BAPI function to create sales order details for a customer in your organization.

In this example to create a sales order, perform the following tasks:

**Step 1: Generate a BAPI/RFC mapplet in Informatica Cloud for the bapi_salesorder_createfromdat1 BAPI function.**

Log in to Informatica Cloud and generate a BAPI/RFC mapplet that contains the metadata of the bapi_salesorder_createfromdat1 BAPI function.

**Step 2 Configure a mapping using the generated mapplet.**

Perform the following steps to configure a mapping:

1. Specify source objects to enter the order header data from the ORDER_HEADER_IN structure, the partner data using the ORDER_PARTNERS table, and item data using the ORDER_ITEMS_IN table as input parameters.

2. Add the Mapplet transformation. Draw a link to connect the flat file Source transformation to the Mapplet transformation. Draw the following links:
   - ORDER_HEADER_IN source object to the Scalar_Input input port of the BAPI mapplet.
   - ORDER_ITEMS_IN source object to the Table_Input_Order_Items_IN input port of the BAPI mapplet.
   - ORDER_PARTNERS source object to the Table_Input_Order_partners input port of the BAPI mapplet.

3. Configure the mapplet transformation.
   a. Select the generated mapplet. Verify that you specify an SAP RFC/BAPI Interface connection for the mapplet.
   b. Map the incoming source fields with the BAPI parameter properties.

4. Configure a flat file object to which you can write the sales order details. Draw a link to connect the Table Output in the Mapplet transformation to the flat file Target transformation. Create multiple flat file target objects to write the sales order. Create the following target objects and map them to the associated output ports in the BAPI mapplet:
   - ORDER_CFGS_BLOB, ORDER_CFGS_INST, ORDER_CFGS_PART_OF, ORDER_CFGS_REF, and ORDER_CFGS_VALUE to write item configuration data.
   - ORDER_ITEMS_OUT to write detailed item data.
   - ORDER_CCARD to write the credit card details.
   - ORDER_SCHEDULE_EX to write the structure of VBEP with English field names.
   - Scalar_Output to write the Scalar_Output from the mapplet.
   - Error_Output to write the Error_Output from the mapplet.

---

**Step 1: Generating a BAPI/RFC Mapplet in Informatica Cloud for the BAPI_SALESORDER_CREATEFROMDAT1 BAPI Function**

Perform the following steps to generate a BAPI/RFC mapplet:

1. Select **Configure > Mapplets** in the Informatica Cloud home page.
   The Mapplet page appears.

2. Click **New > New SAP Mapplet**.
The **New SAP Mapplet** page appears. The following image shows the **New SAP Mapplet** page:

3. Enter a unique name for the BAPI/RFC mapplet.
4. Optionally, enter a description for the BAPI/RFC mapplet you want to generate.
5. Select the transformation type as **BAPI**.
6. Select the BAPI/RFC connection that you want to use.
7. Select the scope of the transformation.
   - In real time, select the transformation option as Transaction. For batch processing and validating in non-production environment, select ALL INPUT as the transformation scope.
8. Enter the name of the BAPI/RFC function.
   - **Note:** Verify that you enter the exact name of the BAPI/RFC function that you want to retrieve.
9. Click **Get Objects**.
   - You can view the import, export, and table parameter details of the BAPI/RFC function.
10. Specify the direction for the tables to indicate if the table parameters in the BAPI are input, output, or both.
11. Click **OK**.
   - The mapplet for the specified BAPI/RFC function is created. You can create a mapping for the generated mapplet.

**Step 2: Configuring a Mapping with the bapi_salesorder_createfromdat1 Mapplet**

1. To create a mapping, click **Design > Mappings**, and then click **New Mapping**.
   - The **New Mapping** dialog box appears.
2. Enter a name and description for the mapping, and click **OK**.
3. To configure the flat file source, on the **Transformation** palette, click **Source**.
4. In the **Properties** panel on the **General** tab, enter a name and description.
5. Click the Source tab and configure the source details.
   a. Select a flat file connection.
   b. Select Single Object as the Source Type.
   c. Click Select to specify a flat file that contains the source fields.
   The following image shows the flat file source details:

6. Add order header, order items, and order partners as flat file source objects for the mapping.

7. To add a BAPI/RFC mapplet transformation, on the Transformation palette, click Mapplet.
   a. On the General tab, enter a name and description for the mapplet.
   b. Draw a link to connect the flat file Source transformation to the Mapplet transformation.
   c. On the Mapplet tab, click Select.
      The Select Mapplet dialog box appears.
   d. Select the bapi_salesorder_createfromdat1 mapplet and click OK.
   e. Click Connection to specify an SAP RFC/BAPI Interface connection.
      The following image shows the bapi_salesorder_createfromdat1 mapplet details:

   f. To preview fields, configure the field rules, or rename fields, click Incoming Fields.
   g. Click Field Mapping and map the incoming source fields with the appropriate mapplet input fields.
   The following image shows the field mapping of the incoming source fields with the mapplet input fields:
8. To add a flat file target, on the **Transformation palette**, click **Target**.
9. On the **General** tab, enter a name and description for the target.
10. Click the **Target** tab and configure target details.
   a. Select a flat file connection for the target.
   b. Select Single Object as the **Source Type**.
   c. Click **Select** to specify the target object.
      The **Target Object** dialog box appears.
   d. Select the flat file object, and click **OK**.
   e. Optionally, you can choose to forward rejected rows in the Advanced Target options.
   f. Repeat the above steps to add all the flat file target objects.

   The following image shows the target transformation details:

11. Draw a link to connect the output ports in the Mapplet transformation to the flat file Target transformation.
    The following image shows the mapping configured for the bapi_salesorder_createfromdat1 mapplet:

12. Save and run the mapping.
Part VI: Data Integration Using IDocs

This part contains the following chapters:

- IDoc Mapplets, 96
- Mapping and Mapping Configuration Tasks Using IDocs, 105
IDoc Mapplets

This chapter includes the following topics:

- **IDoc Mapplets Overview, 96**
- **Segments and Groups, 96**
- **Outbound Mapplet, 99**
- **Inbound Mapplet, 100**
- **Importing IDoc Metadata, 103**

### IDoc Mapplets Overview

You can import an IDoc as a mapplet using the SAP Metadata utility. An IDoc contains a hierarchical structure consisting of segments. Each segment is an SAP structure defined in the SAP system.

An IDoc has header and data record components. The header component contains control information, such as creation date and status. The control information is in an SAP structure called EDIDC. The data records are in an SAP structure called EDIDD.

### Segments and Groups

An IDoc is a hierarchical structure that contains segments. A segment can be a parent or child. A child segment depends on another segment. A parent segment contains child segments. A parent segment can be a child of another segment.

IDoc segments are organized into groups. The following rules determine the group to which a segment belongs:

- A parent segment starts a new group. For example, in the MATMAS04 IDoc, the E1MARCM segment contains a child and therefore starts a group.
- A child segment that is not a parent belongs to the group that is started by its immediate parent. For example, in the MATMAS04 IDoc, the E1MARA1 segment does not contain a child and therefore belongs to the group of its parent E1MARAM.
- A group can also be a parent or a child.
Segment and Group Status

After you specify the message and doc type in the SAP Metadata utility, you can view the segments and groups in the IDoc.

Segments and groups can be required or optional. In an IDoc mapplet, a required segment must exist in the IDoc only if its group, its parent groups, and its parent segments are required or selected. For example, the E1MARAM group is required. Therefore, its required child segment E1MAKTM must exist in the IDoc while its optional child segment E1MARA1 does not have to exist in the IDoc.

If a required segment belongs to an optional group that is not selected, then the segment does not have to exist in the IDoc. For example, the E1MARCM group is optional. Therefore, the required E1MARCM segment also becomes optional.

When a segment is required, the Segment Status column is selected. When a group is required, the Group Status column is selected.

For example, specify the message type as MATMAS, the IDoc Type as MATMAS04, and click Fetch. You can view the segments and groups in the IDoc.

