Oracle SOA Suite 11g Oracle SOA Suite 11g HL7 Inbound Example Back End-constructed Functional ACK Addendum

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Introduction

This article is a follow on to the "<u>Oracle SOA Suite 11g HL7 Inbound Example –</u> <u>Functional ACK Addendum</u>" article and the "<u>Oracle SOA Suite 11g HL7 Inbound –</u> <u>Customized HL7 Message Structure and Data Validation</u>" article. In these articles the B2B infrastructure was configured to return the "Functional ACK" when it validated each message. The ACK was a positive or a negative ACK depending on whether the message passed validation. The ACK was generated by the B2B Layer before the message was passed on to the SOA Layer.

In this article I expand on the previous posts by configuring the B2B Layer to pass the message to the SOA Layer and pass the Functional ACK, generated by the SOA Layer on to the requester. To process a message and produce the ACK we will build and deploy a new SOA Composite.

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 <u>http://blogs.czapski.id.au/wp-content/uploads/2010/06/01_Installing_Oracle_SOA_Suite_for_HL7_exploration_v1.</u> <u>1.pdf</u>, is available and will be used for the work discussed in this article.

It is assumed that the HL7 solutions, discussed in blog articles <u>Oracle SOA Suite 11g</u> <u>HL7 Inbound Example, Oracle SOA Suite 11g HL7 Inbound Example – Functional</u> <u>ACK Addendum</u> and <u>Oracle SOA Suite 11g HL7 Inbound – Customized HL7</u> <u>Message Structure and Data Validation</u> are built and deployed. It is assumed that data in the archive, HL7_messages_sources.zip, has been unpacked to C:\hl7\adt\. This archive is available from <u>http://blogs.czapski.id.au/wp-content/uploads/2010/06/HL7_messages_sources.zip</u>.

It is assumed that the free HL7 Browser tool, "HL7 Browser 1.0", available from its author's page at <u>http://mac.softpedia.com/developer/Michael-Litherland-5914.html</u>, is available.

HL7 v2 Receiver Solution

The solution we will be modifying is a HL7 Receiver, which will receive v2 delimited ADT A01 messages and will write them to files in the file system. This solution was discussed and built in the blog article <u>Oracle SOA Suite 11g HL7 Inbound Example –</u> <u>Functional ACK Addendum</u>.

The solution consists of a B2B Listener Channel, to which HL7 v2 ADT A01 messages will be sent (B2b Layer), and a SOA Composite which will receive these messages and will write them to a file in the file system, and generate a HL7 ACK and return it to the B2B Layer for forwarding to the requester (SOA Layer).



Messages in the sample message set use the following identifiers:

| Sending Application | SystemA |
|------------------------------|---------|
| Sending Facility | HosA |
| Receiving Application | PI |
| Receiving Facility | MDM |

Inbound HL7 v2 Solution

To develop the HL7 v2 inbound solution went through a number of steps. The steps were:

- *1.* Modify HL7 ACK message structure *ADT A01 already done in as we worked through the previous articles*
- 2. Modify B2B configuration to allow Functional ACK being passed between the B2B Layer and the SOA Layer
- 3. Undeploy the original HL7 Receiver SOA Composite
- 4. Create and deploy a new HL7 Receiver SOA Composite

This solution is assumed to be available for extension in this article.

HL7 ADT A01 and ACK Message Structures

HL7 ADT A01 is already available and suitable for processing the inbound ADT A01 message so it is not necessary to go through the process with the B2B Document Editor for the inbound side.



The ACK message specification must be modified to allow 32-bit GUID as MSH-10 Message Control ID and to allow the original MSH-10 to be carried as MSA-2, which is also too short to accommodate the id used in the ADT A01 message. Recall that we modified the ADT A01 structure in the previous article in this series - <u>Oracle SOA</u> <u>Suite 11g HL7 Inbound – Customized HL7 Message Structure and Data Validation</u>

Open B2B Document Editor, choose Open Document, locate the ADT_ACK.ecs guideline and open it.



Select MSH-10 node in the left hand side panel and change the Max Length value to 40 in the right hand side Properties panel.

| Geideline 🛛 🔹 🗰 👘 | Field Properties | Category Reset (|
|--|--|--------------------|
| MSH 001 MSH - message header segment H 00001 1 Field Separator H 00002 2 Encoding Characters D 00003 3 Sending Application D 00005 5 Receiving Application H 00005 5 Receiving Facility D 00005 6 Receiving Facility D 00007 7 Date/Time 01 Message D 00008 8 Security D 00009 9 Message Type T 00001 10 Message Control ID D | General ID: 00010 Position: 1 Name: Message Control ID Data Type: ST string data Requirement: Required | 0 D Type Def. |
| Considering Construction | Field This field contains a number or other identifier that uniquely identifies the message. The receiving system echoes this ID back to the | |

Repeat the process for MSA-2 Message Control ID.

| Guideline 🔶 🖌 = 🗉 | Field Properties | Category Res |
|--|--|--------------------|
| | El General ID: 00010 Position: Name: Message Control ID Data Type: ST string data Requirement: Required Repeats:* User Option: Must use Length:* 40 | 2 3 M PType Bet |
| Constant of the sequence | Purpose Purpose This field contains a number or other identii that uniquely identifies the message. The receiving system echoes this 3D back to the receiving system echoes this 3D back to the system echoes this 3D back to the receiving system echoes this 3D back to the system echoes the system echoes the system echoes the system echoes the system echoes the system echoes | fer = |

Save the modified guideline as ADT_ACK_custom.ecs. Export the XSD as ADT_ACK_custom.xsd.

