Oracle SOA Suite 11g R2 B2B
Receiving a Stream of Multiple HL7 v2 Message Types
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Introduction

In this article I discuss and illustrate a "SOA-less" solution in which the Oracle SOA Suite 11g R2 B2B receives a stream of different HL7 v2 delimited messages types (A01 and A03) using a single inbound adapter. The messages are converted into their "equivalent" HL7 v2 XML messages. I say "SOA-less" because all the work is done entirely within the B2B part of the SOA Suite – no OSB or SOA Composites are involved.

Pre-requisites

It is assumed that a Windows XP SP3 platform with the Oracle SOA Suite 11g, installed and configured as discussed in "Installing Oracle SOA Suite for HL7 Exploration", published at http://blogs.czapski.id.au/wp-content/uploads/2010/06/01_Installing_Oracle_SOA_Suite_for_HL7_exploration_v1.1.pdf, is available and will be used for the work discussed in this article.

Prepare HL7 Data

Unzip the archive, A01s_A03s_individual_files_5099_of_each.zip to C:\hl7\adt\sources\. This archive is available from http://blogs.czapski.id.au/wp-content/uploads/2010/08/A01s_A03s_individual_files_5099_of_each.zip.

HL7 v2 Solution

Oracle uses the SOA Suite B2B component to provide HL7 v2 messaging support. It uses HL7 v2 message libraries and the B2B engine to provide message parsing and transformation between the native format (HL7 v2 delimited) and XML.

The solution we will be building will read v2 delimited ADT A01 and ADT A03 messages through a HL7 Listener and will write their XML equivalents to files in the file system. No SOA composite will be required. All work will be done entirely by the B2B runtime component.

Develop HL7 v2 Inbound Solution

To develop the HL7 v2 inbound solution we need to go through a number of steps. The steps are:

1. Extract HL7 message structures from the standard library
2. Configure Local side of the B2B Partnership
3. Configure Remote side of the B2B Partnership
4. Create and deploy a Partnership Agreement

We have two trading partners, Self, which will write documents to files in the file system and HL7v2A01A03In, which will receive documents arriving over the TCP ML7 MLLP connection and pass them to the B2B infrastructure.
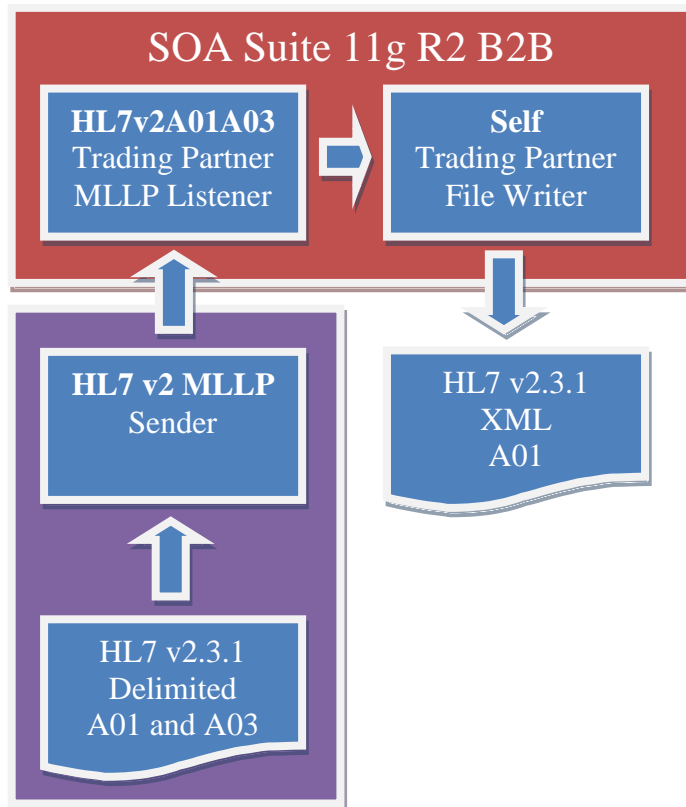
To allow the B2B infrastructure to identify the parties involved in document exchange, and to allow it to find the appropriate Trading Partnership Agreement, we will set the "identify TP by delivery channel" flag for the remote trading partner – more on this later.

Create a directory structure "c:\hl7\adt\from_Remote2", into which "received" files will be written. If you worked through the previous article, http://blogs.czapski.id.au/2010/08/oracle-soa-suite-11g-r2-b2b-quick-hl7-v2-delimited-to-hl7-v2-xml-conversion, this directory should already exist

Extract HL7 Message Structures

As part of the B2B Document Editor installation we installed a number of standards libraries. One of these libraries was the HL7 v2 library.

Since we will be receiving ADT A01 and ADT A03 messages we must obtain the eternal representations of these from the Standards Library.

