Receiving Outbound IDocs from SAP in Real Time
Abstract

You can configure PowerExchange for SAP NetWeaver to receive outbound SAP IDocs in real time as they are generated by mySAP applications. To receive outbound IDocs, PowerExchange for SAP NetWeaver integrates with mySAP applications using Application Link Enabling (ALE). This article explains how you can use the SAP/ALE IDOC Interpreter transformation to read and transform outbound data from the SAP system.

Supported Versions

- PowerCenter 8.6.x - 9.x

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Overview

You can configure PowerExchange for SAP NetWeaver to receive outbound SAP IDocs in real time as they are generated by mySAP applications. To receive outbound IDocs, PowerExchange for SAP NetWeaver integrates with mySAP 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 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 the PowerCenter Integration Service.

The PowerCenter Integration Service and SAP use transactional RFC (tRFC) communication to send and receive IDocs. tRFC is an SAP method that guarantees that the RFCs are executed only once. As a result, the PowerCenter Integration Service receives each IDoc only once.
If the PowerCenter session is not running when the SAP system sends outbound IDocs, the PowerCenter Integration Service 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 PowerCenter Integration Service. When you configure the port, you can enable background processes in SAP that try to resend the IDocs to the PowerCenter Integration Service a set number of times.

**Defining PowerCenter as a Logical System for Outbound IDocs**

Before you can receive IDocs from SAP using ALE, define PowerCenter as a logical system that receives IDocs from the base logical system in SAP.

**Creating an Outbound IDoc Mapping**

To receive outbound IDocs from mySAP applications, create an outbound IDoc mapping. The outbound IDoc mapping can contain the following components:

- SAPALEIDoc source definition. Source definition to read data from the SAP source system.
- Application Multi-Group Source Qualifier transformation. Determines how the PowerCenter Integration Service reads data from the SAP source.
- SAP/ALE IDoc Interpreter transformation (optional). Processes IDoc data according to the IDoc type you specify when you create the transformation.
- Target definition. Definition of the target to which you want the PowerCenter Integration Service to write the IDoc data.

**Creating an SAP/ALE IDOC Mapping**

**Step 1. Creating an SAP/ALE IDoc Source Definition**

To receive outbound IDocs from SAP using ALE, create an SAP/ALE IDoc source definition in the Designer. An SAP/ALE IDoc source definition represents the metadata for outbound IDocs. When you create an SAP/ALE IDoc source definition, the Designer displays a table with IDoc fields and SAP datatypes. When the PowerCenter Integration Service extracts data from the SAP source, it converts the data based on the datatypes in the Source Qualifier transformation associated with the source.

1. In the Source Analyzer, click Sources > Create.
   
   The Create Source dialog box appears.
2. Enter a logical source name for the source.
3. Select the database type as SAPALEIDoc.
4. Click Repository > Save.
   
   The SAP/ALE IDoc source definition appears in the Source Analyzer.

**Step 2. Creating a Target Definition**

1. Click Tools > Target Designer.
2. Create a relational target to which you want to write the IDOC data.
3. Click Repository > Save.
The relational target definition appears in the Target Designer.

**Step 3. Create a Mapping with the SAP/ALE IDOC Interpreter Transformation**

Include an SAP/ALE IDoc Interpreter transformation in an outbound IDoc mapping when you want to process the outbound IDoc data you receive from the SAP system. The transformation receives data from upstream transformations in the mapping and interprets the segment data.

1. Click Tools > Mapping Designer.
2. Drag and drop the SAP ALE generic source and target in the Mapping Designer.
3. Click Transformation > Create.
   The Create Transformation dialog box appears.
4. Select SAP/ALE IDoc Interpreter from the list.
5. Enter a name for the transformation and click Create.
   The Generate SAP IDoc Interpreter Transformation wizard appears.
6. Enter the following information to connect to the SAP system to import the IDoc metadata:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connect String</td>
<td>Required. Type A or Type B DEST entry in the saprfc.ini file.</td>
</tr>
<tr>
<td>User Name</td>
<td>Required. SAP source system connection user name. Must be a user for which you have created a source system connection.</td>
</tr>
<tr>
<td>Password</td>
<td>Required. Password for the user name.</td>
</tr>
<tr>
<td>Client</td>
<td>Required. SAP client number.</td>
</tr>
<tr>
<td>Language</td>
<td>Optional. Language you want for the mapping. Must be compatible with the PowerCenter Client code page. If you leave this option blank, PowerCenter uses the default language of the SAP system.</td>
</tr>
</tbody>
</table>