The following table describes how you can use the Segment Status and Group Status columns to understand which segments are required in the MATMAS04 IDoc:

<table>
<thead>
<tr>
<th>Segment Name</th>
<th>Segment Group</th>
<th>Segment Status</th>
<th>Group Status</th>
<th>Required in IDoc</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1MARAM</td>
<td>E1MARAM</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>E1MARA1</td>
<td>E1MARAM</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>E1MARCM</td>
<td>E1MARCM</td>
<td>Required</td>
<td>Optional</td>
<td>Optional</td>
</tr>
</tbody>
</table>

The following image shows that the E1MARAM segment and the E1MARAM group are required:
IDocs Properties

When you fetch an IDoc in the SAP Metadata utility, you can view all the IDoc segments. Select a segment to view the fields in the segment.

The following table describes the IDocs properties that you can view and specify in the SAP Metadata utility:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>Application messages that classify categories of data. For example, ORDERS and MATMAS (Material Master).</td>
</tr>
<tr>
<td>IDoc Type</td>
<td>Data structure associated with the message type. For example, MATMAS01, MATMAS02 for MATMAS. IDocs contain the data associated with the message type.</td>
</tr>
<tr>
<td>Control Page</td>
<td>Displays the control record. You can add partner profiles to the control record as key value pairs. You can also update and delete any partner profiles associated with the control record.</td>
</tr>
<tr>
<td>Select All Segments</td>
<td>Includes all segments in the IDoc mapplet.</td>
</tr>
<tr>
<td>Deselect All Segments</td>
<td>Removes all selected segments except required segments from the IDoc mapplet.</td>
</tr>
</tbody>
</table>
| Select Transformation| Indicates the type of transformation you want to use to generate the IDoc mapplet. Select one of the following values:  
  · Prepare. Select to generate a mapplet that writes source data as an IDoc message.  
  · Interpreter. Select to generate a mapplet that reads IDoc messages.  
  · Both. Select to generate a mapplet that read IDoc messages and another mapplet to write IDoc messages. |
| Transformation Scope| Indicates how the Secure Agent applies the transformation logic to incoming data. Select one of the following values:  
  · Transaction  
  · All Input  
  Choose Transaction to apply the transformation logic to all rows in a transaction. Select Transaction when the results of the transformation depend on all rows in the same transaction, but not on rows in other transactions. When you select Transaction, associated mappings can run in real time.  
  Choose All Input to apply the transformation logic to all incoming data, and to drop the incoming transaction boundaries. Select All Input when the results of the transformation depend on all rows of data in the source. Default is All Input. |
| Segment Name        | Segment names of the IDoc type.                                             |
| Description         | Description of the segments.                                               |
| Select              | Selects the data segments to include in the transformation.  
  When you select a segment, the parent segments and all required child segments are also selected. When you clear a segment, all child segments are also cleared. |
<p>| Segment Status      | When selected, indicates that the segment is required in the IDoc mapplet.  |
| Group Status        | When selected, indicates that the group is required in the IDoc mapplet.    |</p>
<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. Occurs</td>
<td>Minimum number of occurrences of the segment in an IDoc.</td>
</tr>
<tr>
<td>Max Occurs</td>
<td>Maximum number of occurrences of the segment in an IDoc.</td>
</tr>
</tbody>
</table>

**Segment Fields**

Select a segment name to view the field names of the segment.

The following table describes the segment field details:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Field name of a segment.</td>
</tr>
<tr>
<td>Description</td>
<td>Description of the field.</td>
</tr>
<tr>
<td>SAP Datatype</td>
<td>SAP data type of the field.</td>
</tr>
<tr>
<td>Precision</td>
<td>Precision of the field.</td>
</tr>
<tr>
<td>Scale</td>
<td>Scale of the field.</td>
</tr>
</tbody>
</table>

**Outbound Mapplet**

You can capture changes to the master data or transactional data in the SAP application database in real time.

When data in the application database changes, the SAP system creates IDocs to capture the changes and sends the IDocs to Informatica Cloud. You can use the IDoc Reader connection to read the IDoc message in real time as they are generated by the SAP system.

If the Secure Agent is not running when the SAP system sends outbound IDocs, the Secure Agent does not receive the IDocs. However, the SAP system stores the outbound IDocs in EDI tables, which are a staging area for guaranteed message delivery. You can configure the SAP system to resend the IDocs by configuring the tRFC port used to communicate with the Secure Agent. When you configure the port, you can enable background processes in SAP that try to resend the IDocs to the Secure Agent a set number of times.

To generate the outbound mapplet to read IDoc messages from SAP system, use the IDoc Interpreter when you import the IDoc metadata. Import the outbound mapplet to Informatica Cloud and configure an outbound mapping.

**Outbound Mapplet Ports**

An outbound IDoc mapplet contains predefined ports. You cannot edit the ports.
The following table describes the mapplet ports:

<table>
<thead>
<tr>
<th>Port Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic IDoc Type</td>
<td>Basic IDoc type name. Basic IDoc type defines the structure of an IDoc. Each basic type describes standard IDoc segments, format of data fields, and size. Basic type contains all the standard fields that are necessary for carrying out a business transaction.</td>
</tr>
<tr>
<td>Extended IDoc Type</td>
<td>Extended IDoc type name. IDoc extension is extension of basic type and contains additional custom IDoc segments and fields that are not available in the standard basic type.</td>
</tr>
<tr>
<td>IDocRecord</td>
<td>IDoc message data.</td>
</tr>
<tr>
<td>DocumentNumber</td>
<td>Unique message number of the IDoc.</td>
</tr>
</tbody>
</table>

**Target Object for Outbound Mapplet Error Output**

You can configure an outbound IDoc mapping to write IDocs that are not valid to a relational or flat file target. To write IDocs that are not valid to a relational or flat file target, connect the IDoc_Interpreter_Error_Output_Group port in the outbound mapplet to a relational or flat file target object. You must also configure the error log type session property in the Schedule page.

**Inbound Mapplet**

You can synchronize transactional data in a legacy application with the data in the SAP application database. Use an inbound SAP IDoc mapping to send the transactional data from the legacy application database to the SAP system. Informatica Cloud extracts the data from the legacy application data source, prepares the data in SAP IDoc format, and sends the data to the SAP system as inbound IDocs using ALE. You can use the IDoc Writer connection to write inbound SAP IDoc messages to SAP systems.

To generate the inbound mapplet to write IDocs to SAP systems, use the Prepare transformations when you import the IDoc metadata. Import the inbound mapplet to Informatica Cloud and configure an inbound mapping.

**Key Fields and Control Record Fields**

An IDoc mapplet includes a primary key (GPK) and a foreign key (GFK) in each segment. When you configure a mapping, integration template, or Mapping Configuration task, map the primary key field, foreign key field, and any control record fields.

**Note:** You can enable control record fields when you import the IDoc metadata.

The Prepare transformation in the SAP IDoc Writer mapplet can have primary key and foreign key fields and other input fields, including control record fields.

The Prepare transformation has the following output fields:

- **IDoc Data.** Map this field to an IDoc target.
- **Error IDoc Data.** Map this field to see error messages about IDoc syntax/data conversion.
When you import IDoc metadata, you can add fields to a Prepare transformation. In the SAP Metadata utility, you can click Control Page and add the control record keys as key-value pairs. For example, you can add the following key-value pairs for the sender partner type and the sender partner number:

- Key: SNDPRT and Value: LS for Logical System
- Key: SNDPRN and Value ICS

In an inbound mapping, you can pass the sender partner number to SAP. You can pass a value to the CONTROL_SNDPRN port in the control input group of the Prepare transformation. If you do not connect this port to an upstream transformation, the Secure Agent uses the partner number value of SNDPRN key you specify in the SAP Metadata utility.

## IDoc Primary and Foreign Keys

An IDoc message is organized hierarchically with one top-level parent segment and one or more second-level child segments. Second-level child segments can also have one or more third-level child segments.

To maintain the structure of the IDoc data, the Prepare transformation in the SAP IDoc Writer mapplet uses primary and foreign keys. The top-level parent segment has a primary key. Each child segment has a primary key and a foreign key. The foreign key of each child segment references the primary key of its parent segment. For example, the foreign key of a second-level child segment references the primary key of the top-level parent segment. Similarly, the foreign key of a third-level child segment references the primary key of the second-level child segment.

