

SAP NetWeaver 7.31

SAP NetWeaver Process Integration
Simple Use Cases for B2B NRO and Archive Module
Configuration

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1 Preface

Constraints

The texts, references, and graphics contained in this manual have been compiled with utmost care; nevertheless, it is impossible to guarantee that they are fully without error. SAP cannot assume any responsibility for the correctness or completeness of the following documentation; the user alone is responsible for verifying the information contained therein.

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Definition

This manual describes simple application cases for SFTP (Secure File Transfer Protocol) adapter using NRO (Number Range Object) and Archive Module. The scenario is configured using Integration Flow for process integration and all the configuration steps that are necessary to execute the application cases on the basis of SAP NetWeaver 7.31.

Intended Audience

This manual is intended to be used by both technology and application consultants.

Structure

The structure of this document follows the sequence of steps required to configure and run the use cases.

Additional Documentation

List of related documentation

Documentation	Purpose
SAP NetWeaver Documentation Simple Use Cases	Introduction to Simple Use Cases and description of the simple use case scenarios for Process Integration

2 Introduction and Prerequisites

2.1 Introduction

Use cases are based on simple examples that enable you to learn the main features of PI B2B using iFlow Configuration for the Advanced Adapter Engine Extended. These instructions will enable you to understand, configure, and execute simple scenarios (that are based on fundamental communication patterns), as well as check that the scenarios are executed correctly. The prerequisite for this document is that you have a general understanding of SAP NetWeaver Process Integration along with new B2B adapter and B2B modules.

The following use case variants for the Advanced Adapter Engine Extended are available at present:

Variants	Description
Variants 1: One Sender and One Receiver with NRO and Archive Module at Outbound	NRO and Archive Module at receiver side with Message Mapping along with Java Archiver Mapping class
Variants 2: One Sender and One Receiver with NRO & Archive Module at Outbound and Archive Module at Inbound	NRO Module at receiver side and Archive Module at both sides with Message Mapping along with Java Archiver Mapping class

Variant 3: One Sender and One Receiver with Archive Module at Outbound and Multiple Numbers per message for NRO Module with rotation enabled	NRO Module at receiver side and Archive Module at both sides with Message Mapping along with Java Archiver Mapping class
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You can aim to learn about the following with the use cases:

- Working with SFTP adapter with the Process Integration Designer in NWDS: Configuring simple scenarios and understanding created configuration objects
- Working with B2B module – Number Range Object and Archive Module within B2B adapters
- Working with the runtime: Executing the use cases and checking the results by using the monitoring tools

2.1.1 Archive Module & Java Archiver Mapping

- 1) **Archive Module** is similar to any other standard module that can be used in the channel configuration. It archives the payload of the message with the name and location configured in the module parameters.
- 2) **Archiver Mapping** is similar to any Java Mapping that can be used as one of the message mapping steps in an Operation Mapping. It is used to archive the output of a particular message-mapping step where Archiver Mapping is configured. The location of this archive is configured in parameter ‘tempDirectory’ of the operation mapping where this is used. Name of the archive is taken from the Archive Module parameters which are configured in communication channel.

Note: Archiver Mapping is dependent on the Archive Module and cannot be use independently, whereas the Archive Module can be used independent of the Archiver Mapping.

2.1.2 Number Range Objects (NRO)

Number Range is a set of values between any two numbers. The number range always starts with a minimum value and ends with a maximum value.

E.g. 194, 195, 196, 198 is a Number range.

Number Range Objects (NRO) provides a custom range of numbers. NRO generates numbers within the minimum and the maximum value that is specified.


2.2 Prerequisites

2.2.1 General Prerequisites

To configure and execute the use cases, SAP Net Weaver with usage type Advanced Adapter Engine Extended must be correctly installed and configured. The following table lists the prerequisites and the relevant guides:

List of required steps

Step	Documentation
1. You have installed the Advanced Adapter Engine Extended.	You can find the corresponding guides on SAP Service Marketplace in the Implementation Documentation Center for SAP NetWeaver 7.3 and SAP NetWeaver 7.3 including Enhancement Package 1

<p>2. You have installed the B2B and SFTP Add-on.</p>	<p>You can download the B2B add-on from the following location:</p> <p>http://service.sap.com/swdc -> Installation and Upgrades -> Browse our Download Catalog -> SAP NetWeaver and complementary products -> PI B2B ADDON and PI SFTP PGP ADDON.</p> <p>For downloading latest Support package and patches, please refer to the following location -> http://service.sap.com/swdc -> Support Packages and Patches -> Browse our Download Catalog -> SAP NetWeaver and complementary products -> PI B2B ADDON and PI SFTP PGP ADDON</p>
<p>3. You have imported the content for the Enterprise Services Repository corresponding to the latest support package/patch into the Advanced Adapter Engine Extended System.</p>	<p>SAP Note 836200</p>  <p>The simple use cases are located in the Enterprise Services Repository in below software components →</p> <p><i>SAP BASIS</i>, software component version <i>SAP BASIS 7.31</i>, namespaces http://sap.com/xi/XI/System/Patterns</p> <p><i>SFTP ADAPTER</i>, software component version <i>SFTP ADAPTER 1.0</i>, namespaces http://sap.com/xi/XI/SFTP</p> <p><i>B2B MAPPING KIT</i>, software component version <i>B2B MAPPING KIT 1.0</i>, namespaces http://sap.com/xi/B2B/MappingFunctions</p>
<p>4. You have configured the System Landscape Directory (SLD) for the Advanced Adapter Engine Extended System.</p>	<p>Configuring, Working with and Administering System Landscape Directory</p>
<p>5. You have installed the NetWeaver Developer Studio.</p>	<p>You can find the corresponding guides on SAP Service Marketplace at https://service.sap.com/installnw73 → Under Installation - Standalone Engines and Clients → Installation – Clients → Inst. and Update - SAP NetWeaver Developer Studio 7.3 EHP1.</p>



Note that you set up the use cases in your development or test system, but **not** in your productive system.

