SupportPac LA71: IBM Operational Decision Manager Integration for WebSphere Process Server

Getting started

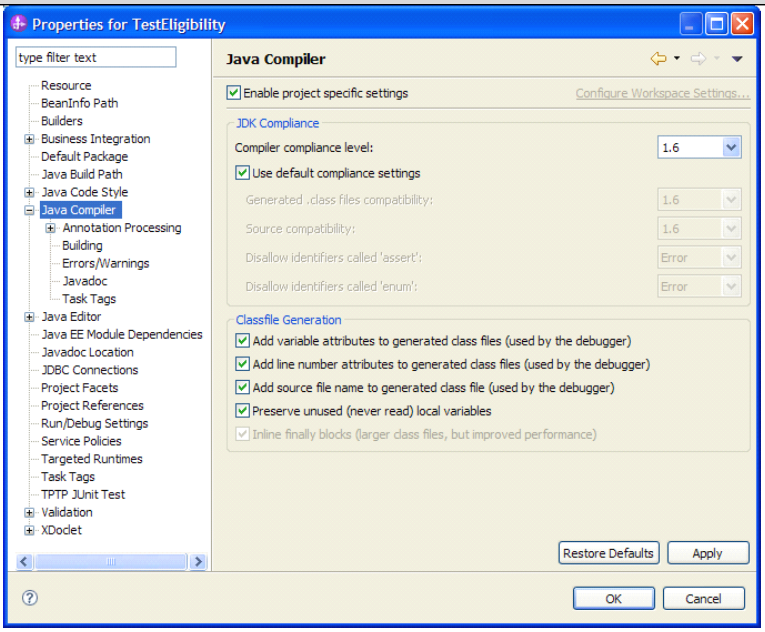
Copyright

Copyright notice

Trademarks

Key reference notes

Passwords, shortcuts, and properties

Password information (credentials also provided in-line with the tutorial)	
Rule Execution Server Console	User: admin Password: admin
IBM Process Server	User: admin Password: admin
Names and locations of server processes, workspaces, etc.	
Tutorial files	[SupportPac LA71 Path]\tutorial\
Completed workspaces for steps	[SupportPac LA71 Path]\tutorial\part_x\*_PI.zip (Import into an empty Eclipse workspace using Project Interchange. Note that some directories exist but do not contain a workspace by design.
Empty tutorial workspace area	[SupportPac LA71 Path]\tutorial\workspace\ Example: C:\Program Files\IBM\ODM801\SupportPacLA71v2.1\tutorial\workspace\
Properties	
Java compiler properties for the IID project containing artifacts from SupportPac LA71	

Properties for TestEligibility

Java Compiler

☑ Enable project specific settings

JDK Compliance

Compiler compliance level: 1.6

☑ Use default compliance settings

Generated .class files compatibility: 1.6

Source compatibility: 1.6

Disallow identifiers called 'assert': Error

Disallow identifiers called 'enum': Error

Classfile Generation

☑ Add variable attributes to generated class files (used by the debugger)

☑ Add line number attributes to generated class files (used by the debugger)

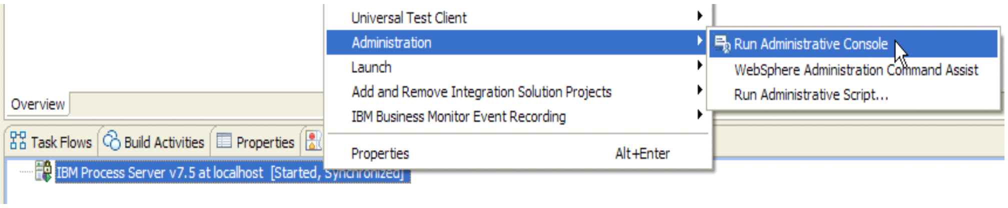
☑ Add source file name to generated class file (used by the debugger)

☑ Preserve unused (never read) local variables

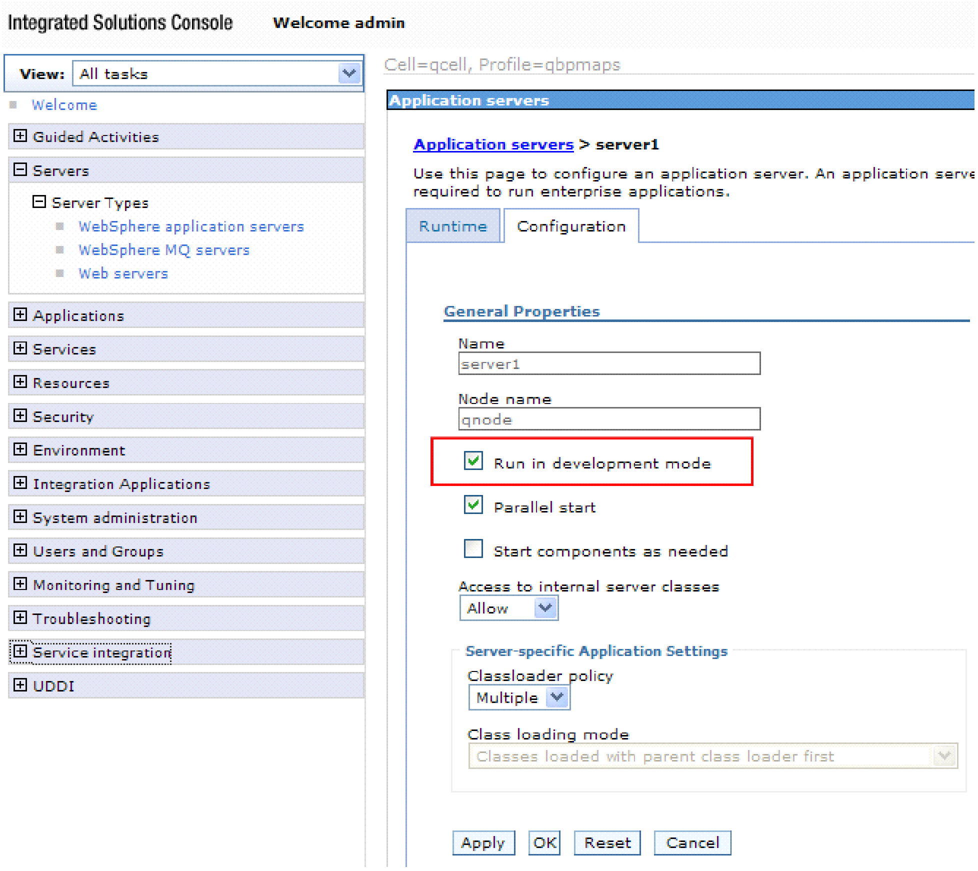
☑ Inline finally blocks (larger class files, but improved performance)

Ensure that the instance of IBM Process Server is running in development mode

Run the Admin console


Universal Test Client
Administration
Launch
Add and Remove Integration Solution Projects
IBM Business Monitor Event Recording
Properties Alt+Enter
Run Administrative Console
WebSphere Administration Command Assist
Run Administrative Script...
Overview
Task Flows
Build Activities
Properties
IBM Process Server v7.5 at localhost [Started, Synchronized]

Navigate to this panel and check the box for development mode:



Application servers > server1

Use this page to configure an application server. An application serve
required to run enterprise applications.

Name: server1

Node name: qnode

☑ Run in development mode

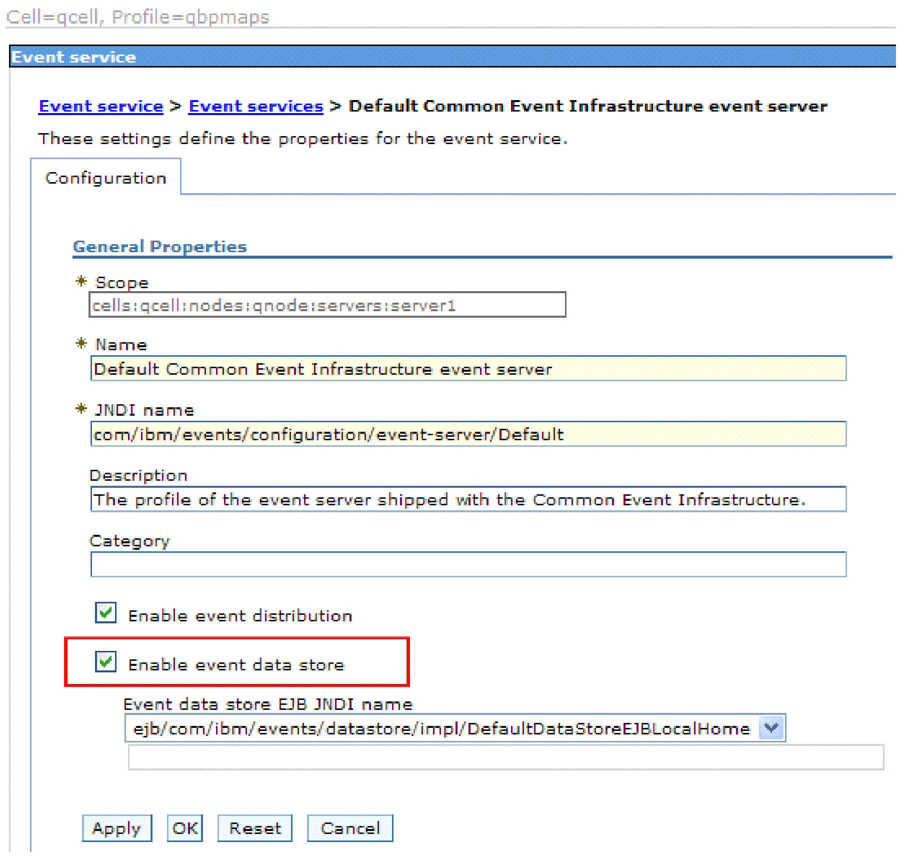
☑ Parallel start

☐ Start components as needed

Access to internal server classes: Allow

Classloader policy: Multiple

Class loading mode: Classes loaded with parent class loader first

Ensure that the CEI event data store is enabled	Run the Admin console Navigate to *Service integration > Common Event Infrastructure > Event service > Event services > Default Common Event Infrastructure event server* and check the box for enable event data store:  Cell=qcell, Profile=qbpmaps Event service Event service > Event services > Default Common Event Infrastructure event server These settings define the properties for the event service. Configuration General Properties * Scope cells:qcell:nodes:qnode:servers:server1 * Name Default Common Event Infrastructure event server * JNDI name com/ibm/events/configuration/event-server/Default Description The profile of the event server shipped with the Common Event Infrastructure. Category ☑ Enable event distribution ☑ Enable event data store Event data store EJB JNDI name ejb/com/ibm/events/datastore/impl/DefaultDataStoreEJBLocalHome
Initialize the Rule Execution Server (RES) databases	In a Web browser, open RES Console with the following URL http://localhost:9080/res Login the RES console with **admin** password **admin**. **Initialize RuleApp persistence:** In **Step 1 – Welcome** – check the details and Click **Next**. In **Step 2 – Database Schema** – ensure **derby** is selected and click **Next**. In **Step 3 - Review Schema** – ensure Create SQL schema “ilog” is selected and click **Execute**. In **Step 4 – Installation Manager Report** – click **Finish**. **Initialize Java XOMs persistence:** In **Step 1 – Welcome** – check the details and click **Next**. In **Step 2 – Choose the database Schema** - ensure **derby** is selected and click **Next**. In **Step 3 – Review Schema** – click **Execute**. In **Step 4 – Report** – click **Finish**.