If you worked through the previous article, http://blogs.czapski.id.au/2010/08/oracle-soa-suite-11g-r2-b2b-quick-hl7-v2-delimited-to-hl7-v2-xml-conversion, A01 document definition should already be there. If not, follow on.
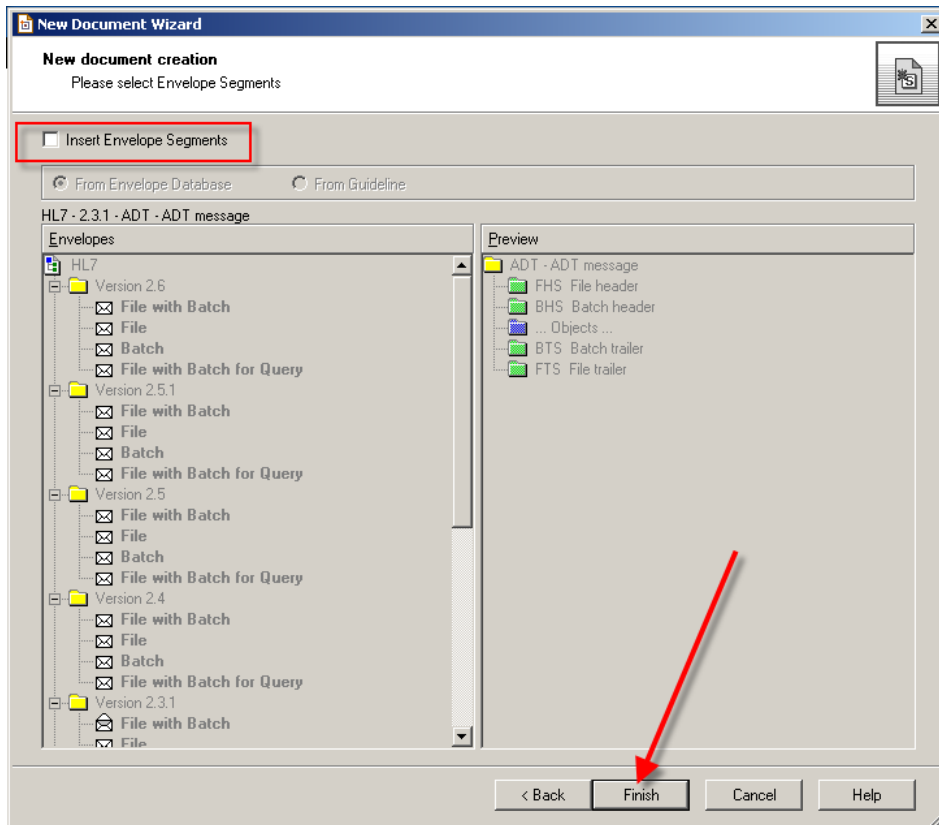
Start the B2B Document Editor, which should be accessible through Start menu → Programs → Oracle as Oracle B2B.
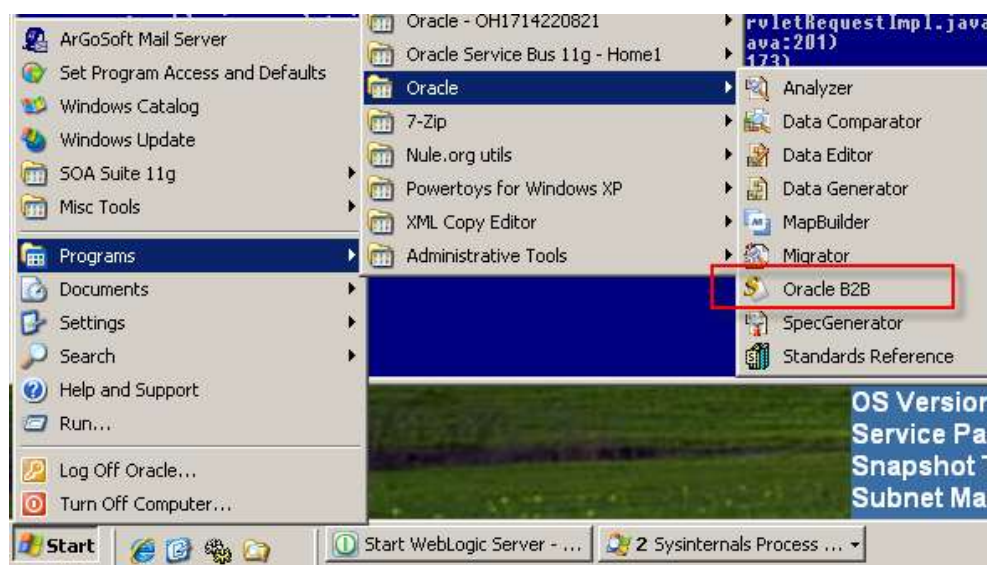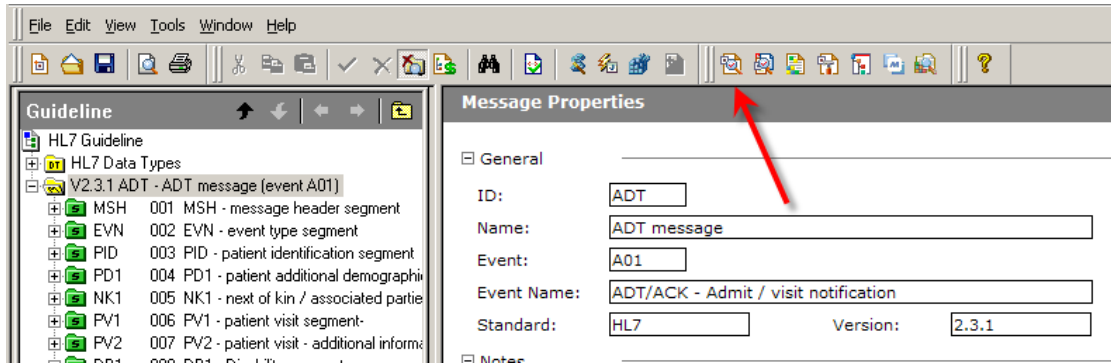

Click the "New Document" button, select HL7 from the list, expand 2.3.1, select Event A01and click Next.
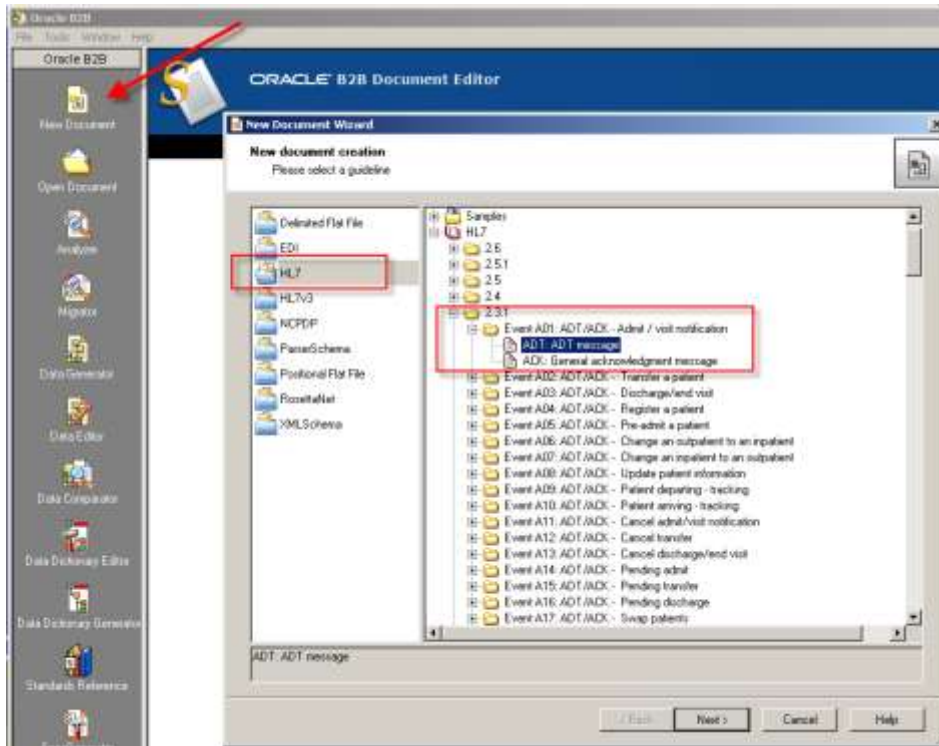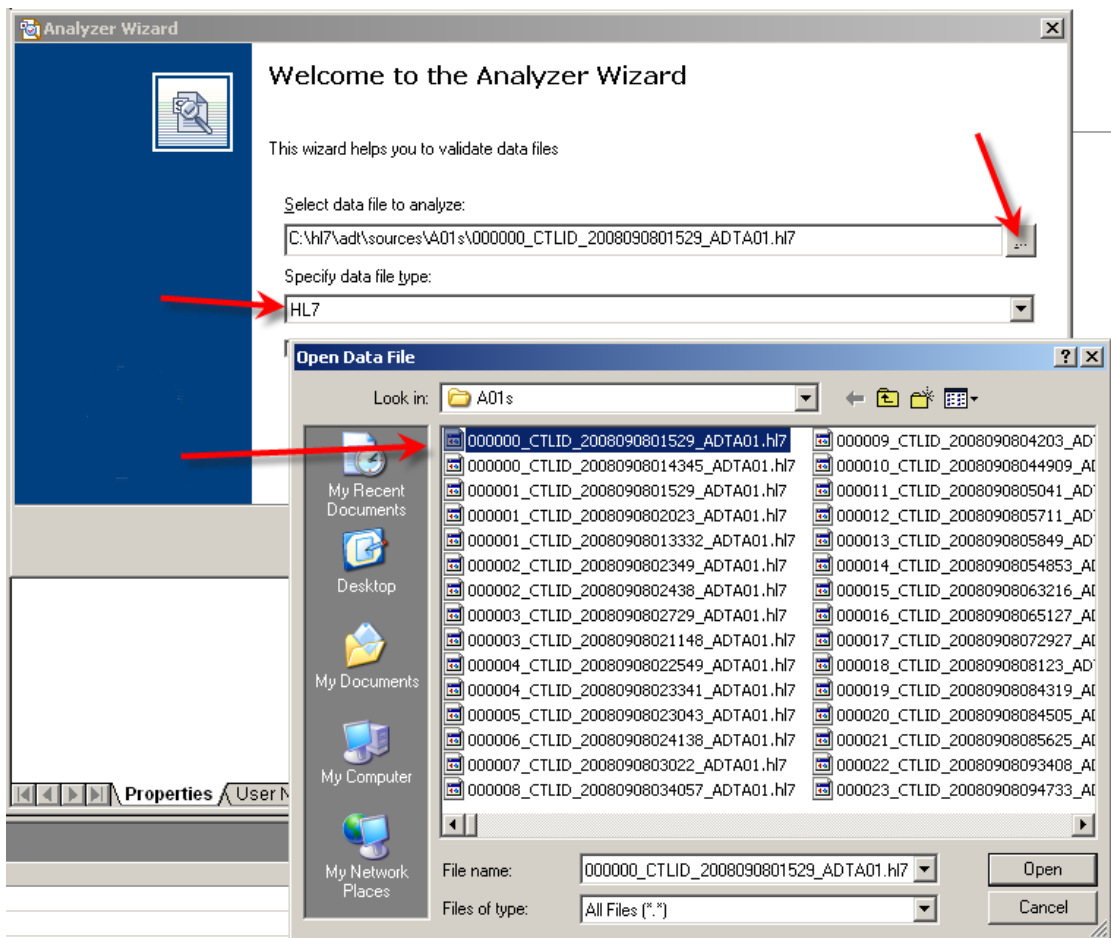
Leave the "Insert Envelope Segments" unchecked and click Finish.

