Article
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HealthConnect (Ensemble) Integration with PKB Service

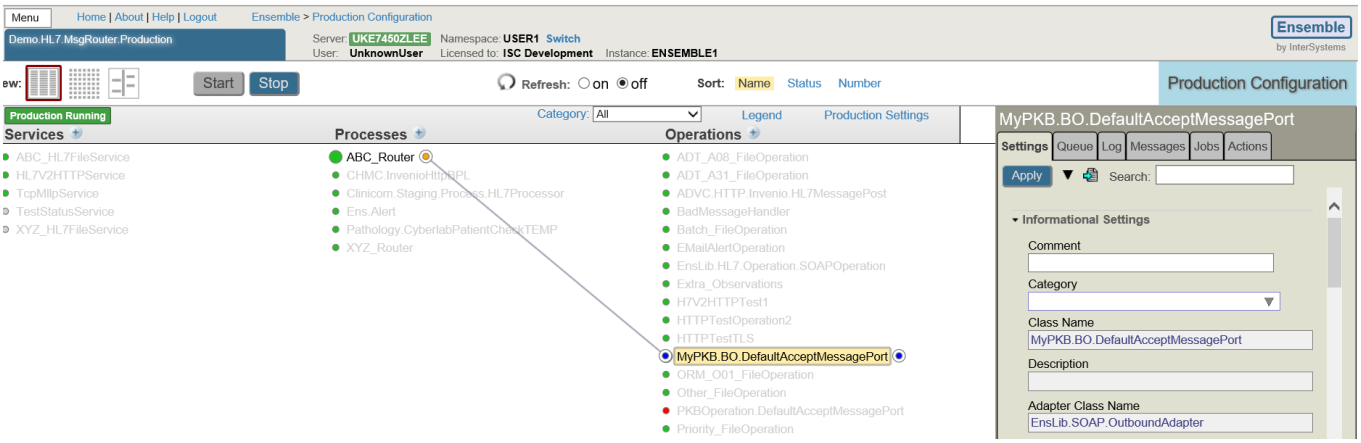
1. Scope and Objective:

Recently we supported a few NHS cases that required TIE (Trust Integration Engine) integration with the PKB service. Hence this article is meant to be a 10-minute quick guide to describe a demo solution (simple configurations and end-2-end implementation steps) for Health Connect (Ensemble) Integration with PKB (Patient-Knows-Best) service.

PKB service is a patient centric information service. It has a set of well defined API interfaces (documentation here) based on HL7 V2 over HTTP/SOAP, REST and FHIR. This article only touches its "HL7 V2 over HTTP/SOAP" service interface.

2. Demo Solution:

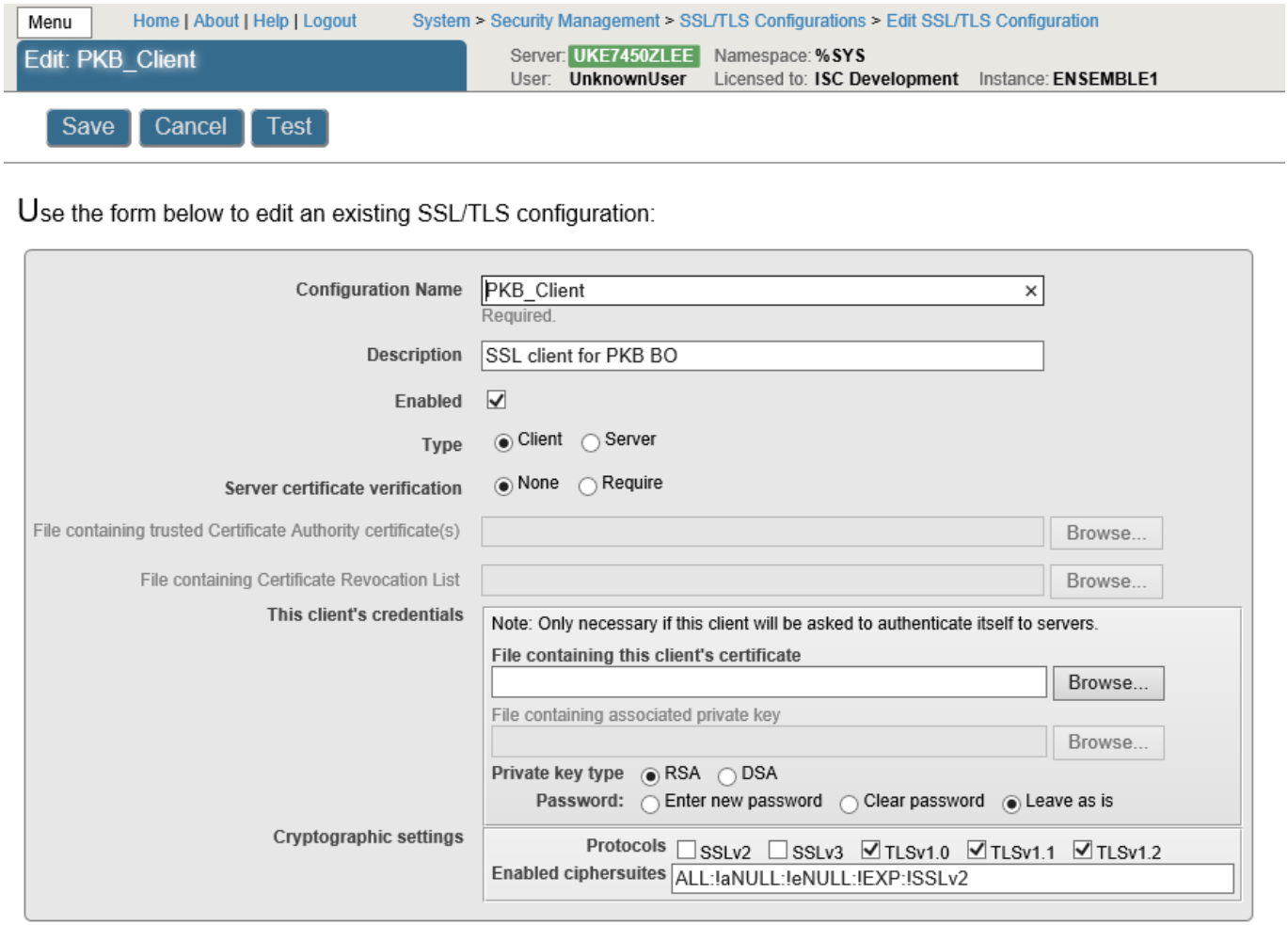
The following end-2-end implementation steps are done in a testing Ensemble instance. We will use Ensemble Studio's "SOAP Wizard" tool to create a new PKB SOAP Client (Business Operation in Ensemble terms) on an existing HL7 V2 demo production, then we will simply link an existing BP(Business Process) to this PKB BO via a standard EnsLib.HL7.Message type request. Here below is a screen capture highlighting the related Ensemble ConfigItems:



