Article
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HealthConnect (Ensemble) Integration with PKB Service

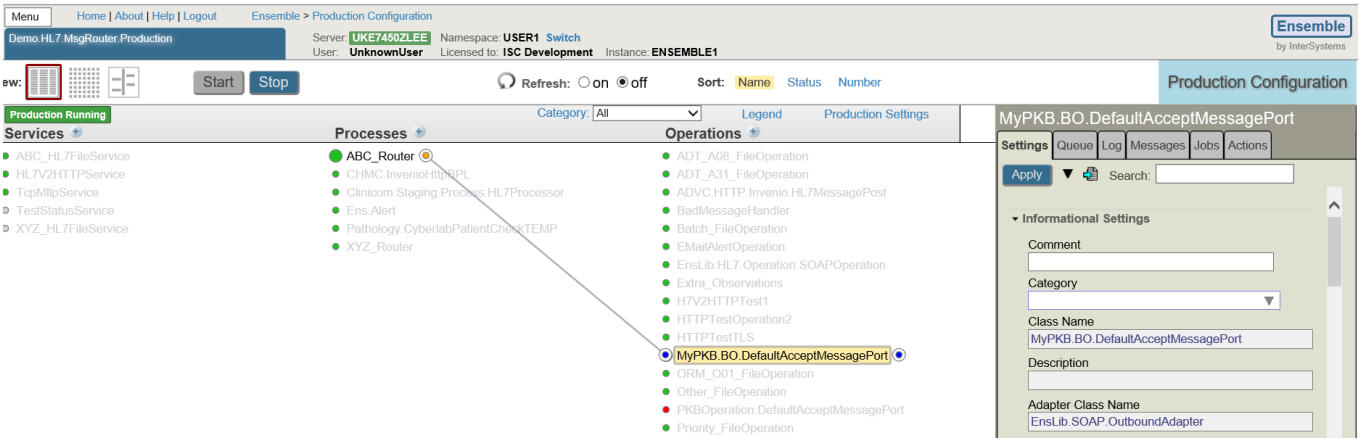
1. Scope and Objective:

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:

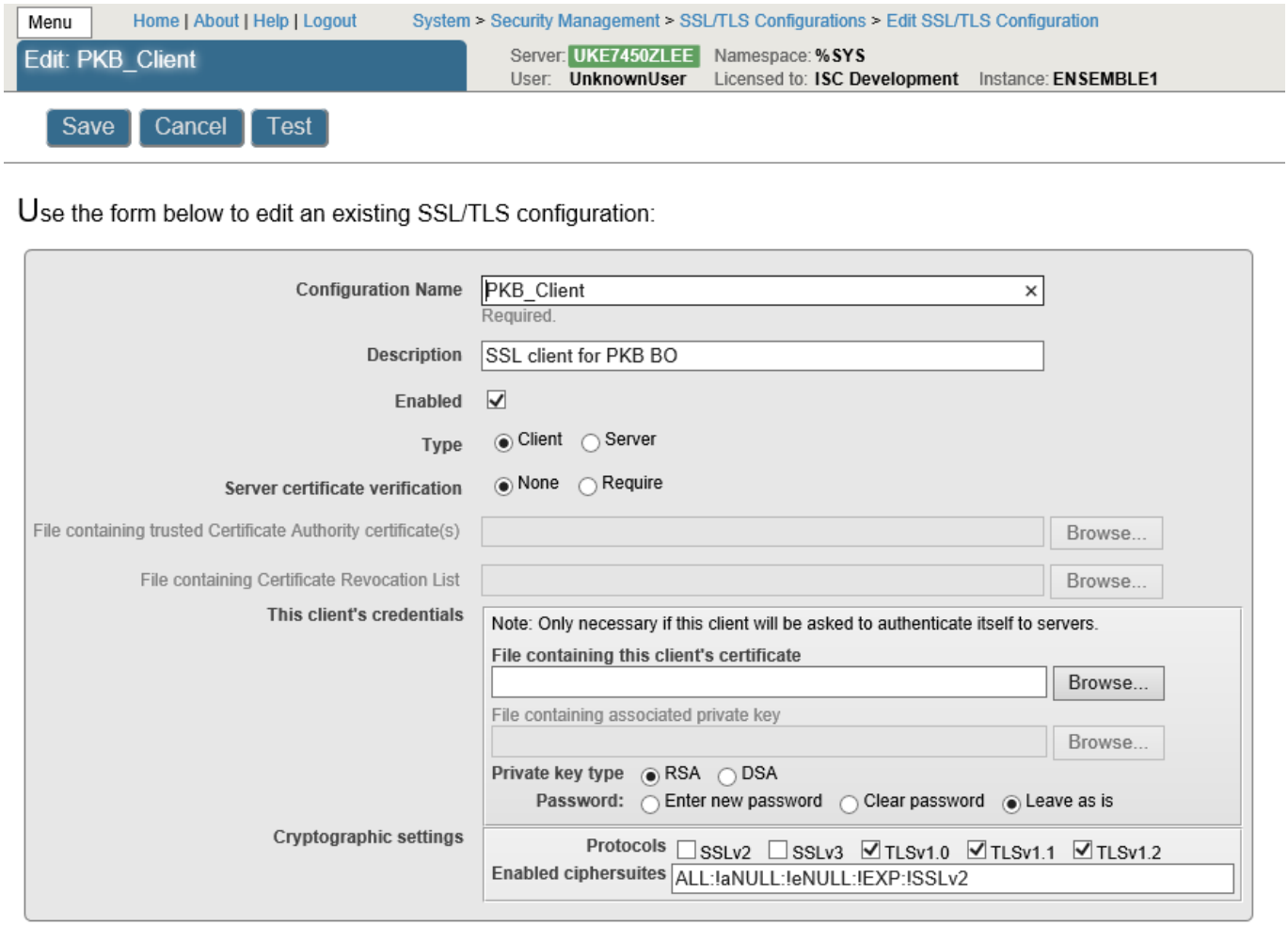