2.2.2 Prerequisites for Archive Module

- The Archiver Module should be deployed in the PI System.
 - Open [http\(s\)://<host>:<post>/nwa/start-stop](http(s)://<host>:<post>/nwa/start-stop)
 - Select Java Application Tab
 - Filter with '*archiver.app'
 - Archiver Module app should be present and running.

2.2.3 Prerequisites for Number Range Objects

A Number Range Object needs to be created via the maintenance tool for NRO available at **B2B Integration Cockpit**. Follow the URL

[http\(s\)://<host>:<port>/webdynpro/resources/sap.com/b2b~home/B2BHome](http(s)://<host>:<port>/webdynpro/resources/sap.com/b2b~home/B2BHome) to open B2B Integration Cockpit and then click on NRO Maintenance.

- Check if following 2 NRO objects **/B2B/NRO01** and **/B2B/NRO02** are present and check for attributes values as per below table. If NRO objects do not exist, proceed with below steps for creation.
- Click create new Number Range Object button.
- Create two NRO’s using the data specified in the below table.
- NRO 1 is with Rotation Disabled.
- NRO 2 is with Rotation Enabled. This means that once the NRO has reached its maximum value, counter will be re-initialized back to the starting value.

Field Names	Description	NRO 1	NRO 2
Name	Name of the NRO with prefix /B2B/<NRO>. The <NRO> specified in this field is used to look up the NRO and substitute the values.	/B2B/NRO01	/B2B/NRO02
Description	Field which describes the function of the NRO	NRO 1 for Simple Use case	NRO 2 for Simple Use case
Minimum Value	The minimum value of the NRO. The start of the number range.	Any Number (e.g. 12350)	Any Number (e.g. 22350)
Maximum Value	The maximum value of the NRO. The end of the number range.	Any Number (e.g. 13350)	Any Number with difference of 10 (e.g. 22360)
Value length	This field lets you control the length of the NRO value that is substituted. The number will be padded with 0’s.	Number of digits to display for NRO value (e.g. 05)	Number of digits to display for NRO value (e.g. 05)
Warn Level	This field lets you control the warning that will be issued when the NRO reaches the test warn level.	Value in terms of Percentage (e.g. 90)	Value in terms of Percentage (e.g. 90)
Rotate	Select this check box if you want to continue the NRO from minimum value again when the end of range is reached.	‘ ‘	‘X’

- Click on Save and Create button to finish the creation.
- Create one more NRO object with one of the above names. Clicking on Save and Create button will throw error.

2.2.4 Providing the necessary User and Authorizations

To log on to the AEX system to configure the simple use cases, you have to create a user *XIDEMO* with the following roles in the Advanced Adapter Engine Extended:

- SAP_XI_CONFIGURATOR_J2EE

- SAP_XI_MONITOR_J2EE

2.2.5 Setting Up the File Directories

The variants are based on a very simple system landscape that comprises various different file systems (on the host of the SAP system on which the Advanced Adapter Engine Extended is installed) for both Sender File Adapter and SFTP receiver adapter. When the use cases are executed, files are moved between file directories. Therefore, to be able to configure the use cases, the file directories must have been created and described in the System Landscape Directory. Only then can you access the directories during configuration in the Integration Directory.

Perform the steps below to create the required directories on the host of the SAP system on which the Advanced Adapter Engine Extended is installed.

1. Open the file directory of the SAP system, on which the Advanced Adapter Engine Extended is installed.
For Example using Windows Explorer on Windows Systems or using a tool (like – FileZilla) for Linux systems.
2. Create a directory in which you can save files temporarily and create sub directories ModuleTest in it.



A work directory already exists on many computers that can be used for this purpose and under which you can create the required directories.

3. Create two further sub directories in the sub directory ModuleTest. Suggested names: *Sender* and *Receiver*. Create one further sub directory in both the sub directories *Sender* and *Receiver*. Suggested names: *Archive*.



You must have authorization to access this directory to be able to test the process integration scenario. Bear this in mind when you define the directory, and, if applicable, contact your system administrator.

4. Copy the following files to directory *Sender*
 - *ZB2B_InvoiceInput1.xml*
 - *ZB2B_InvoiceInput2.xml*
 - *ZB2B_InvoiceInput3.xml*



These files are provided by SAP in a ZIP file. The ZIP file for 7.31 containing also the EOIO test files is available in SAP Developer Network (SDN) and can be found using the direct link [EHP 1 for SAP NetWeaver Process Integration 7.3 – Test Files for Simple Use Cases](#).