3. Detailed Implementation Steps

3.1 Prerequisites:

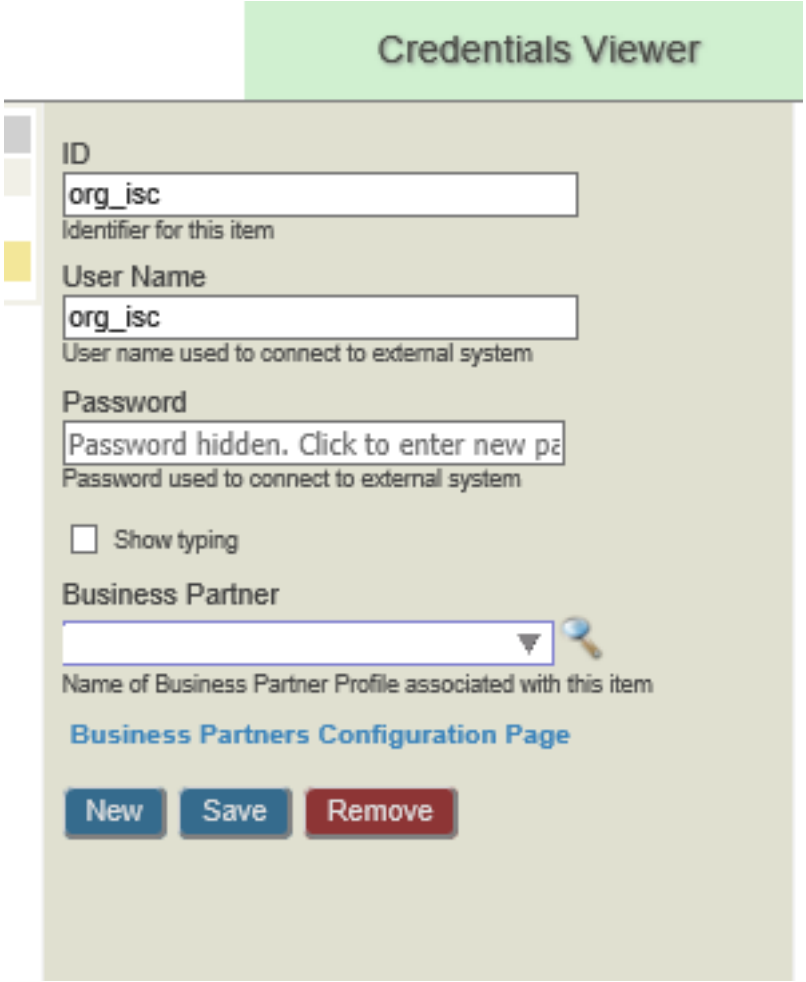
3.1.1 Create a basic SSL/TLS Configuration called e.g. "PKBClient":



3.1.2 To create a SOAP Credential in Ensemble

Note: You can contact PKB Service to get a SOAP credential (plain-text username/password) to its Test Environment, by following the documentation here.

Here below is a sample configuration of the Test Credential: (by clicking in *Management Portal -> Ensemble -> Configure -> Credentials*)