The messages with which we will be dealing are not quite valid. Our HL7 Spec will not accept them as valid unless it is modified to fit the data. In the new window click the "Launch Analyzer" button.

Locate a sample file in c:\hl7\adt\sources\A01s and choose HL7 as the data file type.


Click Next, Next and OK. A new Analyzer window opens with data errors displayed in the bottom pane.
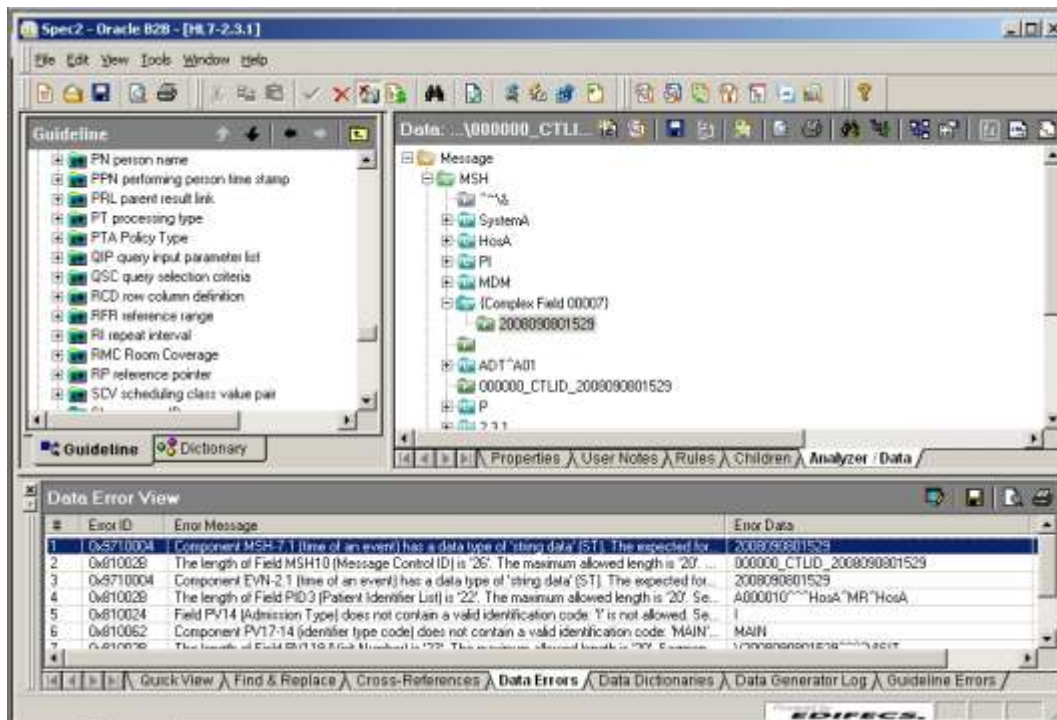
Follow the discussion in section "Data Analysis and Guideline Customization" in blog article "Oracle SOA Suite 11g HL7 Inbound – Customized HL7 Message Structure and Data Validation" at http://blogs.czapski.id.au/2010/06/oracle-soa-suite-11g-hl7-inbound-customized-hl7-message-structure-and-data-validation, to resolve data errors by modifying the guideline to fit the data. Once done, export the guideline in the ECS and XSD formats to c:\hl7\adt\guidelines as adt_a01_custom.ecs and adt_a01_custom.xsd.

Now go back to the beginning of this section, page 3, and repeat the steps using A03 instead of A01.

At the end of the process you should have ADT_A01_custom.ecs, ADT_A01_custom.xsd, ADT_A03_custom.ecs and ADT_A03_custom.xsd documents.
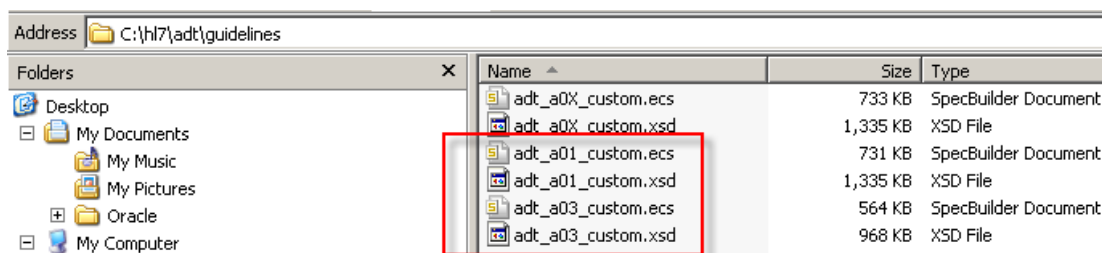
Close B2B Document Editor windows. We are done with the B2B Document Editor for this exercise.

We exported the HL7 v2 ADT A01 and A03 definitions in both the XML Schema form and the format used by the EDIFECS engine. The former can be used in the SOA Composite and the later is required to configure the B2B document for the trading partnership we will create shortly.

Configure B2B Partnership

Start the B2B Trading Partner Manager console by pointing the web browser at
http://localhost:7001/b2b. Log in as weblogic/welcome1.