2.2.6 Adding Software Components to PI B2B ADDON product

Perform the following steps in the System Landscape Directory (SLD) for the **Advanced Adapter Engine Extended**:

1. To call the System Landscape Directory for the Advanced Adapter Engine Extended System, open the Advanced Adapter Engine Extended Start Page using the URL: `http(s)://<AEX-Host>:<AEX-Port>/dir`.
2. Start the SLD. To do so, on the Advanced Adapter Engine Extended start page, choose *System Landscape Directory*.
3. Log on using your user you created.
4. On the initial screen of the SLD, choose *Products*.
5. Filter for *PI B2B ADDON* product and check for *B2B MAPPING KIT 1.0* software component version is available in Software Components tab. If not proceed with below associations steps.
6. Return back to initial screen of SLD by clicking on link to Home.

7. On the initial screen of the SLD, choose *CIM Instances*.
8. Filter for *B2B MAPPING KIT 1.0* for class *Software Component Version*.
9. Click on New Association.
10. Filter for **B2B** with Association Type *Software Features Software Component* and Associated Class as *Product Instance*.
11. Select *PI B2B ADDON 1.0: JAVA COMPONENTS* and click on Associate. A message for successful association is displayed.
12. Now software component version *B2B MAPPING KIT 1.0* will be available in list of Software Components for *PI B2B ADDON* product.
13. Return back to initial screen of SLD by clicking on link to Home.

2.3 Design Objects Used



This section explains all the design objects that are used for describing the variants. The subsequent description of each variant will refer to the description in this section; the relevant design objects will only be listed briefly in each case.

Below you can find details of the design objects being used in this use case →

Object Type (Name)	Explanation
Service Interface (SI_INBOUND_VDA490500)	Specifies the communication mode (asynchronous) and references the message type used.
Message Type (VDA490500)	Describes the message sent at runtime and references the data type used.
Data Type (VDA490500)	Describes the data structure of the message
Function Libraries (UDFArithmeticsPool, UDFDateTimePool, UDFNodePool, UDFUtilsPool, UDFVdaPool)	User defined functions used in the mapping
External Definition (INVOIC02)	Describes the message sent at runtime and references the IDOC message used.
Operation mapping (OM_INVOIC02_TO_VDA4905, OM_INVOIC02_TO_VDA4905_EXTN & OM_INVOIC02_TO_VDA4905_R)	Describes the mapping between the source and target interface
Message Mapping (MM_INVOIC02_TO_VDA4905 & MM_INVOIC02_TO_VDA4905_R)	Describes the mapping between the source and target structure in detail

Below you can find details for Message Mapping object being used in this use case →

Pool Name	Used Function in the Mapping	Mapping Elements used as I/P	Explanation
UDFNodePool	CreateNumberRange	I/P: startValues and endValues <u>I/P Elements:</u> E1EDK01: NTGEW E1EDK01: BRGEW <u>O/P Element:</u> S511: LIEFNR	Creates an empty string for each number of the missing argument-argument 2-interval
UDFArithmetics Pool	bigDecimalMod	I/P: value and modValue <u>I/P Elements:</u> E1EDKA1: TELFX CONSTANT: 2 <u>O/P Element:</u> S512: SATZART	Returns the MOD value based on the inputs provided
UDFVdaPool	transformFromVDADate	I/P: vdaDate <u>I/P Element:</u> E1EDK03: DATUM E1EDK23: DATUM <u>O/P Element:</u> “getDateDifference“ Function Node (UDFDateTimePool)	Transform a valid VDA date (the argument) to format YYYYMMDD
UDFDateTimePool	getDateDifference	I/P: dateBegin and dateEnd <u>I/P Elements:</u> O/P from transformFromVDADate (E1EDK03: DATUM) O/P from transformFromVDADate (E1EDK23: DATUM) <u>O/P Element:</u> S512: LIEFABFNRNEU	Gets the number of days between two dates of YYYYMMDD format.
UDFUtilsPool	tailString	I/P: value and tailLength <u>I/P Elements:</u> E1EDK02: BELNR CONSTANT: 8 <u>O/P Element:</u> S512: BESTELLNR	Removes the leading characters of the first argument leaving the number of characters given by the second argument.

Below you can find details for **Operation Mapping** object being used in this use case →

The Operation mapping *OM_INVOIC02_TO_VDA4905* is having two mappings – a Java Archiver Class and a Message Mapping. The Java Archiver Class archives the result of the mapping as per its order of usage in operation mapping and saves the result in temporary location of PI server (which will remain until PI server it's not restarted). Later if archive module is set at channel, then archived file from archiver class is copied from temporary location to the location mentioned in module parameter.

The Operation mapping *OM_INVOIC02_TO_VDA4905_EXTN* is similar to above mapping except that the order of mapping is reversed.

The Operation mapping *OM_INVOIC02_TO_VDA4905_R* is having only message mappings with multiple message at outbound.

3 Variant 1: One Sender and One Receiver with NRO and Archive Module at Outbound

This variant enables you to configure and execute the simplest kind of message exchange:

One sender (file directory *Sender*) sends a message to one receiver (file directory *Receiver*). Hereby, the message is exchanged between sender and receiver adapter by using one Advanced Adapter Engine Extended. Two Mappings are used. First mapping (Java Class archiver) archives the sender payload to a temporary location of the PI server. The second mapping uses Number Range object to assign values from Number Range Object in two elements on the inbound interface. Also some fields result in values as per the User Defined Functions used (see 2.4.4). At last Archive Module used on receiver channel picks the sender payload from temporary location and archives it to the directory set along with the mapped file.