Tutorial objectives

There are many starting points when using IBM Operational Decision Manager (ODM) with BPM and IBM Process Server in particular to build flexible and dynamic BPM applications. You can start in the Rule Developer role and capture the business logic in business rules or you can start in the IT Developer Role and create the business process. In this tutorial, we explore how to bring a rule project and an integration project together at different points in their life cycle. You will start as the Rule Developer, building business rules and testing. You will then take on the IT Developer role and define the process and integrate the rules into the business process. This will empower one to know how to make good decision based on needs at the time. In more general terms, tutorial participants should walk away with the following skills:

1. How to identify the required artifacts to build a rule project.
2. How to establish the best times to integrate a rule project (ODM) with an integration project (BPM).
3. How to take steps to make the process of integration easier.
4. How to establish clear criteria for integration choices—APIs, wizards, standards and the like.
5. How to engineer for reuse and minimize the cost of refactoring.
6. How to bring a rule project into an integration project using perspectives.
7. How to do end-to-end testing from IBM Integration Designer (IID) into a deployed ODM decision.
8. How to use CEI events that contain Decision Service traces for basic debugging requirements.
9. How to bring business users into the process life-cycle using ODM tooling.

Prerequisite knowledge

- General knowledge of IBM Operational Decision Manager, IBM Integration Designer, and WebSphere Business Process Management
- General knowledge of business rules

Introduction

Business Process Management (BPM) and Decision Management (DM) are two technologies that are used to improve the agility, flexibility and efficiency of operational processes. Many people have questions about the differences between the two, or use the terms interchangeably—there are, however, clear differences in terms of the functionality and value of each. BPM is focused on defining, orchestrating and monitoring long running processes that are comprised of both people- and system-based activities. DM is focused on defining, maintaining and executing decision logic that is used at specific points within a process or as part of automated decisions within business systems. Overall, the complement, or synergy, between BPM and DM is about reaching further—expanding the breadth of problems that can be solved with a single solution. Both technologies share goals such as improving the efficiency and visibility of business processes, but they do so at different levels in a solution.

While it is true that BPM thrives on Service Oriented Architecture (SOA) and open architectures, it cannot by itself replace many of the systems it orchestrates. At the same time, the drive for transparency and encapsulation of business logic still remains for those existing systems. DM can open up existing systems, provide extended levels of transparency and allow both BPM and existing applications to share more than ever before. The synergy relies on the difference in orientation between BPM and DM.

First, consider the following comparison:

BPM orchestrates and improves business processes
- Flow orientation
- Human orientation
- Crosses system and organization boundaries
- Process-oriented transparency—driving awareness and improvement of business processes to an increased set of stakeholders
- Long and short running

DM expresses and automates business decisions
- Data orientation
- Encapsulates to a single boundary of a decision
- Promotes reuse for any client (BPM and otherwise)
- Decision-oriented transparency—increasing visibility of decisions driving critical business applications and processes
- Straight through processing

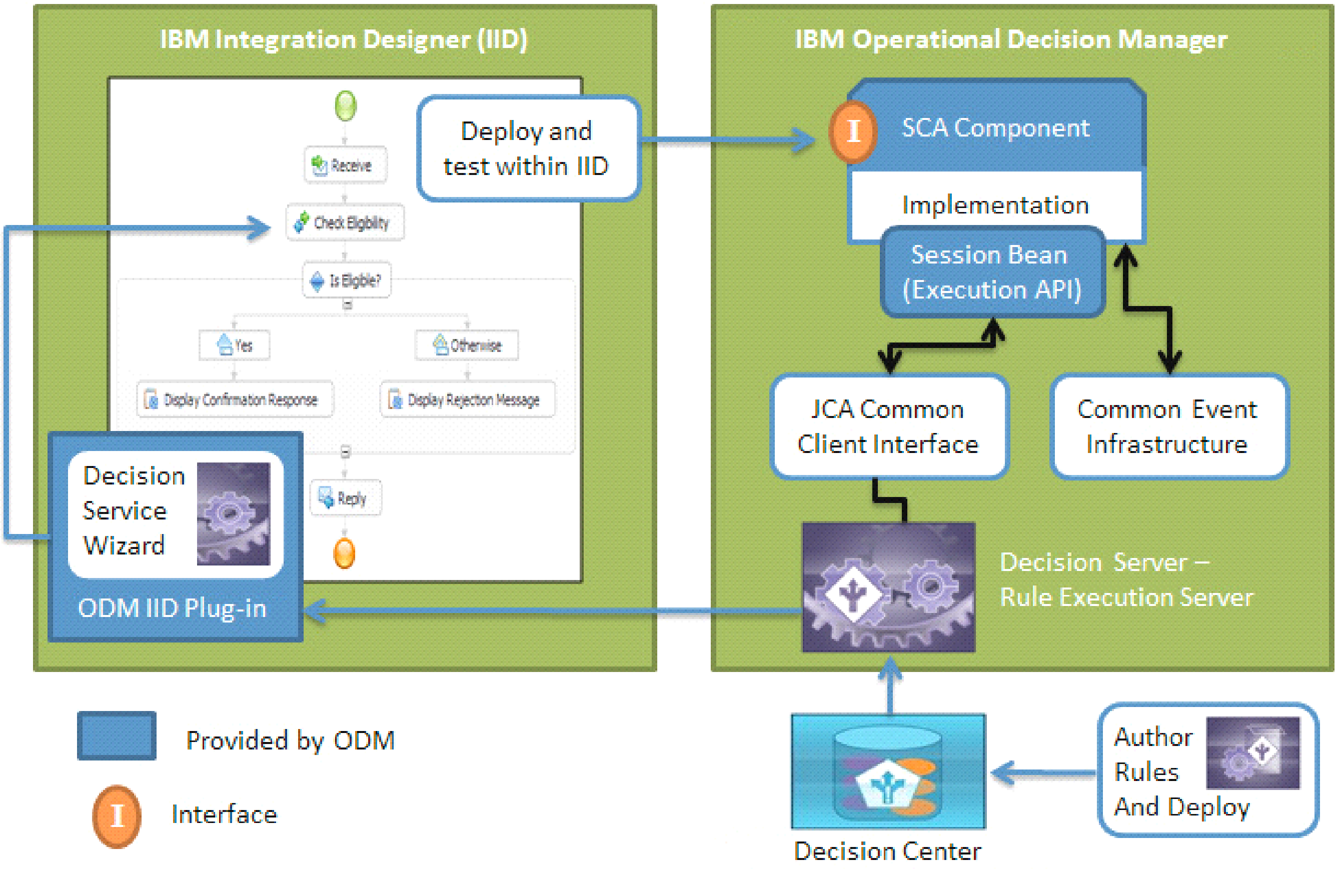
While BPM focuses on the overall business process, DM automates and encapsulates business decisions at every level of a solution. When they work together, BPM can resolve problems related to silos and inefficient human interactions with systems and each other, while DM employs data validation, transformation and selection to automate tasks or make a step in a process (or application) more productive and predictable.

While the orientations of the technologies may be orthogonal, they depend upon a contractual relationship that is typical in an SOA. For example, in the case of SOAP, the service signature is defined by a WSDL, an XML schema (XSD) and a policy. The XSD may in turn be shared among all upstream and downstream integration points within a business process, and is a critical artifact in the integration between BPM and a DM.

Managing a decision and authoring rules is primarily focused on data. At design time, a DM presents decision content to business users for authoring and management, since they understand the content directly and make the better owner. They also benefit from separating the DM life cycle from the BPM life cycle to support rapid changes to decisions that are owned by the business. Business process models tend to change less frequently than decisions, and the overall business goals may be maintained while operationally the frequency of change continues at different rates between all of the participating life cycles.

For integrating ODM and business process created with IBM BPM, there are two options.   The first option is to integrate through Web Services. All ruleapps are exposed on the Rule Execution Server (RES) as Web Services with WSDL interfaces and these interfaces can be used directly in BPM applications with a Web Service import . The second option is to use the support provided by IBM Operational Decision Manager LA71 SupportPac. With the SupportPac, the specific rulesets of the ruleapps can be selected to be exposed as SCA components where they can then be wired to other components.

The scenario for this tutorial is to build an insurance quote process that uses ODM to capture the business logic in determining whether a driver is approved for insurance. While the quote process and the eligibility rules are fairly simplistic, they show the integration and can be expanded for more complex processes and rules.

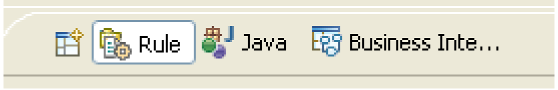

IBM Integration Designer (IID)
Receive
Check Eligibility
Is Eligible?
Yes
Otherwise
Display Confirmation Response
Display Rejection Message
Reply
Deploy and test within IID
Decision Service Wizard
ODM IID Plug-in
IBM Operational Decision Manager
I
SCA Component
Implementation
Session Bean (Execution API)
JCA Common Client Interface
Common Event Infrastructure
Decision Server – Rule Execution Server
Decision Center
Author Rules And Deploy
Provided by ODM
I
Interface

Part 1: Creating a rule project with an existing XSD model

The existence of a reusable model is one of the single more important artifacts for both a project in Rule Designer and IBM Integration Designer. This data represents a contract for many integration points. Moreover, the more mature a model is, then the more refactoring of project content can be avoided.