The Prepare transformation groups incoming IDoc data based on the values in the primary and foreign key fields. The Control Input group of the Prepare transformation represents the parent segment. All other groups of the Prepare transformation except the ErrorIDocData group represent second-level or third-level child segments. The ErrorIDocData group is used for processing invalid IDocs.

The following table shows the groups of the Prepare transformation and the fields used for the primary and foreign keys:

<table>
<thead>
<tr>
<th>Groups</th>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Input Group</td>
<td>GPK_DOCNUM</td>
<td>Primary key of the parent segment.</td>
</tr>
<tr>
<td>Child Segment 1</td>
<td>GPK_&lt;Child1_name&gt;</td>
<td>Primary key of Child Segment 1.</td>
</tr>
<tr>
<td>Child Segment 1</td>
<td>GFK_DOCNUM_&lt;Child1_name&gt;</td>
<td>Foreign key of Child Segment 1 references the primary key of the parent segment.</td>
</tr>
<tr>
<td>Child Segment A of Child Segment 1</td>
<td>GPK_&lt;Child1A_name&gt;</td>
<td>Primary key of Child Segment A of Child Segment 1.</td>
</tr>
<tr>
<td>Child Segment A of Child Segment 1</td>
<td>GFK_&lt;Child1_name&gt;_&lt;Child1A_name&gt;</td>
<td>Foreign key of Child Segment A of Child Segment 1 references the primary key of Child Segment 1.</td>
</tr>
<tr>
<td>Child Segment 2</td>
<td>GPK_&lt;Child2_name&gt;</td>
<td>Primary key of the IDoc child segment.</td>
</tr>
<tr>
<td>Child Segment 2</td>
<td>GFK_DOCNUM_&lt;Child2_name&gt;</td>
<td>Foreign key of Child Segment 2 references the primary key of the parent segment.</td>
</tr>
</tbody>
</table>
Each value for the GPK_<name> field needs to be unique. Each GFK_<parent_name>_<group_name> field needs to reference the primary key of its parent segment.

For example, the following table shows the relationship of primary and foreign keys in an IDoc message named ABSEN1 with four child segments:

<table>
<thead>
<tr>
<th>Group</th>
<th>Field</th>
<th>Primary/Foreign Keys</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTROL_INPUT_ABSEN1</td>
<td>GPK_DOCNUM</td>
<td>P1</td>
</tr>
<tr>
<td>E2ABSE1</td>
<td>GPK_E2ABSE1</td>
<td>C1</td>
</tr>
<tr>
<td>-</td>
<td>GFK_DOCNUM_E2ABSE1</td>
<td>P1</td>
</tr>
<tr>
<td>E2ABSE2</td>
<td>GPK_E2ABSE2</td>
<td>C2</td>
</tr>
<tr>
<td>-</td>
<td>GFK_DOCNUM_E2ABSE2</td>
<td>P1</td>
</tr>
<tr>
<td>E2ABSE2A</td>
<td>GPK_E2ABSE2A</td>
<td>C2A</td>
</tr>
<tr>
<td>-</td>
<td>GFK_E2ABSE2_E2ABSE2A</td>
<td>C2</td>
</tr>
<tr>
<td>E2ABSE3</td>
<td>GPK_E2ABSE3</td>
<td>C3</td>
</tr>
<tr>
<td>-</td>
<td>GFK_DOCNUM_E2ABSE3</td>
<td>P1</td>
</tr>
<tr>
<td>E2ABSE3B</td>
<td>GPK_E2ABSE3B</td>
<td>C3B</td>
</tr>
<tr>
<td>-</td>
<td>GFK_E2ABSE2_E2ABSE2A</td>
<td>C3</td>
</tr>
<tr>
<td>E2ABSE4</td>
<td>GPK_E2ABSE4</td>
<td>C4</td>
</tr>
<tr>
<td>-</td>
<td>GFK_DOCNUM_E2ABSE4</td>
<td>P1</td>
</tr>
</tbody>
</table>

The Prepare transformation uses these primary and foreign key relationships to maintain the structure of the IDoc data. Any foreign key field that does not match the primary key of its parent segment results in an orphan row. Any primary key field that is not unique results in a duplicate row.

Verify that each IDoc message has a unique primary key for the top-level parent segment, each child segment, and that each foreign key matches the primary key of its parent.
Importing IDoc Metadata

1. Navigate to the SAP Metadata utility installation directory and double-click the SAPUtil.bat file. The Import SAP IDOC/BAPI/RFC wizard appears.
2. Select the SAP system to which you want to connect. All systems specified in the sapnwrfc.ini file appear in the drop-down list.
3. Enter the SAP user name.
4. Enter the password associated with the SAP user.
5. Enter the client number.
6. Enter the language code.
7. Select IDoc and click Connect. The connection to the SAP system is established.
9. Enter the message type and the IDoc type, and click Fetch. You can view the segment details of the IDoc.
10. Select the transformation type. You can choose one of the following options:
   • To generate outbound mappings to read IDocs from an SAP system, select the Interpreter transformation.
   • To generate inbound mappings to write IDocs to an SAP system, select the Prepare transformation.
   • To generate outbound and inbound mappings, select Both.
11. Select the transformation scope. You can choose one of the following options:
   • Choose Transaction to apply the transformation logic to all rows in a transaction. Select Transaction when the results of the transformation depend on all rows in the same transaction, but not on rows in other transactions. When you select Transaction, associated mappings can run in real time. For outbound mappings, select Transaction.
   • Choose All Input to apply the transformation logic to all incoming data, and to drop the incoming transaction boundaries. Select All Input when the results of the transformation depend on all rows of data in the source.
12. Select the segments you want to include in the mapplet. You can click Select All Segments to include all segments in the IDoc. Click Deselect All Segments to remove all selected segments except required segments from the IDoc.
13. To add other fields into the Control Record input group of a mapplet, perform the following steps:
   a. Click Control Page. Add more control records if you have more than one logical system.
   b. Select the checkbox for the field that you want to add, and then click Partner Profile > New.
   c. Enter the key and value for the partner profile. The key is the field name, and the value is the partner type.
   d. Optionally, to add a control record field to the mapplet, from the Control Record page, select the checkbox for the field you want to add. This will enable you to map the selected control record fields when you configure a mapping, integration template, or Mapping Configuration task.
14. Select a directory for the output files and click OK.
15. Click **Finish**.

The mapplet for the specified IDoc is created in the output directory.
CHAPTER 11

Mapping and Mapping Configuration Tasks Using IDocs

This chapter includes the following topics:

- Mapping and Mapping Configuration Tasks Using IDocs Overview, 105
- IDoc Reader Sources in Mappings, 106
- Importing an IDoc Mapplet to Informatica Cloud, 107
- Configuring an Outbound Mapping to Read IDocs from SAP, 107
- Configuring an Inbound Mapping to Write IDocs to SAP, 109
- Outbound Mapping to Read IDocs from SAP Example, 110
- Inbound Mapping to Write IDocs To SAP Example, 115

Mapping and Mapping Configuration Tasks Using IDocs Overview

To send and read IDocs, Informatica Cloud integrates with SAP applications using Application Link Enabling (ALE).

ALE is an SAP proprietary technology that enables data communication between SAP systems. ALE also enables data communication between SAP and external systems.

You can configure outbound mappings to read IDocs from SAP and inbound mappings to write IDocs to SAP.

To configure an outbound mapping to read IDocs from SAP, perform the following tasks:

1. Import the IDoc metadata from SAP and generate a mapplet using the SAP Metadata utility. Verify that you selected the segments and groups you want to include in the IDoc. In addition, select the Interpreter transformation.
2. Import the IDoc mapplet to Informatica Cloud.
3. Configure an outbound mapping using the generated IDoc mapplet. Add a Source transformation to read data from the SAP system, configure the IDoc mapplet, and add a Target transformation to write the IDoc in the target object.
To configure an inbound mapping to write IDocs to SAP, perform the following tasks:

1. Import the IDoc metadata from SAP and generate a mapplet using the SAP Metadata utility. Verify that you selected the segments and groups you want to include in the IDoc. In addition, select the Prepare transformation.