3.1 Design Object Used

The Operation mapping *OM_INVOIC02_TO_VDA4905* & *OM_INVOIC02_TO_VDA4905_EXTN* will be used.

3.2 Configuring the Process Integration Scenario

In configuration, you use the design objects in the process integration scenario for the actual system landscape. You have already described the system landscape in the SLD. The communication components that will be defined in this section enable you to address them as senders/receivers of message.

You perform the following configuration steps in the SAP Process Integration Designer for the Advanced Adapter Engine Extended.

3.2.1 Calling the Process Integration Designer

First, open the SAP NetWeaver Developer Studio.

Set the connection data for accessing the Integration Directory under the menu *Process Integration* → *Change Preferences*. The connection details to the Advanced Adapter Engine Extended System have to be maintained using URL or AEX-Host and AEX-Port.

To call the SAP Process Integration Designer follow the menu path *Window* → *Open Perspective* → *Other* → *SAP Process Integration Designer*.

Logon to the AEX system using the Menu *Process Integration* → *Connect* providing your user credentials.

In the menu select *Process Integration* □ *Change Preferences*. The Preferences Window will appear.

Under PI Tools configuration select Tool-Specific.

Under Update Local Cache Status click the button Update to Refresh the SLD cache.

Click on OK button to close the window. On the Right bottom corner of NWDS the label "Updating cache" will appear & it will show the status progress. When the cache update finished continue with the next steps.

3.2.2 Creating the Business Components


Perform the following steps to create the Business Component:

1. To create the Business Components, select *Systems*. Right click and select *New Business Components* options from the context menu. A Pop-up titled Create Business Components will appear.

2. Enter the name of Business Component as <SID>_iFlow_FileSystem_Module1. <SID> is the system ID of the Advanced Adapter Engine Extended System.
3. Click *Finish*. Business Component details will be open.
4. Within Sender Interface frame, click on *Add*. Select *INVOIC.INVOIC02* of *SWCV B2B MAPPING KIT 1.0* and click *OK*. Idoc type interface *INVOIC.INVOIC02* will be added as sender interface to the Business Component <SID>_iFlow_FileSystem_Module1.
5. Click on *Save* button to submit changes to the above created Business Component.
6. Repeat step 5 & 6 to create another Business Component <SID>_iFlow_FileSystem_Module2.
7. Now click on *Add* button within receiver interface frame. Select *SI_INBOUND_VDA490500* of namespace <http://sap.com/xi/B2B/MappingFunctions> *SWCV B2B MAPPING KIT 1.0* and click *OK*. It will be added as receiver interface to the Business Component <SID>_iFlow_FileSystem_Module2.
8. Click on *Save* button to submit changes to the above created Business Component.

3.2.3 Creating the Integration Flow

Perform the following steps to create a new integration flow.

1. In the Process Integration Designer choose *New* → *Integration Flow* ().
2. In category *Enterprise Integration Patterns* select the *Point-to-Point Pattern* and set the name of the Integration Flow as *B2B_ModuleTest*.
3. Choose *Next*.
4. As *Sender Business System* select the Business Component <SID>_iFlow_FileSystem_Module1 you created above using the *Browse...* button.
5. As *Interface* select idoc interface *INVOIC.INVOIC02*.
6. In *Tab Receiver Systems* select the Business Component <SID>_iFlow_FileSystem_Module2 using the input help for the *Receiver Name*.
7. As *Receiver Interface* select *SI_INBOUND_VDA490500*.
8. Choose *Finish*.

The integration Flow will be displayed in a graphical overview.

3.2.4 Creating Channels

You perform the following steps to configure the connection of the process integration scenario. You activate the relevant sender-receiver relation (between the sender and receiver component) and assign both the sender and receiver a (sender or receiver) communication channel.

1. In the graphical editor, click on channel for the sender component. The *Details* tab for the channel will open.
2. As *Channel Name* set *ModuleTest_FileSend*.
3. As *Adapter Type* select *File SAP BASIS 7.31*.
4. In *tab Adapter Specific* under *File Access Parameter* in the *Source Directory* field, enter the path in the file directory that you defined previously (see **Error! Reference source not found.**). In the case of the sender communication channel, enter the whole path for the file directory *Sender*.
Example: C:/<selected path>/ModuleTest/Sender
5. As *File Name* set *InvoiceInput.xml*.
6. Following the same procedure (see step 1-2), create the communication channel *ModuleTest_SftpReceive* of Adapter type *SFTP SFTP ADAPTER 1.0* for the receiver Component <SID>_iFlow_FileSystem_Module2.
7. Enter the following below details within *Destination* tab for SFTP receiver channel

Field Name	Value
SFTP Server -> Server	Host/IP address of the system where SFTP server is installed
SFTP Server -> Port	SFTP Port (default – 22)
SFTP Server -> Server fingerprint	Server Fingerprint Value (you can refer http://wiki.sdn.sap.com/wiki/display/XI/How+to+Determine+the+Public+Key+Finger+Print+of+a+SSH+Server)
Authentication	Enter Username & Password for authentication to SFTP Server
File Parameter	Enter details of the Filename and Filepath (~/- represent the home directory of the configured user where SFTP server is installed)

8. To enter details for NRO (Number Range Object) and Archive Module, click on Module tab of SFTP receiver channel. Enter the following below details within Processing Sequence table.