Let's start by creating a rule project from an existing XSD:

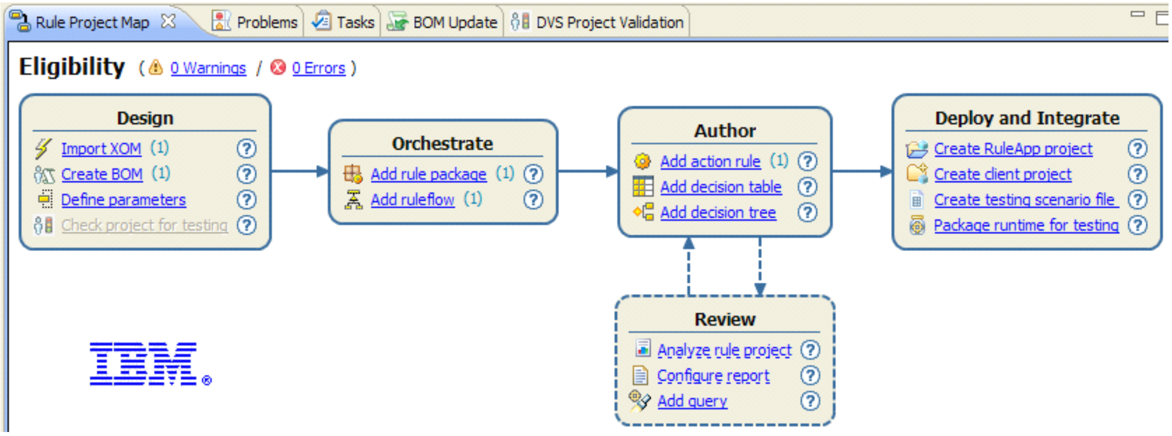
____ 1. Creating a new Rule Project:

__ a. Click  and go to **Rule Perspective**.

__ b. Go to **File > New > Rule Project**.
__ c. Select **Rule Project with a BOM**
__ d. Enter **Eligibility** as the project name. Click **Next** two times.
__ e. In the Rule Project XOM settings wizard page, click **Add External XSD**. Point to **[SupportPac LA71 Path]\tutorial\part_1\InsuranceSampleObjectModel.xsd**. Click **Finish**.

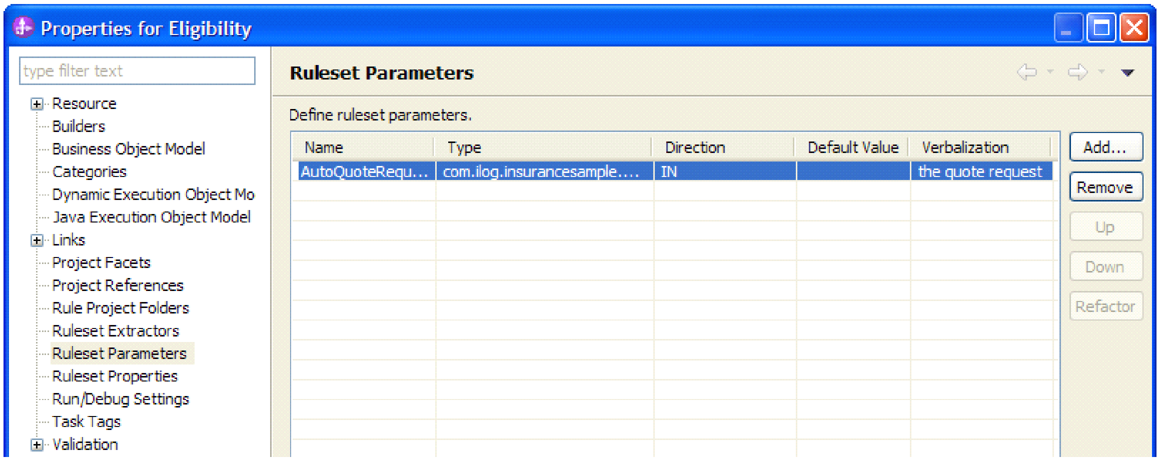
You should see a newly created project named Eligibility. This Rule Project corresponds to a Decision Service Eligibility which is consumed by the business process.

____ 2. Select **Eligibility** Rule Project in the Rule Explorer. You will see the Project Map:



__ a. Click **Define parameters** link under the Design box. You will define the signature of the Eligibility service in this step.
__ b. Click **Add**.
__ c. Enter **AutoQuoteRequest** as the name of the Ruleset Parameter.
__ d. Enter Select **com.ilog.insurancesample.AutoQuoteRequest** as the type. This type corresponds to the AutoQuoteRequest XML type defined in the schema.
__ e. Select **IN** as Direction to indicate this is the input of the service.

__ f. Enter **the quote request** as the verbalization. You will write a rule to access the parameter with the term.

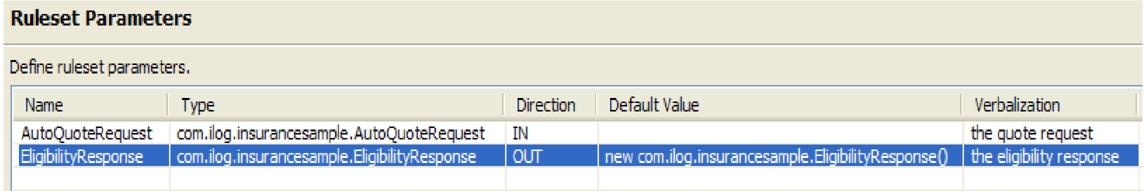


Ruleset Parameters

Define ruleset parameters.

Name	Type	Direction	Default Value	Verbalization
AutoQuoteRequ...	com.ilog.insurancesample....	IN		the quote request

__ g. Click Add again. Enter **EligibilityResponse** as the name of the Ruleset Parameter.
__ h. Enter Select **com.ilog.insurancesample EligibilityResponse** as the type.
__ i. Select **OUT** as Direction to indicate this is the decision result.
__ j. Enter **new com.ilog.insurancesample.EligibilityResponse()** as the Default Value to initialize the output parameter.
__ k. Enter **the eligibility response** as the verbalization.



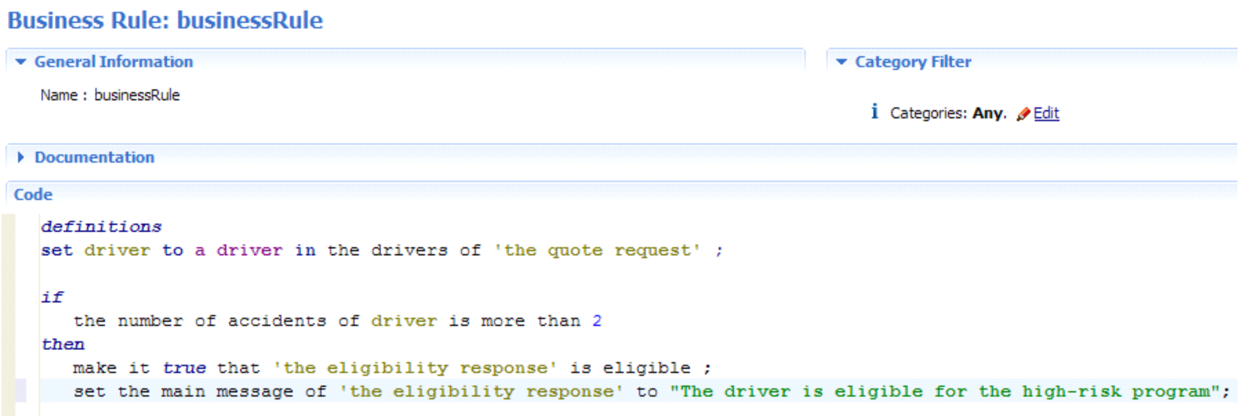
Ruleset Parameters

Define ruleset parameters.

Name	Type	Direction	Default Value	Verbalization
AutoQuoteRequest	com.ilog.insurancesample.AutoQuoteRequest	IN		the quote request
EligibilityResponse	com.ilog.insurancesample.EligibilityResponse	OUT	new com.ilog.insurancesample.EligibilityResponse()	the eligibility response

__ l. Enter the following rule in ***businessRule*** artifact with BAL editor. It looks like the follows:

```
definitions
set driver to a driver in the drivers of 'the quote
request' ;

if
   the number of accidents of driver is more than 2
then
   make it true that 'the eligibility response' is eligible ;
   set the main message of 'the eligibility response' to
"The driver is eligible for the high-risk program";
```



Business Rule: businessRule

Name : businessRule

Categories: **Any**.

```
definitions
set driver to a driver in the drivers of 'the quote request' ;

if
   the number of accidents of driver is more than 2
then
   make it true that 'the eligibility response' is eligible ;
   set the main message of 'the eligibility response' to "The driver is eligible for the high-risk program";
```

_____ 3. Now, create DataValidation Rule Project. Repeat Step 1a to Step 1e but enter **DataValidation** as the project name.

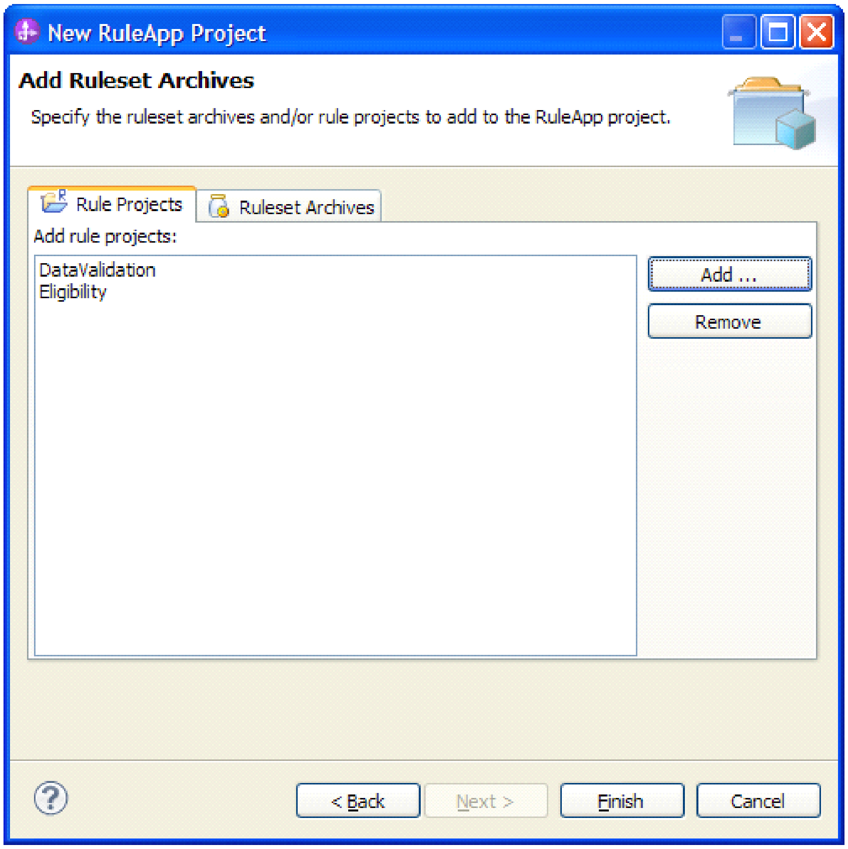
__ a. Click on DataValidation Project. Click Define ruleset parameters in the Rule Project Map.
__ b. Add **AutoQuoteRequest** ruleset parameter.
__ c. Enter Select **com.ilog.insurancesample.AutoQuoteRequest** as the type.
__ d. Select **IN** as Direction to indicate this is the input of the service.
__ e. Enter **the quote request** as the verbalization.
__ f. Add **DataValidationResponse** output ruleset parameter.
__ g. Enter Select **com.ilog.insurancesample.ValidationResponse** as the type.
__ h. Select **OUT** as Direction to indicate this is the input of the service.
__ i. Enter **new com.ilog.insurancesample.ValidationResponse()** as the default value.
__ j. Enter **the validation response** as the verbalization.