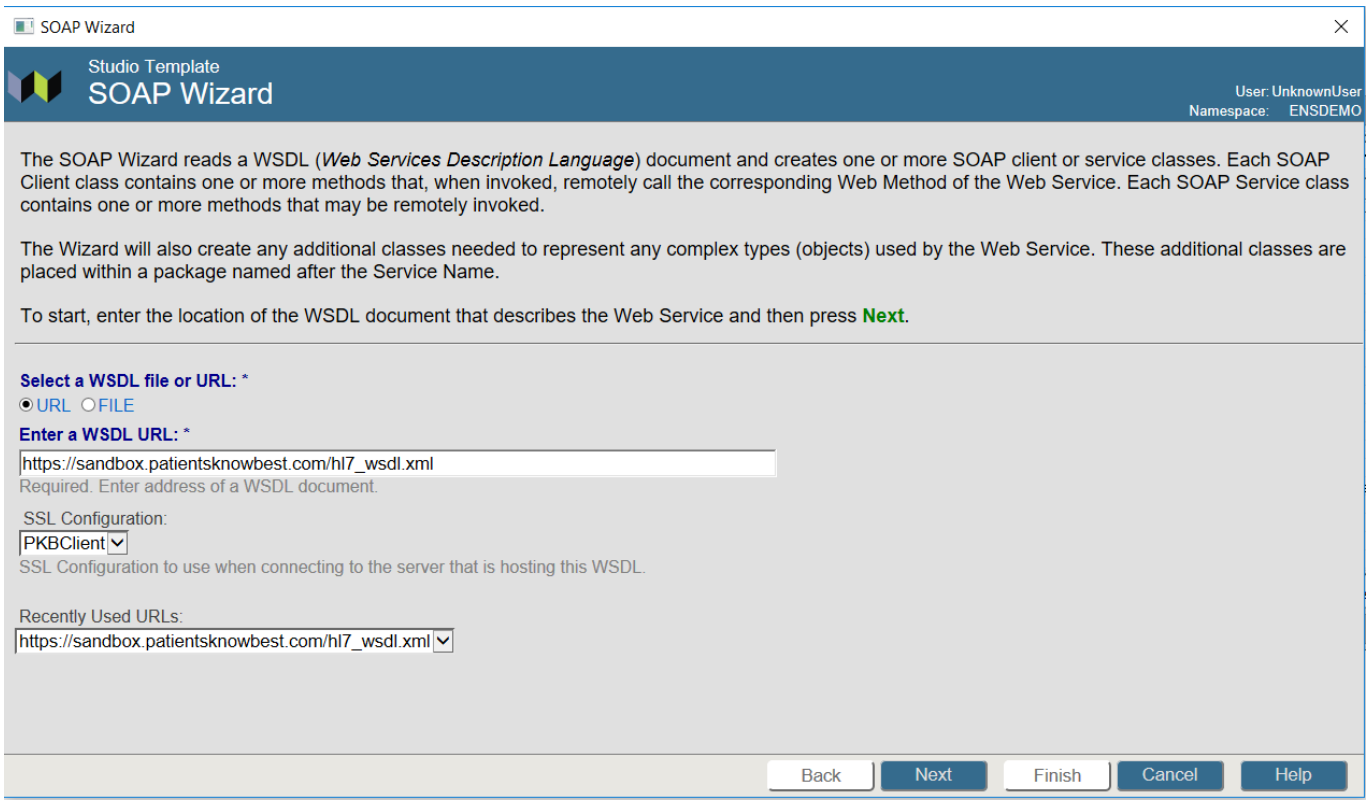
3.2 Use "SOAP Wizard" to create PKB SOAP Client BO Package:

3.2.1 Start "SOAP Wizard" from Ensemble Studio:

Start *"Studio";* go to right namespace such as "*TEST1"*; Click menu *"Tools" -> "Add-Ins" -> "SOAP Wizard"*

3.2.2 Steps through "SOAP Wizard" pages for PKB Service's Endpoint:

Note: You can see the PKB service's Test Endpoint in its online documentation here.


SOAP Wizard
Studio Template
SOAP Wizard
User: UnknownUser
Namespace: ENSDEMO
The SOAP Wizard reads a WSDL (Web Services Description Language) document and creates one or more SOAP client or service classes. Each SOAP Client class contains one or more methods that, when invoked, remotely call the corresponding Web Method of the Web Service. Each SOAP Service class contains one or more methods that may be remotely invoked.
The Wizard will also create any additional classes needed to represent any complex types (objects) used by the Web Service. These additional classes are placed within a package named after the Service Name.
To start, enter the location of the WSDL document that describes the Web Service and then press Next.
Select a WSDL file or URL: *
URL
FILE
Enter a WSDL URL: *
https://sandbox.patientsknowbest.com/hl7_wsdl.xml
Required. Enter address of a WSDL document.
SSL Configuration:
PKBClient
SSL Configuration to use when connecting to the server that is hosting this WSDL.
Recently Used URLs:
https://sandbox.patientsknowbest.com/hl7_wsdl.xml
Back
Next
Finish
Cancel
Help

SOAP Wizard

Studio Template
SOAP Wizard

User: UnknownUser
Namespace: ENSDEMO

Step 2 - The WSDL you have selected is displayed below. If this is correct, select options as wanted and press **Next**.

Options to control class generation and compilation: *

☑ Create Client for Web Service
☐ Create Web Service

☑ Compile generated classes Compile flags: dk

Class Type:
- ○ Persistent
- ○ Persistent using one-many relationships
- ○ Persistent using indexed one-many relationships
- ○ Persistent using parent-child relationships
- ◉ Serial