Click the Administration link, select the Document Tab, select HL7 in the node tree
and click the large Plus sign to add a new document. If you followed through the
previous article the hierarchy HL7 → 2.3.1 → ADT_A01 → ADT_A01_DocDef will
already exist.
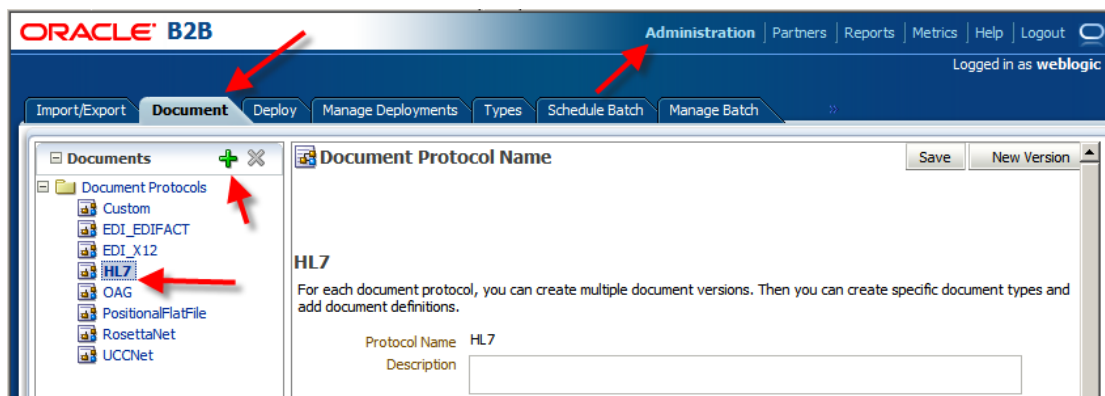
Enter 2.3.1 for Version Name and click Save. The screenshot shows the state after the
Save button has been clicked.
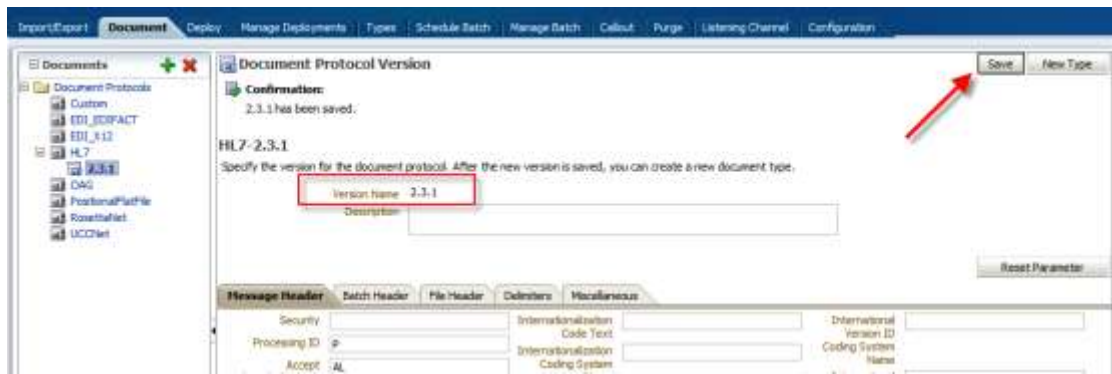
With the new node, 2.3.1, selected, click the large Plus sign to create a new document under that node, name if ADT_A01 and click Save.
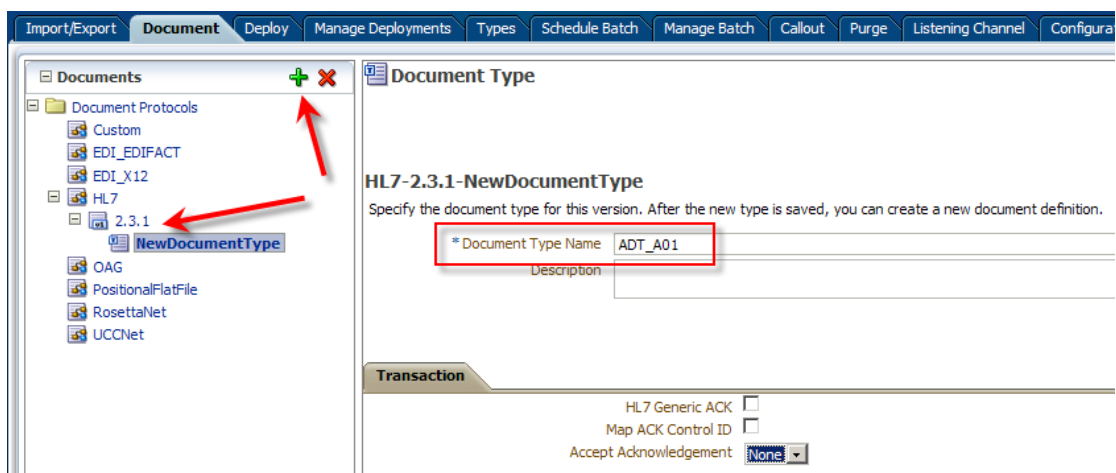

With the new node, ADT_A01, selected click the large Plus sign to add a new document under that node. Provide the name of ADT_A01_DocDef, locate and choose C:\hl7\adt\guidelines\ADT_A01_custom.xsd file for document definition and C:\hl7\adt\guidelines\ADT_A01_custom.ecs file for Transaction Set ecs File. Click Save to save the changes.
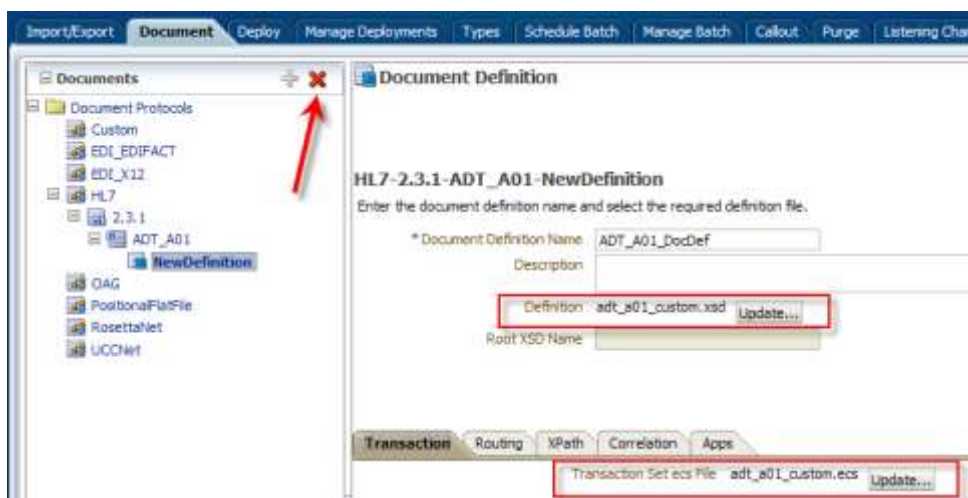
A hierarchy like that shown below should be now defined.
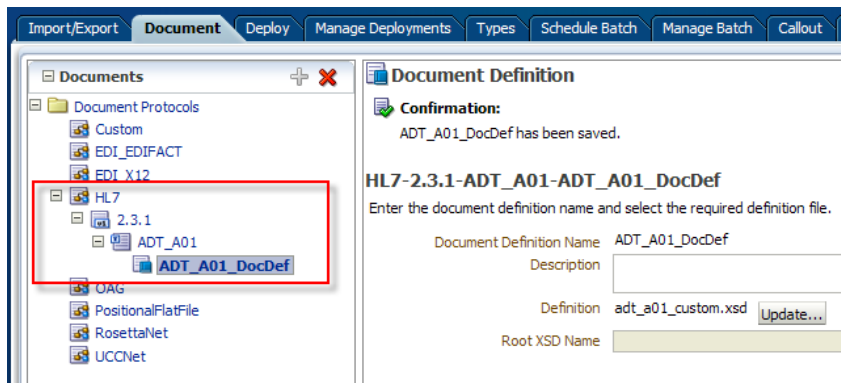
Now repeat the steps, adding the ADT_A03 document and ADT_A03_DocDef document definition.
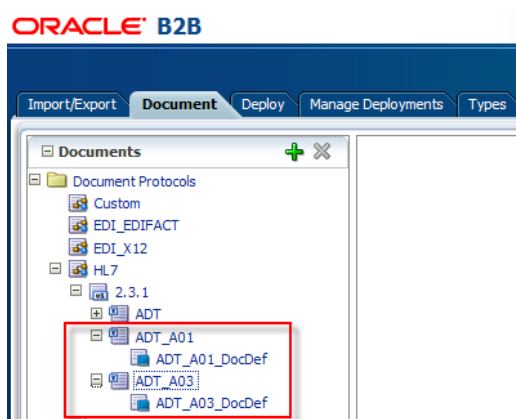
This defines documents to be used in setting up message exchanges.