7. Click Connect.
8. After you connect to the SAP system, enter a filter condition to display specific IDoc types.
9. Select one of the following filter types:
   - **Message Type.** Select to display IDocs by the message type. The Designer displays the basic and extended type for each IDoc that meets the filter condition.
   - **Basic IDoc Type.** Select to display IDocs by the basic IDoc type. The Designer displays only the basic type for each IDoc that meets the filter condition.
   - **Extended IDoc Type.** Select to display IDocs by the extended IDoc type. The Designer displays only the extended type for each IDoc that meets the filter condition.
10. Enter a filter condition.
    You can enter an IDoc name. Or, use an asterisk (*) or percent sign (%) as wildcard characters to display IDocs that meet the filter condition. Use the following syntax when you enter a wildcard character:
    - Enter the filter condition as a prefix. For example, enter MAT* or MAT% to display all IDocs that begin with MAT.
    - Enter the filter condition as a suffix. For example, enter *AT or %AT to display all IDocs that end with AT.
- Enter the filter condition as a substring. For example, enter *MAT* or %MAT% to display all IDocs that contain MAT.

11. Click Show IDoc Types.
   All IDocs that meet the filter condition appear.

12. To refine the IDocs that display, you can select one or both of the following options:
   - Show Only Unknown Message Type. If IDocs display that are of an unknown message type, you can select this option to display only those IDocs.
   - Show Release For Message Type. Select to display IDocs by the SAP release.

13. Expand an IDoc Type to see a list of basic and extended IDocs.

14. Select the basic or extended IDoc to import its metadata and click Next.
   Step 2 of the wizard appears.

15. Click Show Group Status to show the required groups in the Group Status column.

16. Select the IDoc segments that you want to include in the transformation.
   You can manually select the segments that you want to include. Or, click Select All Segments to include all the segments.
17. Click Next.
18. Step 3 of the wizard appears.
   The wizard provides a name for the transformation.
19. Optionally, modify the name of the transformation.
   If you clicked Transformation > Create to create the transformation, you cannot modify the
   name of the transformation in Step 3 of the wizard. The Designer uses the transformation you
   entered in the Create Transformation dialog box.
20. Optionally, modify the description of the transformation.
21. Click Finish.
22. Map the required fields from the interpreter transformation to the target fields.
23. Validate the mapping.
24. Click Repository > Save.

**Step 4. Create a Session for the SAP/ALE IDOC Mapping**

You can configure session properties for IDoc sessions using ALE.
1. In the Task Developer, double-click an SAP session to open the session properties.

2. If you are configuring an outbound IDoc session and want to guarantee the delivery of messages, select a recovery strategy from the General Options in the Properties tab.

   To enable message recovery and guarantee the delivery of messages, select Resume from Last Checkpoint.

   If you enable message recovery, you can configure a value for the recovery cache folder from the Properties settings of the Mapping tab (Sources node). Or, use the default cache folder $PMCacheDir$.

3. In the Config Object tab, configure the advanced settings, log options, and error handling properties.

4. Click the Mapping tab.

5. From the Connections settings on the Mapping tab (Sources node), select the connection values for the sources.

   If you are configuring an outbound IDoc session, select an SAP_ALE_IDoc_Reader application connection for the Application Source Qualifier associated with the SAPALEIDoc source definition.

6. If you are configuring an outbound IDoc session, click Properties.

7. Optionally, edit the values for the Idle Time, Message Count, and Reader Time Limit terminating conditions.

   The Workflow Manager assigns the following default values to the terminating conditions:

<table>
<thead>
<tr>
<th>Terminating Condition</th>
<th>Default Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle Time</td>
<td>-1</td>
<td>SAP can remain idle for an infinite period of time before the PowerCenter session ends.</td>
</tr>
<tr>
<td>Packet Count</td>
<td>-1</td>
<td>The PowerCenter Integration Service can read an infinite number of packets before the session ends.</td>
</tr>
<tr>
<td>Reader Time Limit</td>
<td>0</td>
<td>The PowerCenter Integration Service can read IDocs from SAP for an infinite period of time.</td>
</tr>
</tbody>
</table>

8. Optionally, configure real-time flush latency.

   By default, the PowerCenter Integration Service does not run the session in real time. Default is 0.