Proxy Class Package: MyPKB.Proxy
SSL Configuration name: PKBClient

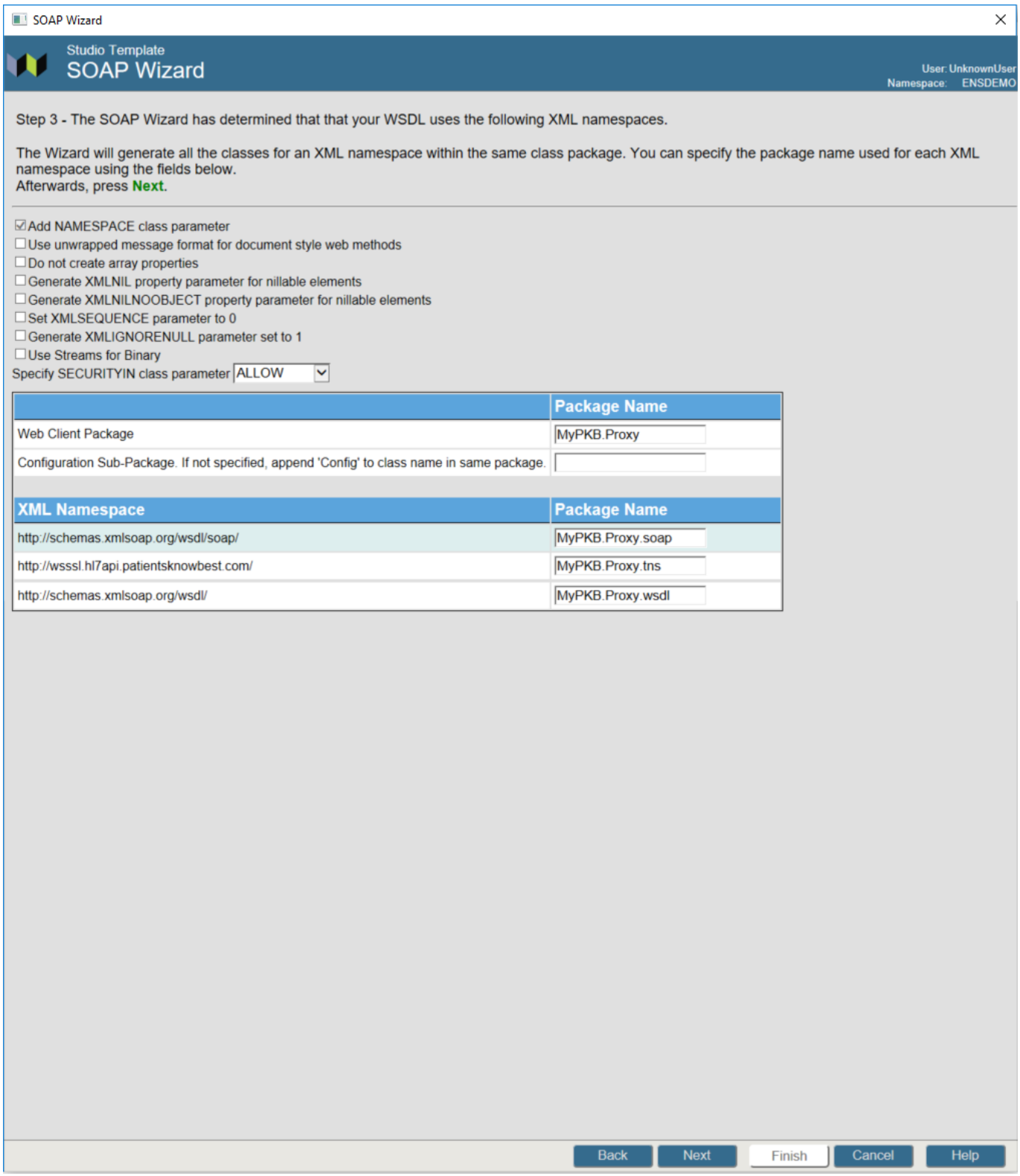
☑ Create Business Operation
Business Operation Package: MyPkb.Operation
Request Object Package: MyPKB.Request
Response Object Package: MyPKB.Response

WSDL Document: https://sandbox.patientsknowbest.com/hl7_wsdl.xml

Expand All

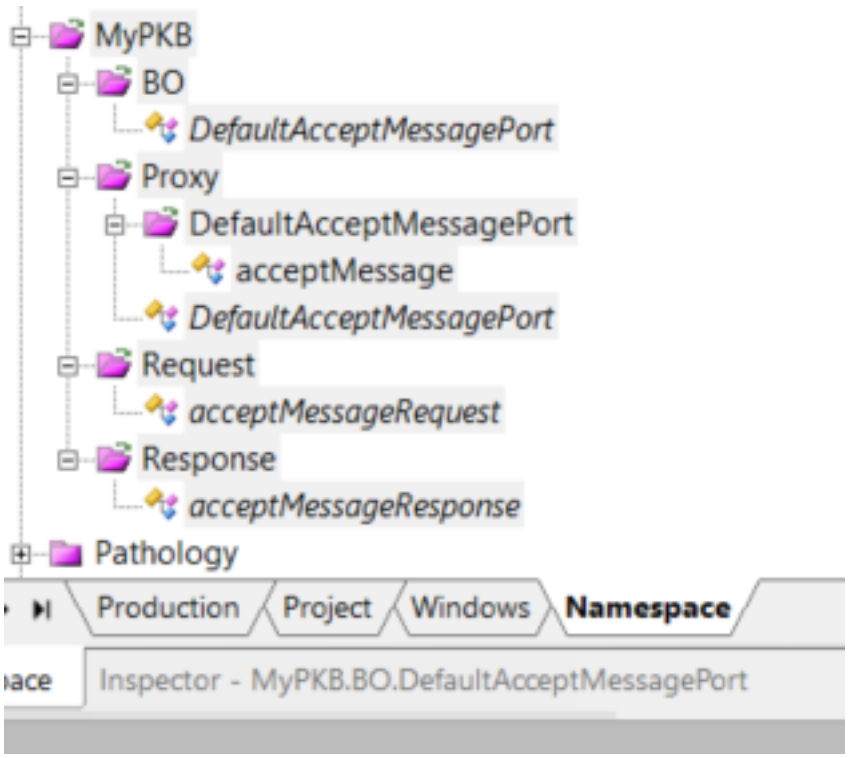
```
<?xml version="1.0" ?>
<definitions xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:tns="http://wsssl.hl7api.patientsknowbest.com/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://schemas.xmlsoap.org/wsdl/" targetNamespace="http://wsssl.hl7api.patientsknowbest.com/"
name="DefaultAcceptMessageService">
    <types>
        <xsd:schema>
            <xsd:import namespace="http://wsssl.hl7api.patientsknowbest.com/"
            schemaLocation="https://sandbox.patientsknowbest.com/hl7_xsd.xml"></xsd:import>
        </xsd:schema>
    </types>
    <message name="acceptMessage">
        <part name="parameters" element="tns:acceptMessage"></part>
    </message>
    <message name="acceptMessageResponse">
        <part name="parameters" element="tns:acceptMessageResponse"></part>
    </message>
    <portType name="DefaultAcceptMessage">
        <operation name="acceptMessage">
            <input message="tns:acceptMessage"></input>
            <output message="tns:acceptMessageResponse"></output>
        </operation>
    </portType>
    <binding name="DefaultAcceptMessagePortBinding" type="tns:DefaultAcceptMessage">
        <soap:binding transport="http://schemas.xmlsoap.org/soap/http" style="document"></soap:binding>
        <operation name="acceptMessage">
            <soap:operation soapAction=""></soap:operation>
            <input>
                <soap:body use="literal"></soap:body>
            </input>
            <output>
                <soap:body use="literal"></soap:body>
            </output>
        </operation>
    </binding>
    <service name="DefaultAcceptMessageService">
        <port name="DefaultAcceptMessagePort" binding="tns:DefaultAcceptMessagePortBinding">
            <soap:address location="https://sandbox.patientsknowbest.com:7443/services/hl7"></soap:address>
        </port>
    </service>
</definitions>
```

