



SAP Cloud Integration – Integration Flow SAP IDoc to ASC X12 - Outbound



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1. Introduction

The SAP BTP includes the SAP Cloud Integration, which offers diverse approaches to connect your IT systems with other cloud or on-premise system landscapes. This makes cloud integration simple and reliable. Hence it is SAP's strategic integration platform for SAP Cloud customers. It provides out-of-the-box connectivity across cloud and on-premise solutions. Since the SAP Cloud Integration is operated by SAP, you don't need to worry about basic activities. Additionally, SAP is offering prepackaged integration content as reference templates, that allows customers to quickly realize new business scenarios. This drastically reduces integration project lead times and lowers resource consumption significantly.

This document gives an overview about the outbound IDOC to ASC X12 template flow of SAP Cloud Integration in combination with SAP Integration Advisor (IA). It is explained how exported runtime artefacts from SAP IA can be imported into the flow and how the flow can be configured.

We assume the reader is an integration developer and is familiar with SAP Cloud Integration.

2. Usage Policy and Copyright Statement: ASC X12 and SAP SE

For downloading and using one of the provided ASC X12 message XSD file a valid license for the respective X12 standard is required. Consumers have to be in compliance with ASC X12 IP Usage Policies (<http://store.x12.org/store/ip-use>).

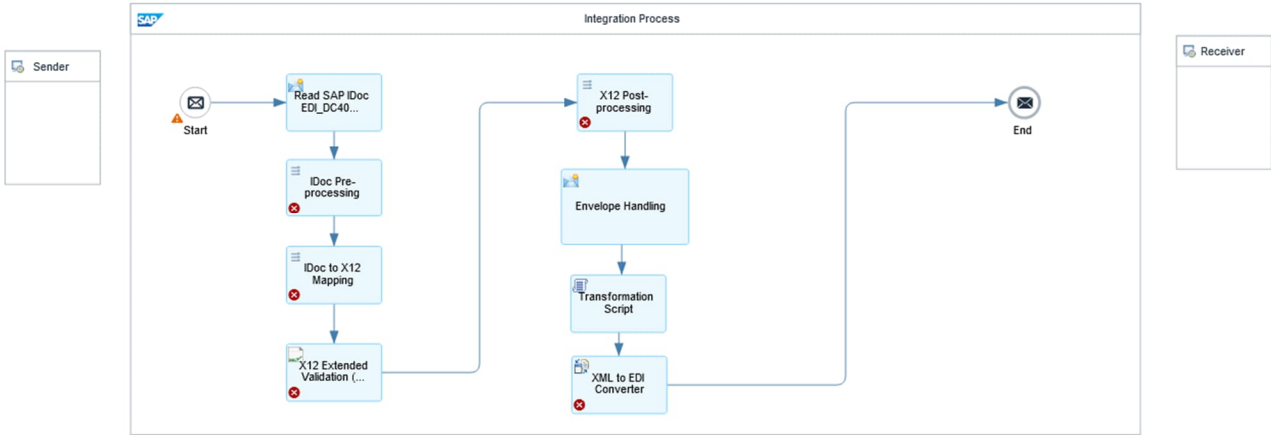
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3. Integration Flow

Integration Flow	
Name	SAP IDoc to X12 - Outbound
Description	SAP IDoc to X12 - Outbound Template



3.1 Basic Concepts

With the SAP Integration Advisor one can create MIG (message implementation guidelines) and MAG (mapping guidelines). These can be exported as SAP Cloud Integration runtime artifacts (zip file containing *.xslt and *.xsd files). The flow templates contain steps serving as containers for the exported runtime artifacts (where the runtime artifacts can be imported into). E.g. the runtime artifacts exported from the MIG and MAG of the SAP Integration Advisor can be used as follows: schemas (xsd) can be used in EDI Splitter, EDI to XML Converter, XML to EDI Converter, XML Validator (extended validation) ; stylesheet transformations (xslt files) in XSLT Mapping.

Furthermore, it is necessary to define and customize the communication adapters as well as the required information of the interchange envelope and header structures (e.g. in the content modifier).

3.2 Sender Channel

Sender channel is configured by the customer. In case of IDoc outbound scenario, an IDoc SOAP adapter should be used.