Module Name	Type	Module Key
localejbs/TransmissionNumberModule	Local Enterprise Bean	Nro
localejbs/ArchiverModuleBean	Local Enterprise Bean	Amb

Use the Move Up button to move module for NRO as first and then module for Archiver Module.

9. Enter following details within Module Configuration table.

Module Key	Parameter Name	Parameter Value
Amb	archiveBaseDir	Directory path for Archived files to be stored on receiver (see 2.2.4)
Amb	archiveFile	File Name of the archived file (e.g. %id_[http://sap.com/xi/XI/System/idocNo]_File)


3.2.5 Assign Mapping to Integration Flow

You perform the following steps to assign mapping between the sender and receiver interfaces.

1. On the line representing the message flow to receiver <SID>_iFlow_FileSystem_Module2 in the context menu select Add Mapping.
2. Select the mapping object in the graphical view. The properties tab will open.
3. Using the Browse functionality select the operation mapping OM_INVOIC02_TO_VDA4905 of namespace <http://sap.com/xi/B2B/MappingFunctions>.
4. The above operation mapping is having a parameter 'tempDirectory'. This parameter has to be assigned a value (folder/directory location) to which the Java Archiver Mapping Class (used in operation mapping) will archive the file during runtime.

3.2.6 Saving and Activating the Configuration Objects

In the following steps, you save the integration flow with all its objects and activate it for the runtime.

1. Save the Integration Flow by pressing the save button ().
2. Use the *Activate* entry in the context menu of the integration flow *B2B_ModuleTest* to activate the configuration.
3. Use the *Deploy* entry in the context menu of the integration flow *B2B_ModuleTest* to deploy it in the runtime.

3.3 Executing the Use Case

You perform the following steps to check that the use case is executed without errors.

1. On the host of the Advanced Adapter Engine Extended, open the file directory Sender.
2. Rename the file ZB2B_InvoiceInput1.xml as B2B_InvoiceInput1.xml.
3. The File/FTP adapter is designed in a way that a file with exactly this name is recognized and moved from the source directory every 60 seconds. If the configuration was executed without errors, the file will be moved from the source directory within 60 seconds after it is renamed. After the file is picked either rename it back to ZB2B_InvoiceInput1.xml or else stop the sender channel.
4. Open the receiver directory as per configured within SFTP channel and check that the file has arrived.
5. Open the file and check whether the content has changed. It will have 2 new elements with values from Number Range Object. It will be as below

```
<S512>
  <DOCNUM_PREV><current value – 1 from NRO></DOCNUM_PREV>
  <DOCNUM_CUR><current value from NRO></DOCNUM_CUR>
```

6. Go to NRO Module maintenance page and check for above values from the file with values per NRO object.
7. Now open the archived directory location as per configured in receiver SFTP channel for archive module. It should be having 2 files, one file with .arc and other with .1 as extension. Both the files will named as per configured parameter archiveFile for Archive Module Bean (e.g. %id – represents Message ID, <http://sap.com/xi/XI/System/idocNo> - represents idoc number from sender file)
8. The Java Archiver class used in operation mapping is first in order and hence it archives the sender file into a temporary location as per configured in parameter 'tempDirectory' of operation mapping with .arc file. Later when it finds Archive Module used in receiver channel, it moves the file from temporary location to the directory location mentioned as per receiver channel archive module. Additionally the archive module archives the mapped file but since there is already a file with .arc it will archive the file with .1 as extension. The mapped file will be same as received file.

3.3.1 Channel Monitoring

Access Channel Monitor on PI Runtime Explorer

1. Open the view for PI Runtime Explorer
2. Under the corresponding node for the server where the Advanced Adapter Engine is running, locate the Integration Flow *B2B_ModuleTest*.
3. Select the Integration Flow *B2B_ModuleTest* and on the context menu (right-click) select "Open Channel Monitoring"
4. Proceed with log-in credentials if necessary

Alternatively, you can access the Channel Monitoring from the Monitoring Home page of the Advanced Adapter Engine:

1. Start the Monitoring by calling the *Configuration and Monitoring Home* on the AAE:
`http(s)://<AAE-host>:<AAE-port>/pimon.`
2. Select tab Monitoring and choose Adapter Engine → Communication Channel Monitor

3. Use appropriate filter criteria to restrict the number of channels displayed. On the very right hand side select Advanced to get all possible filter criteria displayed. To select your channels, put in the channel ID (you can find it in the channel editor screen) into the communication channel field, press Go and select your sender channel from the list.

Check communication channels

1. Check that the channel is running without error.
2. In the Processing Details section you can find the processing logs and the links to the processed messages. The link can be followed to get the message details.