9. On the Targets node, enter the connection values for the targets in the mapping.

   If you are configuring an inbound IDoc session, select an SAP_ALE_IDoc_Writer application connection for the SAPALEIDoc target definition.

10. If you are configuring an inbound IDoc session, click the Properties settings.

11. Edit the following properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packet Size</td>
<td>Number of IDocs you want the PowerCenter Integration Service to send in a packet to SAP.</td>
</tr>
<tr>
<td>Number of Retries</td>
<td>Number of times you want the PowerCenter Integration Service to attempt to connect to the SAP system.</td>
</tr>
<tr>
<td>Delay Between Retries</td>
<td>Number of seconds you want the PowerCenter Integration Service to wait before attempting to connect to the SAP system if it could not connect on a previous attempt.</td>
</tr>
<tr>
<td>Send IDoc Based on</td>
<td>Select one of the following options: - Packet Size. The PowerCenter Integration Service commits IDocs to SAP based on the value you set for the Packet Size property. The PowerCenter Integration Service collects</td>
</tr>
</tbody>
</table>
Do not select Generate Request ID. Use this property only when you configure send request workflows for business content integration.

12. On the Transformations node, edit the following properties, depending on whether you are configuring an inbound or outbound IDoc session:

<table>
<thead>
<tr>
<th>Property</th>
<th>Outbound/Inbound</th>
<th>Description</th>
</tr>
</thead>
</table>
| Duplicate Parent Row Handling   | Both             | Determines how the PowerCenter Integration Service handles duplicate parent rows. Select one of the following values:  
- First Row. The PowerCenter Integration Service passes the first duplicate row to the target. The PowerCenter Integration Service rejects rows with the same primary key that it processes after this row.  
- Last Row. The PowerCenter Integration Service passes the last duplicate row to the target.  
- Error. The PowerCenter Integration Service passes the first row to the target. Rows that follow with duplicate primary keys increment the error count. The session fails when the error count exceeds the error threshold. |
| Orphan Row Handling             | Both             | Determines how the PowerCenter Integration Service handles orphan rows. Select one of the following values:  
- Ignore. The PowerCenter Integration Service ignores orphan rows.  
- Error. The session fails when the error count exceeds the error threshold.                                                      |
| Extended Syntax Check           | Both             | Checks for IDocs that are not valid. Validating IDocs can decrease session performance.                                                                zech for IDocs that are not valid. Validating IDocs can decrease session performance.                                                                 |
| Row Level Processing            | Outbound        | Outbound PowerCenter Integration Service can process each row of an outbound IDoc according to the IDoc metadata and pass it to a downstream transformation. If you enable row-level processing, the PowerCenter Integration Service does not validate IDocs. Select this option to increase session performance. |
| NULL Field Representation       | Inbound         | Determines how the PowerCenter Integration Service handles fields with a null value when preparing the data in the IDoc format. Select one of the following values:  
- Blank. The PowerCenter Integration Service inserts all blanks for the field.  
- Slash (/). The PowerCenter Integration Service inserts a single slash (/) for the field.                                                                 |
| Cache Directory                 | Inbound         | Default directory used to cache inbound IDoc or DMI data. By default, the cache files are created in a directory specified by the variable $PMCacheDir. If you override the directory, make sure that the directory exists and contains enough disk space for the cache files. The directory can be a mapped or mounted drive. |
| Cache Size                      | Inbound         | Total memory in bytes allocated to the PowerCenter Integration Service for the caching of data prepared by SAP/ALE IDoc Prepare or SAP DMI Prepare transformations. Default is 10 MB.                                                                                                           |
Step 5. Creating an SAP/ALE IDOC Reader Connection

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 saprfc.ini.

To use RFC, configure the saprfc.ini file on the machines hosting the PowerCenter Client and PowerCenter Integration Service with parameters that enable communication with SAP. This file enables PowerCenter to connect to the SAP system as an RFC client.