The following end-2-end implementation steps are done in a testing Ensemble instance. We will use Ensemble Studio's "SOAP Wizard" tool to create a new PKB SOAP Client (Business Operation in Ensemble terms) on an existing HL7 V2 demo production, then we will simply link an existing BP(Business Process) 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:

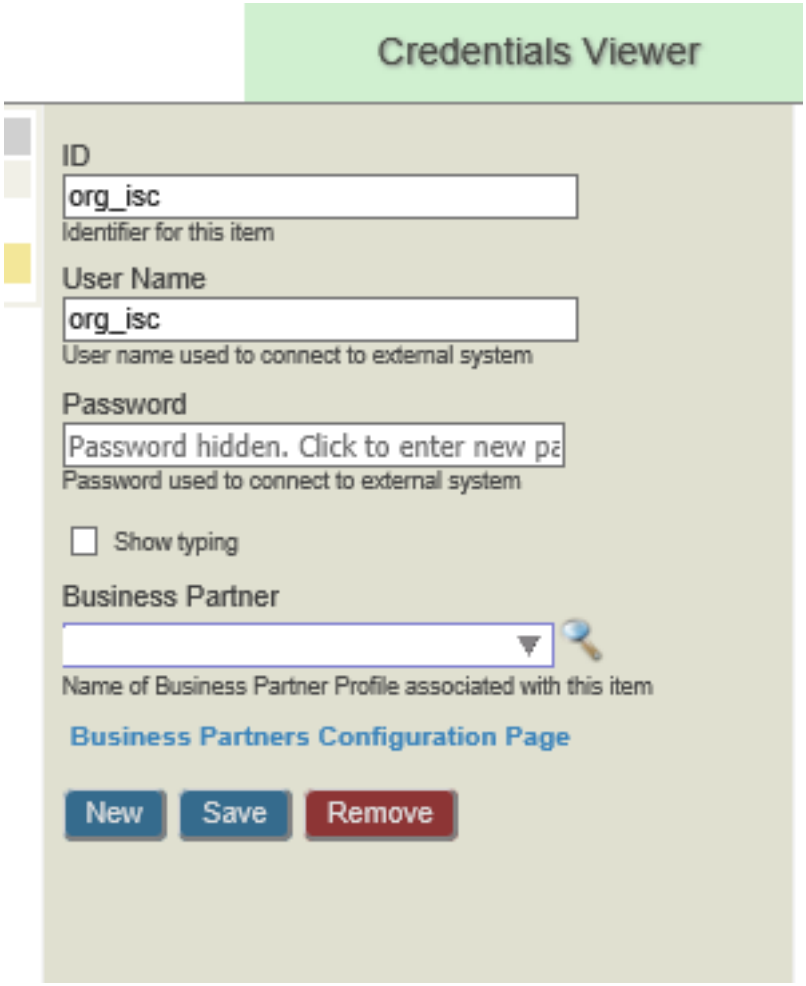
3.1.1 Create a basic SSL/TLS Configuration called e.g. "PKBClient":



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*)



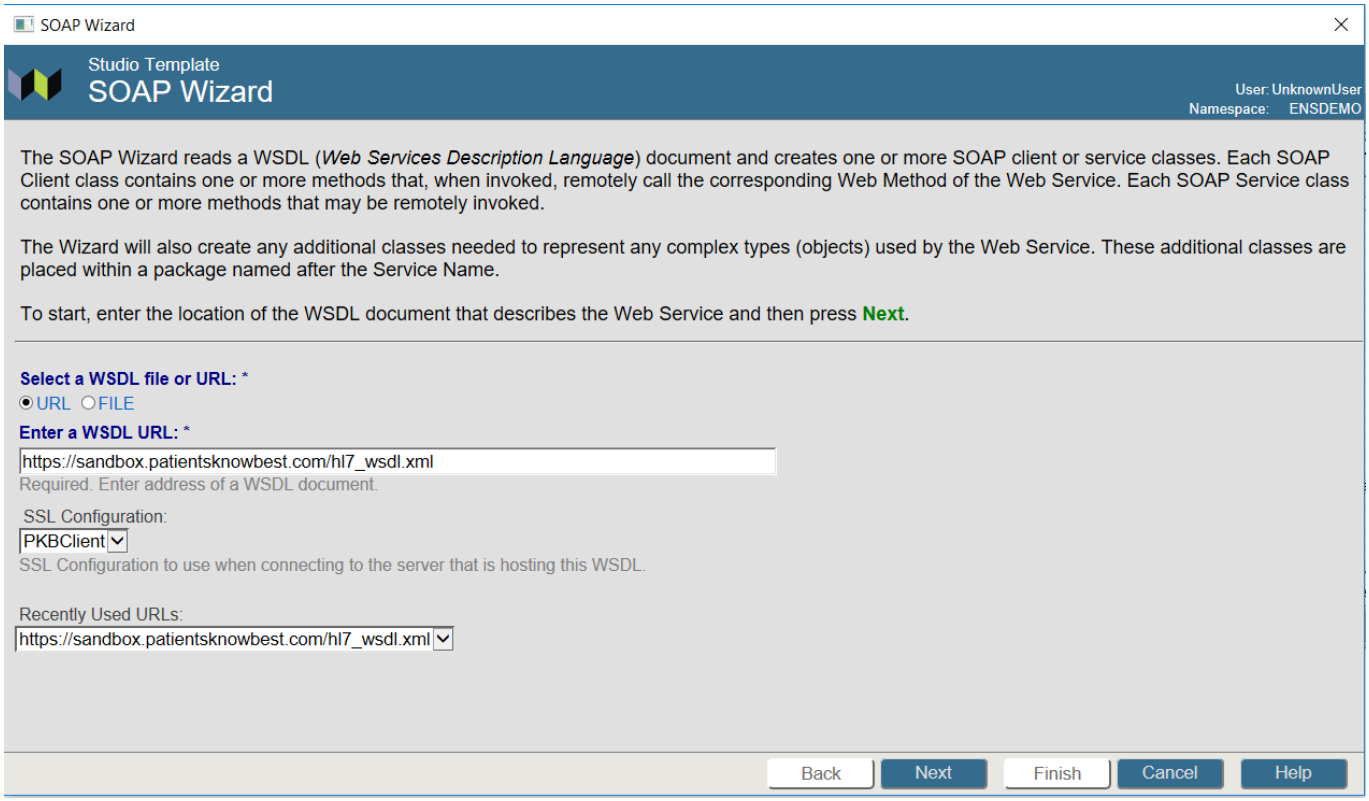
3.2 Use "SOAP Wizard" to create PKB SOAP Client BO Package:

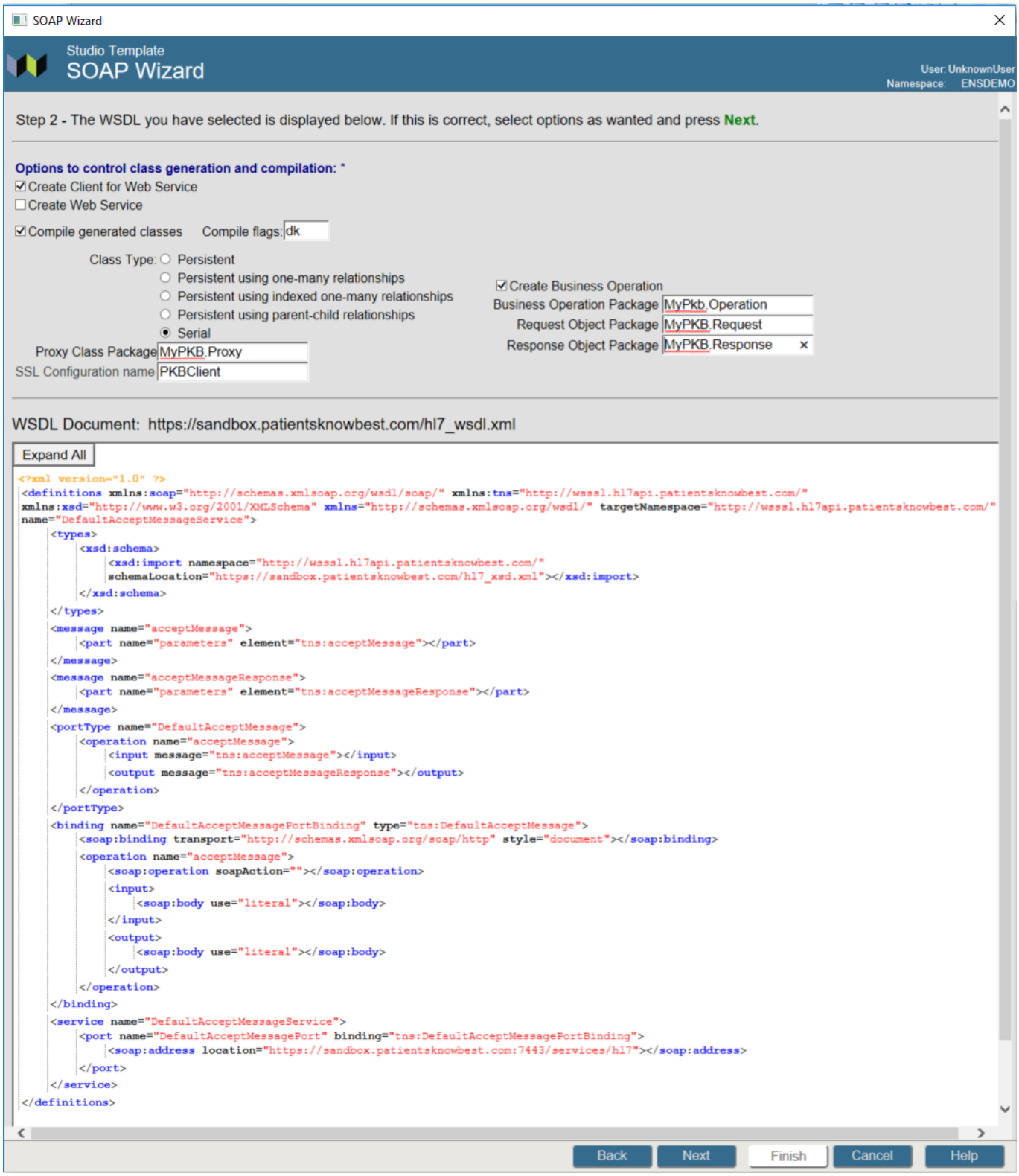
3.2.1 Start "SOAP Wizard" from Ensemble Studio:

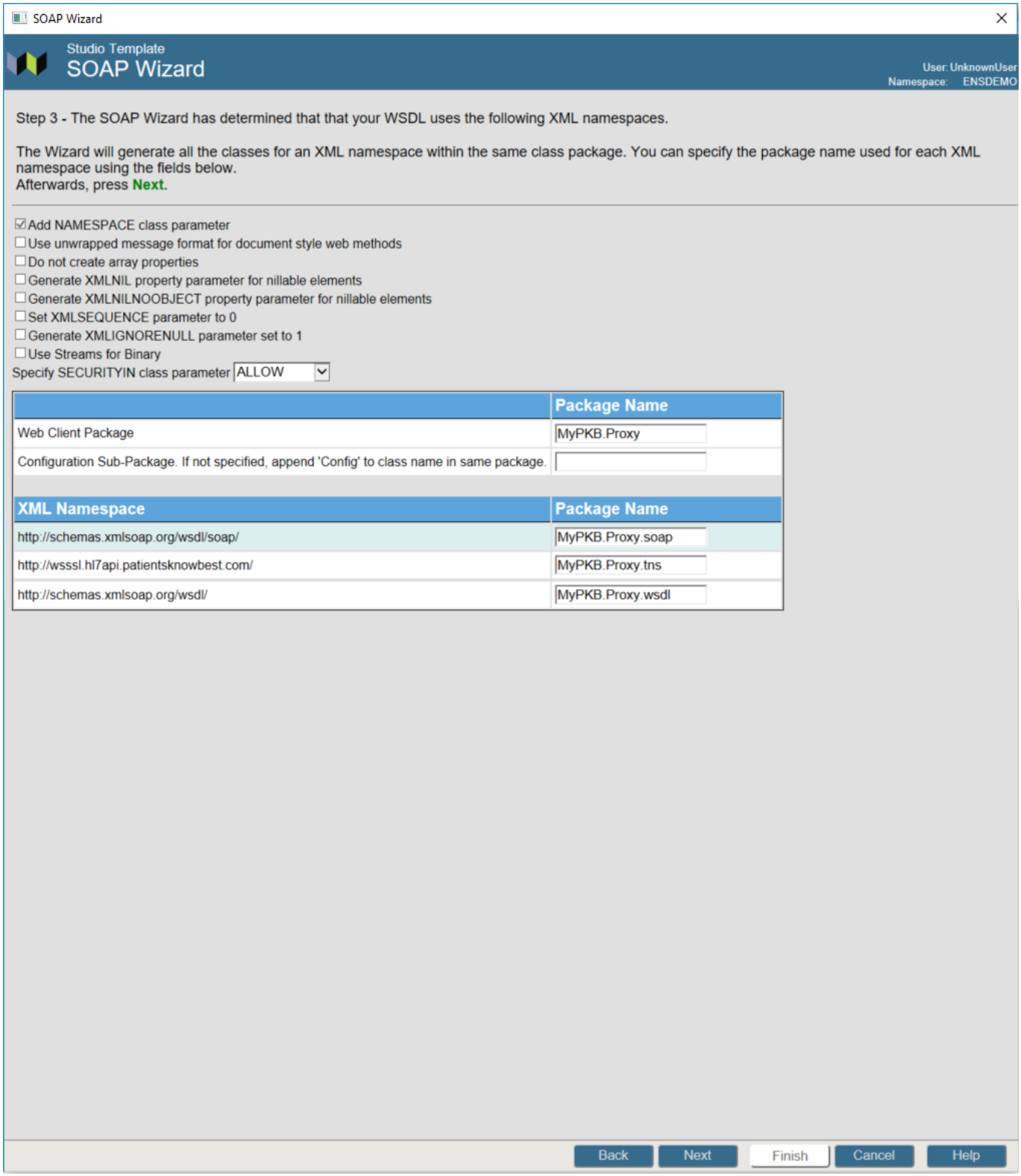
Start *"Studio";* go to right namespace such as "*TEST1*"; Click menu *"Tools" -> "Add-Ins" -> "SOAP Wizard"*

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.