2. Import the IDoc mapplet to Informatica Cloud.

3. Configure an inbound mapping using the generated IDoc mapplet. Add a Source transformation to read data from the source system, configure the IDoc mapplet, and add a Target transformation to write the IDoc to the SAP system.

For information about mappings and Mapping Configuration task, see Deploy.

**IDoc Reader Sources in Mappings**

To read IDocs from an SAP application, use an SAP IDoc Reader connection and configure the IDoc Reader source properties in the Source transformation in a mapping.

Specify the name and description of the IDoc Reader source. Configure the source and advanced properties for the source object.

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

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>Name of the source connection.</td>
</tr>
<tr>
<td>Source Type</td>
<td>Source type. Select Single for a single source object. When you select an SAP IDoc Reader as connection, the source type can be a single object and source object is the IDoc Reader Object. The source object has the generic structure of an IDoc message.</td>
</tr>
<tr>
<td>Object</td>
<td>Source object.</td>
</tr>
</tbody>
</table>

The following table describes the SAP IDoc Reader advanced source properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle Time</td>
<td>Indicates the number of seconds the Secure Agent waits for IDocs to arrive before it stops reading from the SAP source. For example, if you enter 30 seconds for idle time, the Secure Agent waits 30 seconds after reading from the SAP source. If no new IDocs arrive within 30 seconds, the Secure Agent stops reading from the SAP source. Default is 300.</td>
</tr>
<tr>
<td>Packet Count</td>
<td>Controls the number of packets the Secure Agent reads from SAP before stopping. For example, if you enter 10 for Packet Count, the Secure Agent reads the first 10 packets from the SAP source and then stops. The packet Size property in the ALE configuration determines the number of IDocs the Secure Agent receives in a packet. If you enter packet count as -1, you can read infinite number of packets. Default is -1.</td>
</tr>
<tr>
<td>Realtime Flush Latency</td>
<td>Determines, in seconds, how often the Secure Agent flushes data from the source.</td>
</tr>
</tbody>
</table>

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**Property** | **Description**
---|---
Reader Time Limit | Sets a period of time, in seconds, during which the Secure Agent reads IDocs from the SAP source. For example, if you specify 10 as the reader time limit, the Secure Agent stops reading from the SAP source after 10 seconds. If you enter reader time limit as 0, the Security Agent continues to read IDocs from SAP for an infinite period of time. Default is 0.
Recovery Cache Folder | Specifies the location of the recovery cache folder.
Tracing Level | Sets the amount of detail that appears in the log file. You can choose terse, normal, verbose initialization or verbose data. Default is normal.

### Importing an IDoc Mapplet to Informatica Cloud

1. Select **Configure > Mapplets**.
   The Mapplets page appears.
2. Click **New**.
   The **New Mapplet** page appears.
3. Enter an unique name for the IDoc mapplet.
4. Optionally, enter a description for the IDoc mapplet you want to import.
5. Select the mapplet type as **Active**.
   All IDoc mapplets are active.
6. Click **Upload** to navigate to the XML file you generated using the SAP Metadata utility.
   The **Upload Metadata XML File** dialog box appears.
7. Click **Choose File**.
   By default, you can view the generated IDoc mapplets as XML files in the `<SAP Metadata Utility installation directory>/generatedMappings directory`.
8. Select an XML file and click **Open**.
   You can view the XML file details of the IDoc mapplet.
9. Click **OK**.
   You can view the imported mapplet in the **Mapplets** page.

### Configuring an Outbound Mapping to Read IDocs from SAP

1. To create a mapping, click **Design > Mappings**, and then click **New Mapping**.
   The **New Mapping** dialog box appears.
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 source, on the **Transformation** palette, click **Source**.

4. In the **Properties** panel, on the **General** tab, enter a name and description.

5. Click the **Source** tab and select an SAP IDoc Reader connection.
   When you select an SAP IDoc Reader as connection, the source type is a single object and source object is the IDoc Reader Object.

6. If required, configure the advanced source properties.

7. To add an IDoc mapplet transformation, on the **Transformation palette**, click **Mapplet**.
   a. On the **General** tab, enter a name and description for the mapplet.
   b. Draw a link to connect the previous transformation to the transformation.
   c. On the **Mapplet** tab, click **Select**.
      The **Select Mapplet** dialog box appears.
   d. Specify an IDoc mapplet that you imported using the Interpreter transformation and click **OK**.

8. To add any other transformation, on the **Transformation palette**, click the transformation name. Or, drag the transformation onto the mapping canvas.
   a. On the **General** tab, 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 that you create.
   e. To add another transformation, repeat these steps.

9. To add a Target transformation, on the **Transformation palette**, click **Target**.
   a. On the **General** tab, enter a name and description.
   b. Draw a link to connect the previous transformation to the Target transformation.
   c. Click the **Target** tab and configure target details. If required, configure the advanced target properties.
      Target details and advanced target properties appear based on the connection type.
   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.

10. Save and run the mapping. Or save and create a Mapping Configuration task.
    For information about the source and target transformations, see the **Informatica Cloud Transformation Guide**.
Configuring an Inbound Mapping to Write IDocs to SAP

1. To create a mapping, click Design > Mappings, and then click New Mapping.
   The New Mapping dialog box appears.
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 a source, on the Transformation palette, click Source.
4. In the Properties panel, on the General tab, enter a name and description.
5. Click the Source tab and configure the source details.
6. To add an IDoc mapplet transformation, on the Transformation palette, click Mapplet.
   a. On the General tab, enter a name and description for the mapplet.
   b. Draw a link to connect the previous transformation to the transformation.
   c. On the Mapplet tab, click Select.
      The Select Mapplet dialog box appears.
   d. Specify an IDoc mapplet that you imported using the Prepare transformation and click OK.
   e. To preview fields, configure the field rules, or rename fields, click Incoming Fields.
      Note: You must link the DOCNUM port of the mapplet to the source transformation. The DOCNUM port represents a unique number for each IDoc and the SAP system does not accept inbound IDocs without a unique document number.
7. To add any other transformation, on the Transformation palette, click the transformation name. Or, drag the transformation onto the mapping canvas.
   a. On the General tab, 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 that you create.
   e. To add another transformation, repeat these steps.
8. To add a Target transformation, on the Transformation palette, click Target.
   a. On the General tab, enter a name and description.
   b. Draw a link to connect the previous transformation to the Target transformation.
   c. Click the Target tab and configure SAP target details.
   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.
9. Save and run the mapping or save and create a Mapping Configuration task.
Outbound Mapping to Read IDocs from SAP Example

You can read material master (MATMAS) IDocs from SAP and write it to a flat file object.

In this example to read the MATMAS IDocs, perform the following steps:

**Step 1: Import MATMAS metadata using the SAP Metadata utility.**

Perform the following steps to import the MATMAS IDoc:

1. Launch the SAP Metadata utility and specify the SAP connection properties to connect to the SAP system.
2. Verify that you select the IDoc option and then connect to the SAP system. The Next button is enabled only after you establish a connection to the SAP system.
3. Enter the MATMAS as the message type and MATMAS04 as the IDoc type to fetch the IDoc segments and fields for MATMAS.
4. To read IDocs, select the Interpreter transformation.
5. Retain the default output directory for the generated mapplet.

**Step 2: Import the generated mapplet to Informatica Cloud.**

Login to Informatica Cloud and import the MATMAS mapplet XML file from the output directory.

**Step 3: Configure a mapping using the generated mapplet.**

Perform the following steps to configure a mapping:

2. Add the Mapplet transformation. Draw a link to connect the Source transformation to the Mapplet transformation.
3. Map the incoming IDoc Record field with the IDocData field in the mapplet.
4. Configure the Mapplet transformation. Select the generated Mapplet from the output directory.
5. Configure a flat file object to which you can write the material master details. Draw a link to connect the Control Output Group in the Mapplet transformation to the flat file Target transformation.

   **Note:** Based on your requirement, you can choose to configure multiple flat file objects for each segment in the IDoc and for the IDoc_Interpreter_Error_Output_Group.