3.3.2 Message Monitoring

Similar to the steps for accessing the Communication Channel Monitoring previously mentioned, follow these steps for accessing the Message Monitoring on the PI Runtime Explorer:

1. Open the view for PI Runtime Explorer
2. Under the corresponding node for the server where the Advanced Adapter Engine is running, locate the Integration Flow *B2B_ModuleTest*.
3. Select the Integration Flow *B2B_ModuleTest* and on the context menu (right-click) select "Open Message Monitoring"
4. Proceed with log-in credentials if necessary.
5. Go to Message Log tab for the successful message. It will have entry in message log for the modules (NRO and Archive) being used.
6. In case of NRO, it will provide information about the NRO object being used as well as the value fetched from the same.
7. For archive module, there will be entry for archive directory where file will be archived as well as the file name being created.
8. Message log will also have entry for information about SFTP server and the receiver directory on this server where the received file be stored.

Alternatively, you can access the Message Monitor from the Monitoring Home page of the de-central Adapter Engine

1. Start the Monitoring by calling the *Configuration and Monitoring Home* on the AAE:
`http(s)://<AAE-host>:<AAE-port>/pimon`.
2. Select tab Monitoring and choose Adapter Engine → Message Monitor
3. Use appropriate filter criteria to restrict the number of XML messages displayed (for example, the processing period).
4. Choose Go.
5. The system displays the selected messages in a table. You want to locate the messages that were sent during execution. Look for the corresponding Integration Flow and Sender/Receiver Component, respectively.
6. Select the message(s) to be displayed by selecting the link (number of messages) on the Overview table. i.e. under the column "Success"

Check the processed messages

1. The "Message List" table is displayed at the bottom of the Message Monitor page. Select the message you want to have a look at by selecting the corresponding row.
2. The section "Message Details" is displayed. On the tab Message Content, details of the message can be seen. Processing details can be seen on the tab Message Log.

3.3.3 Modify Operation Mapping and Execute the Use Case (Optional)

In this case different operation mapping will be used. Here the message mapping is first in order and then java class archiver mapping. Hence Java Class archiver mapping archives the mapped payload (including 2 NRO elements with parameter based NRO values e.g. \$B2B_UEBNR*).

1. In the SAP Process Integration Designer open the integration flow *B2B_ModuleTest* by double-clicking.
2. Select the mapping object in the graphical view. The properties tab will open.
3. Using the Browse functionality select the operation mapping `OM_INVOIC02_TO_VDA4905_EXTN` of namespace `http://sap.com/xi/B2B/MappingFunctions`.
4. The above operation mapping is having a parameter 'tempDirectory'. This parameter has to be assigned a value (folder/directory location) to which the Java Archiver Mapping Class (used in operation mapping) will archive the file during runtime.
5. Save, Activate and Deploy the integration flow.
6. On the host of the Advanced Adapter Engine Extended, open the file directory Sender.
7. Rename the file `ZB2B_InvoiceInput1.xml` as `B2B_InvoiceInput1.xml`.
8. If the configuration was executed without errors, the file will be moved from the source directory within 60 seconds after it is renamed. After the file is picked either rename it back to `ZB2B_InvoiceInput1.xml` or else stop the sender channel.
9. Open the receiver directory as per configured within SFTP channel and check that the file has arrived.
10. Open the file and check whether the content has changed. It will have 2 new elements with values from Number Range Object. It will be as below

```
<S512>
  <DOCNUM_PREV><current value – 1 from NRO></DOCNUM_PREV>
  <DOCNUM_CUR><current value from NRO></DOCNUM_CUR>
```

11. Go to NRO Module maintenance page and check for above values from the file with values per NRO object.
12. Now open the archived directory location as per configured in receiver SFTP channel for archive module. It should be having 2 files, one file with .arc and other with .1 as extension. Both the files will named as per configured parameter archiveFile for Archive Module Bean.
13. The Java Archiver class used in operation mapping will be executed after the message mapping and hence it archives the mapped file (with variable value for NRO) into a temporary location location as per configured in parameter 'tempDirectory' of operation mapping with .arc file. Later when Archive Module is found on receiver side, this file is moved to the directory location mentioned in receiver channel archive module. This file will have below elements

```
<S512>
  <DOCNUM_PREV><$B2B_UEBNR_BEFORENRO01$B2B_END_UEBNR></DOCNUM_PREV>
  <DOCNUM_CUR><$B2B_UEBNRNRO01$B2B_END_UEBNR></DOCNUM_CUR>
```

14. Additionally the archive module archives the mapped file but since there is already a file with .arc it will put .1 as extension to the file in the archive directory location. The structure of this file will be same as received file.

4 Variant 2: One Sender and One Receiver with NRO & Archive Module at Outbound and Inbound

This variant extends variant 1 by adding an archive module bean at sender. This will enable to archive the sender payload and mapped file at sender archive module bean directory.

4.1 Extending the Integration Flow

In this variant, the integration flow *B2B_ModuleTest* created in variant 1 is extended.

Perform the following steps to open the integration flow you created in variant 1.

1. In the SAP Process Integration Designer open the integration flow *B2B_ModuleTest*. To do so, in the SAP NetWeaver Developer Studio call the SAP Process Integration Designer and open the integration flow *B2B_ModuleTest* by double-clicking.
2. On the line representing the sender channel, double click to enter into details of the same.
3. Enter the following below details within Processing Sequence table.

Module Name	Type	Module Key
localejbs/TransmissionNumberModule	Local Enterprise Bean	Nro
localejbs/ArchiverModuleBean	Local Enterprise Bean	Amb

Use the Move Up button to move module for NRO as first and then module for Archiver Module.