Modify B2B Document Definition for ACK

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

Click the Administration link, choose Document Tab, expand HL7 \rightarrow 2.3.1 \rightarrow ACK_A01. Click ADT_ACK _DocDef. Update Definition and Transaction Set files. Click Save.

| 🗄 Documents 🛛 🕂 🗙 | Document Definition |
|---|--|
| Contem Contem EDC_EDDFACT EDC_V12 H H 7 C 2.3.1 C 2.3.1 C ACC_AD1 ACC_AD1 C ACC_DocDef H ACC_AD1 C ACC_DocDef H ACC_AD1 C ACC_DocDef H C ACC_DocDef H C ACC_DocDef H C ACC_DocDef H C ACC_DOCDef H C ACC_DOCDef H C ACC_DOCDEF | HL7-2.3.1-ACK_A01-ADT_ACK_DocDef Enter the document definition name and select the required definition file. Document Definition Name ADT_ACK_DocDef Description Definition ADT_ACK_DocDef Definition ADT_ACK_DocDef Transaction Set etcs File |

Click Partners link, select the Remote HL7Sender partner and Save and Deploy both ACK Trading Partnership Agreements. These will be HL7ReceiverOutboundTPA_ACK_Agr and HL7ReceiverTPA_ACK_Agr.

| SPatter +/250 | Agreenteet | | | | |
|--|-----------------------|--|-----------------|---|----------|
| Seath, Moncel | ara III.7ReceiverTPA | ACK_Agr | ADT, ACK, DwDet | Eare Valdate | Depity |
| | *Agreement Persenters | HL Receive (THA_AC) HL Receive (THA AC) | | Tari Dan Sel Ope Called Tar Calcot Datain | 19 19 |
| Aprocessent Aprocessent Advanced Advanced | LocalitZReceiver | yaka 🔶 | × 4 | Ramotalli,75endar Mul (Renated, Xender, Daviel 🕑 entifiers ge (Vitar | |

Re-configure B2B Layer

Click the Administration link, select the Configuration Tab and change the value of the "Functional Ack Handled by B2B" to false. Also ensure that the value of the "Notify Inbound Functional Acks" property is set to false. Click Save.

| RACLE B2B | | | | Administration | Partners | Reports Neb | nca Help La | oquut C |
|---------------------------------------|--------------|--------------|------------------------|------------------------|----------|---------------------|--------------|---------|
| Types Schedule Batch | Manage Batch | Calout Purge | Latening Channel | Configuration | > | | Logged in as | weblogk |
| | | | | | | | | Save * |
| 🗄 Acknowledgment | | Function | al Ark is Harvled by B | a pellaneous | | | | - |
| Punctional Ack Handled by 828 | false | 2 (41)14 | 1 | etsuit reding | | Recornect | false | |
| Punctional Ack internal properties | false | | P | artner lonore ester | | HITP | | -1 |
| Notify Inbound Recept Acka | faise | | Com | stonal | | Deliviter | 1411-1 | |
| Notify Inbound Functional Acks | faise | | | MDHE Types | | Reply To message | Tase | -1 |

Note, as discussed in Oracle B2B User's Guide [2], pp. B-2 and B-3, this change places specific limitations on functionality:

The following limitations apply when generating the FA from the back-end application:

- The FA is correlated with the original message based on the ReferToMsgID value set in the enqueue properties. The FA is correlated based on control numbers also.
- If the FA indicates that there was an error in the received message, the status of the correlated message is not updated to indicate an error. The correlated message is updated to MSG_COMPLETE.

These limitations are not present when the FA is generated by B2B (that is, when b2b.FAHandledByB2B is true).

This change takes effect immediately upon Save and affects the behavior of all deployed trading partnership agreements.

If this is not a desirable behavior for some partnership agreements a separate WebLogic Domain will have to be created for a separate B2B infrastructure where the default behavior (Functional Ack Handled By B2B == true) is in force.

Undeploy original HL7 Receiver

Log into the Enterprise Manager, <u>http://loalhost:7001/em</u>, expand SOA, soa-infra through to default. Right-click HL7Receiver, choose SOA Deployment \rightarrow Undeploy.



Confirm undeployment and verify that the composite is no longer deployed.



Close the Enterprise Manager window.

Build New HL7 Receiver Acker Composite

Oracle SOA Suite offers a number of components which can host application logic. In this example we will use the Mediator, as we have done before. We will use it to implement a "splitter" pattern – one copy of the message will be written to a file in the file system, as we did in the original HL7 Receiver solution, and one copy will be used to construct a HL7 ACK and send it back to the B2B Layer.

Let's start JDveloped IDE and create a new SOA Application.