Now we need to configure trading partners, the local partner "Self" and the remote partner "HL7v2A01A03In".

Click the Partners navigational link, select the default pre-defined MyCompany partner and click the Edit button (Pencil icon) – this should already have been done if you followed the previous article. If it is done follow the steps to confirm that all is defined as it should be.

Change the name to Self and click OK.

With the "Self" node selected click the Documents Tab, uncheck the Sender checkbox for both the ADT_A01 and ADT_A03 documents and click Save. We are configuring the HL7 inbound so the local role is that of a receiver of messages. The receiver will be receiving both the ADT A01 and ADT A03 documents.
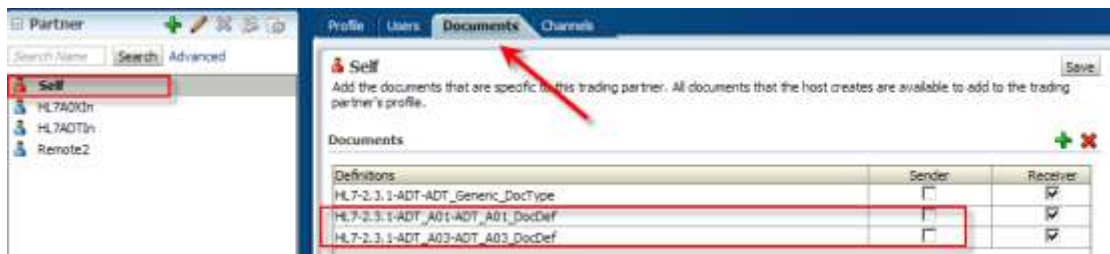
Click the large Plus sign to create a new trading partner, named HL7v2A01A03In, enter the name and click OK.
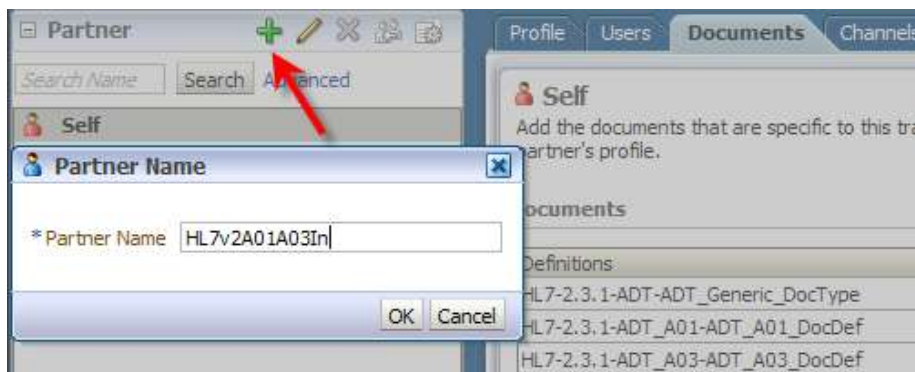
With the HL7v2A01A03In selected, click the Documents Tab, click the large Plus sign to add a document, select HL7 → 2.3.1 → ADT_A01 → ADT_A01_DocDef, and click Add.
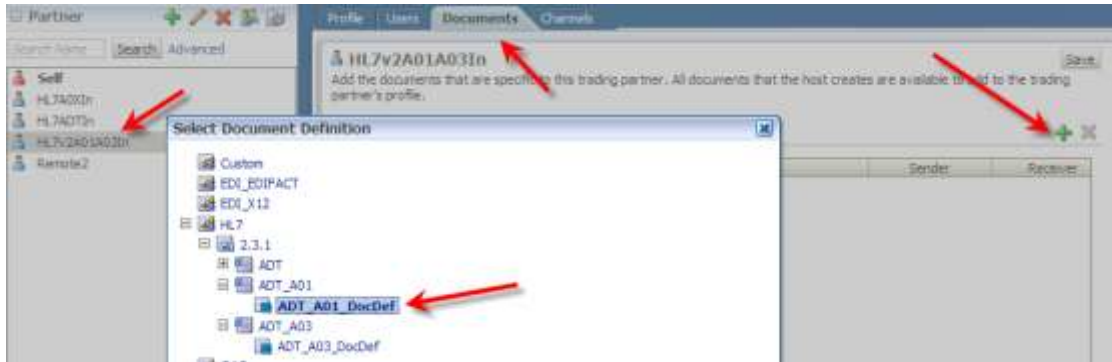
Uncheck the Receiver checkbox and click Save.

Repeat with HL7 → 2.3.1 → ADT_A03 → ADT_A03_DocDef. Uncheck Receiver checkbox and click Save.
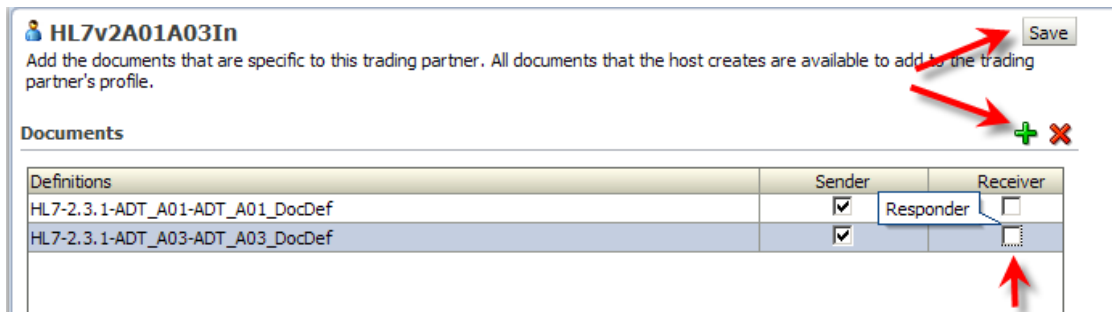
We defined document types the remote partner will be sending.