**Step 1: Importing MATMAS IDoc Metadata**

1. Navigate to the SAP Metadata utility installation directory and double-click the SAPUtil.bat file.
   The Import SAP IDOC/BAPI/RFC wizard appears.
2. Select the SAP system to which you want to connect.
   All systems specified in the sapnwrfc.ini file appear in the drop-down list.
3. Enter the SAP user name.
4. Enter the password associated with the SAP user.
5. Enter the client number.
6. Enter the language code.
7. Select IDoc and click Connect.
   The SAP Metadata utility establishes a connection to the SAP system.
The following image shows the Connection Properties dialog box in the SAP Metadata utility:

9. Enter the message type as MATMAS and the IDoc type as MATMAS04, and click Fetch.
   You can view the segment and field details of the IDoc.
10. Select the Interpreter transformation and the scope of the transformation as Transaction.
    The following image shows the SAP IDoc specification dialog box:
11. Select the segments you want to include in the mapplet.
   You can click Select All Segments to include all segments in the IDoc. You can click Deselect All Segments to remove all selected segments except required segments from the IDoc.

12. Retain the default directory for the output files and click OK.

13. Click Finish.

The MATMAS04_Interpreter_Mapping.xml mapplet for the MATMAS IDoc is created in the <SAP Metadata Utility installation directory>/generatedMappings directory.

Step 2: Importing the MATMAS04_Interpreter_Mapping Mapplet to Informatica Cloud

1. Select Configure > Mapplets.
   The Mapplets page appears.

2. Click New.
   The New Mapplet page appears.

3. Enter an unique name for the IDoc mapplet.
4. Optionally, enter a description for the IDoc mapplet you want to import.
   The following image shows the New Mapplet page:

   ![New Mapplet](image)

5. Select the mapplet type as **Active**.
6. Click **Upload** to navigate to the XML file you generated using the SAP Metadata utility.
   The **Upload Metadata XML File** dialog box appears.
7. Click **Choose File**.
8. Navigate to the `<SAP Metadata Utility installation directory>/generatedMappings directory`, select the `MATMAS04_Interpreter_Mapping.xml` file, and click **Open**.
   The following image shows the input and output details of the `MATMAS04_Interpreter_Mapping` mapplet:

   ![Input and Output Details](image)

9. Click **OK**.
   You can view the imported mapplet in the **Mapplets** page.

**Step 3: Configuring an Outbound Mapping with the MATMAS IDoc**

1. To create a mapping, click **Design > Mappings**, and then click **New Mapping**.
   The **New Mapping** dialog box appears.
2. Enter a name and description for the mapping, and click **OK**.
3. To configure an SAP source, on the **Transformation palette**, click **Source**.

4. In the **Properties** panel, on the **General** tab, enter a name and description.

5. Click the **Source** tab and select an SAP IDoc Reader connection.

   When you select an SAP IDoc Reader as connection, the source type is a single object and source object is the IDoc Reader Object.

6. If required, configure the advanced source properties.

   The following image shows the SAP source details:

   ![SAP Source Details](image)

7. To add an IDoc mapplet transformation, on the **Transformation palette**, click **Mapplet**.

8. On the **General** tab, enter a name and description for the mapplet.

9. Draw a link to connect the Source transformation to the Mapplet transformation.

10. On the **Mapplet** tab, click **Select**.

    The **Select Mapplet** dialog box appears.

11. Specify an IDoc mapplet that you imported using the Interpreter transformation and click **OK**.

    The following image shows the MATMAS mapplet details:

    ![MATMAS Mapplet Details](image)
12. To preview the incoming single IDoc Reader Object, click **Incoming Fields**. The following image shows the incoming single IDoc Reader object:

![Incoming Fields Image]

13. Click **Field Mappings** to map the incoming IDoc Record field with the IDocData field in the mapplet.

14. To add a flat file Target transformation, on the **Transformation palette**, click **Target**.

15. On the **General** tab, enter a name and description.

16. Click the **Target** tab and configure target details.
   a. Select a flat file connection for the target.
   b. Select Single Object as the **Target Type**.
   c. Click **Select** to specify the target object. The **Target Object** dialog box appears.
   d. Select the **Create New at Runtime** option, specify a name for the flat file object, and click **OK**.
   e. Optionally, you can choose to forward rejected rows in the Advanced Target options.

The following image shows the target transformation details:

![Target Properties Image]

17. Draw a link to connect the mapplet groups to the flat file target object.

18. Save and run the mapping.

**Inbound Mapping to Write IDocs To SAP Example**

You can create material master (MATMAS) in SAP using MATMAS IDoc type.

In this example to write MATMAS IDoc to SAP, perform the following steps:

**Step 1: Import MATMAS metadata using the SAP Metadata utility.**

Perform the following steps to import the MATMAS IDoc:

1. Launch the SAP Metadata utility and specify the SAP connection properties to connect to the SAP system.
2. Verify that you select the IDoc option and then connect to the SAP system. The Next button is enabled only after you establish a connection to the SAP system.

3. Enter the MATMAS as the message type and MATMAS03 as the IDoc type to fetch the IDoc segments and fields for MATMAS.

4. To write IDocs, select the Prepare transformation.

5. Retain the default output directory for the generated mapplet.

Step 2: Import the generated mapplet to Informatica Cloud.

Login to Informatica Cloud and import the MATMAS mapplet XML file from the output directory.

Step 3: Configure a mapping using the generated mapplet.

Perform the following steps to configure a mapping:

1. Configure multiple flat file sources to provide data to the mapplet input fields.
2. Add the Mapplet transformation. Draw a link to connect the Source transformation to the Mapplet transformation.
3. Configure the Mapplet transformation. Select the generated mapplet from the output directory.
4. Configure an SAP object to write the material master details and a flat file object to write the error details. Draw a link to connect the IDoc_Prepare_Output_Group_For_MATMAS03 to the IDocWriter object. Draw another link to connect the IDoc_Prepare_Error_Output_Group_For_MATMAS03 to the Error_Output flat file object.

Step 1: Importing MATMAS IDoc Metadata

1. Navigate to the SAP Metadata utility installation directory and double-click the SAPUtil.bat file. The Import SAP IDOC/BAPI/RFC wizard appears.
2. Select the SAP system to which you want to connect.
   All systems specified in the sapnwrfc.ini file appear in the drop-down list.
3. Enter the SAP user name.
4. Enter the password associated with the SAP user.
5. Enter the client number.
6. Enter the language code.
7. Select IDoc and click Connect.
   The SAP Metadata utility establishes a connection to the SAP system.
8. Click Next.
   The Step 2: Select SAP IDoc Prepare Transformation page appears.
9. Enter the message type as MATMAS and the IDoc type as MATMAS03, and click Fetch.
   You can view the segment and field details of the IDoc.
10. Select the Prepare transformation and the scope of the transformation as All Input.
11. Select the segments you want to include in the mapplet.
   You can click Select All Segments to include all segments in the IDoc. You can click Deselect All Segments to remove all selected segments except required segments from the IDoc.
12. To add other fields into the Control Record input group of a mapplet, perform the following steps:
   a. Click Control Page. Add more control records if you have more than one logical system.
b. Select the checkbox for the field that you want to add, and then click Partner Profile > New.

c. Enter the key and value for the partner profile. The key is the field name, and the value is the partner type.

d. Optionally, to add a control record field to the mapplet, from the Control Record page, select the checkbox for the field you want to add. This will enable you to map the selected control record fields when you configure a mapping, integration template, or Mapping Configuration task.

13. Retain the default directory for the output files and click OK.

14. Click Finish.

The MATMAS IDoc is created in the <SAP Metadata Utility installation directory>/generatedMappings directory.

Step 2: Importing the MATMAS03_Prepare_Mapping Mapplet to Informatica Cloud

1. Select Configure > Mapplets.

The Mapplets page appears.

2. Click New.

The New Mapplet page appears.

3. Enter an unique name for the IDoc mapplet.

4. Optionally, enter a description for the IDoc mapplet you want to import.

5. Select the mapplet type as Active.

6. Click Upload to navigate to the XML file you generated using the SAP Metadata utility.

The Upload Metadata XML File dialog box appears.