Let's call this application HL7ReceiverAckerApp.

| lication SOA Application | 1 - Step 1 of 3 |
|--------------------------|--|
| Name your application | |
| Application Name | Application Name: |
| | HL7ReceiverAckerApp |
| Project Name | Directory: |
| O Project SOA Settings | C:\JDeveloper\mywork\HL7ReceiverAckerApp Browse |
| | Application Package Prefix: |
| | Application Template: |
| | Java Desktop Application (ADF) Creates a databound rich client application. The application consists of one project for the client (ADF Swing), and another project for the ADF Model (ADF Business Components). |
| | Java EE Web Application Creates a databound web application. The application consists of one project for the view and controller components (JSF), and another project for the data model (EJB session beans and JPA entities). |
| | SOA Application Creates a SOA (service-oriented architecture) application. The application consists of one SOA project for the SOA composite, components, and adapters. |
| | < Back Next > Einish Cancel |

Let's name the project HL7ReceiverAcker.

| Name your project | | 5 |
|----------------------|--|-----------------|
| Application Name | Project Name: HL7ReceiverAcker Dirgctory: JDeveloper\mywork\HL7ReceiverAckerApp\HL7ReceiverAcker | Bro <u>w</u> se |
| Project SOA Settings | Project Technologies Generated Components Associated Libraries Available: Selected: SOA ADF Business Components ADF Desktop Integration ADF Faces ADF Faces ADF Faces SOA ADF Swing Image Flow Image Flow ADF Swing Image Flow Image Flow Ant Image Flow Image Flow ADF Swing Image Flow Image Flow Ant Image Flow Image Flow Database (Offline) Image Flow Image Flow EDB Image Flow Image Flow HTML Image Flow Image Flow SOA is the Service Oriented Architecture to build composite applications. Image Flow | |

Accept Empty Composite and click Finish.

| SCreate SOA Application | - Step 3 of 3 | | × |
|--|---|------------------------------|--------|
| Configure SOA settin | gs | The logarithment in Managers | 5 |
| Application Name Project Name Project SDA Settings | Composite Name: HL7ReceiverAcker Composite Template: Empty Composite Composite With BPEL Process Composite With Business Rule Composite With Mediator Composite With Mediator Composite With Human Task Composite With Spring Context Composite From Oracle BPA Blueprint | | |
| (<u> </u> | Customizable | < Back Next > Finish | Cancel |

Drag B2B Adapter to the "Exposed Services" swim line.



Name the service ADT_A01_In and click Next.

Accept default for "B2B integration type" and click Next.

Choose WebLogic_Local for AppServer Connection and Test B2B (this requires that the app server be up and running). Click Next.

Choose "Receive" as Operation and click Next.

Accept default of Basic for Document Definition Handling and click Next.

Choose ADT_A01_DocDef HL7 Document Definition and click Next, than Finish.

| B2B Configuration Wizard - Step 7 of 8 | | |
|--|----------------|-------------------|
| Document Definition | | 10 - D |
| Select the document definition for this service. | | |
| | Search Refresh | B2B Configuration |
| Use Routing ID | | |
| Document Definitions | | |
| ₽ <mark>₽</mark> HL7 | | |
| E- 2.3.1 | | |
| | | |
| ADI_ADI | | |
| | | |

The inbound B2B Adapter is configured.

Drag the File Adapter onto the External References swim line.

Name the service WriteADTA01 and click Next.

Accept the default for "Adapter Interface" and click Next.

Select Write File as Operation Type and click Next.

Enter c:\hl7\received as physical path, HL7_ADT_A01_%SEQ%.xml as File Naming Convention and click Next.

| Adapter Configuration Wizard - St | ep 5 of 7 |
|---|--|
| File Configuration | and and a second se |
| Specify the parameters for the Write File | operation. |
| Directory specified as <u>o physical</u> F Directory for Outgoing Files (physical path | Path OLogical Name |
| c:\hl7\received | Browse |
| File Naming Convention (po_%5EQ%.txt |): HL7_ADT_A01_%SEQ%.xml |
| Append to existing file | |
| -Write to output file when any of these o | conditions are met |
| ✓ Number of Messages Equals: 1 | |
| Elseend Time Evenades | minutes - |

Locate the ADT_A01 XML Schema file, choose the ADT_A01 Element, click OK, Next and Finish.

| Messages | | |
|--|--|-------------|
| Define the message I defines the message 'Schema is Opaque', | or the Write File operation. Specify the Schema File Location and select the Schema Element s in the outgoing files. Use the Browse button to find an existing schema definition. If you che then you do not need to specify a Schema. | that :ck |
| -Message Schema | \ | |
| Native <u>f</u> ormat tr | anslation is not required (Schema is Opaque) | |
| URL | Q 4 | Ş |
| <u>S</u> chema Element | Type Chooser | × |
| | 42 f | 6 |
| | Type Explorer Type Explorer ADT_A01 Project WSDL Files | |
| | Type: {N5_66B64CC42F614C27B026CDA3347E411420070423183755}ADT_A01 | |
| | Show Detailed Node Information | |
| | Help OK Cancel | |
| | | |
| Help | < <u>Back</u> Next > Einish Can | cel |

Drag the B2B Adapter to the External References swim line.

Give the service the name ADT_ACK_Out and click Next.

Leave B2b Integration Type as default and click Next.

Choose WebLogic_Local for AppServer Connection and Test B2B (this requires that the app server be up and running). Click Next.

Leave the default of "Send" as Operation and click Next.

Accept default of Basic for Document Definition Handling and click Next.

Choose ADT_ACK_DocDef HL7 Document Definition and click Next, than Finish.

| B2B Configuration Wizard - Step 7 of 8 | | | |
|--|----------|-----------------------|-------|
| Document Definition | | alinaka 🔅 | 5 |
| Select the document definition for this service. | | | |
| | Search F | tefresh B2B Configura | ation |
| Use Routing ID | | | |
| Bocument Definitions | | | |
| | | | |
| | | | |
| ADT_ACK_DocDef | | | |
| 🖶 🗀 ADT_A01 | | | |
| ⊞… 🛄 B2B | | | |

All adapters are now added and configured.

| ADT_ACK_Out Operations: send |
|------------------------------------|
| WriteADTA01 |
| |

Drag the Mediator component to the Components swim line.