Back | Next | Finish | Cancel | Help



3.2.3 Inspect the generate "MyPKB" SOAP Client Package in "Studio":

Now within the Studio, you can see the following classes have been automatically generated by "SOAP Wizard":



Note: For detailed introductions, click on the product documentation "how Ensemble SOAP Wizard works" here.

3.3 Customise the MyPKB.BO class slightly to accept "EnsLib.HL7.Message" request from BP:

1. Open " MyPKB.BO.DefaultAcceptMessagePort.cls" in Studio

2. Add in "EnsLib.HL7.Message" in its "MessageMap"

3. Define its handler as e.g. "HandleHL7Messages" Method.

4. Recompile the MyPKB package.

So the resulted source code of this class file could be something like this sample below:

```
Class MyPKB.BO.DefaultAcceptMessagePort Extends Ens.BusinessOperation [ ProcedureBlock ]
{
  Parameter ADAPTER = "EnsLib.SOAP.OutboundAdapter";

Method acceptMessage(pRequest As
MyPKB.Request.acceptMessageRequest, Output pResponse As
MyPKB.Response.acceptMessageResponse) As %Library.Status
  {
    Set ..Adapter.WebServiceClientClass = "MyPKB.Proxy.DefaultAcceptMessagePort"
    Set tSC = ..Adapter.InvokeMethod("acceptMessage",.return,pRequest.arg0) Quit:$$$ISERR(tSC) tSC
    Set tSC = pRequest.NewResponse(.pResponse) Quit:$$$ISERR(tSC) tSC
    Set pResponse.return=$get(return)
    Quit $$$OK
  }
```

```
Method HandleHL7Messages(pRequest As EnsLib.HL7.Message, Output pResponse As
MyPKB.Response.acceptMessageResponse) As %Library.Status
 {
   //From PKB
   Set PKBReq = ##class(MyPKB.Request.acceptMessageRequest).%New()
   Set PKBReq.arg0 = pRequest.RawContent

   Set ..Adapter.WebServiceClientClass = "MyPKB.Proxy.DefaultAcceptMessagePort"
   Set tSC = ..Adapter.InvokeMethod("acceptMessage",.return,PKBReq.arg0) Quit:$$$ISERR(tSC) tSC
   Set tSC = PKBReq.NewResponse(.pResponse) Quit:$$$ISERR(tSC) tSC
   Set pResponse.return=$get(return)
    Quit $$$OK
 }
 XData MessageMap
 {
   <MapItems>
     <MapItem MessageType="MyPKB.Request.acceptMessageRequest">
     <Method>acceptMessage</Method>
  </MapItem>
  <MapItem MessageType="EnsLib.HL7.Message">
     <Method>HandleHL7Messages</Method>
  </MapItem>
 </MapItems>
 }
}
```

3.4 Customise property "return" within "MyPKB.Response.acceptMessageResponse" class

So the "return" property can accept a long string returned from PKB service of more than 50 chars:

```
Property return As %String(MAXLEN = 5000);
```