3.3 Start Event

The Start Message event is triggered by the sending system.

3.4 Read SAP IDoc EDI_DC40 Parameters

Content Modifier

Content Modifier		<i>Description: From the source IDoc, EDI_DC40 parameters are extracted.</i>			
Message Header					
Action	Name	Type	Data Type	Value	Default
Create	SAP_IDoc_EDIDC_TABNAM	XPath	java.lang.String	//EDI_DC40/TABNAM	
Create	SAP_IDoc_EDIDC_MANDT	XPath	java.lang.String	//EDI_DC40/MANDT	
Create	SAP_IDoc_EDIDC_DOCNUM	XPath	java.lang.String	//EDI_DC40/DOCNUM	
Create	SAP_IDoc_EDIDC_DOCREL	XPath	java.lang.String	//EDI_DC40/DOCREL	
Create	SAP_IDoc_EDIDC_STATUS	XPath	java.lang.String	//EDI_DC40/STATUS	
Create	SAP_IDoc_EDIDC_DIRECT	XPath	java.lang.String	//EDI_DC40/DIRECT	
Create	SAP_IDoc_EDIDC_OUTMOD	XPath	java.lang.String	//EDI_DC40/OUTMOD	
Create	SAP_IDoc_EDIDC_EXPRSS	XPath	java.lang.String	//EDI_DC40/EXPRSS	
Create	SAP_IDoc_EDIDC_TEST	XPath	java.lang.String	//EDI_DC40/	
Create	SAP_IDoc_EDIDC_IDOCTYP	XPath	java.lang.String	//EDI_DC40/IDOCTYP	
Create	SAP_IDoc_EDIDC_CIMTYP	XPath	java.lang.String	//EDI_DC40/CIMTYP	
Create	SAP_IDoc_EDIDC_MESTYP	XPath	java.lang.String	//EDI_DC40/MESTYP	

Content Modifier		<i>Description: From the source IDoc, EDI_DC40 parameters are extracted.</i>			
Message Header					
Action	Name	Type	Data Type	Value	Default
Create	SAP_IDoc_EDIDC_MESCOD	XPath	java.lang.String	//EDI_DC40/MESCOD	
Create	SAP_IDoc_EDIDC_MESFCT	XPath	java.lang.String	//EDI_DC40/MESFCT	
Create	SAP_IDoc_EDIDC_STD	XPath	java.lang.String	//EDI_DC40/	
Create	SAP_IDoc_EDIDC_STDVRS	XPath	java.lang.String	//EDI_DC40/STDVRS	
Create	SAP_IDoc_EDIDC_STDMES	XPath	java.lang.String	//EDI_DC40/STDMES	
Create	SAP_IDoc_EDIDC_SNDPOR	XPath	java.lang.String	//EDI_DC40/SNDPOR	
Create	SAP_IDoc_EDIDC_SNDPRT	XPath	java.lang.String	//EDI_DC40/SNDPRT	
Create	SAP_IDoc_EDIDC_SNDPFC	XPath	java.lang.String	//EDI_DC40/SNDPFC	
Create	SAP_IDoc_EDIDC_SNDPRN	XPath	java.lang.String	//EDI_DC40/SNDPRN	
Create	SAP_IDoc_EDIDC_SNDSAD	XPath	java.lang.String	//EDI_DC40/SNDSAD	
Create	SAP_IDoc_EDIDC_SNDLAD	XPath	java.lang.String	//EDI_DC40/SNDLAD	
Create	SAP_IDoc_EDIDC_RCVPOR	XPath	java.lang.String	//EDI_DC40/RCVPOR	
Create	SAP_IDoc_EDIDC_RCVPRT	XPath	java.lang.String	//EDI_DC40/RCVPRT	