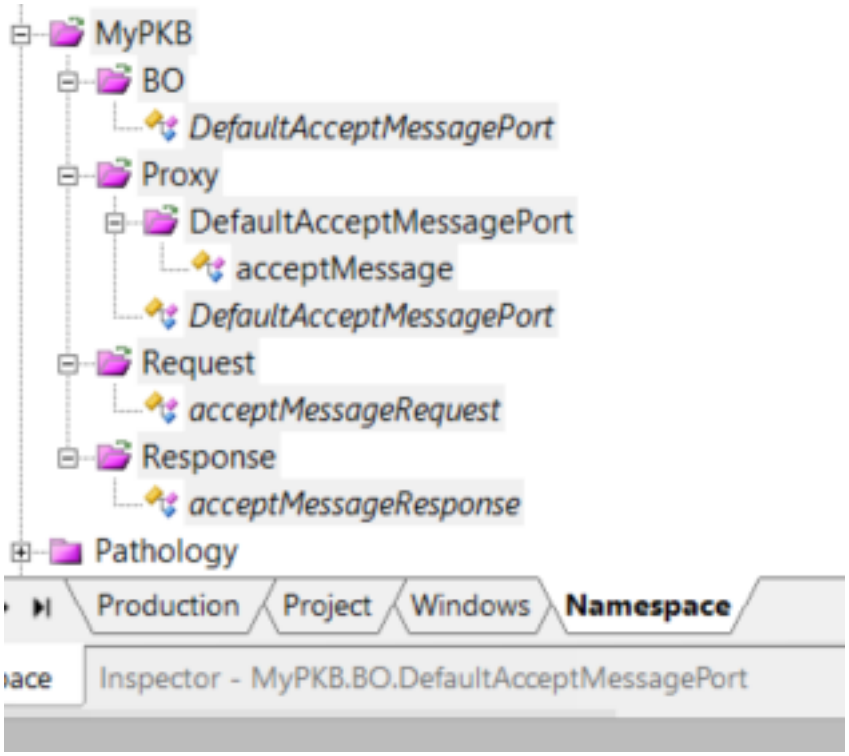

SOAP Wizard
Studio Template
SOAP Wizard
User: UnknownUser
Namespace: ENSDEMO
The SOAP Wizard reads a WSDL (Web Services Description Language) document and creates one or more SOAP client or service classes. Each SOAP Client class contains one or more methods that, when invoked, remotely call the corresponding 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);
```

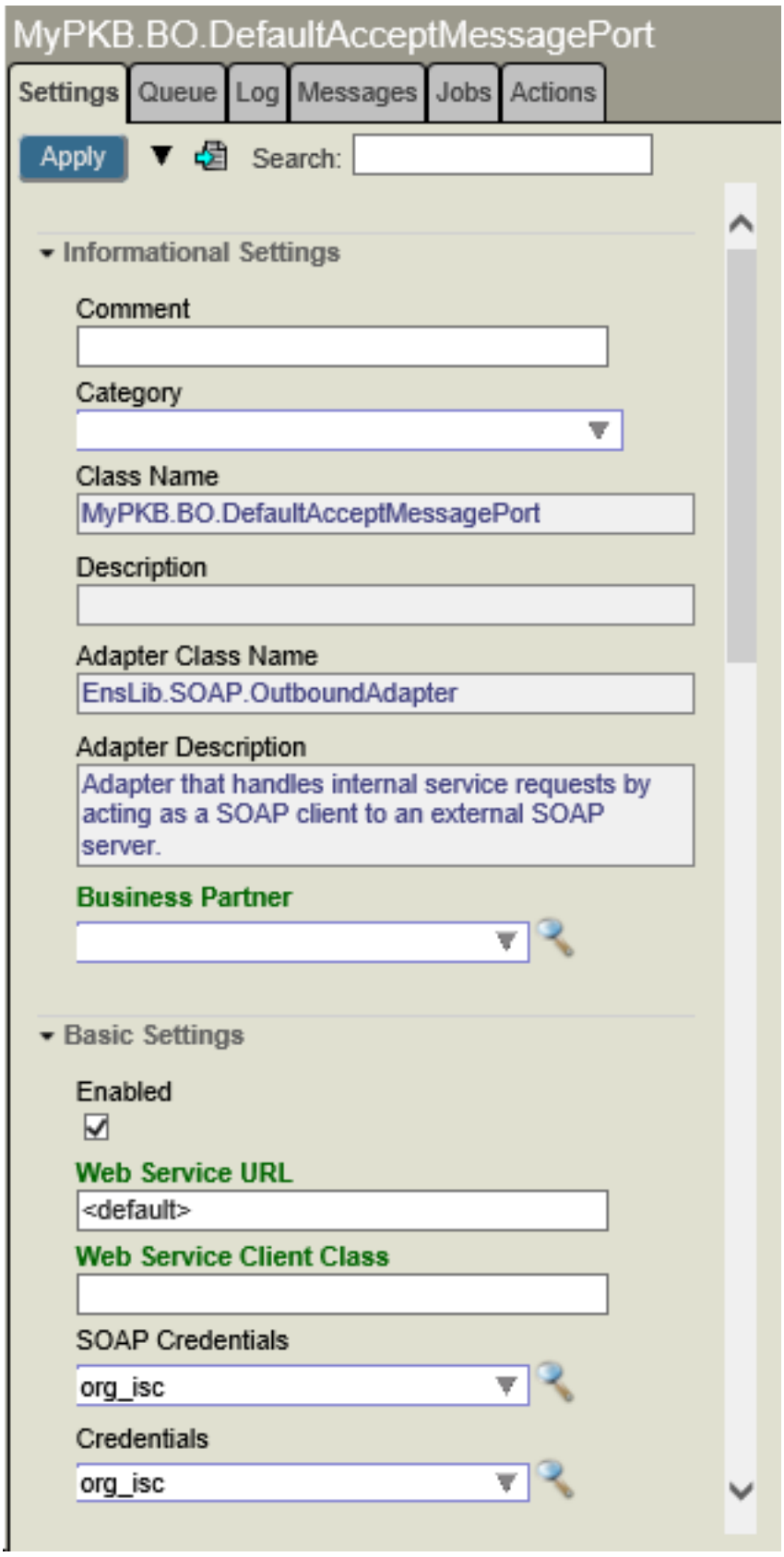
Recompile the class again.