Name the Mediator component WriteAndMakeACK, and then click OK.

Wire the ADT_A01_In B2B Adapter to the Mediator and the Mediator to the ADT_ACK_Out B2B Adapter and the WriteADTA01 File Adapter.



Double-click the Mediator component to open the mediator plan.

Click the Assign Value button in the WriteADTA01::Write operation routing rule.

| Mediator | | | | | | |
|--|--|---|--|---|--|--------------|
| Name: | WriteAndMakeAOX | | | | | |
| WSDL URL: | ADT_A01_In.visdl | B | | | | |
| Port Type: | 828_receive_pit | | | | | |
| Resequence Level: | operations 🔹 | | | | | |
| = 🚑 Routing Ru | les | | | | | |
| Operations | | | | | | 44 54 |
| - receive | | Priority In C | Validate Syntax (XSD) | | 4 | - +- × |
| 1 1 1 1 1 1 1 1 | | Duning 1. C | C Trease shows Ages | | | |
| Callout To | <<3ava Callout Class | D>: | | | | |
| Callout To Resequence | <<2ava Callout Class | DX | | | | |
| Calout To Resequence | <<2ava Callout Class | s> | | | | |
| Callout To Resequence State Routing | <<2ava Callout Class Off • Expression>> | ov 10 | ⇒ ADT_ACK_Outisend | | 0 | Sequential • |
| Callout To Resequence Statu: Nouting E < <pitter< td=""><td><<dava callout="" class<br="">off • Expression>></dava></td><td>Valdato Semartic</td><td>⇒ ADT_ACK_Out::send</td><td></td><td>0</td><td>Sequential 💌</td></pitter<> | < <dava callout="" class<br="">off • Expression>></dava> | Valdato Semartic | ⇒ ADT_ACK_Out::send | | 0 | Sequential 💌 |
| Callout To Resequence State: Routing E [< <piter< td=""><td><<java callout="" class<br="">Off • Expression>></java></td><td>Validate Semantic Transform Using</td><td>ADT_ACK_Out:isend body: <<transformation map="">></transformation></td><td>•</td><td>0 4</td><td>Sequential 🕶</td></piter<> | < <java callout="" class<br="">Off • Expression>></java> | Validate Semantic Transform Using | ADT_ACK_Out:isend body: < <transformation map="">></transformation> | • | 0 4 | Sequential 🕶 |
| Callout To Resequence State: No.Eng E < <piter< td=""><td><<dava callout="" class<br="">Off</dava></td><td>Validate Semantic Transform Using Assign Values</td><td>ADT_ACK_Out::send body : <<transformation map="">></transformation></td><td>•</td><td>0 4 14</td><td>Sequential •</td></piter<> | < <dava callout="" class<br="">Off</dava> | Validate Semantic Transform Using Assign Values | ADT_ACK_Out::send body : < <transformation map="">></transformation> | • | 0 4 14 | Sequential • |
| Callout To Resequence Statu: No.Con E < <piter< td=""><td><<java callout="" class<br="">Off • Expression>></java></td><td>Validate Semantic Transform Using Assign Values</td><td>ADT_ACK_Out::send body:<<transformation map="">></transformation></td><td></td><td>0 1 11 11 11 11 11 11 11 11 11 11 11 11</td><td>Sequential •</td></piter<> | < <java callout="" class<br="">Off • Expression>></java> | Validate Semantic Transform Using Assign Values | ADT_ACK_Out::send body:< <transformation map="">></transformation> | | 0 1 11 11 11 11 11 11 11 11 11 11 11 11 | Sequential • |
| Callout To Resequence State: Routing C <filter< td=""><td><<dava callout="" class<br="">Off • Expression>></dava></td><td>Validate Semantic Transform Using Assign Values Validate Semantic</td><td>ADT_ACK_Out::send body : <<transformation map="">> WhiteADTA01::Write</transformation></td><td>•</td><td>0 1 10 10 10 10 10</td><td>Sequential •</td></filter<> | < <dava callout="" class<br="">Off • Expression>></dava> | Validate Semantic Transform Using Assign Values Validate Semantic | ADT_ACK_Out::send body : < <transformation map="">> WhiteADTA01::Write</transformation> | • | 0 1 10 10 10 10 10 | Sequential • |
| Callout To Resequence Statu: Boutin Control Co | < <java callout="" class<br="">Off</java> | Validate Semantic Transform Using Assign Values Validate Semantic Transform Using Validate Semantic Transform Using | ADT_ACK_Out::send body:<< <transformation map="">> WriteADTA01::Write body:<<<transformation map="">></transformation></transformation> | • | 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | Sequential • |

Click the Add a New Value Assignment icon (Plus sign) and choose expression for the From and the To sides.

| | Nonio, | WILLISHILLISICISCHES IS | | | |
|---|--------------------------|-------------------------|---|------------------|---|
| | WSDL URL: | Transign Values | | | |
| | Port Type: | From | | То | |
| | Resequence Lev | | | | |
| ć | Assign Value | | | | × |
| | From | | ~ | То | |
| > | <u>Type</u> : expression | חנ | - | Type: expression | |
| | Expression: | | | Expression: | |
| | | | | | |

Click the "Invoke Expression Builder" on the From side, expand the variables list, choose in.body, click the wide "Insert Into Expression" button and click OK.

| 🕹 Assign Value | |
|--------------------------|------------------------------|
| From Iype: expression | To Type: expression |
| Expression: | Expression: |
| 📥 Expression Builder | |
| Expression: | |
| \$in.body | |
| | |
| | |
| | |
| | |
| | \land Insert Into Expression |
| Variables | |
| Cartables | Advanced Fu |
| i(X) in i≣ body | f() create- |
| | 🕝 general |

Repeat the process for the To side choosing out.body variable.

| 📥 Assign Value | | x |
|--------------------------|--------------------------|---|
| From Iype: expression | ▼ To Type: expression | |
| Expression: \$in.body | Expression: | |

Click OK to close the Assign Values dialogue box.

| From | То |
|------------------------|-------------------------|
| expression : \$in.body | expression : \$out.body |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

The mapping required to pass the entire ADT A01 to the File Adapter is now complete.