Select the Self partner and create a File channel to use for writing converted files. Name the Channel Self_FileChannel. Choose Generic File-1.0 protocol. If you followed through the previous article this will already have been done. If this is the case just follow through to confirm that things are configured as they should be.
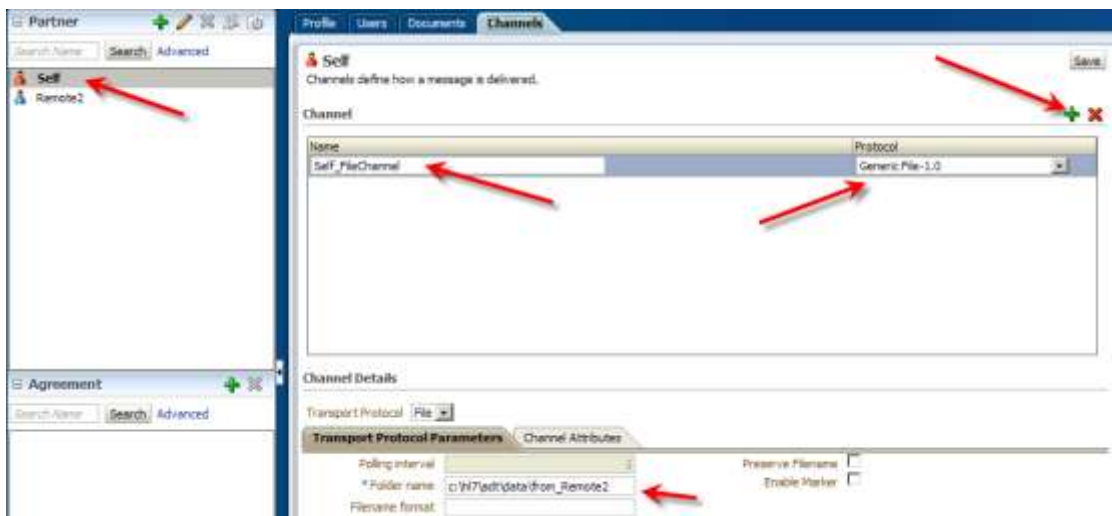
Set Folder name to c:\hl7\adt\data\from_Remote2
Leave Filename format blank. We asked the Listening Channel to preserve file names so we will have files named as they were.

Click Save.

Select the HL7v2A01A03In partner and click the Channels Tab.

Click the Plus sign to add channel to the trading partner. Choose MLLP-1.0 from the Protocol drop-down. Change Connection Mode to server. Provide localhost for Host Name and port 3333 for Port (use what port you have free to use). Check the Permanent Connection checkbox. Click Save.
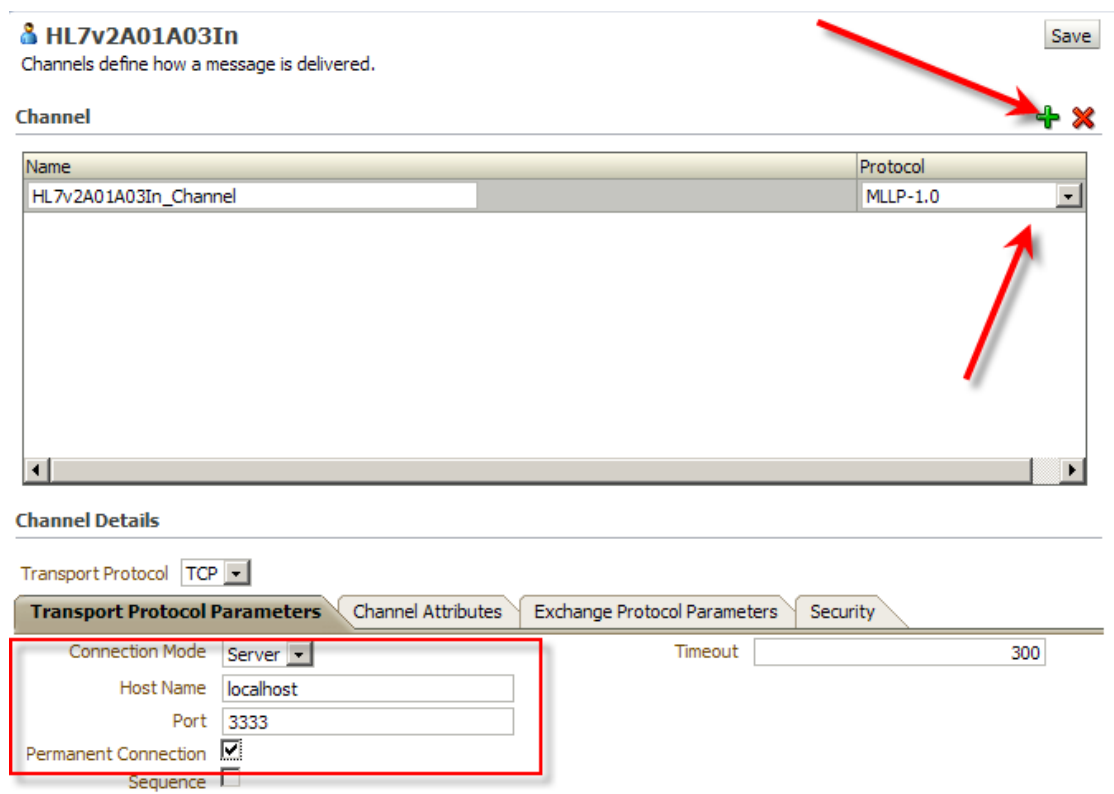
Click the Exchange Protocol Parameters tab in the bottom pane. Check the Identify TP by delivery channel checkbox. Choose Default for Immediate ACK. Click Save.

Delivery channel in now configured to receive HL7 messages over MLLP on port 3333.

Select the HL7v2A01A03In partner. Click the large Plus sign in the Agreements section to add a new trading partnership agreement.

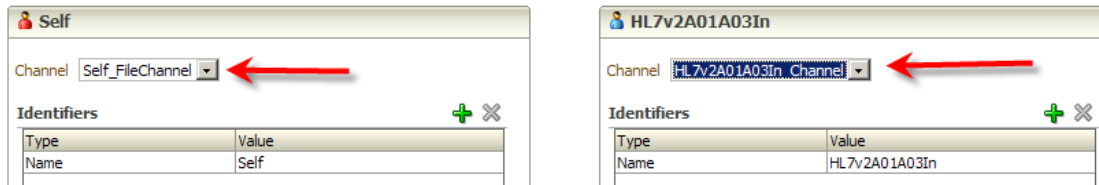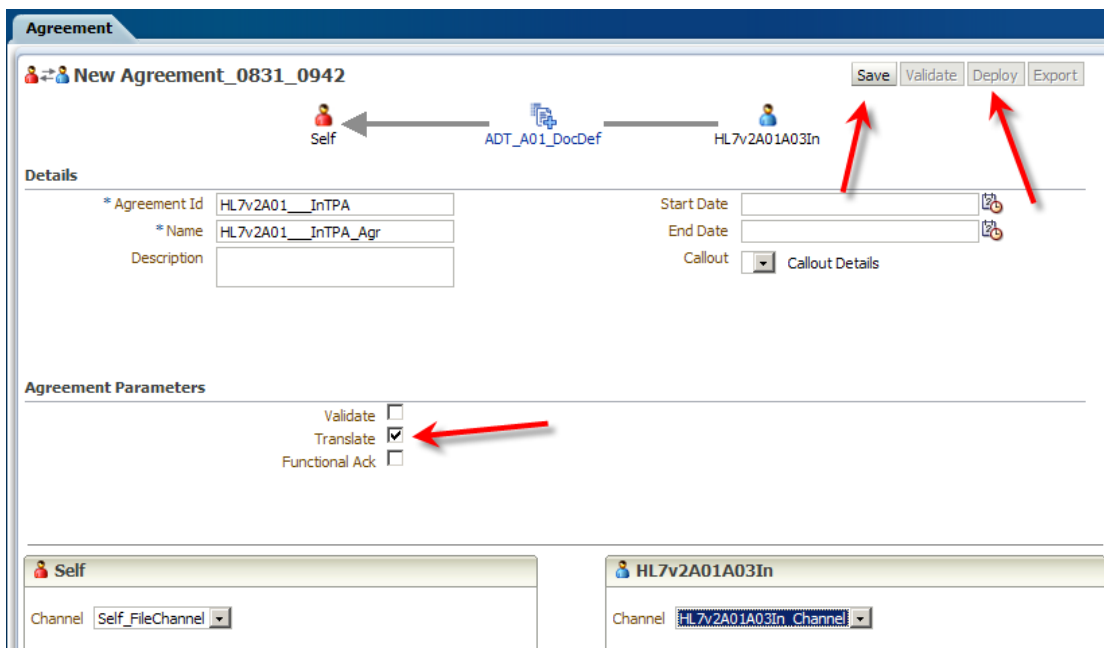Provide the Agreement ID of HL7v2A01___InTPA and the Name of HL7v2A01___InTPA_Agr. Click Select Document Definition.