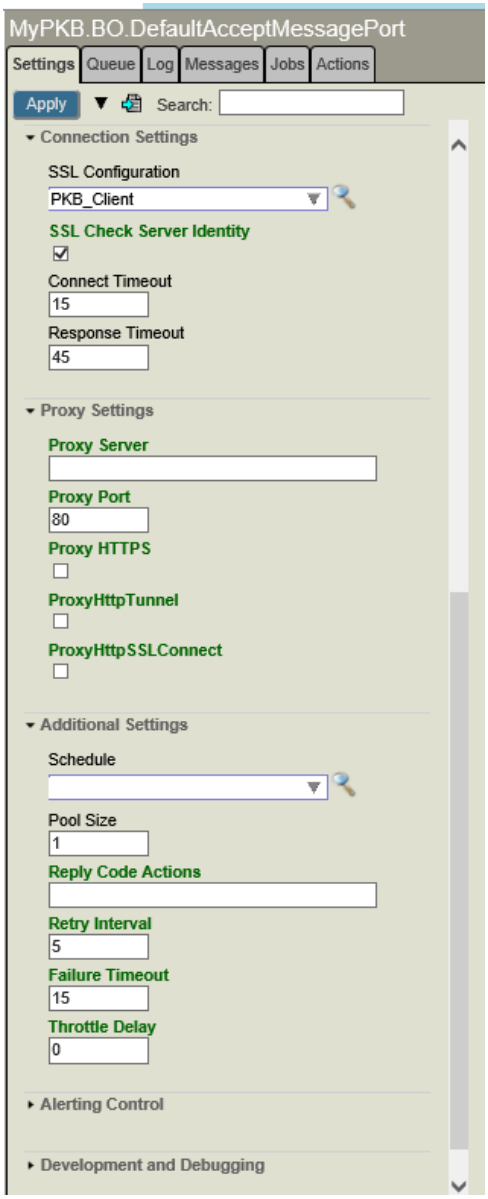
3.5 Add the newly created MyPKB SOAP Client into a demo HL7 Production

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

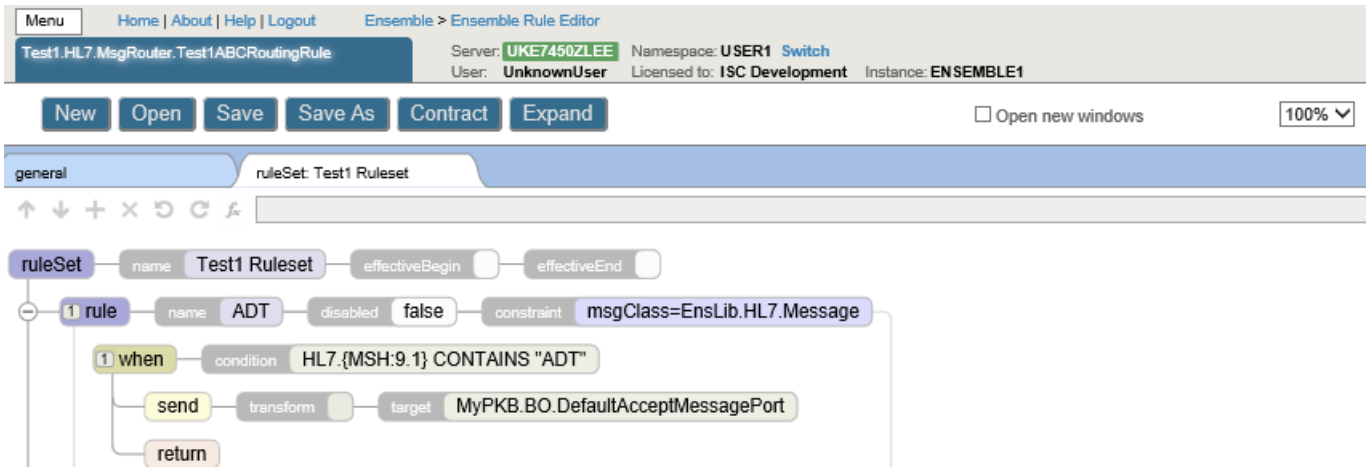
2. Add the newly created "MyPKB.BO.DefaultAcceptMessagePort" BO class into the production (click "+" beside "Operations")

3. Configure it as follows, for example:

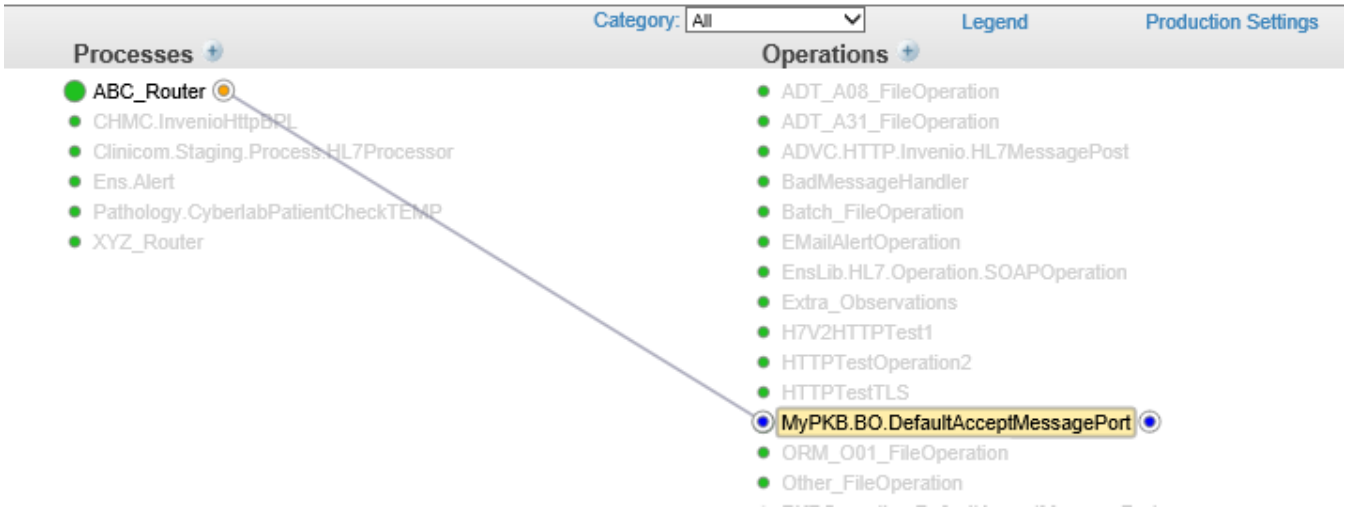