Create	SAP_IDoc_EDIDC_RCVPFC	XPath	java.lang.String	//EDI_DC40/RCVPFC	
Create	SAP_IDoc_EDIDC_RCVPRN	XPath	java.lang.String	//EDI_DC40/RCVPRN	
Create	SAP_IDoc_EDIDC_RCVSAD	XPath	java.lang.String	//EDI_DC40/RCVSAD	
Create	SAP_IDoc_EDIDC_RCVLAD	XPath	java.lang.String	//EDI_DC40/RCVLAD	
Create	SAP_IDoc_EDIDC_CREDAT	XPath	java.lang.String	//EDI_DC40/CREDAT	
Create	SAP_IDoc_EDIDC_CRETIM	XPath	java.lang.String	//EDI_DC40/CRETIM	
Create	SAP_IDoc_EDIDC_REFINT	XPath	java.lang.String	//EDI_DC40/REFINT	
Create	SAP_IDoc_EDIDC_REFGRP	XPath	java.lang.String	//EDI_DC40/REFGRP	
Create	SAP_IDoc_EDIDC_REFMES	XPath	java.lang.String	//EDI_DC40/REFMES	
Create	SAP_IDoc_EDIDC_ARCKEY	XPath	java.lang.String	//EDI_DC40/ARCKEY	
Create	SAP_IDoc_EDIDC_SERIAL	XPath	java.lang.String	//EDI_DC40/SERIAL	

3.5 IDOC Pre-Processing

XSLT Mapping

Mapping	<i>In this step, the IDoc is preprocessed via an XSLT mapping.</i>
Name	<SourceMIGName>__preproc.xsl
Resource	<i>Runtime artefact from SAP IA. Located in the MIG source folder within the exported zip file.</i>
Type	XSLT Mapping
Output Format	XML

3.6 IDoc to X12 Mapping

XSLT Mapping

Mapping	<i>Mapping step where the IDoc message is transformed into the ASC X12 message via XSLT.</i>
Name	<MAGName>.xsl
Resource	<i>Runtime artefact from SAP IA. Located at the root folder of the exported zip file.</i>
Type	XSLT Mapping
Output Format	XML

3.7 X12 Extended Validation (optional)

XML Validator

Mapping	<i>XML Validation step where the result of the XSLT mapping is validated against the ASC X12 extended validation XSD. Supports XSD 1.1 version.</i>
Name	<SourceMIGName>__RD.xsd
Resource	<i>Runtime artefact from SAP IA. Located in the MIG target folder within the exported zip file.</i>
Type	XSLT Mapping

Output Format	XML
---------------	-----

This validation step is optional but recommended in case the generated payload needs to be validated against a xsd. E.g. for target message 810 4010, N1.98 qualified "BY" (Buying Party), N4.26 (country code) is restricted using a codelist only to value "DE".

If you don't want to execute validation of the message, simply remove this flow step from your integration flow.

3.8 X12 Post-processing

XSLT Mapping

Mapping	<i>The qualifiers within the target ASCX12 message are removed via an XSLT mapping.</i>
Name	<code><TargetMIGName>__postproc.xsl</code>
Resource	<i>Runtime artefact from SAP IA. Located in the MIG target folder within the exported zip file.</i>
Type	XSLT Mapping
Output Format	XML

3.9 Envelope Handling

Content Modifier

The body of the message is extracted into the header variable *ExtractedMessage*.

Example: The customer could to set the value for the XPath variable in the following format:

`//<TargetMessageType>`

Example values are provided here:

Content Modifier					
Message Header (example)					
Action	Name	Type	Data Type	Value	Default
Create	ExtractedMessage	XPath	org.w3c.dom.NodeList	//M_850	
or					
Create	ExtractedMessage	XPath	org.w3c.dom.NodeList	@* node()	

In case the requirement is to generate a new Interchange Control Number each time you are sending an ANSI X12 message, you can use Number Ranges.

To configure Number Ranges, navigate to Monitor->Manage Stores->Number Ranges.

Example of a Number Range object:

A number range can be used to insert unique sequence numbers.

Add Number Range

*Name:

Description:

*Minimum Value:

*Maximum Value:

Field Length:

Rotate

To rotate next value once it reaches the maximum value.

Each time an unique number is generated, the length will stay at 9 characters. This means 1 will become 000000001 .

OK Cancel

EDI Integration Templates for SAP Integration Advisor

The rest of this paragraph lists the technical details of this Content Modifier used for X12 envelope handling.