Choose ADT_A01_DocDef and click OK.
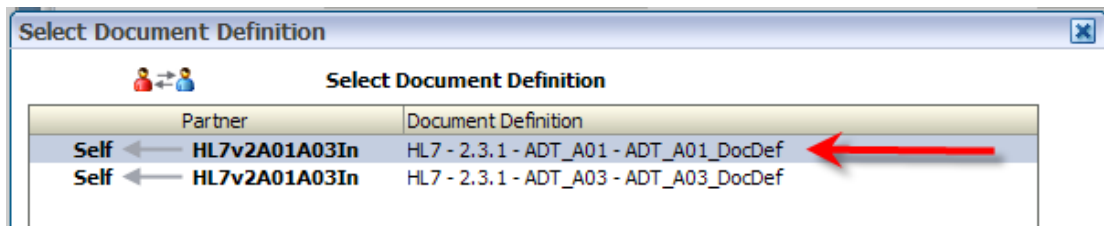
Choose the Self_FileChannel from the Channel drop-down on the Self panel in the bottom left portion of the display. Choose HL7v2A01A03In_Channel from the Channel drop-down in the bottom right portion of the display.

Check the Translate checkbox.

Click Save to save the new trading partnership agreement.
Click Deploy to deploy the agreement.

Repeat the process, creating a partnership agreement with ID of HL7v2___A03InTPA and name HL7v2___A03InTPA_Agr

Select document definition of ADT_A03_DocDef and choose the same channels on the local and the remote sides. Save and Deploy.
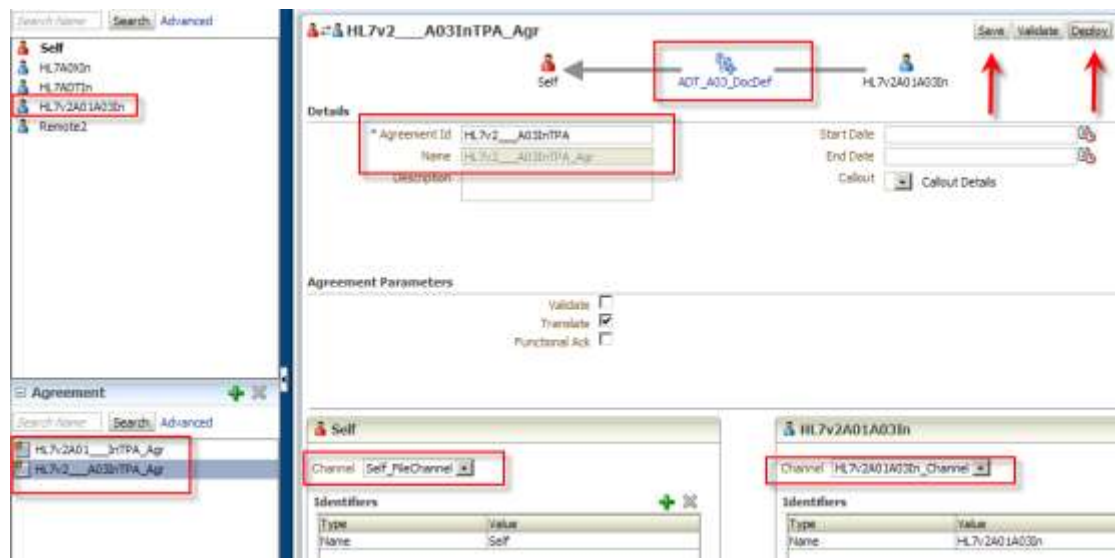
We are finished with the trading partner management console. The partnerships have been defined and deployed.

Exercise the Solution

Use your favorite HL7 sender tool to submit A01 and A03 messages to the listening channel on localhost on port 3333. Perhaps a free tool, HL7 Browser, discussed on Page 2 in http://blogs.czapski.id.au/2010/06/oracle-soa-suite-11g-hl7-inbound-example. This is the tool I am using here.

Start the HL7 Browser and load one A01 and one A03 transaction from the transaction set we acquired earlier in this article.
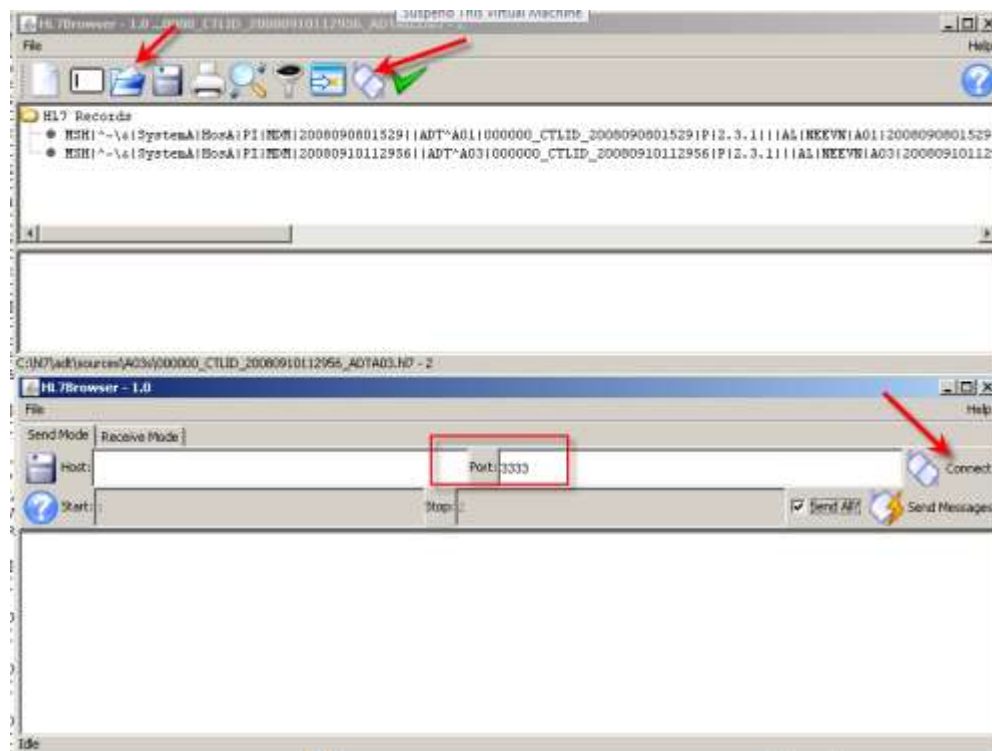
"Run the network utility" to open a sender window (bottom part of the picture above), enter 3333 (or whatever port you configured) for a port and click Connect.