You can also configure the saprfc.ini file if you are integrating with mySAP applications using ABAP. Configure the file on the node where the PowerCenter Integration Service process runs to include parameters specific to SAP. This file enables PowerCenter to initiate CPI-C with the SAP system.

If the SAP GUI is not installed on the machine that uses the saprfc.ini file, you must make entries in the Services file to run stream mode sessions. Enter the details in the saprfc.ini file in the windows/system32 folder.

A sample saprfc.ini file with entries to connect to the SAP system is as shown:

/*DEV 260 R */
DEST=INF_PWRCTR_DEV_1
TYPE=R
PROGID=INF_PWRCTR_DEV
GWHOST=hslsid95.heiway.net
GWSERV=sapgw96
RFC_TRACE=0

Configuring an Entry in saprfc.ini

The PowerCenter Client and PowerCenter Integration Service use the Type A, Type B, and Type R entries in saprfc.ini. The Designer connects to SAP to import metadata into the repository. The PowerCenter Integration Service connects to SAP to read and write data as an RFC client using the database connection that you create in the Workflow Manager.

1. Open saprfc.ini.
2. Enter the following parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEST</td>
<td>All</td>
<td>Logical name of the SAP system for the connection. All DEST entries must be unique. You must have only one DEST entry for each SAP system. For SAP versions 4.6C and later, use up to 32 characters. For earlier versions, use up to eight characters.</td>
</tr>
<tr>
<td>TYPE</td>
<td>All</td>
<td>Type of connection. Set to A, B, or R.</td>
</tr>
<tr>
<td>ASHOST</td>
<td>A</td>
<td>Host name or IP address of the SAP application. PowerCenter uses this entry to attach to the application server.</td>
</tr>
<tr>
<td>SYSNR</td>
<td>A</td>
<td>SAP system number.</td>
</tr>
<tr>
<td>R3NAME</td>
<td>B</td>
<td>Name of the SAP system.</td>
</tr>
<tr>
<td>MSHOST</td>
<td>B</td>
<td>Host name of the SAP message server.</td>
</tr>
<tr>
<td>GROUP</td>
<td>B</td>
<td>Group name of the SAP application server.</td>
</tr>
<tr>
<td>PROGID</td>
<td>R</td>
<td>Program ID. The Program ID must be the same as the Program ID for the logical system you define in the SAP system to send or receive IDocs or to consume business content data. For business content integration, set to INFACONTNT.</td>
</tr>
<tr>
<td>GWHOST</td>
<td>R</td>
<td>Host name of the SAP gateway.</td>
</tr>
<tr>
<td>GWSERV</td>
<td>R</td>
<td>Server name of the SAP gateway.</td>
</tr>
<tr>
<td>RFC_TRACE</td>
<td>A/R</td>
<td>Debugs RFC connection-related problems. 0 is disabled. 1 is enabled.</td>
</tr>
</tbody>
</table>

3. If you are connecting to multiple SAP systems, create an entry for each system in saprfc.ini with unique DEST parameters.

**Configure the SAP_ALE_IDoc_Reader Connection in the Workflow Manager**

1. Click Connections > Application.
   - The Application Connection Browser dialog box appears.
2. In the Select Type list, select SAP_ALE_IDoc_Reader.
3. Click New.
   - The Application Connection Editor dialog box appears.
4. Enter a value for the Destination Entry and click OK.
The SAP_ALE_IDoc_Reader connection is created.

**Tuning Tips**

You can configure the following options in the session properties to improve session performance:

- **DTM Buffer Size.** The DTM buffer size specifies the amount of memory that the PowerCenter Integration Service uses as DTM buffer memory. When you increase the DTM buffer memory, the PowerCenter Integration Service creates more buffer blocks, which improves performance during momentary slowdowns. Set the DTM buffer size to at least 100 MB.

- **Default Buffer Block Size.** The default buffer block size specifies the size of buffer blocks used to move data from sources to targets. By default, this value is set to auto. Change the default buffer block size to at least 64 KB.

- **Real-time Flush Latency.** Increase the real-time flush latency to a value greater than zero to extract data in real time.

- **Commit Type.** Change the commit type to source to extract data in real time.

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