Example values for the ASC X12 Interchange header are provided in the following table:

Content Modifier					
Exchange Property (example)					
Action	Name	Type	Data Type	Value	Remark
Create	InterchangeControlNumber	Number Range		ICN_X12	Number Range Object
Create	GroupControlNumber	Number Range		GCN_X12	Number Range Object (can be different from ICN)
Create	InterchangeDate	Expression		\${date.now:yyMMdd}	Current system date
Create	InterchangeTime	Expression		\${date.now:HHmm}	Current system time
Create	Date	Expression		\${date.now:yyyyMMdd}	
Create	Time	Expression		\${date.now:HHmm}	

The image displays two side-by-side screenshots of the SAP Integration Advisor interface, showing the structure of the ISA - Interchange Control Header for different X12 versions.

The left screenshot shows the structure for X12 004010. The structure is as follows:

Node	Constr...	Cardinality	Length
ISA - Interchange Control Header		1.1	
I01 - Authorization Information Qualifier		1.1	2.2
I02 - Authorization Information		1.1	10..10
I03 - Security Information Qualifier		1.1	2.2
I04 - Security Information		1.1	10..10
I05 - Interchange ID Qualifier		1.1	2.2
I06 - Interchange Sender ID		1.1	15..15
I07 - Interchange Receiver ID		1.1	15..15
I08 - Interchange Date		1.1	6.6
I09 - Interchange Time		1.1	4.4
I10 - Interchange Control Standards Identifier		1.1	1.1
I11 - Interchange Control Version Number		1.1	5.5
I12 - Interchange Control Number		1.1	9.9
I13 - Acknowledgment Requested		1.1	1.1
I14 - Usage Indicator		1.1	1.1
I15 - Component Element Separator		1.1	1.1

The right screenshot shows the structure for X12 004020. The structure is as follows:

Node	Constr...	Cardinality	Primitive Type	Length
ISA - Interchange Control Header		1.1		
I01 - Authorization Information Qualifier		1.1	Token	2.2
I02 - Authorization Information		1.1	String	10..10
I03 - Security Information Qualifier		1.1	Token	2.2
I04 - Security Information		1.1	String	10..10
I05 - Interchange ID Qualifier		1.1	Token	2.2
I06 - Interchange Sender ID		1.1	String	15..15
I07 - Interchange Receiver ID		1.1	String	15..15
I08 - Interchange Date		1.1	Date	6.6
I09 - Interchange Time		1.1	Time	4.4
I10 - Interchange Control Standards Identifier		1.1	String	1.1
I11 - Interchange Control Version Number		1.1	Token	5.5
I12 - Interchange Control Number		1.1	Integer	9.9
I13 - Acknowledgment Requested		1.1	Token	1.1
I14 - Usage Indicator		1.1	Token	1.1
I15 - Component Element Separator		1.1	String	1.1

The picture above shows the difference between the ISA segments for X12 4010 or below and X12 4020 and above.

3.10 Transformation Script

We use a groovy script to adjust the Interchange Control Reference to the value set above with the Number Range (3.9.).

Content of the script is:

```

Groovy Script

import com.sap.gateway.ip.core.customdev.util.Message;
import java.util.HashMap;
def Message processData(Message message) {
    def body = message.getBody(new java.lang.String().getClass());

    //Properties
    def properties = message.getProperties();

    def interchangeControlNumber = properties.get("InterchangeControlNumber");
    def groupControlNumber = properties.get("GroupControlNumber");

    def iCNRegex = (<D_I12>.*?</D_I12>/);
    def gCNRegex = (<D_28>.*?</D_28>/);

    def updatedICN = body.replaceAll(iCNRegex, "<D_I12>${interchangeControlNumber}</D_I12>");
    def updatedGCN = updatedICN.replaceAll(gCNRegex, "<D_28>${groupControlNumber}</D_28>");

    message.setBody(updatedGCN);

    return message;
}
    
```

3.11 XML To EDI Converter

Converter

XML To EDI Converter	
General	
Name	XML to EDI Converter
X12	
Source Encoding	e.g. UTF-8
EDI Schema Definition	Integration Flow
Schema Name	<i>ASC-X12_<TransactionSet>_<MessageVersion>.xsd</i> Runtime artefact from SAP IA. Located in the MIG target folder within the exported zip file.

3.12 End Event

The End Message event should be connected with the receiving system.

3.13 Receiver Channel

Receiver channel is configured by the customer.