_____ 4. Enter the following rule in the **businessRule** artifact in the **DataValidation** project.

```
definitions
    set driver to a driver in the drivers of 'the quote
request' ;
if
    the number of accidents of driver is less than 0
then
    make it false that 'the validation response' is
validated ;
    set the main message of 'the validation response' to
"The number of accidents should not be negative" ;
```

____ 5. Now, create a RuleApp Project for deployment.

__ a. Click **File > New > Project…**.
__ b. Select **RuleApp project**.
__ c. Enter **InsuranceSampleRuleApp** for the RuleApp project name.
__ d. In the Add ruleset archive wizard page, click **Add**.
__ e. Select both **DataValidation** and **Eligibility** Rule Project. Press **Ctrl** for multiple select.
__ f. Click **OK**.



Specify the ruleset archives and/or rule projects to add to the RuleApp project.

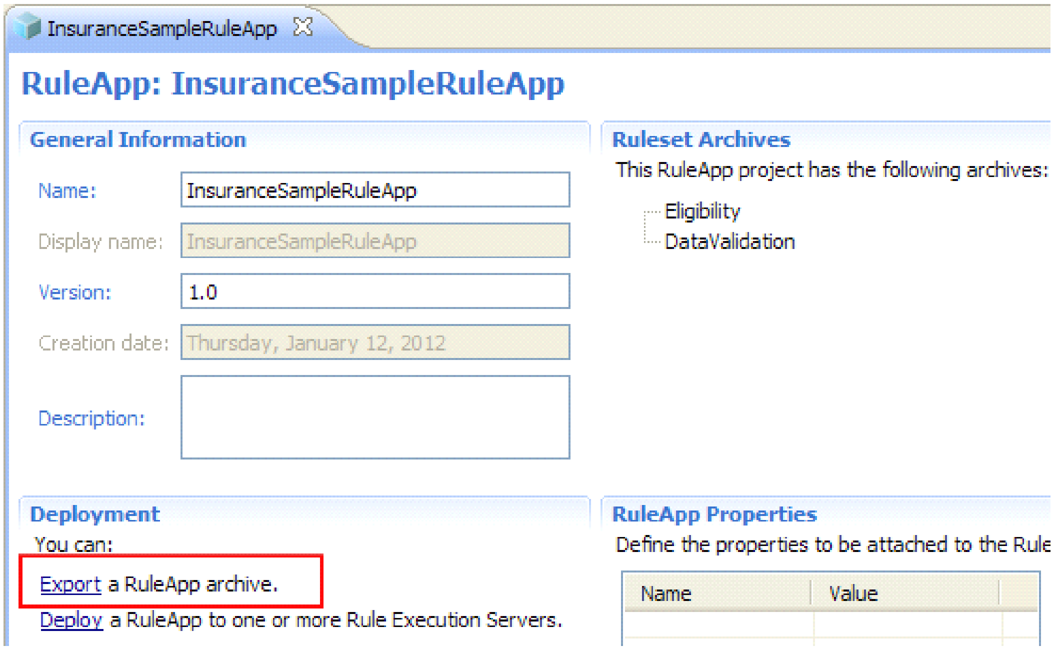
Add rule projects:

DataValidation
Eligibility

__ g. Click **Finish**.

____ 6. Export the RuleApp archive for integration with the business process.

__ a. Click **Export** a RuleApp archive.


InsuranceSampleRuleApp

RuleApp: InsuranceSampleRuleApp

General Information

Name: InsuranceSampleRuleApp

Display name: InsuranceSampleRuleApp

Version: 1.0

Creation date: Thursday, January 12, 2012

Description:

Ruleset Archives

This RuleApp project has the following archives:

- Eligibility
- DataValidation

Deployment

You can:

Export a RuleApp archive.

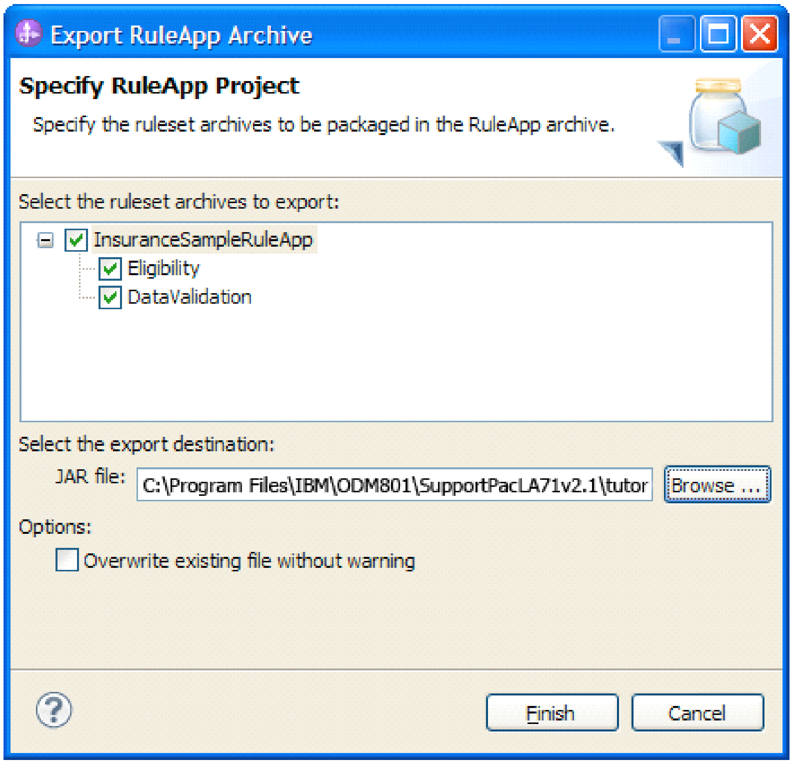
Deploy a RuleApp to one or more Rule Execution Servers.

RuleApp Properties

Define the properties to be attached to the Rule

Name	Value

__ b. Enter **[SupportPac LA71 Path]\tutorial\part_2\InsuranceSampleRuleApp.jar** for export destination.


Export RuleApp Archive

Specify RuleApp Project

Specify the ruleset archives to be packaged in the RuleApp archive.

Select the ruleset archives to export:

- ☑ InsuranceSampleRuleApp
  - ☑ Eligibility
  - ☑ DataValidation

Select the export destination:

JAR file: C:\Program Files\IBM\ODM801\SupportPacLA71v2.1\tutor

Options:

☐ Overwrite existing file without warning

__ c. Click **Finish**.

Part 2: Deploy the archive to Rule Execution Server (RES)

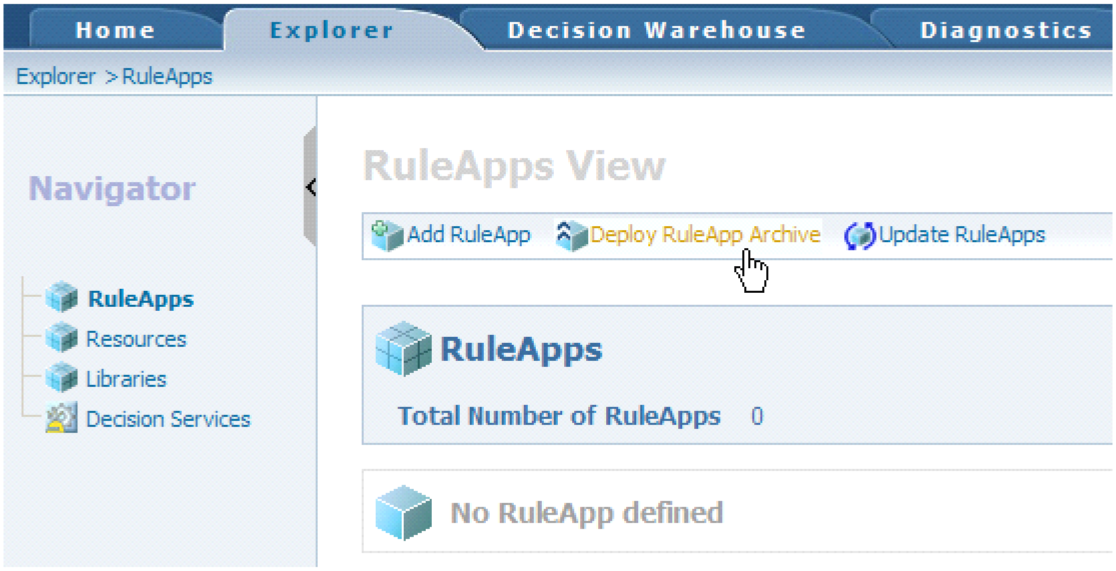
A rule application is deployed to Rule Execution Server as an archive—a JAR file that usually bears the name of the rule project. The archive is a portable representation of the decision and it can be used to move the decision between environments and/or be used as a hand-off artifact to System Administrators where there is a separation of responsibility between developers and those that have direct access to production servers.

____ 1. Start the server.

- __ a. In IBM Integration Designer, select the **Servers** view and select **IBM Process Server v8.0**. The Rule Execution Server has already been configured on the IBM Process Server test server.
- __ b. Right-click and select **Start**.

____ 2. Deploy the RuleApp with the business rules.

- __ a. In a Web browser, open RES Console with the following URL http://localhost:9080/res.
- __ b. Login with **Username** admin and **Password** admin. Click **Sign In**.
- __ c. Click **Deploy RuleApp Archive**.

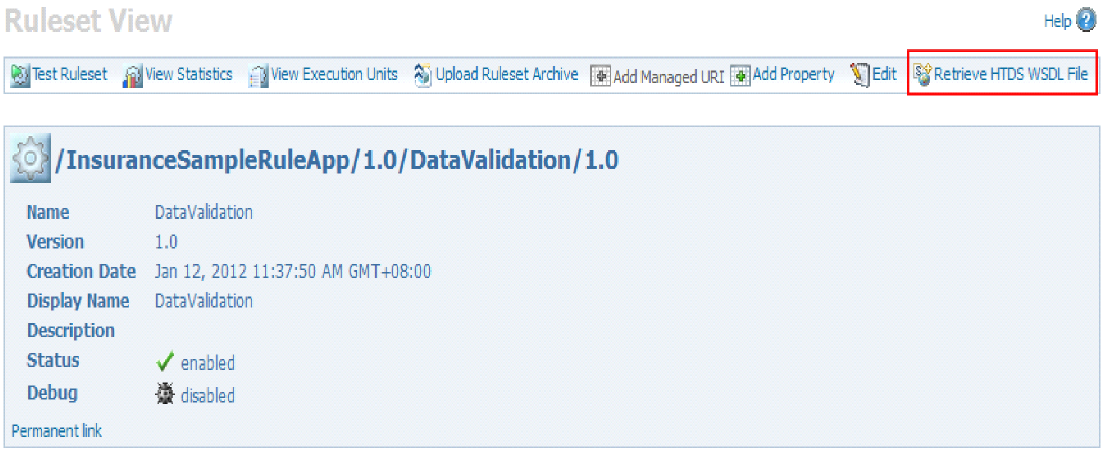


- __ d. Click **Browse** and select **[SupportPac LA71 Path]\tutorial\part_2\InsuranceSampleRuleApp.jar**.
- __ e. Click **Deploy** and then click **OK**.