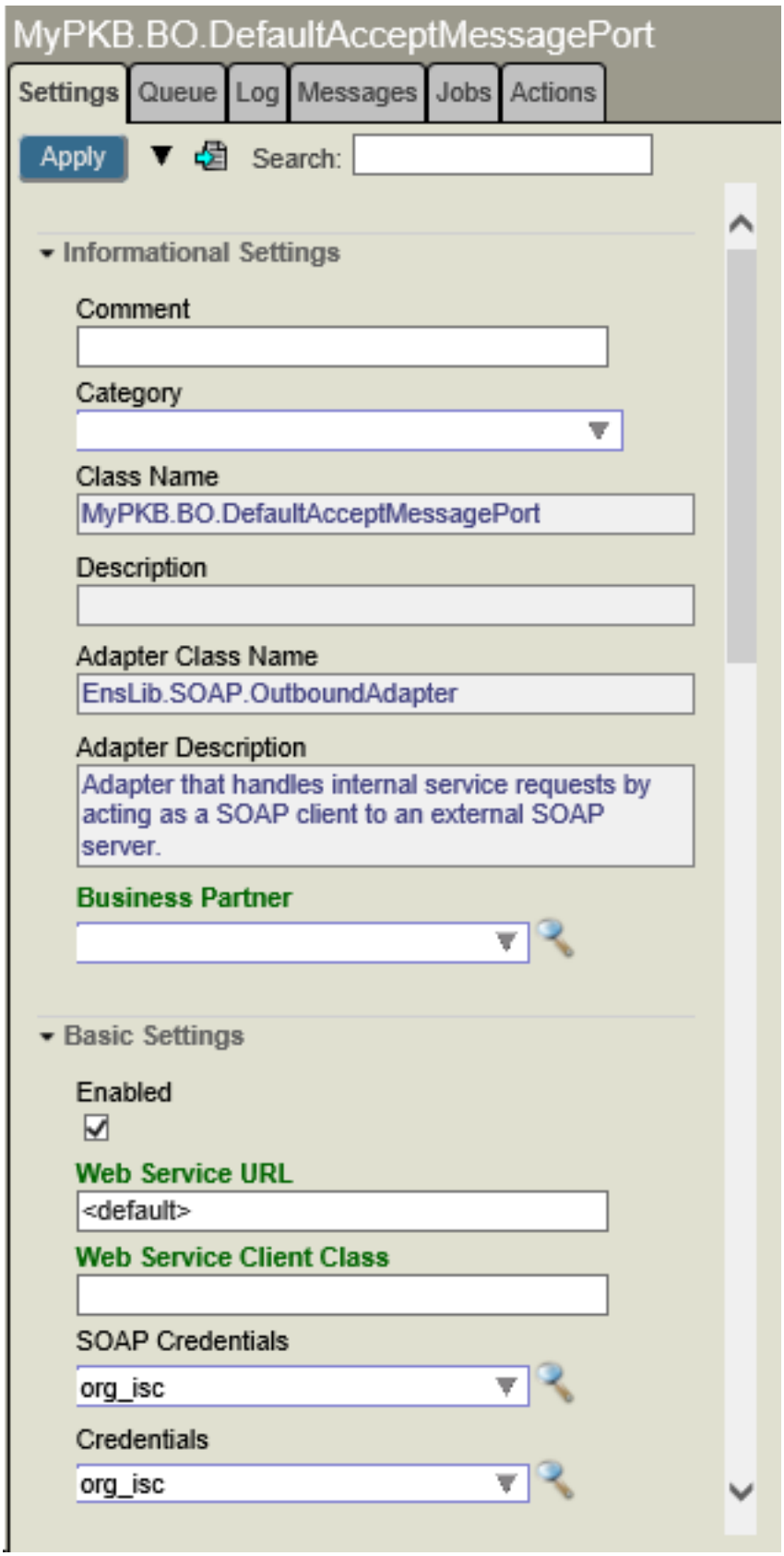
Recompile the class again.

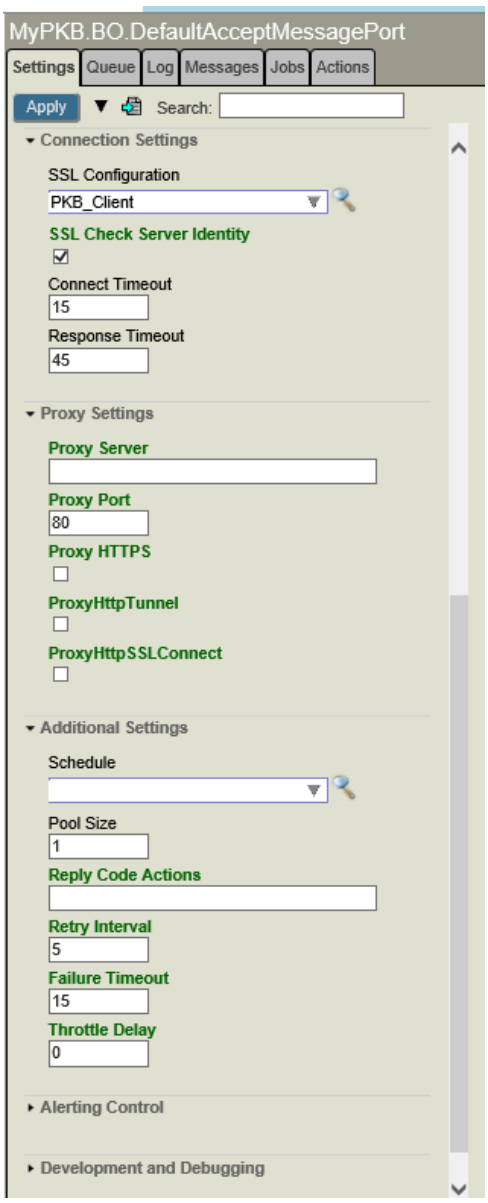
3.5 Add the newly created MyPKB SOAP Client into a demo HL7 Production