Create a New Mapper file for the ADT_ACK_Out mapping, accepting default name.

| Resequence Off | | |
|---|--|--------------|
| Estatic Routing | | |
| 😑 < <filter expression="">> 🗣 🔞</filter> | ADT_ACK_Out::send | Sequential 👻 |
| Validate Semantic | & | |
| Transform Using | body : < <transformation map="">> 🔹 🕅</transformation> | K |
| Assign Values | • | |
| | | |
| < <filter expression="">></filter> | International and the second s | Sequential 🔻 |
| Validate Semantic | | |
| Transform Using | body : < <transformation map="">> 🔹 🕅</transformation> | |
| Assign Values | \$out.body := \$in.body | |

Map MSH to MSH, choosing to Match Elements with Exact Names, Match Elements Considering their Ancestor Names and For optional nodes with required children.



Click Deselect All button then select only the Element nodes, that is nodes whose source path does not contain the @ sign. Leave MSH3, MSH-4, MSH-5, MSH-6, MSH-9.1 and MSH-10 deselected. We will map them individually.

| ns1:AD | T_A01/ns1:MSH | | |
|----------|----------------------------|----------------------------|---|
| arget: | | | |
| ns0:AC | K_A01/ns0:M5H | | |
| lanning | Candidates: | | |
| Select | Source | Target | - |
| | @Type | @Type | 1 |
| | @ID | @ID | |
| | @Name | @Name | |
| ~ | ns1:MSH.1 | ns0:MSH.1 | |
| | ns1:MSH.1/@Item | ns0:MSH.1/@Item | |
| | ns1:MSH.1/@Type | ns0:MSH.1/@Type | |
| | ns1:MSH.1/@LongName | ns0:MSH.1/@LongName | |
| | ns1:MSH.1/@ApplicationInfo | ns0:MSH.1/@ApplicationInfo | |
| ✓ | ns1:MSH.2 | ns0:MSH.2 | |
| | ns1:MSH.2/@Item | ns0:MSH.2/@Item | |
| | ns1:MSH.2/@Type | ns0:MSH.2/@Type | |
| | ns1:MSH.2/@LongName | ns0:MSH.2/@LongName | |
| | ns1:MSH.2/@ApplicationInfo | ns0:MSH.2/@ApplicationInfo | |
| | ns1:MSH.3/@Item | ns0:MSH.3/@Item | |
| | ns1:MSH.3/@Type | ns0:MSH.3/@Type | |
| | ns1:MSH.3/@LongName | ns0:MSH.3/@LongName | |
| | ns1:MSH.3/@ApplicationInfo | ns0:MSH.3/@ApplicationInfo | |
| | net-MSH-3/@vei-nil | ne0-MSH-3/@vei-nil | |

Map source MSH-3 to target MSH-5, source MSH-4 to target MSH-6, source MSH-5 to target MSH-3 and source MSH-6 to target MSH-4.

| End MOULO | | name 🔤 |
|--|-----------|-----------------|
| 🖮 🛞 ns1:MSH.1 | | —— for-each 😣 🕁 |
| 🗄 🛞 ns1:MSH.2 | | —— for-each 🐼 🕀 |
| 🕀 🐼 ns1:MSH.3 | | —— for-each 🐼 🕁 |
| ■ 🕺 ns1:MSH.4 | | for-each 🔬 🕀 |
| The way is a second sec | | for-each 🔬 🗄 |
| B Stringer | | for-each 👰 🕀 |
| Burger (MSH 7 | | |
| | | for-each |
| | | |
| 🖮 🛞 ns1:MSH.9 ———— | | —— for-each 🚧 🕀 |
| 🖶 🛞 ns1:MSH.10 | | ns0:MSH.10 🛞 🕀 |
| 🗄 🛞 ns1:MSH.11 ———— | | —— for-each 🐼 🕁 |
| | ········· | for-each 🔬 д |

Switch to Advanced Palette, choose Advanced Functions and drag generate-guid function to the canvas. Connect it to the MSH-10 node on the target side.

| ndMakeACK.mplan 🔣 | ADT_A01_To_ACK_A01.xsl | | Component Palette | te 🖃 |
|---------------------------------------|------------------------|-------------|-----------------------|------------|
| | XSLT File: ADT_A | CK_Out.wsdl | Advanced 룾 | - |
| · · · · · · · · · · · · · · · · · · · | for-each 🚧 🕀 | ~ | | |
| · · · · · · · · · · · · · · · · · · · | for-each 🐼 🕀 | | <u>iii</u> | _ O |
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| · · · · · · · · · · · · · · · · · · · | —— ns0:MSH.10 🛞 🕀 | | f() parseXML | |
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| | for-each 🐼 🗄 | | Bocketendoatpat | |
| · · · · · · · · · · · · · · · · · · · | for-each 😣 🕀 | | 🔭 socketRead | |
| · · · · · · · · · · · · · · · · · · · | for-each 😣 🕀 | | socketReadWithXlation | |
| · · · · · · · · · · · · · · · · · · · | for-each 🙆 🗄 | • | | |
| <u> </u> | for-each 🛞 🗄 | | socketWrite | ~ |
| | for-each 🕺 🖽 | | Database Functions | |

Set text of MSH-9 \rightarrow MSG.1 to the literal ACK.