Part 3: Assemble ODM SCA component with Web Services

In this part, the task is to generate an SCA component from a web service and test. The purpose of the test is to establish a feedback-loop for observing the behavior of the decision and make required modifications. The test will be done from IBM Integration Designer (IID) using Hosted Transparent Decision Services (HTDS) provided by Rule Execution Server (RES).

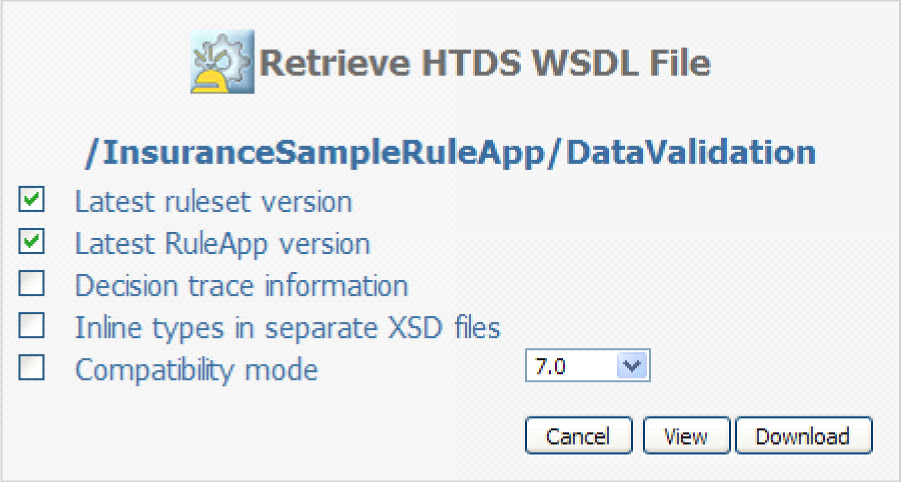
____ 1. Log into Rule Execution Server (http://localhost:9080/res/ User: admin Password: admin)
- __ a. Click **Explorer**.
- __ b. Click **InsuranceSampleRuleApp**.
- __ c. Click **DataValidation**.
- __ d. Click on **Retrieve HTDS WSDL File**.



/InsuranceSampleRuleApp/1.0/DataValidation/1.0

Name	DataValidation
Version	1.0
Creation Date	Jan 12, 2012 11:37:50 AM GMT+08:00
Display Name	DataValidation
Description	
Status	✓ enabled
Debug	disabled

- __ e. Select **Latest ruleset version** and **Latest RuleApp version**. Then click **Download** to save the WSDL to the local file system. You may also find a copy of this already in **[SupportPac LA71 Path]\tutorial\part_3\**.



/InsuranceSampleRuleApp/DataValidation

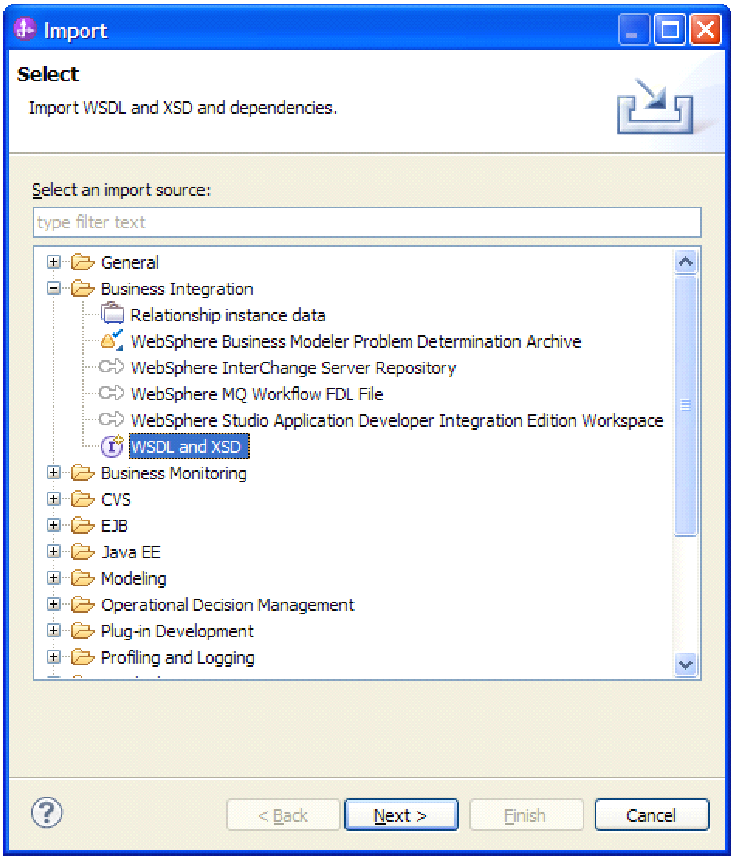
☑ Latest ruleset version
☑ Latest RuleApp version
☐ Decision trace information
☐ Inline types in separate XSD files
☐ Compatibility mode 7.0

____ 2. Follow the steps in (1) above for “Eligibility”.

____ 3. Change the perspective within IID to “Business Integration”.
  __ a. From the top menu, click **Window** → **Open Perspective** → **Other**.
  __ b. Select **Business Integration** from the list.

____ 4. Create a test module for DataValidation.
  __ a. Click **File** → **New** → **Module** from the menu.
  __ b. Give the module the following name: **TestDataValidation.**
  __ c. Click **Finish**.

____ 5. Import the WSDL files and XSD.
  __ a. From the top menu click **File** → **Import**.
  __ b. Select **Business Integration** → **WSDL and XSD**.


Import

Select

Import WSDL and XSD and dependencies.

Select an import source:

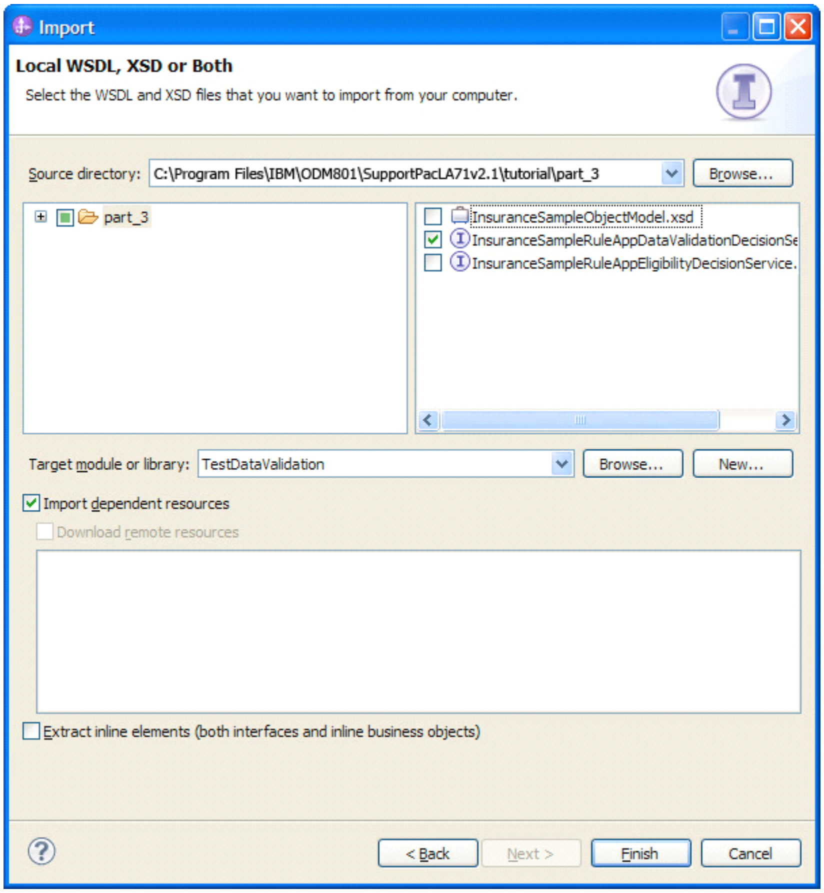
type filter text
General
Business Integration
Relationship instance data
WebSphere Business Modeler Problem Determination Archive
WebSphere InterChange Server Repository
WebSphere MQ Workflow FDL File
WebSphere Studio Application Developer Integration Edition Workspace
WSDL and XSD
Business Monitoring
CVS
EJB
Java EE
Modeling
Operational Decision Management
Plug-in Development
Profiling and Logging
< Back
Next >
Finish
Cancel

  __ c. Click **Next**.
  __ d. Select **Local WSDL or XSD file, or both**.
  __ e. Click **Next**.

__ f. Provide the path to your WSDL and XSD files. You can use the artifacts provided by the tutorial: **[SupportPac LA71 Path]\tutorial\part_3\**.

__ g. Select the DataValidation WSDL file, InsuranceSampleRuleAppDataValidationDecisionService.wsdl.

__ h. Select the module: TestDataValidation. Click **Finish**.



Local WSDL, XSD or Both

Select the WSDL and XSD files that you want to import from your computer.

Source directory: C:\Program Files\IBM\ODM801\SupportPacLA71v2.1\tutorial\part_3

☐ InsuranceSampleObjectModel.xsd
☑ InsuranceSampleRuleAppDataValidationDecisionSe
☐ InsuranceSampleRuleAppEligibilityDecisionService.