Click Send Messages and observe messages being submitted and acknowledgments being returned.
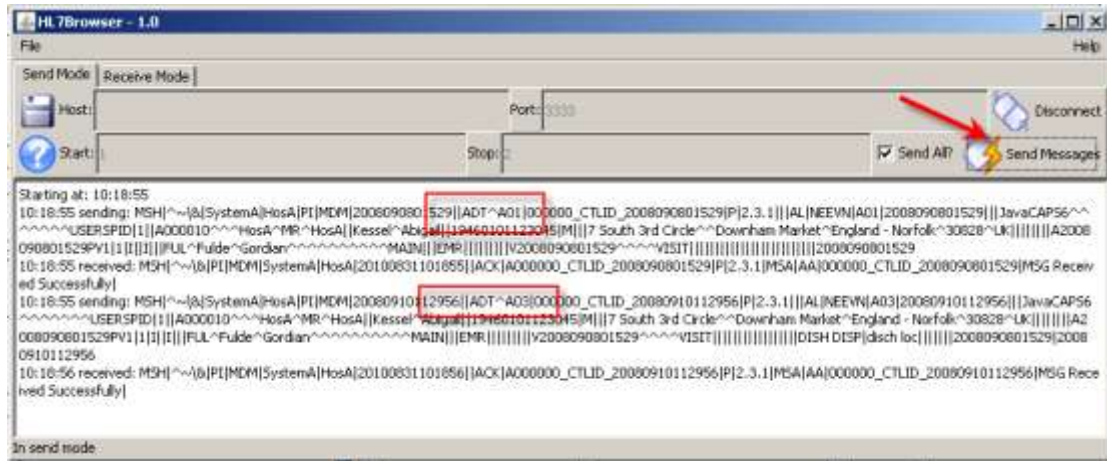
If all was configured correctly you will see two files deposited in directory "C:\hl7\adt\data\from_Remote2".
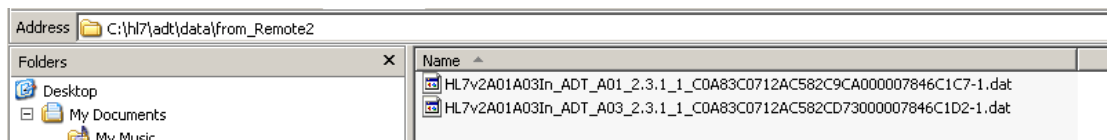
Since we did not configure a file name for the files to be written the default file name was constructed using the remote partner name (HL7v2A01A01In), document type (ADT_A01), document version (2.3.1) and message id which was generated by the B2B infrastructure.

Open one of the files with a XML formatting capable editor, for example Notepad++ or XMLCooktop, to see the content of the file.

Start the B2B Web Console and choose Reports Tab. Search for messages submitted "today".
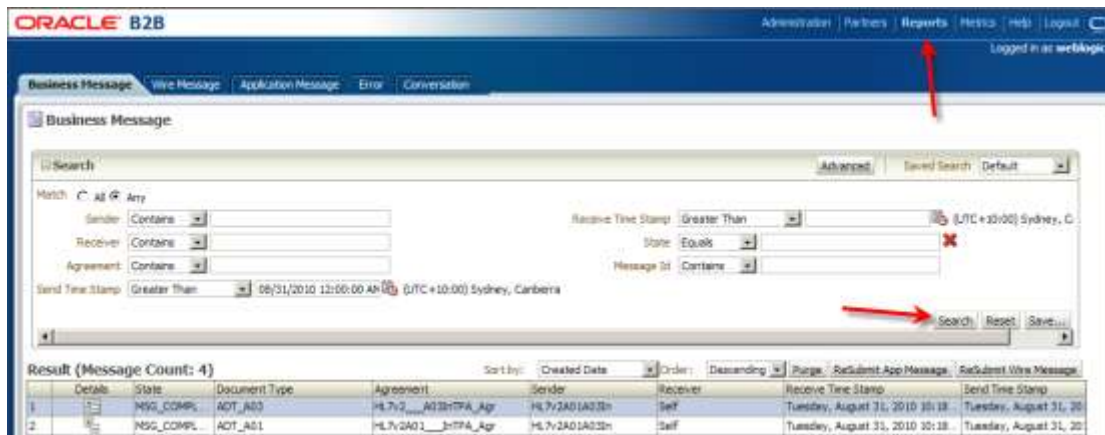
Expand one of the document "Details" and inspect information collected and provided.
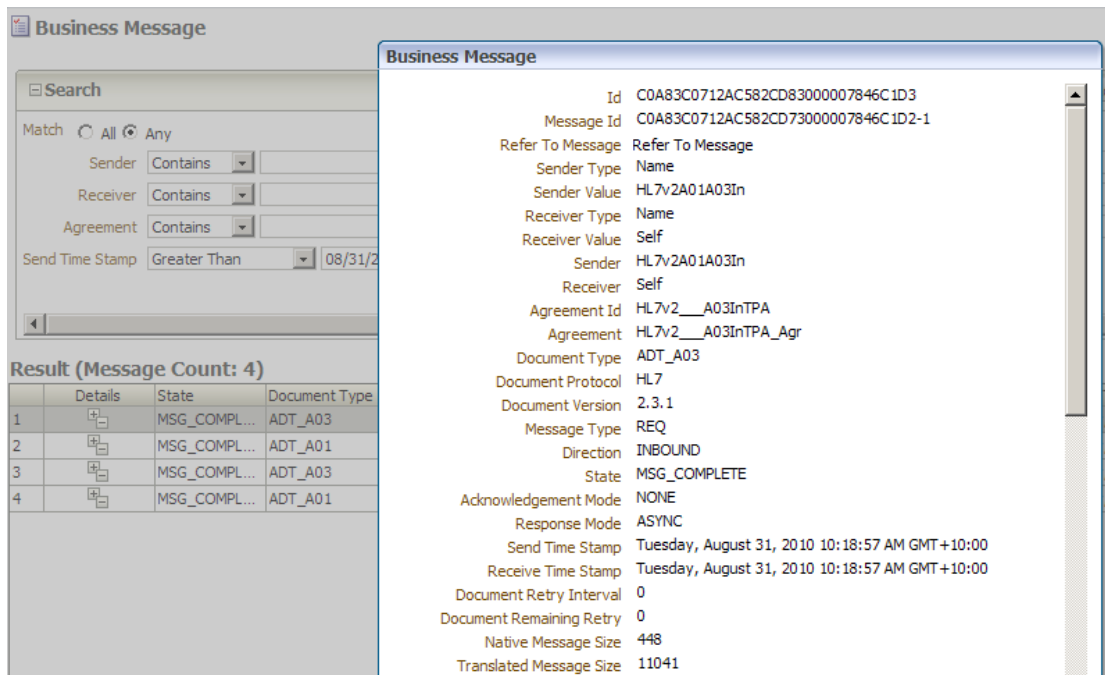
Explore Reports functionality.

Click the Metrics Tab. Explore information collected and provided. Explore Metrics functionality.

This concludes the exercise. Submit as many HL7 v2.3.1 delimited ADT A01's and A03's as you like and see them converted to XML.