Collapse MSH structure on the target side and expand the MSA structure on the target side one level.

Set text "AA" in target MSA-1. Map source MSH-10 (Message Control ID) to target MSA-2. Set text "All is well" in target MSA-3.

| urrena-Propercies | | |
|-------------------|---|-----------------------------|
| STICK NS1:MSH | | GUID 🚾 |
| | | CreatedBy 🏧 |
| | | CreatedDate 🚾 |
| Name | | ID 🔤 |
| A nome | | Name 🚾 |
| | | ns0:Internal-Properties 🐼 🕀 |
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| H 03 ns1:M5H.3 | | |
| | | |
| 🕀 🐼 ns1:MSH.5 | | iype 🔤 |
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| 🕀 🛞 ps1:MSH.10 | | for-each 🐼 😑 |
| | | ns0:MSA.2 🛞 🗄 |
| | | ns0:MSA.3 = All i T 😹 🕀 |
| | | ps0:MSA.4 🞊 🕀 |
| | | pc0:MS0 5 5 |
| H RAY NS1:MSH.14 | — <u> </u> | |
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| 🕀 🐼 ns1:MSH.16 | — V • /• /• /• /• • • • • • • • • • • • • | nsu:ERR 🐼 🗠 |

Set text HL7 in the global attribute Standard and text 2.3.1 in the global attribute Version.

| akeACK.mplan | ADT_A01_To_ACK_A01.xsl |
|--------------|-----------------------------|
| | XSLT File: ADT_ACK_Out.wsdl |
| | <target> 🚼 🖃</target> |
| | ns0:ACK_A01 🖇 📋 |
| | Туре 🚾 |
| | XDataVersion and |
| | Standard = HL7 [T] 🚾 |
| | Version = 2.3.1 [T] |
| | GUID 202 |
| | CreatedBy |

Click Save All toolbar button and close the mapper.

Click the Assign Values button to set properties for the message exchange in such a way that the B2B infrastructure can identify the trading partnership agreement to use for processing the ACK and so that it can correlate this ACK with the original message.

| _Static Routing | | |
|---|--|----------------|
| 😑 < <filter expression="">> 🛛 🗣 🏹</filter> | ADT_ACK_Out::send | Sequential • |
| Validate Semantic | | 8 |
| Transform Using | body : xsl/ADT_A01_To_ACK_A01.xsl | R |
| Assign Values | | • |
| | | |
| 😑 < <filter expression="">></filter> | ↔ WriteADTA01::Write | 🌼 Sequential 🕶 |
| Validate Semantic | | 8 |
| Transform Using | body : << <transformation map="">></transformation> | 88 |

Populate the following properties as indicated in the table below. The process is illustrated in the article Oracle SOA Suite 11g HL7 Outbound Example.

| Expression | Property |
|--|------------------------------|
| oraext:generate-guid() | b2b.messageId |
| \$in.body/ns1:ADT_A01/ns1:MSH/ns1:MSH.10 | b2b.replyToMessageId |
| | |
| Constant | Property |
| LocalHL7Receiver | b2b.fromTradingPartnerId |
| Name | b2b.fromTradingPartnerIdType |
| RemoteHL7Sender | b2b.toTradingPartnerId |
| Name | b2b.toTradingPartnerIdType |
| ADT_ACK_DocDef | b2b.documentDefinitionName |
| ACK_A01 | b2b.documentTypeName |
| HL7 | b2b.documentProtocolName |
| 2.3.1 | b2b.documentProtocolVersion |
| 9 | b2b.messageType |

Message types are 1 == Request, 2 == Response, 9 == Functional Acknowledgement.

The value of the MSH-10 field, set in the b2b.replyToMessageId property, is used by the B2B infrastructure to correlate the ACK and the original request so that it can be sent as a response on the same channel and so that it is tracked together with the request.

The properties are now set.

| | + / × |
|---|---|
| From | То |
| expression : oraext:generate-guid() | property : b2b.messageId |
| constant : LocalHL7Receiver | property : b2b.fromTradingPartnerId |
| constant : Name | property : b2b.fromTradingPartnerIdType |
| constant : RemoteHL7Sender | property : b2b.toTradingPartnerId |
| constant : Name | property : b2b.toTradingPartnerIdType |
| constant : ADT_ACK_DocDef | property : b2b.documentDefinitionName |
| constant : ACK_A01 | property : b2b.documentTypeName |
| constant : HL7 | property : b2b.documentProtocolName |
| constant : 2.3.1 | property : b2b.documentProtocolVersion |
| constant : 9 | property : b2b.messageType |
| expression : \$in.body/ns1:ADT_A01/ns1:MSH/ns1:MSH.10 | property : b2b.replyToMessageId |
| Help | OK Cancel |

Save All, close the Mediator plan and Deploy this composite.

Once deployment is finished close JDeveloper.

Exercise HL7 Inbound solution

In the B2B Trading Partner Manager Web Console, http://localhost:7001/b2b.

Open a command window and run the HL7Browser:

C:\jdk1.6.0_20\bin\java.exe -jar C:\tools\Hl7Browser.1.0\HL7Browser.jar

When the UI appears click the "Open an HL7 File" button, locate the ADT A01 transaction file, C:\hl7\adt\sources\ADT_A01_output1.hl7, and open it.