MyPKB.BO.DefaultAcceptMessagePort
Settings
Queue
Log
Messages
Jobs
Actions
Apply
Search:
Informational Settings
Comment
Category
Class Name
MyPKB.BO.DefaultAcceptMessagePort
Description
Adapter Class Name
EnsLib.SOAP.OutboundAdapter
Adapter Description
Adapter that handles internal service requests by 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:

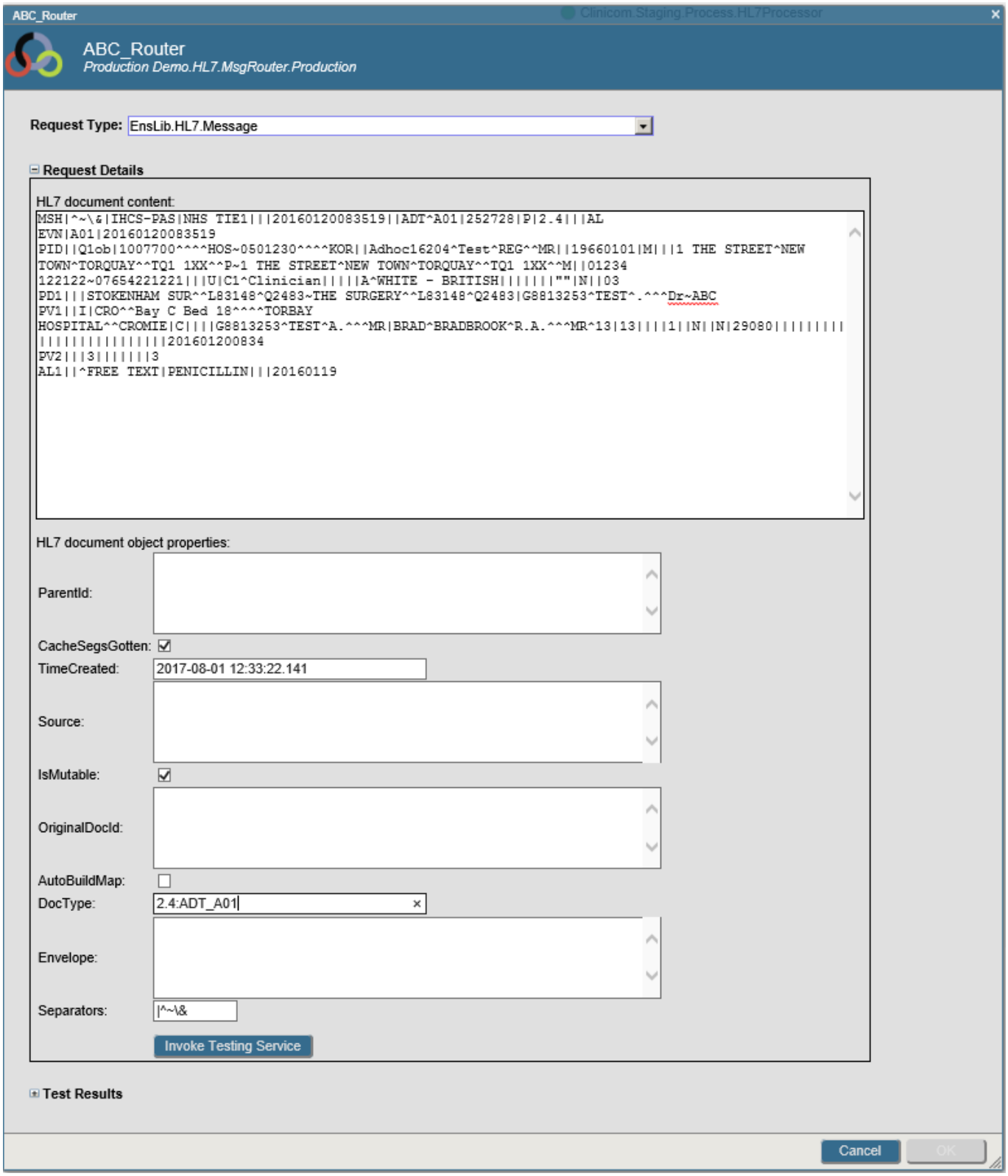