7. Click Choose File.

8. Navigate to the <SAP Metadata Utility installation directory>/generatedMappings directory, select the MATMAS03_Prepare_Mapping.xml file, and click Open.

9. Click OK.

You can view the imported mapplet in the Mapplets page.

Step 3: Configuring an Inbound Mapping with the MATMAS IDoc

1. To create a mapping, click Design > Mappings, and then click New Mapping.

The New Mapping dialog box appears.

2. Enter a name and description for the mapping, and click OK.

3. To configure a flat file source, on the Transformation palette, click Source.

4. In the Properties panel, on the General tab, enter a name and description.

5. Click the Source tab and select an flat file connection.

6. Add separate flat file sources for the control_input group and segments in the MATMAS IDoc.

7. To add an IDoc Mapplet transformation, on the Transformation palette, click Mapplet.

8. On the General tab, enter a name and description for the mapplet.

9. On the Mapplet tab, click Select.

The Select Mapplet dialog box appears.
10. Specify an IDoc mapplet that you imported using the Prepare transformation and click OK.

11. Draw a link to connect the Source transformations to the Mapplet transformation. For example, connect the Control_Input source object to the Control_Input_Group for the MATMAS IDoc.

12. To preview the incoming fields, click **Incoming Fields**.

   The following image shows the incoming fields:

   ![Incoming Fields Image](image)

13. Click **Field Mappings** to map the incoming fields with the mapplet input fields.

   The following image shows the field mapping in the mapplet:

   ![Field Mappings Image](image)

14. To add a Target transformation for writing to SAP, on the **Transformation palette**, click **Target**.
   a. On the **General** tab, enter a name and description.
   b. Click the **Target** tab and configure SAP target details.

15. To add a flat file Target transformation for the error output, on the **Transformation palette**, click **Target**.
   a. On the **General** tab, enter a name and description.
   b. Click the **Target** tab and configure flat file target details.
16. Draw a link to connect the IDoc_Prepare_Output_Group_For_MATMAS03 to the IDocWriter object. Draw another link to connect the IDoc_Prepare_Error_Output_Group_For_MATMAS03 to the Error_Output flat file object.

The following image shows the mapping for the inbound mapping for the MATMAS IDoc:

![Mapping Diagram]

17. Save and run the mapping.
Part VII: SAP BW Data Extraction

This part contains the following chapters:

- Data Synchronization Tasks with SAP BW, 121
- Mappings and Mapping Configuration Tasks with SAP BW, 126
Data Synchronization Tasks with SAP BW

This chapter includes the following topics:

- Data Synchronization Tasks with SAP BW Overview, 121
- SAP BW Sources in Data Synchronization Tasks, 122
- Configuring a Data Synchronization Task with a Single SAP BW Object as the Source, 123
- Monitoring a Data Synchronization Task, 124

Data Synchronization Tasks with SAP BW Overview

You can configure a Data Synchronization task to synchronize data between an SAP BW source and a target. You can use the Data Synchronization Task wizard to configure the Data 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 in the activity monitor and view logs about completed tasks in the activity log.

For more information about Data Synchronization tasks, see *Deploy*. 
SAP BW Sources in Data Synchronization Tasks

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

The following table describes the SAP BW source properties:

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

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

The following table describes the SAP BW advanced source properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packet Size in MB</td>
<td>Size of the HTTP packet that SAP sends to the Secure Agent. The unit is MB. Default is 10 MB.</td>
</tr>
<tr>
<td>Package Size in ABAP in Rows</td>
<td>Number of rows that are read and buffered in SAP at a time. Default is 1000 rows.</td>
</tr>
<tr>
<td>Enable Compression</td>
<td>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.</td>
</tr>
</tbody>
</table>
Configuring a Data Synchronization Task with a Single SAP BW Object as the Source

1. Click Task Wizards > Data Synchronization.
   The Data Synchronization Tasks page appears.
2. Click New.
   The Data Synchronization Task Wizard appears.
3. Enter a name for the Data Synchronization task.
   The names of Data Synchronization tasks must be unique within the organization. Data Synchronization task names are not case sensitive. Data Synchronization task names can contain alphanumeric characters, spaces, and the following special characters: _, + -
4. Enter a description for the Data Synchronization task.
   The description can have a maximum length of 255 characters.
5. Select the task operation that you can perform on the target.
   You can select one of the following options:
   - Insert
   - Update
   - Upsert
   - Delete
6. Click Next to enter the source details.
   a. Select an SAP BW Reader connection from the list or click New to 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.
7. Click Next to specify the target connection and target objects.
8. 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.

9. 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.

10. 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.

11. Save the Data 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 Data Synchronization Task**

When you run a Data Synchronization task, you can view details about the task in the activity monitor.

Select Monitor > Activity Monitor to view the tasks details.

After the job is completed, select Monitor > Activity Log to view the activity log. Select the name of the task to view the task details. Click the session log to view details about the completed task. In addition, you can view the ABAP statement associated with the task in the session log.
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 Informatica Cloud activity log is a higher value because it also includes time required to complete processing in Informatica Cloud.

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.
Mappings and Mapping Configuration Tasks with SAP BW Overview

Use a mapping to define data flow logic that is not available in Data Synchronization tasks, such as specific ordering of logic. Use the Informatica Cloud 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.

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 Configuration task. You can use the Mapping Configuration application to process data based on the data flow logic that you defined in the mapping.

Use the Mapping Configuration Task wizard to create a Mapping Configuration task. When you create a Mapping Configuration 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 Configuration task. You can define parameters for additional flexibility and to use the same mapping in multiple Mapping Configuration 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 Configuration task.

When you create a Mapping Configuration 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 in the activity monitor and view details about completed tasks in the activity log.

For more information, see Deploy.

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:

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

The following table describes the SAP BW advanced source properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packet Size in MB</td>
<td>Size of the HTTP packet that SAP sends to the Secure Agent. The unit is MB. Default is 10 MB.</td>
</tr>
<tr>
<td>Package Size in ABAP in Rows</td>
<td>Number of rows that are read and buffered in SAP at a time. Default is 1000 rows.</td>
</tr>
<tr>
<td>Enable Compression</td>
<td>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.</td>
</tr>
<tr>
<td>Tracing Level</td>
<td>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.</td>
</tr>
</tbody>
</table>
Configuring a Mapping with a Single SAP BW Source

Use the Informatica Cloud Mapping Designer to configure a mapping.

1. Click Design > Mappings, and then click New Mapping. The New Mapping dialog box appears.
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 Configuration 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 the Informatica Cloud Transformation Guide.

   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 Configuration Task to save and create a Mapping Configuration task.

Creating a Mapping Configuration Task

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

1. Click Task Wizards > Mapping Configuration.

   The Mapping Configuration Task page appears.

2. Click New .

   The New Mapping Configuration Task page appears.

3. 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: _ + -

4. Select the runtime environment that contains the Secure Agent that you want to use to access the SAP BW objects.

5. Select Mapping as the task based on which you want to create the Mapping Configuration task.

6. Click Select to specify a mapping.

   The Select a Mapping dialog box appears.

7. Select a mapping. You can also search for a mapping based on its name and description.
8. Click **OK**.
   The image of the selected mapping appears.

9. 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.

10. 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.

11. Optionally, add advanced session properties.
    a. Click **Add**.
    b. Select a session property.
    c. Configure the value of the session property.

12. Save the Mapping Configuration 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 Configuration Task

When you run a Mapping Configuration task, you can view details about the task in the activity monitor.

Select **Monitor > Activity Monitor** to view the tasks details.

After the job is completed, select **Monitor > Activity Log** to view the activity log. Select the name of the task to view the task details. Click the session log to view details about the completed task. In addition, you can view the ABAP statement associated with the task in the session log.

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 Informatica Cloud activity log is a higher value because it also includes time required to complete processing in Informatica Cloud.