Click "Run the network utility" button, provide localhost as the Host (or leave blank since this defaults to localhost) and 12121 as the Port (recall this is the port on which the B2B listener is listening) and click Connect.

| 10 Heromer 10 and data more different and | DIREAMINE I | |
|---|--|---------------------------------|
| | ~ | nep (|
| | | <u> </u> |
| HL7 Records H2FIA-ActiverenalBonalFILMENI200809088 | 115291140 00000 CTLID 200809080152 | 191112.3.1111ALINEEVMIA01120080 |
| ESHI ~~\siSystemAiNosAiFIIMDN1200809 | 080152911ADT 011000000_CTLID_200809080 | 13291912.3.1111ALINE |
| EVN(A01/200809080152911) JavaCAP36^^ PID(1) (A000010^^*BosA^RE*BosA) (Kess | el^Abiguil1119460101123045181117 South | 3rd Circle**Downham Market*Eng |
| • FV1 1 1 1 PUL^Fulde*Gordian***** | ************************************** | 4,3 |
| HI 70rowser - 1.0 | | |
| File | | Helc |
| Send Mode Receive Mode | | |
| Host localhost | Port: 12121 | Connect |
| Creation | 200 | G Send AP |
| | <u>al</u> | re senerer Seneresette |
| | | |
| | | |

Once connected, click the "Send Messages" button.

Observe message exchange - the message sent and the ACK received.

Inspect message tracking information.

Application Message Tab.

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| | Decise | wett Defin | then Disaste . | 1 | | | | | Reference field | Contaria | - | | | |
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| | | | CAN AN AN ADDRESS | 40.11 | | | | | | | | 5 | See () Asset | |
| tes | uit (Me | essage (| Count: 3) | | | | | | | berthvi | Created Date | 2 on | en Destending 💌 | Resubrat |
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| | 把 | Herm | Local-L.7Remarker | Dame | Remotert.7. | ADK_A01 | ADT_NOK_Decowf | 16.7 | 2.3.1 | 0.080.0 | HER_COMPLETE | Sunday, Jure 27, | 2010 10:14:51 AH GM | 00:51+T |
| - | 聖 | MELP ID | 127.0.0.1 | Name | LisseHL/Nec | ADT_A01 | AUT_AUS_DeeDef | 16.7 | 2.3.1 | 140,00 | HER_COMPLETE | Seriday, Jure 27, | 2010 10:14:55 AM GM | 00:01+T |

ADT A01 Details.

| Application Message | | |
|---|--|---|
| Application Message Id Sender Id Type Sender Value Receiver Id Type Receiver Value Document Type Document Definition Document Protocol Name | ReSubmit Image: CoasaA48112976C1AB0F000004AF98B00 MLLP ID 127.0.0.1 Name LocalHL 7Receiver ADT_A01 ADT_A01 ADT_A01 ADT_A01 | |
| Document Protocol Version Refer To Application Message Id App Conversation Id App Message property | 2.3.1 Refer To Application Message Id {b2b.documentProtocolVersion=2.3.1, | |
| | b2b.documentProtocolName =HL7, b2b.replyToMessageId=null, b2b.toTradingPartnerIdType=Name, b2b.conversationId=COA8A48112976C1A85F000004AF98500, b2b.documentDefinitionName=ADT_A01_DocDef, b2b.messageId=COA8A48112976C1AA5300004AF98700-1, b2b.fromTradingPartnerIdType=HLIP ID, b2b.messageType=1, MESH_METRICS=null, tracking.compositeInstanceId=80002, b2b.toTradingPartnerId=LocalHL7Receiver, tracking.ecid=COA8A48112976C1AB0F000004AF98E00, b2b.fromTradingPartnerId=127.0.0.1, tracking.conversationId=COA8A48112976C1AB0F000004AF98E00, tracking.conversationId=COA8A48112976C1AB0F000004AF98E00, tracking.conversationId=COA8A48112976C1AB0F000004AF98E00, tracking.conversationId=COA8A48112976C1AB0F000004AF98E00, tracking.compositeInstanceCreatedTime=Sun Jun 2710:14:50 EST 2010, b2b.documentTypeName=ADT_A01} | |
| Direction | INBOUND | |
| State | MSG_COMPLETE | |
| Error Code | | |
| Error Text | | |
| Error Description | • | Ĺ |
| | | |
| | OK | |

Application Message Payload (XML).

Business Message Details.

| Business Message | | |
|---------------------------|---|----|
| Td | C048448112976C144630000044E98800 | |
| Message Id | C048448112976C144530000044E98700-1 | |
| Pefer To Message | Defer To Message | |
| Sender Type | MIPID | |
| Sender Value | 127.0.0.1 | |
| Receiver Type | Name | |
| Receiver Value | LocalHL7Receiver | |
| Sender | RemoteHL7Sender | |
| Receiver | LocalHL7Receiver | |
| Agreement Id | HL7ReceiverTPA | |
| Agreement | HL7ReceiverTPA_Agr | |
| Document Type | ADT_A01 | |
| Document Protocol | HL7 | |
| Document Version | 2.3.1 | |
| Message Type | REQ | |
| Direction | INBOUND | |
| State | MSG_COMPLETE | |
| Acknowledgement Mode | SYNC | |
| Response Mode | ASYNC | |
| Send Time Stamp | Sunday, June 27, 2010 10:14:49 AM GMT+10:00 | |
| Receive Time Stamp | Sunday, June 27, 2010 10:14:49 AM GMT+10:00 | |
| Document Retry Interval | 0 | |
| Document Remaining Retry | 0 | |
| Native Message Size | 412 | |
| Translated Message Size | 10989 | |
| Business Action Name | | |
| Business Transaction Name | | |
| Xpath Name 1 | XPathName1 | - |
| • | | |
| | | OK |