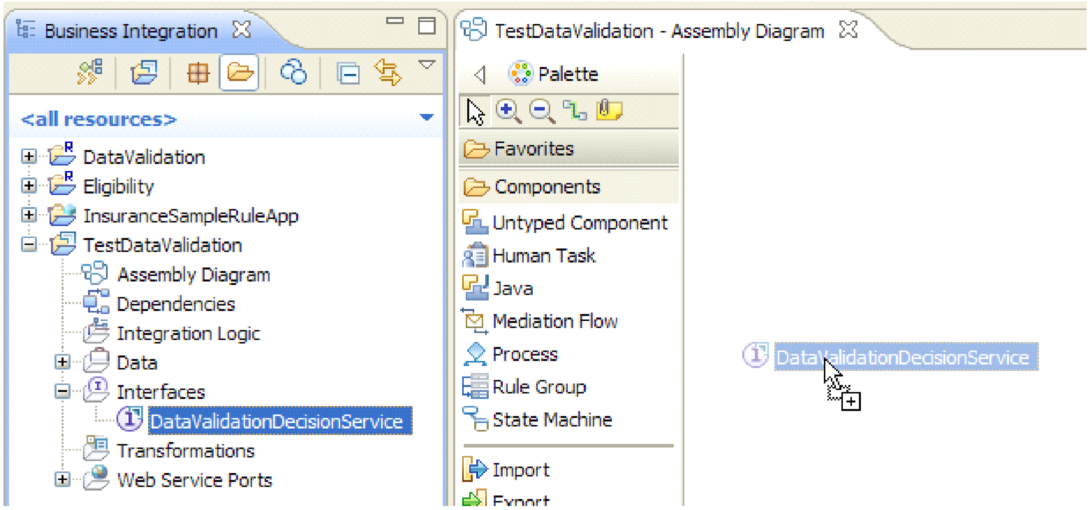
Target module or library: TestDataValidation

☑ Import dependent resources
☐ Download remote resources

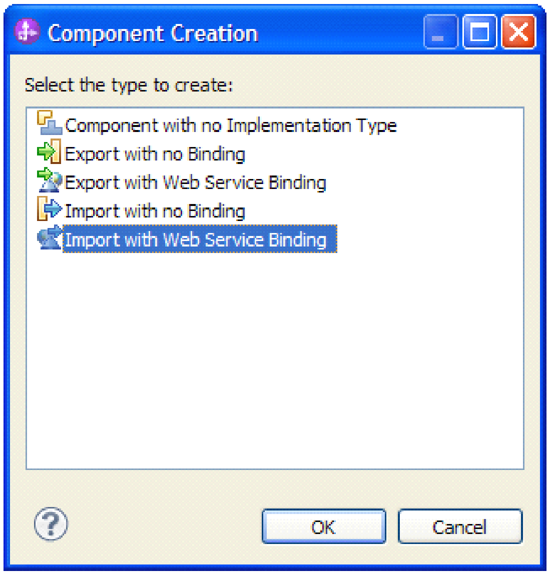
☐ Extract inline elements (both interfaces and inline business objects)

____ 6.   Implement the web service import.

__ a. Drag the DataValidationDecisionService interface onto the assembly diagram (you may need to expand the tree to see it).



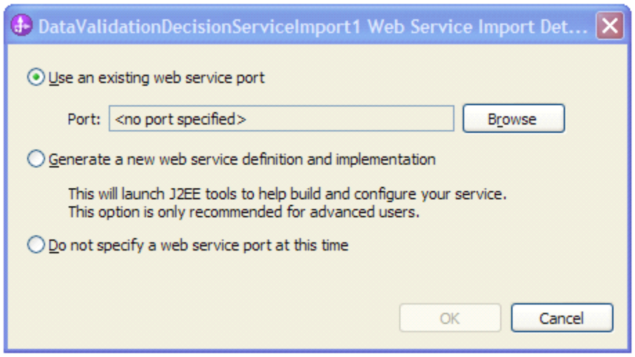
__ b. Select **Import with Web Service Binding** in the dialog box:



Select the type to create:

- Component with no Implementation Type
- Export with no Binding
- Export with Web Service Binding
- Import with no Binding
- Import with Web Service Binding

__ c. Select **Use an existing web service port**.
__ d. Click **Browse**.
__ e. Select the existing port in the window like the following:


DataValidationDecisionServiceImport1 Web Service Import Det...
Browse
OK
Cancel

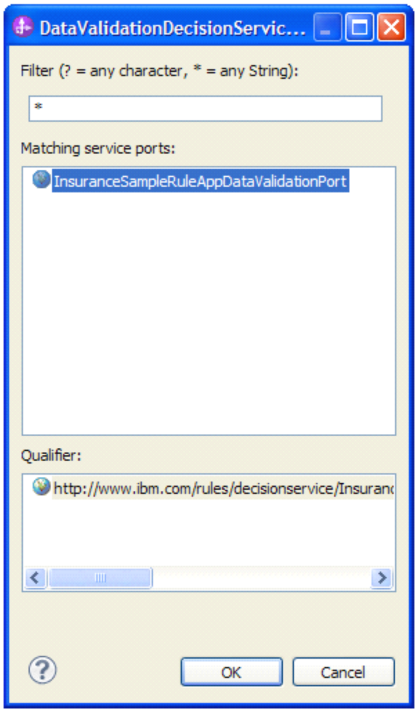
● Use an existing web service port

Port: <no port specified>

○ Generate a new web service definition and implementation

This will launch J2EE tools to help build and configure your service.
This option is only recommended for advanced users.

○ Do not specify a web service port at this time



Filter (? = any character, * = any String): *

Matching service ports:

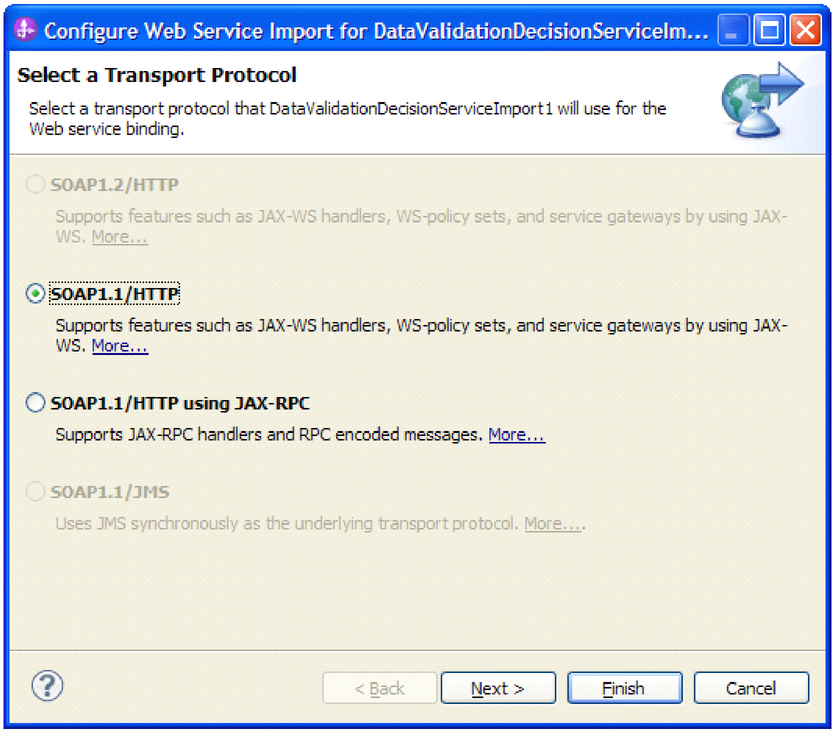
InsuranceSampleRuleAppDataValidationPort

Qualifier:

http://www.ibm.com/rules/decisionservice/Insuranc

__ f. Click **OK**.

__ g. Select **SOAP1.1/HTTP using JAX-RPC**


Configure Web Service Import for DataValidationDecisionServiceIm...

Select a Transport Protocol

Select a transport protocol that DataValidationDecisionServiceImport1 will use for the Web service binding.

○ SOAP1.2/HTTP

Supports features such as JAX-WS handlers, WS-policy sets, and service gateways by using JAX-WS. More...

● SOAP1.1/HTTP

Supports features such as JAX-WS handlers, WS-policy sets, and service gateways by using JAX-WS. More...

○ SOAP1.1/HTTP using JAX-RPC

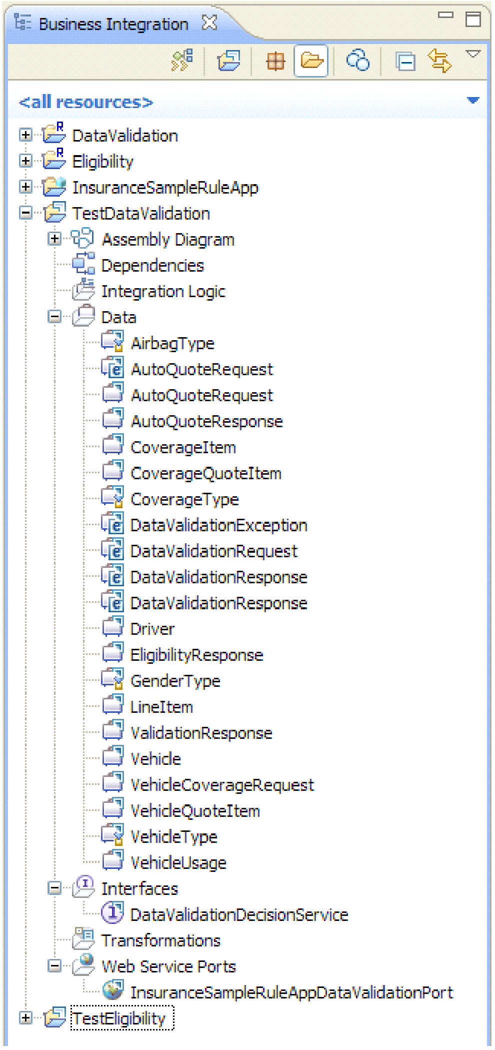
Supports JAX-RPC handlers and RPC encoded messages. More...

○ SOAP1.1/JMS

Uses JMS synchronously as the underlying transport protocol. More...

__ h. Click **Finish**.
__ i. Click **OK**.

____ 7. Repeat the steps for a new module called “TestEligibility”. At this point, the project should contain several modules and look something like the following:



Business Integration

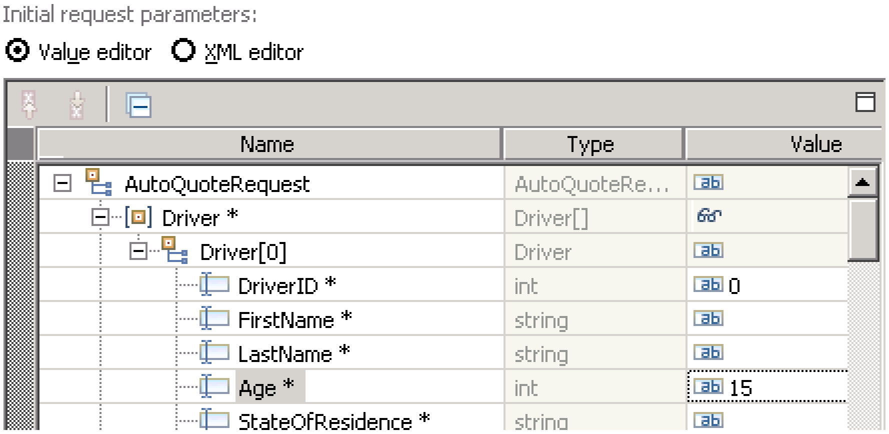
<all resources>

- DataValidation
- Eligibility
- InsuranceSampleRuleApp
- TestDataValidation
  - Assembly Diagram
  - Dependencies
  - Integration Logic
  - Data
    - AirbagType
    - AutoQuoteRequest
    - AutoQuoteRequest
    - AutoQuoteResponse
    - CoverageItem
    - CoverageQuoteItem
    - CoverageType
    - DataValidationException
    - DataValidationRequest
    - DataValidationResponse
    - DataValidationResponse
    - Driver
    - EligibilityResponse
    - GenderType
    - LineItem
    - ValidationResponse
    - Vehicle
    - VehicleCoverageRequest
    - VehicleQuoteItem
    - VehicleType
    - VehicleUsage
  - Interfaces
    - DataValidationDecisionService
  - Transformations
  - Web Service Ports
    - InsuranceSampleRuleAppDataValidationPort
- TestEligibility