So in the demo production, it will be shown as below, for example:

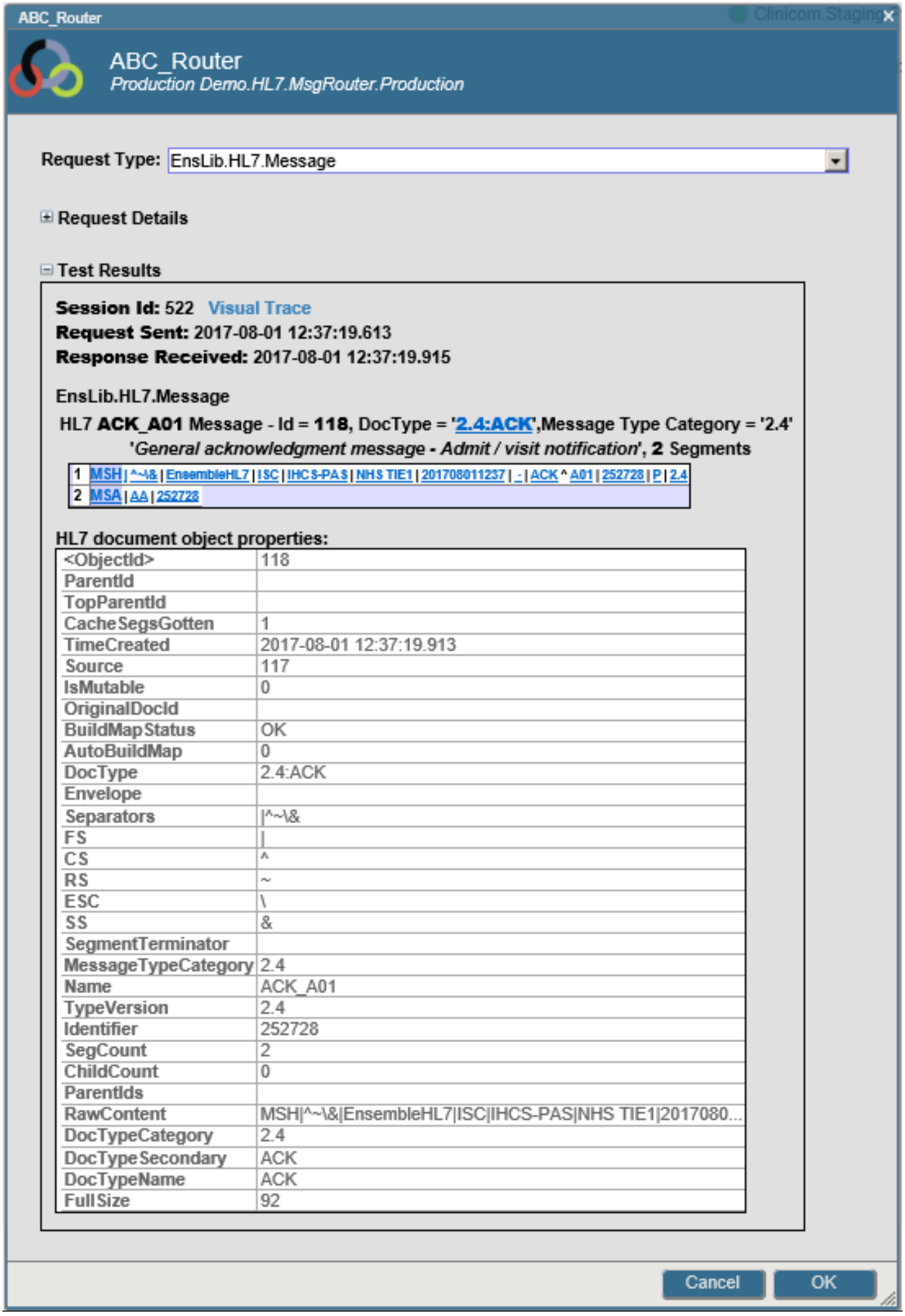


4. Testing

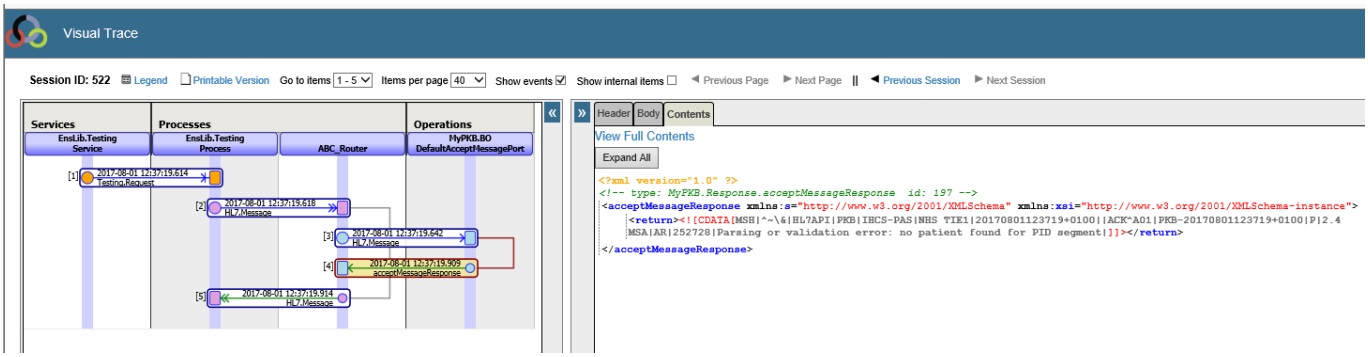
Now let's use the Ensemble Production's *"Test"* facility to do a quick test on the demo "ABCRouter":



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 #Health Connect #HealthShare

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