Wire Message Details.

| Wire Message | |
|------------------------------|--|
| | ReSubmit |
| Id | C0A8A48112976C1A37D000004AF98000 |
| Message Id | C0A8A48112976C1A37D000004AF98000 |
| Business Message | C0A8A48112976C1AA63000004AF98800 |
| Packed Message | Packed Message |
| Payload | Payload |
| Protocol Message Id | 12775976886701975452346 |
| Refer To Protocol Message Id | |
| Protocol Collaboration Id | |
| Protocol Transport Binding | From=localhost FromIP=127.0.0.1 MSG_RECEIVED_TIME=Sun Jun 27 10:14:48 EST 2010 protocolVersion=1.0 ToIP=127.0.0.1 Port=12121 Sequencing=false Message- Id=12775976886701975452346 DynamicIP=127.0.0.1:2582 To=localhost protocol=TCP |
| Message Digest | Message Digest |
| Digest Algorithm | |
| Transport Protocol | TCP |
| Transport Protocol Version | 1.0 |
| Url | TCP://127.0.0.1:12121 |
| security | |
| Transport Headers | From=localhost FromIP=127.0.0.1 MSG_RECEIVED_TIME=Sun Jun 27 10:14:48 EST 2010 protocolVersion=1.0 ToIP=127.0.0.1 Port=12121 Sequencing=false Message- Id=12775976886701975452346 DynamicIP=127.0.0.1:2582 To=localhost protocol=TCP |
| certificates | certificates |
| State | COMPLETE |
| Error Code | |
| Error Description | |
| Error Text | - |
| | |
| | ОК |

Wire Message Payload.



Conversations.

| | | And a standard and a standard | 160000125 | | | |
|--|---|--|----------------------------|--|----------------|-----------------|
| Conver | sation Message | | | | | |
| Search | š. | | | | | |
| Aatch C | All @ Any | | | | | |
| Send Time | Stamp Greater Than | 06/27/2 | 010 12:00:00 AN | C+10:00) Surbey, Canherra | | |
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| olaboratio | n name Contains | | | | | |
| Collabora | ston Id Contains | | | | | |
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| esult (Co | onversation Cour | it: 7) Collaborat | ton Name. | | | |
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| Colubori Colubori COABA40 COABA40 | nversation Cour iton Id 112977489A93000004 112977489786000004 | AF9C200 AF9B500 | ion Name | | | |
| Colabor Colabor COABA4 COABA4 COABA4 | nversation Cour iton Id 112977489A93000004 112977489786000004 112977489227000044 | Lt: 7) Collaborat AF9C200 AF96500 AF9AA00 | ion Name | | | |
| Collabori Collabori COABA48 COABA48 COABA48 COABA48 | onversation Cour aton Id \$112977489A93000004 \$11297748976600004 \$112977489227000044 \$112977488A8500004 | Lt: 7) Collaborat AF9C200 AF96500 AF94A00 AF99000 | ton Name | | | |
| esult (Co Collabori Colaba44 Coa8a44 Coa8a44 Coa8a44 Coa8a44 Coa8a44 | onversation Cour iton Id 11297748926000004 1129774892600004 112977489222000044 112977488485000004 112975C IB4C 300004 | It: 7) Collaborat AF9C200 AF96500 AF99000 AF99000 AF99200 | ton Name | | | |
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| esult (Co Colabor CoaBa4 CoaBa4 CoaBa4 CoaBa4 CoaBa4 CoaBa4 CoaBa4 CoaBa4 | onversation Cour ition Id 8112977489A9300004 811297748976600004 81129774884500004 81129766154C300004 81129766154C300004 81129768240200004 811297688240200004 ition details for co | Collaborat AF96200 AF96500 AF9600 AF99200 AF99200 AF96500 A | A8A4811297688 | 2402000004AF96E00(Mes | sage Count: 1) | |
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Acknowledgement Payload.



Messaging Metrics.

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This concludes the exercise.

Summary

Oracle SOA Suite B2B component can be used to provide HL7 v2 messaging support for healthcare environments.

This article is a follow on to the "<u>Oracle SOA Suite 11g HL7 Inbound Example –</u> <u>Functional ACK Addendum</u>" article and the "<u>Oracle SOA Suite 11g HL7 Inbound –</u> <u>Customized HL7 Message Structure and Data Validation</u>" article. In these articles the B2B infrastructure was configured to return the "Functional ACK" when it validated each message. The ACK was a positive or a negative ACK depending on whether the message passed validation. The ACK was generated by the B2B Layer before the message was passed on to the SOA Layer.

In this article I expanded on the previous posts by configuring the B2B Layer to pass the message to the SOA Layer and pass the Functional ACK, generated by the SOA Layer, on to the requester. To process a message and produce the ACK we built and deployed a new SOA Composite.

References

- [1] Oracle B2B Site, Available: <u>http://www.oracle.com/technology/products/integration/b2b/index.html</u>, Accessed: 4 June 2010
- [2] Oracle B2B User's Guide, Available: <u>http://download.oracle.com/docs/cd/E15523_01/integration.1111/e10229.pdf</u>, Accessed: 19 June 2010