____ 8. Run the test of a module containing a decision:

__ a. Right click on the module “TestEligibility” and click on **Test → Test Modules**.

__ b. For the Initial request parameters section, enter **15** for the driver **Age**

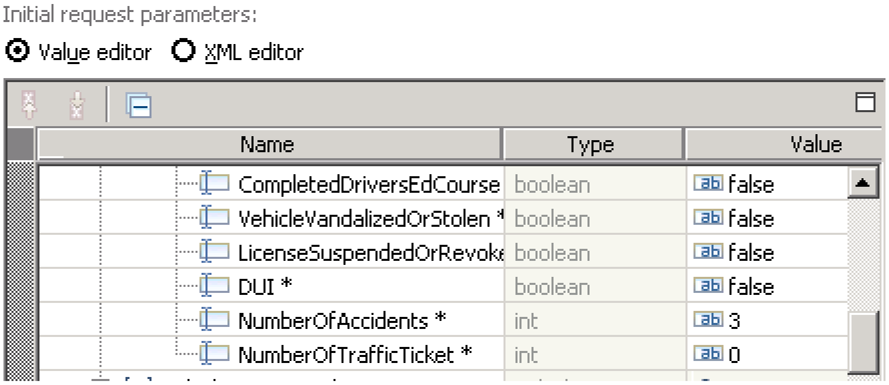


Initial request parameters:

● Value editor ○ XML editor

Name	Type	Value
AutoQuoteRequest	AutoQuoteRe...	
Driver *	Driver[]	
Driver[0]	Driver	
DriverID *	int	0
FirstName *	string	
LastName *	string	
Age *	int	15
StateOfResidence *	string	

__ c. For the Initial request parameters section, enter **3** for the driver **NumberOfAccidents**.

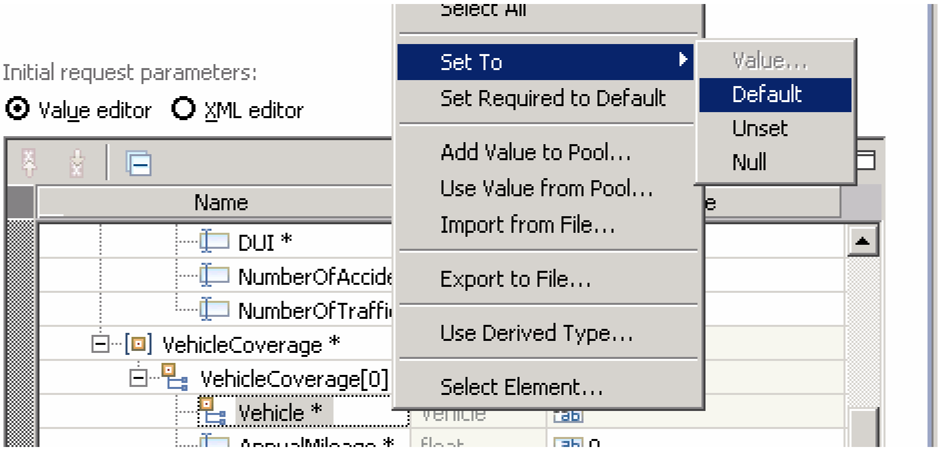


Initial request parameters:

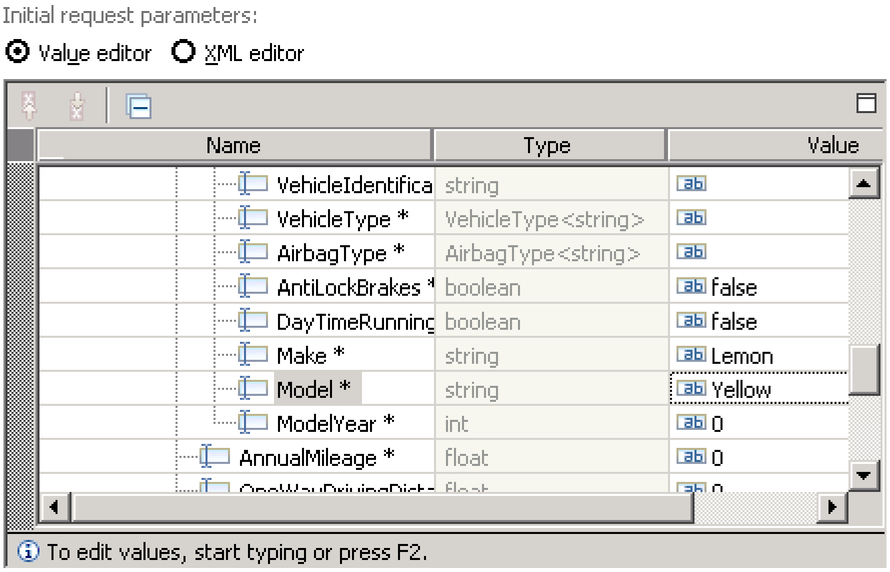
● Value editor ○ XML editor

Name	Type	Value
CompletedDriversEdCourse	boolean	false
VehicleVandalizedOrStolen *	boolean	false
LicenseSuspendedOrRevoke	boolean	false
DUI *	boolean	false
NumberOfAccidents *	int	3
NumberOfTrafficTicket *	int	0

__ d. Under **VehicleCoverage**, right-click on **Vehicle** and select **Set To > Default**.



__ e. Under Vehicle, for the Make enter **Lemon** and for the Model enter **Yellow**.



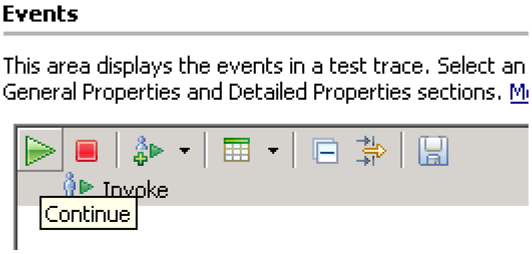
Initial request parameters:

● Value editor ○ XML editor

Name	Type	Value
VehicleIdentifica	string	
VehicleType *	VehicleType<string>	
AirbagType *	AirbagType<string>	
AntiLockBrakes *	boolean	false
DayTimeRunning	boolean	false
Make *	string	Lemon
Model *	string	Yellow
ModelYear *	int	0
AnnualMileage *	float	0

To edit values, start typing or press F2.

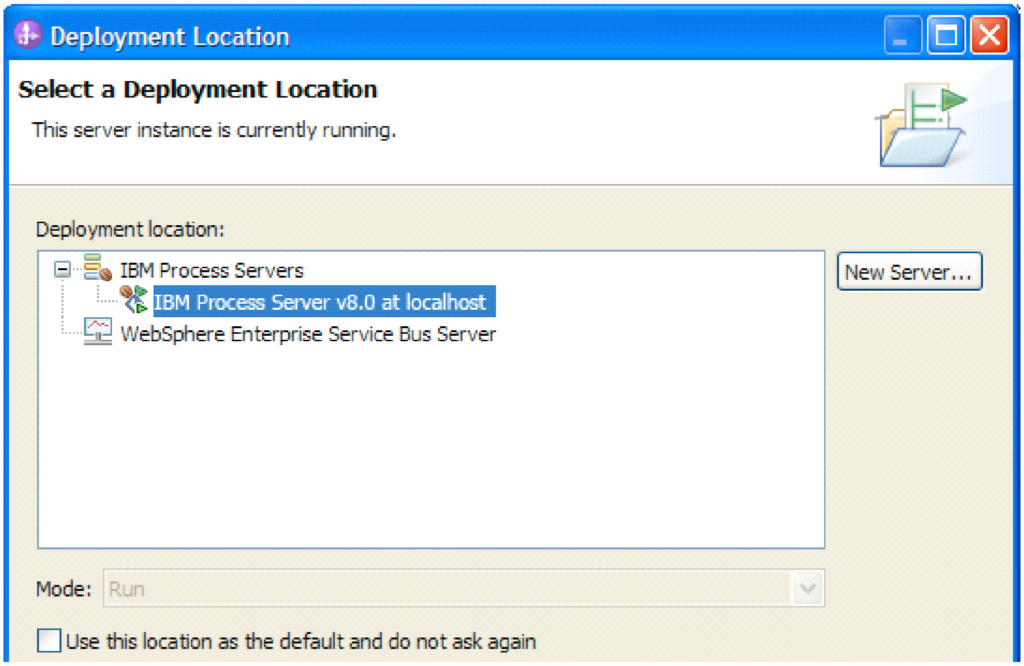
__ f. Click the **Continue** button.



Events

This area displays the events in a test trace. Select an
General Properties and Detailed Properties sections. M

__ g. Insure the Deployment location is **IBM Process Server v8.0 at localhost** and click **Finish**.



Select a Deployment Location

This server instance is currently running.

Deployment location:

- IBM Process Servers
  - IBM Process Server v8.0 at localhost
- WebSphere Enterprise Service Bus Server

Mode: Run

☐ Use this location as the default and do not ask again

__ h. For the User Login screen, accept the existing values and click **OK**.

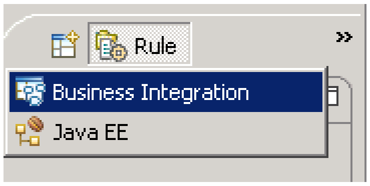
__ i. Inspect the data returned for eligibility information and the main message. Repeat the step for the TestDataValidation module if desired.

Part 4: Assemble ODM SCA component with SupportPac LA71

For this exercise we are going to integrate using the SCA component. It is natural for the testing of the Decision Service to be done with the integrated Test Component in preparation of integrating with the business process.

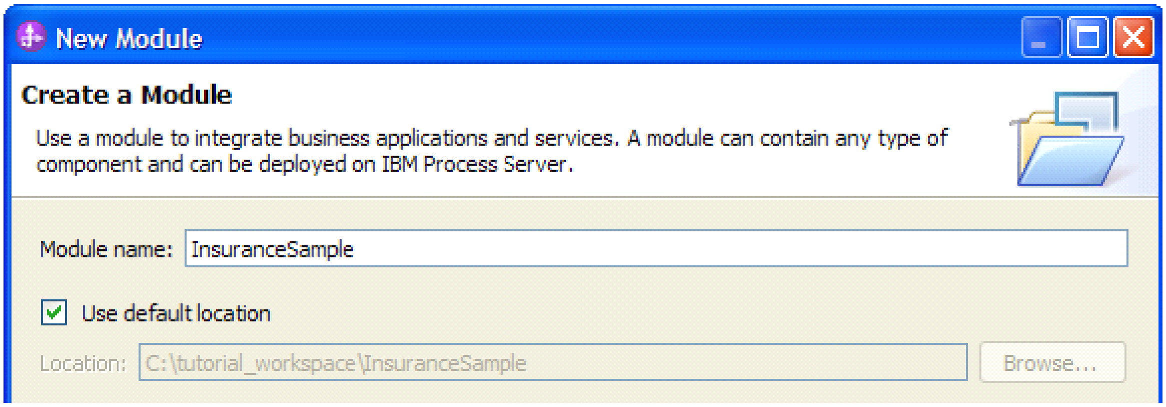
____ 1. Start by creating a module for the SCA components. This module will also be used for the business process.