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.
Part VIII: SAP BW BEx Query Data Extraction

This part contains the following chapter:

- Mappings and Mapping Configuration Tasks with SAP BW BEx, 132
This chapter includes the following topics:

- **Mappings and Mapping Configuration Tasks with SAP BW BEx Overview, 132**
- **Prerequisites, 133**
- **SAP BW BEx Sources in Mappings, 133**
- **Advanced Source Properties in Mappings, 133**
- **Configuring a Mapping with a Single SAP BW BEx Source, 134**
- **Creating a Mapping Configuration Task, 135**
- **Monitoring a Mapping Configuration Task, 136**
- **Mapping and Mapping Configuration Task Example with SAP BW BEx Query, 137**
- **Rules and Guidelines for SAP BW BEx Query Operations, 140**

### Mappings and Mapping Configuration Tasks with SAP BW BEx Overview

You can create a mapping to read data from SAP BEx queries. SAP Connector uses the SAP APIs to integrate with the SAP BW system and read data from BEx queries.

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 Configuration task. You can use the Mapping Configuration application to process data based on the data flow logic that you defined in the mapping.

Use the Mapping Configuration Task wizard to create a Mapping Configuration task. When you create a Mapping Configuration task, you can select the mapping based on which you want to create the 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 monitor tasks in the activity monitor and view details about completed tasks in the activity log.
Prerequisites

Before you use SAP Connector to read data from an SAP BEx query, you must allow access to the SAP BEx query from external systems.

1. Open the query in the SAP BEx Query Designer.
2. Click the Extended tab on the right pane.
3. In the Release for External Access section, select the By OLE DB for OLAP option under Allow External Access to this Query.

SAP BW BEx Sources in Mappings

To read data from an SAP BEx query, configure a Source transformation in the mapping.

When you select an SAP BW BEx query connection for a Source transformation, you can select a read operation that represents the imported SAP BEx query from which you want to read data.

You can use the sample XML template provided to configure the request message in an XML format. You can also configure filter conditions in the request XML to filter the data that you read from an SAP BEx query. Configure the advanced properties to set the tracing level and the cache size for the Web service response.

You can view the response structure in the field mapping. When you map the elements from the response structure to the output fields, the Secure Agent creates an output group. Map the fields from the SAP BEx query to the output group, and then connect the output group to a transformation or target to which you want to write data.

Advanced Source Properties in Mappings

In a mapping, you can configure a Source transformation to represent an SAP BEx query source. For SAP BW BEx query connections used in Mapping Configuration tasks, you can configure advanced properties in the Source page of the Mapping Configuration Task wizard.
The following table describes the advanced properties that you can configure in a Source transformation:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
</table>
| Tracing Level                               | Amount of detail that appears in the log for the Source transformation. Use the following tracing levels:  
  - Terse  
  - Normal  
  - Verbose Initialization  
  - Verbose  
  Default is normal. |
| Cache Size for Web Service Response (KB)    | Memory available for the web service response. The cache size depends on the amount of data you read from the SAP BEx query. If the web service response contains many rows or columns, you might want to increase the cache size. You can specify a maximum size of 99999 KB. Default is 1024 KB. |

### Configuring a Mapping with a Single SAP BW BEx Source

Use the Informatica Cloud Mapping Designer to configure a mapping. Create a Source transformation to read data from an SAP BW BEx query.

1. Click **Design > Mappings**, and then click **New Mapping**. The **New Mapping** dialog box appears.
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 BEx query 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 BEx query source.
5. Click the **Source** tab and configure the SAP BW BEx query source details.
   a. In the **Connection** list, specify the SAP BW BEx query connection that you want to use to read data.
   b. In the **Operation** list, click **Select** to specify the read operation that you want to use to read data. When you click **Select**, a list of SAP BEx queries appears. You can search for a BEx query based on the technical name of the query. Special characters in the query are replaced with _. Select the SAP BEx query from which you want to read data.
   c. Under the **Request Options** section, click **Configure**. The **Edit Request Message** page appears and displays a sample XML template that you can use for the request message. You can copy and paste the sample message into the **Request Message** text box or customize the sample message. For example, if you want to filter the data that you read from the SAP BEx query, you can add filter conditions in the request message. Click **OK** to save the request message.
   d. Under the **Advanced** section, configure the tracing level and the cache size for the Web service response.
6. In the **Field Mapping** tab, click **Map all descendants** to map all the incoming fields from the SAP BEx query to the fields in the output group.
7. Click the **Fields** tab to edit the precision and scale for the output fields.

   **Note:** The Secure Agent imports the decimal data type as double. You must manually edit the scale and precision of decimal fields so that they match with the values in SAP. The maximum precision that SAP BW BEx Query Connector supports for key figure data is 22. If the precision exceeds 22, the data gets corrupted.

8. 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 output group 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.

9. 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. You can also create a target at run time. If necessary, configure the advanced target properties.
      Target details and advanced target properties appear based on the connection type. For more information, see the *Informatica Cloud Transformation Guide*.
   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.

10. 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 Configuration Task** to save and create a Mapping Configuration task.

---

**Creating a Mapping Configuration Task**

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

1. Click **Task Wizards > Mapping Configuration**.
   The **Mapping Configuration Task** page appears.
2. Click **New**.
   The **New Mapping Configuration Task** page appears.
3. 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: _ . + -

4. Select the runtime environment that contains the Secure Agent that you want to use to access the SAP BEx queries.

5. Select Mapping as the task based on which you want to create the Mapping Configuration task.

6. Click Select to specify a mapping.
   The Select a Mapping dialog box appears.

7. Select a mapping. You can also search for a mapping based on its name and description.

8. Click OK.
   The image of the selected mapping appears.

9. Click Next.
   The Schedule page appears.

10. 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.

11. Optionally, add advanced session properties.
   a. Click Add.
   b. Select a session property.
   c. Configure the value of the session property.

12. Save the Mapping Configuration 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 Configuration Task**

When you run a Mapping Configuration task, you can view details about the task in the activity monitor.

Select Monitor > Activity Monitor to view the tasks details.

After the job is completed, select Monitor > Activity Log to view the activity log. Select the name of the task to view the task details. Click the session log to view details about the completed task.
You are a financial consultant and you want to use SAP BW BEx Query Connector to read data from an SAP BW BEx query that extracts a financial planning report in SAP BW. You want to configure a filter to extract a specific project plan from the financial report.

To configure a mapping and Mapping Configuration task to extract a specific project plan from SAP BW BEx Query and write to a flat file, perform the following tasks:

1. Create an SAP BW BEx Query connection. Select SAP as the authentication method, select Application as the connection type, and enter the SAP connection properties.

The following image shows the configured SAP BW BEx Query connection:

2. Create a flat file connection to write data to the flat file.

3. Create an SAP BW BEx Query mapping in the Cloud Mapping Designer.

The following image shows the SAP BW BEx Query mapping:

4. Add a Source transformation, specify a name and description in the general properties.
5. On the Source tab, perform the following steps:
   a. In the Connection field, select the configured SAP BW BEx Query connection to connect to SAP BW BEx Query.
   b. In the Operation field, select query REP_20161212094150 as the operation to extract the financial planning report from SAP BW BEx Query.
      The following image shows the queries from the list of read operations:

You can view the SAP BW BEx source and flat file target in the mapping.

   c. In the Request Options section, configure the request message in the following XML format, specify the attributes in the message, and validate the message:

      ```xml
      <!!--1 or more repetitions:-->  
      <!--Optional:-->  
      <REP_20161212094150/>  
      <!--Optional:-->  
      <var_temp>$$Param_variable</var_temp>  
      </REP_20161212094150>  
      </proc:REP_20161212094150_INPUT>
      
      The request message specifies the criteria to include the financial planning report query REP_20161212094150 and includes a parameter to filter a particular project plan within the financial planning report. You need to define the parameter $$Param_variable=PR00004446 entry in a parameter file, parameterfile_name.txt, and save the file in the following directory: $/Secure Agent installation directory/apps/Data_Integration_Server/data/userparameters. Later, enter the parameter file name on the Schedule and Advanced Options page of the Mapping Configuration Task wizard.
   d. In the Advanced Properties section, set the tracing level to Normal, and use the default cache size of 1024.

   6. On the Field Mapping tab, map all descendants from the incoming fields of the SAP BEx query response structure to the output fields.
7. Add a flat file Target transformation and specify the target object for the transformation. Perform the following steps:
   a. Select a flat file connection for the target transformations to write data to the flat file.
   b. Draw a link to connect the previous transformation to the Target transformation.
   c. Create a target object Bex_query.csv file to write data to the target.
   d. Map the fields that you want to link to the target fields.