1. Create or re-use a demo HL7 Production.

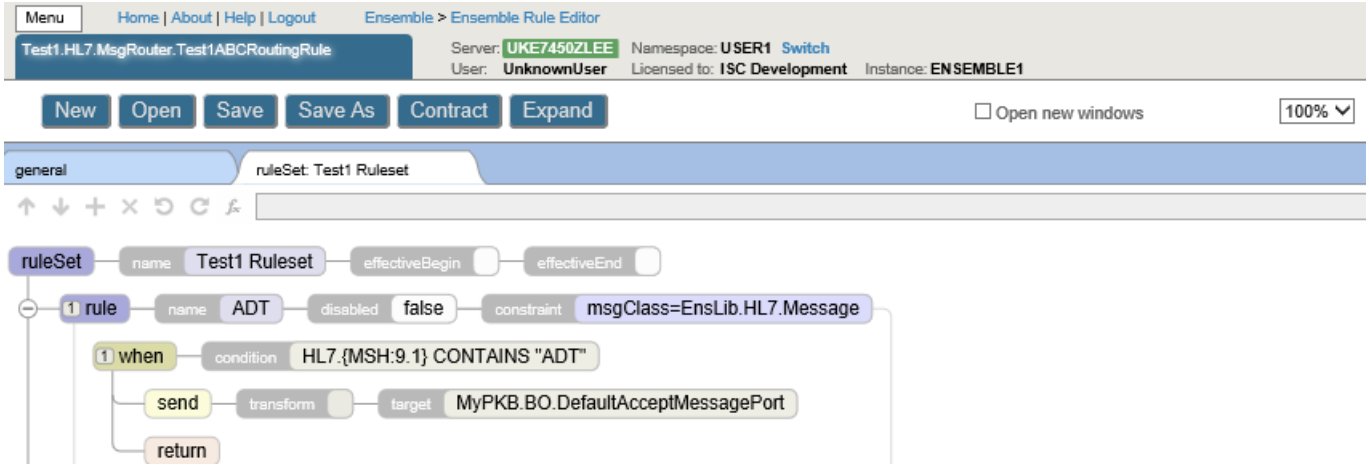
2. Add the newly created "MyPKB.BO.DefaultAcceptMessagePort" BO class into the production (click "+" beside "Operations")

3. Configure it as follows, for example:

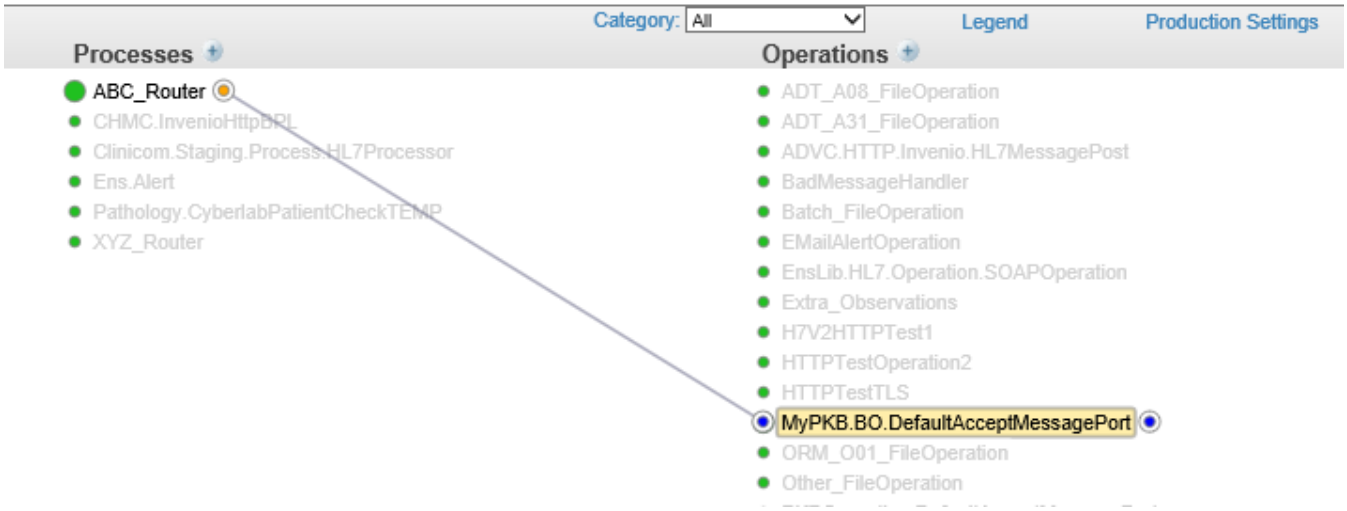

MyPKB.BO.DefaultAcceptMessagePort
Settings
Queue
Log
Messages
Jobs
Actions
Apply
Search:
Informational Settings
Comment
Category
Class Name
MyPKB.BO.DefaultAcceptMessagePort
Description
Adapter Class Name
EnsLib.SOAP.OutboundAdapter
Adapter Description
Adapter that handles internal service requests by acting as a SOAP client to an external SOAP server.
Business Partner
Basic Settings
Enabled
Web Service URL
<default>
Web Service Client Class
SOAP Credentials
org_isc
Credentials
org_isc



3.6 Optionally, we can link a HL7 V2 BP to this PKB Client BO via "EnsLib.HL7.Message" request:



So in the demo production, it will be shown as below, for example:



4. Testing

Now let's use the Ensemble Production's *"Test"* facility to do a quick test on the demo "ABCRouter":