4. Enter following details within Module Configuration table.

Module Key	Parameter Name	Parameter Value
Amb	archiveBaseDir	Directory path for Archived files to be stored on sender (see 2.2.4)
Amb	archiveFile	File Name of the archived file

4.2 Saving and activating the Configuration Objects

Proceed as described in variant 1.

4.3 Executing the Use Case

In this case sender payload will be archived in sender archived directory location and the same location will be passed as message attributed to the mapping.

On the host of the Advanced Adapter Engine Extended, open the file directory Sender.

1. Rename the file ZB2B_InvoiceInput2.xml as B2B_InvoiceInput2.xml.
2. If the configuration was executed without errors, the file will be moved from the source directory within 60 seconds after it is renamed. After the file is picked either rename it back to ZB2B_InvoiceInput2.xml or else stop the sender channel.
3. Open the sender archive directory as per configured within File sender channel and check that the file has arrived. The sender payload is first saved here and directory location is passed as message attributes. Later Java Archiver class saves the mapped file (with variable value for NRO e.g. \$B2B_UEBNR*) in this location but since there is already a file with .arc (sender payload file) it will put .1 as extension to the file.
4. Open the receiver archive directory. Since the Archive module is also used in receiver channel with a different directory the mapped file (.arc) will be archived here. It will be as below.

```
<S512>
<DOCNUM_PREV><current value – 1 from NRO></DOCNUM_PREV>
<DOCNUM_CUR><current value from NRO></DOCNUM_CUR>
```

15. Go to NRO Module maintenance page and compare above values from the file with values per NRO object.

5 Variant 3: One Sender and One Receiver with Archive Module at Outbound and Multiple Numbers per message for NRO Module with rotation enabled

This variant extends variant 1 with iteration of values per NRO constant in the same message.

5.1 Design object used

The Operation mapping *OM_INVOIC02_TO_VDA4905_R* will be used.

5.2 Extending the Integration Flow

In this variant, the integration flow *B2B_ModuleTest* created in variant 1 is extended.

1. In the SAP Process Integration Designer open the integration flow *B2B_ModuleTest* by double-clicking.
2. Double click on the line representing the sender channel. Go to tab Adapter-Specific tab of File channel and change value of File Name to InvoiceInput3.xml.
3. Now go to Modules tab and delete both TransmissionNumberModule & ArchiverModuleBean from Processing Sequence table.
4. Click on back to Model Configuration.
5. Select the mapping object in the graphical view. The properties tab will open.
6. Using the Browse functionality select the operation mapping *OM_INVOIC02_TO_VDA4905_R* of namespace <http://sap.com/xi/B2B/MappingFunctions>.
7. Double click on the line representing the receiver channel. Go to tab Adapter-Specific tab of SFTP channel and enter the following details within Proxy frame.

Field Name	Field Value
Proxy	SOCKS4
Server	Proxy server value where SOCKS4 is installed
Port	Proxy server port value where SOCKS4 is installed
Username	Username for proxy authentication (Optional)
Password	Password for proxy authentication (Optional)

8. Now go to Modules tab and click on Add button for Module Configuration table.

Module Key	Parameter Name	Parameter Value
Nro	multipleNumbersPerMessage	true/TRUE/yes/YES/1 (Any one of these)

5.3 Saving and activating the Configuration Objects

Proceed as described in variant 1.

5.4 Executing the Use Case

In this case sender payload will be archived in sender archived directory location and the same location will be passed as message attributed to the mapping. On the host of the Advanced Adapter Engine Extended, open the file directory Sender.

1. Rename the file ZB2B_InvoiceInput3.xml as B2B_InvoiceInput3.xml.

2. If the configuration was executed without errors, the file will be moved from the source directory within 60 seconds after it is renamed. After the file is picked either rename it back to ZB2B_InvoiceInput3.xml or else stop the sender channel.
3. Check the receiver directory location to find file with iteration of values per NRO constant in the same message. It will be as below.

<S512>

<DOCNUM_PREV><current value – 1 from NRO></DOCNUM_PREV>
 <DOCNUM_CUR><current value from NRO></DOCNUM_CUR>

One more structure as below ->

<S512>

<DOCNUM_PREV><current value from NRO ></DOCNUM_PREV>
 <DOCNUM_CUR><current value from NRO + 1></DOCNUM_CUR>

4. Go to NRO Module maintenance page and compare above values from the file with values per NRO object.
5. Open the receiver archive directory. Since the Archive module is also used in receiver channel, it will archive the mapped file and hence structure of archive file is same as the received file.
6. Since in this NRO object (/B2B/NRO02) rotation is enabled, execute the scenario again and again until the NRO value starts repeating. Also compare the value of NRO field to the maintenance tool value.

5.5 Modify NRO Parameter and Execute the Use Case

Now the NRO module parameter *multipleNumbersPerMessage* is set to false.

1. In the SAP Process Integration Designer open the integration flow *B2B_ModuleTest* by double-clicking.
2. Double click on the line representing the receiver channel. Go to tab Modules tab of SFTP channel.
3. Set the NRO module parameter *multipleNumbersPerMessage* to false. Save and Activate the Integration Flow.
4. Execute the scenario using step 1 & 2 of section 5.4.
5. Check the receiver directory location to find file with iteration of values per NRO constant in the same message. It will be as below.