8. Click **Save and New Mapping Configuration Task** to save and create a Mapping Configuration task. The following image shows the Mapping Configuration Task wizard with the applied mapping:

9. Under **Advanced Options** on the **Schedule** tab, specify the parameter file name `parameterfile_name.txt` in which you configured the filter parameter value for the request XML.
10. When you save and run the mapping, the Secure Agent retrieves the specified project plan from SAP BW BEx Query and writes the data to the corresponding flat file. The target flat file shows the following data extracted from the specified project plan after you run the task:

   "Document_Number__CPD_FDOCNUM","Structure_Element__CPD_FPID","Profile__CPD_FPROFILE", "Resource__CPD_FRES","Resource_Type__CPD_FRTYP","Client__OCLIENT", "Calendar_Year_Month__OCALMONTH","UOM_Converted__CPD_FCUOM","UOM__CPD_FUOM","Margin_DB 8POYXR0WSE3AMR99591G6ER","Quantity_DB8POYXR0WSE3AMR99591G6ER","Cost__Plan_DB8POYXR0WSE3AMR99591G61V","Revenue__Plan_DB8POYXR0WSE3AMR99591G6QB","Co 8POYXR0WSE3AMR99591GPOZ","Var_Temp","800PR00004444","8002MR90MS1429","8002MR90MS8",......-12,0,1200,0,20000,"PR00004446"

**Note:** You can also read data from an SAP BW BEx query by using a Web Services transformation. For more information, see the Informatica How-To Library article, "Configuring a Web Services Transformation in Informatica Cloud to Read Data from an SAP BW BEx Query":

[https://kb.informatica.com/h2L/HowTo%20Library/1/1053_ConfiguringWebServicesTransformationinInformaticaCloudtoReadDatafromSAPBWBExQuery_H2L.pdf](https://kb.informatica.com/h2L/HowTo%20Library/1/1053_ConfiguringWebServicesTransformationinInformaticaCloudtoReadDatafromSAPBWBExQuery_H2L.pdf)

**Rules and Guidelines for SAP BW BEx Query Operations**

Consider the following rules and guidelines when you read data from SAP BW BEx Query:

- Configure characteristics as rows and key figures as columns in the SAP BEx query.
- Configure characteristics to be displayed as keys and suppress the result rows. To do this, open the query in the SAP BEx Query Designer, select the characteristic, and click the **Display** tab on the right pane. In the **Value Display** section, select the **Key** option under **Display As**. In the **Result Rows** section, select the **Always Suppress** option.
- Verify that the SAP BEx query does not contain more than one key figure structure.
- The value of each key figure must be in a single currency.
- You cannot read data from free characteristics. Even though the free characteristic fields appear in the response structure, the data from the free characteristics is not fetched in the output.
- Verify that the SAP BEx query does not contain the following components:
  - Characteristic hierarchies
  - Characteristic structures
- To read large number of records from SAP BW BEx Query, you must perform the following tasks:
  - Set the JVM options for type DTM to increase the -Xms and -Xmx values in the system configuration details of the Secure Agent.
  - Increase the cache size for the web service response in the advanced properties of the SAP BW BEx Source transformation
SAP Data Type Reference

This appendix includes the following topics:

- **SAP Data Type Reference Overview, 141**
- **SAP and Transformation Data Types, 142**
- **SAP BW and Transformation Data Types, 143**

SAP Data Type Reference Overview

Informatica Cloud uses the following data types in mappings, Data Synchronization tasks, and Mapping Configuration tasks with SAP:

**Native data types**

Native data types are data types specific to the source and target databases or flat files. They appear in non-SAP sources and targets in the mapping.

**SAP data types**

SAP data types appear in the Fields tab for Source and Target transformations 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 Informatica Cloud uses to move data across platforms. Transformation data types appear in all remaining transformations in a mapping, Data Synchronization task, or Mapping Configuration task.

When Informatica Cloud reads source data, it converts the native data types to the comparable transformation data types before transforming the data. When Informatica Cloud writes to a target, it converts the transformation data types to the comparable native data types.
# SAP and Transformation Data Types

The following table lists the SAP data types that SAP Table Connector and SAP IDocs and RFCs/BAPI Connector support along with the corresponding transformation data types:

<table>
<thead>
<tr>
<th>SAP Data Type</th>
<th>Transformation Data Type</th>
<th>Range for Transformation Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCP</td>
<td>Date/time</td>
<td>Jan 1, 0001 A.D. to Dec 31, 9999 A.D.</td>
</tr>
<tr>
<td>CHAR</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>CLNT</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>CUKY</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>CURR</td>
<td>Decimal</td>
<td>Precision 1 to 28 digits, scale 0 to 28</td>
</tr>
<tr>
<td>DATS</td>
<td>Date/time</td>
<td>Jan 1, 0001 A.D. to Dec 31, 9999 A.D. Precision to the nanosecond.</td>
</tr>
<tr>
<td>DEC</td>
<td>Decimal</td>
<td>Precision 1 to 28 digits, scale 0 to 28</td>
</tr>
<tr>
<td>FLTP</td>
<td>Double</td>
<td>Precision 15, scale 0</td>
</tr>
<tr>
<td>INT1</td>
<td>Small Integer</td>
<td>Precision 5, scale 0</td>
</tr>
<tr>
<td>INT2</td>
<td>Small Integer</td>
<td>Precision 5, scale 0</td>
</tr>
<tr>
<td>INT4</td>
<td>Integer</td>
<td>Precision 10, scale 0</td>
</tr>
<tr>
<td>LANG</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>LCHR</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>LRAW</td>
<td>Binary</td>
<td>Uninterrupted sequence of bytes with a maximum length of 255 positions.</td>
</tr>
<tr>
<td>NUMC</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>PREC</td>
<td>Binary</td>
<td>Uninterrupted sequence of bytes with a maximum length of 255 positions.</td>
</tr>
<tr>
<td>QUAN</td>
<td>Decimal</td>
<td>Precision 1 to 28 digits, scale 0 to 28</td>
</tr>
<tr>
<td>RAW</td>
<td>Binary</td>
<td>Uninterrupted sequence of bytes with a maximum length of 255 positions.</td>
</tr>
<tr>
<td>TIMS</td>
<td>Date/time</td>
<td>Jan 1, 0001 A.D. to Dec 31, 9999 A.D. Precision to the nanosecond.</td>
</tr>
</tbody>
</table>
**SAP BW and Transformation Data Types**

The following table lists the SAP data types that SAP BW Connector and SAP BW BEx Query Connector support along with the corresponding transformation data types:

<table>
<thead>
<tr>
<th>SAP Data Type</th>
<th>Transformation Data Type</th>
<th>Range for Transformation Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>VARC</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>CHAR</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>CUKY</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>CURR</td>
<td>Decimal</td>
<td>Precision 1 to 28 digits, scale 0 to 28</td>
</tr>
<tr>
<td>DATS</td>
<td>Date/time</td>
<td>Jan 1, 0001 A.D. to Dec 31, 9999 A.D. Precision to the nanosecond.</td>
</tr>
<tr>
<td>DEC</td>
<td>Double</td>
<td>Precision 1 to 28 digits, scale 0 to 28</td>
</tr>
<tr>
<td>FLTP</td>
<td>Double</td>
<td>Precision 15, scale 0</td>
</tr>
<tr>
<td>INT4</td>
<td>Integer</td>
<td>Precision 10, scale 0</td>
</tr>
<tr>
<td>LANG</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>NUMC</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
<tr>
<td>QUAN</td>
<td>Decimal</td>
<td>Precision 1 to 28 digits, scale 0 to 28</td>
</tr>
<tr>
<td>TIMS</td>
<td>Date/time</td>
<td>Jan 1, 0001 A.D. to Dec 31, 9999 A.D. Precision to the nanosecond.</td>
</tr>
<tr>
<td>UNIT</td>
<td>String</td>
<td>1 to 104,857,600 characters Fixed-length or varying-length string.</td>
</tr>
</tbody>
</table>
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