ABC_Router

ABC_Router
Production Demo.HL7.MsgRouter.Production

Request Type: EnsLib.HL7.Message

Request Details

HL7 document content:

```
MSH|^~\&|IHCS-PAS|NHS TIE1|||20160120083519||ADT^A01|252728|P|2.4|||AL
EVN|A01|20160120083519
PID||Q1ob|1007700^^^^HOS~0501230^^^^KOR||Adhoc16204^Test^REG^^MR||19660101|M|||1 THE STREET^NEW
TOWN^TORQUAY^^TQ1 1XX^^P~1 THE STREET^NEW TOWN^TORQUAY^^TQ1 1XX^^M||01234
122122~07654221221|||U|C1^Clinician|||||A^WHITE - BRITISH||||||""|N||03
PD1|||STOKENHAM SUR^^L83148^Q2483~THE SURGERY^^L83148^Q2483|G8813253^TEST^.^^^Dr~ABC
PV1||I|CRO^^Bay C Bed 18^^^^TORBAY
HOSPITAL^^CROMIE|C||||G8813253^TEST^A.^^^MR|BRAD^BRADBROOK^R.A.^^^MR^13|13||||1||N||N|29080||||||||
||||||||||||||||201601200834
PV2|||3||||||3
AL1||^FREE TEXT|PENICILLIN|||20160119
```

HL7 document object properties:

ParentId:

CacheSegsGotten: ☑

TimeCreated: 2017-08-01 12:33:22.141

Source:

IsMutable: ☑

OriginalDocId:

AutoBuildMap: ☐

DocType: 2.4:ADT_A01

Envelope:

Separators: |^~\&

Invoke Testing Service

Test Results

Cancel OK

And we would expect to get the response such as this, then it means the integration with PKB Service (Test environment) has been working end-2-end:

ABC_Router

Clinicom.Staging

ABC_Router
Production Demo.HL7.MsgRouter.Production

Request Type: EnsLib.HL7.Message

Request Details

Test Results

Session Id: 522 Visual Trace
Request Sent: 2017-08-01 12:37:19.613
Response Received: 2017-08-01 12:37:19.915

EnsLib.HL7.Message

HL7 **ACK_A01** Message - Id = **118**, DocType = '**2.4:ACK**',Message Type Category = '2.4'
'*General acknowledgment message - Admit / visit notification*', **2** Segments

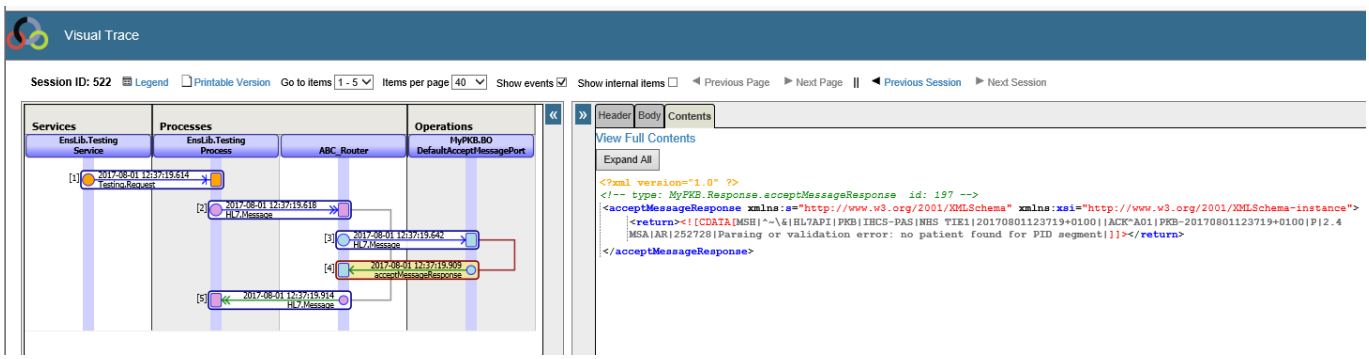
1	MSH | ^~\& | EnsembleHL7 | ISC | IHCS-PAS | NHS TIE1 | 201708011237 | - | ACK ^ A01 | 252728 | P | 2.4
2	MSA | AA | 252728

HL7 document object properties:

<ObjectId>	118
ParentId	
TopParentId	
CacheSegsGotten	1
TimeCreated	2017-08-01 12:37:19.913
Source	117
IsMutable	0
OriginalDocId	
BuildMapStatus	OK
AutoBuildMap	0
DocType	2.4:ACK
Envelope	
Separators	|^~\&
FS	|
CS	^
RS	~
ESC	\
SS	&
SegmentTerminator	
MessageTypeCategory	2.4
Name	ACK_A01
TypeVersion	2.4
Identifier	252728
SegCount	2
ChildCount	0
ParentIds	
RawContent	MSH|^~\&|EnsembleHL7|ISC|IHCS-PAS|NHS TIE1|2017080...
DocTypeCategory	2.4
DocTypeSecondary	ACK
DocTypeName	ACK
FullSize	92

Cancel OK

And its Ensemble message viewer for this transaction would be such as this:



5. Follow-up questions?

Again, this article only describes a demo integration between Health Connect (Ensemble) and PKB Service in its Test environment. If you have any further requirements including production grade functional and non-functional requirement, please do not hesitate to contact an Intersystems Sales Engineer, or Intersystems WRC at support@intersystems.com - we are always happy to support you anytime.

6. Acknowledgement

Special thanks to Abdul Kazi and Alice Shrestha, of Chelsea and Westminster Hospital NHS Trust, who kindly organised an additional review with PKB service team on this article.

#API #Business Operation #SOAP #HealthShare

Source URL:https://community.intersystems.com/post/healthconnect-ensemble-integration-pkb-service