<S512>

<DOCNUM_PREV><current value – 1 from NRO></DOCNUM_PREV>
 <DOCNUM_CUR><current value from NRO></DOCNUM_CUR>

One more structure as below ->

<S512>

<DOCNUM_PREV><current value -1 from NRO ></DOCNUM_PREV>
 <DOCNUM_CUR><current value from NRO></DOCNUM_CUR>

6. Go to NRO Module maintenance page and compare above values from the file with values per NRO object.
7. Open the receiver archive directory. Since the Archive module is also used in receiver channel, it will archive the mapped file and hence structure of archive file is same as the received file.

6 Appendix

6.1 Formatting options supported for Directory and File name of Archiver Module Parameters

Pattern	Description
"%id"	Will be substituted with the message ID
"%TS"	Will be substituted with the current time in the format: "yyyy.MM.dd_HH-mm-ss.SSS", e.g. 2004-12-24_17-30-59.362

"%fp"	Will be substituted with the sending party.
"%tp"	Will be substituted with the receiving party.
"%fs"	Will be substituted with sending service.
"%ts"	Will be substituted with receiving service.
{ ... }	Before applying any other substitutions expressions in curly braces are parsed by the java SimpleDateFormat function. All expressions that can be parsed by this function are allowed. For an overview take a look at the Java SimpleDateFormat documentation . Note that erroneous expressions lead to errors in message processing. Furthermore all whitespaces are interpreted.
[...]	Values in square brackets are treated as dynamic configuration values and replaced. If no configuration value with the given name can be found, it will be left out. Example: To place the IDOC-Number set by the Archiver Java Mapping the value [http://sap.com/xi/XI/System/idocNo] can be used

6.2 Number Range Object

At any point of time if you wish to delete the NRO you created, after the execution of this Simple use case you can follow the below steps.

Select the NRO Object and Click on Edit number range object. Check the flag Deleted and click on save button. The selected Number Range Object gets deleted. You can hit the refresh button to validate whether it is deleted or not.

The screenshot displays the SAP NetWeaver configuration interface for a Number Range Object (NRO). On the left, a table lists existing NROs, with '/B2B/NRO01' highlighted. The main area shows the configuration for this selected NRO:

- Number range object name: /B2B/NRO01
- Description: NRO 1 for Simple Use case
- Value: 0
- Last Value: 0
- Min value: 1
- Max value: 100
- Formatted Value length: 0
- Test Warn Level: 80
- Rotate:
- Deleted:

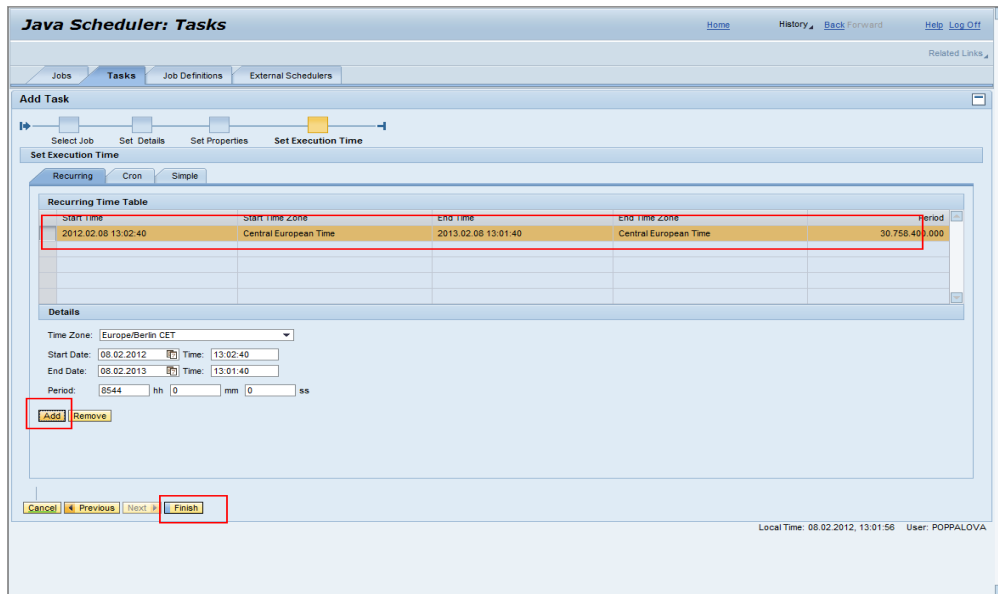
At the bottom, there are three buttons: 'Get next number', 'Save Changes', and 'Cancel'.

If you wish to create a Background Job in NWA to perform the Assigned numbers clean up task, follow the below steps.

Go to NWA (<http://<host>:<port>/nwa>) and navigate to Operation -> Jobs -> Java Scheduler -> Job Definitions -> filter for 'AssignedNumbersCleanup'. The Job '**AssignedNumbersCleanup**' should be present in the table:

Go to the Tasks tab. If the task '**AssignedNumbersCleanup**' is not configured execute the following configuration steps:

- Press New/Add to create new Task
- Select the '**AssignedNumbersCleanup**' and press Next:
- Leave the default settings and press Next:
- Enter a value for the messageLifetime property, for example 1 hour:
- Create a recurring schedule when the job to be executed (be sure to configure the first execution of the job in several minutes so you can monitor the execution) and press the finish button:



The configured task will be added to the Tasks table.

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