__ a. Select **Window > Open Perspective > Business Integration** or **Business Integration** from the quick view.



__ b. Select **File > New > Module**.

__ c. For the Module name, enter **InsuranceSample**.



Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on IBM Process Server.

Module name: InsuranceSample

☑ Use default location

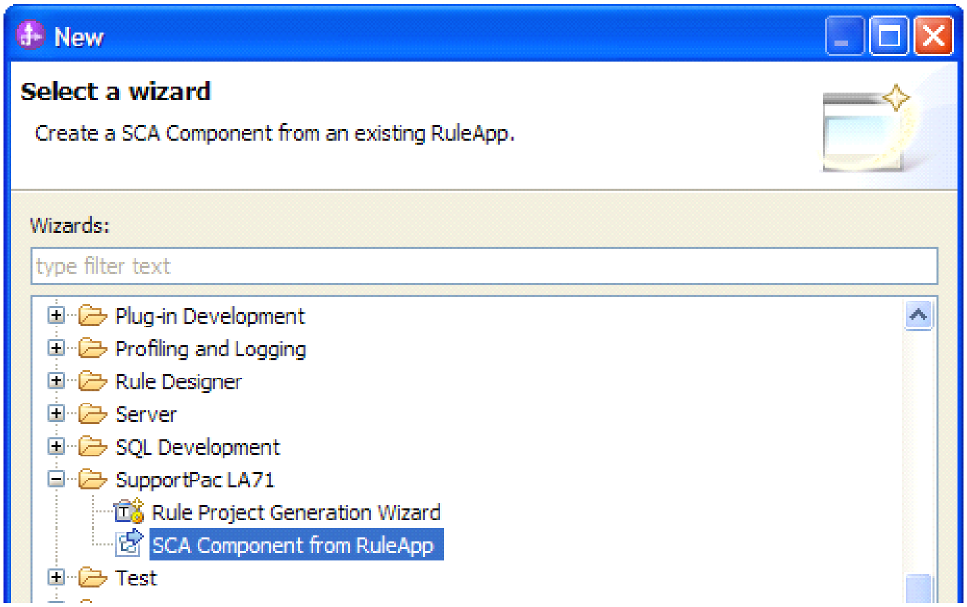
Location: C:\tutorial_workspace\InsuranceSample

__ d. Click **Finish**.

____ 2. Create the SCA Component for the ODM.

__ a. Select **File > New > Others** .

__ b. Expand **SupportPac LA71** and select **SCA Component from RuleApp**. Click **Next**.

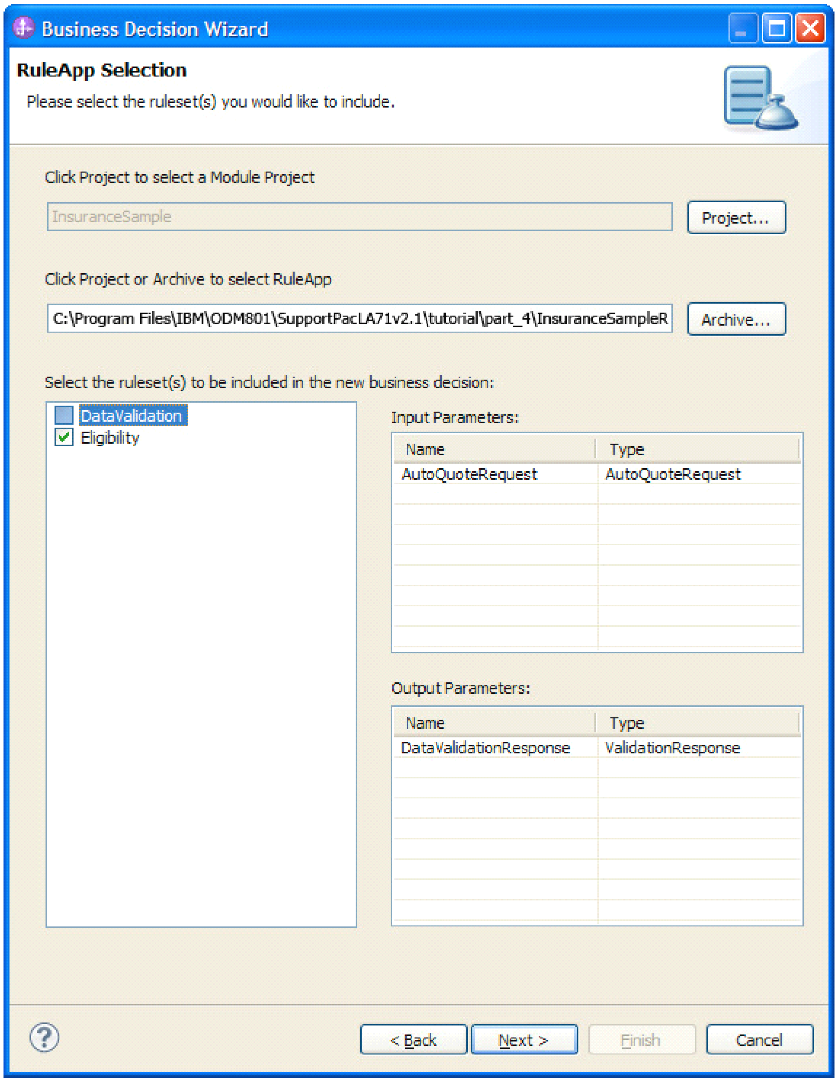


__ c. In the Decision Service Wizard, if the InsuranceSample module project was not selected click **Project…** and select **InsuranceSample**. Click **OK**.

The RuleApp must be provided as input for creation of the SCA Component. Click **Archive...** and select the RuleApp JAR you exported in Part 2 or pick up the jar at **[SupportPac LA71 Path]\tutorial\part_4\InsuranceSampleRuleApp.jar** provided for convenience.

The wizard automatically detects the rulesets on the left panel and they are checked by default. It also reads input and output parameters for the rule application.

__ d. Select the “**Eligibility**” decision. In addition, make sure that “InsuranceSample” is the project.



RuleApp Selection

Please select the ruleset(s) you would like to include.

Click Project to select a Module Project

InsuranceSample [Project...]

Click Project or Archive to select RuleApp

C:\Program Files\IBM\ODM801\SupportPacLA71v2.1\tutorial\part_4\InsuranceSampleR [Archive...]

Select the ruleset(s) to be included in the new business decision:

☐ DataValidation
☑ Eligibility

Input Parameters:

Name	Type
AutoQuoteRequest	AutoQuoteRequest

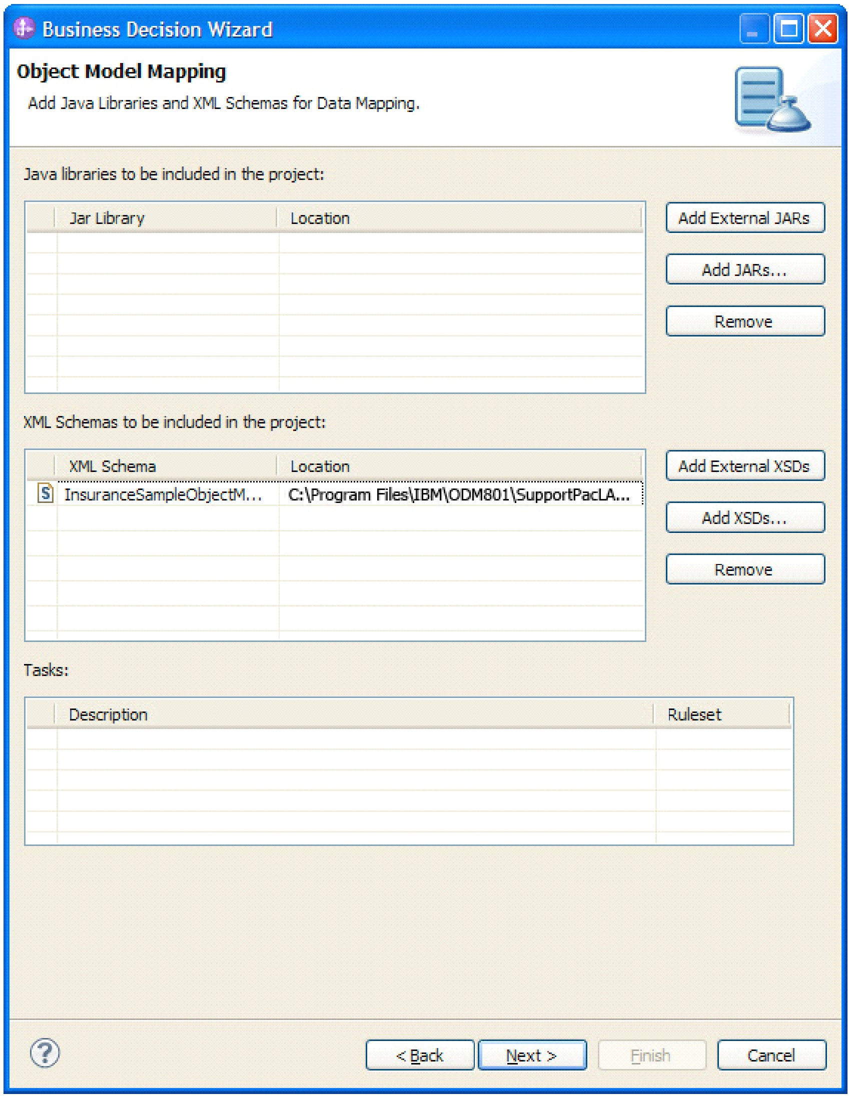
Output Parameters:

Name	Type
DataValidationResponse	ValidationResponse

__ e. Click **Next**.

__ f. In this page of the wizard, there are some warnings in the bottom Task List due to unresolved types in the ruleset signatures. In some cases you need to provide java libraries as well as XML schemas used in the Rule Projects; however, for the tutorial you will use the same XML schema for the creation of the component signature that you used for the Execution Object Model (XOM) and Business Object Model (BOM). Click **Add External XSD** and browse to **[SupportPac LA71 Path]\tutorial\part_4*\InsuranceSampleObjectModel.xsd***, then click **OK**.

The warnings are resolved after object model is defined.



Jar Library	Location

XML Schema	Location
InsuranceSampleObjectM...	C:\Program Files\IBM\ODM801\SupportPacLA...

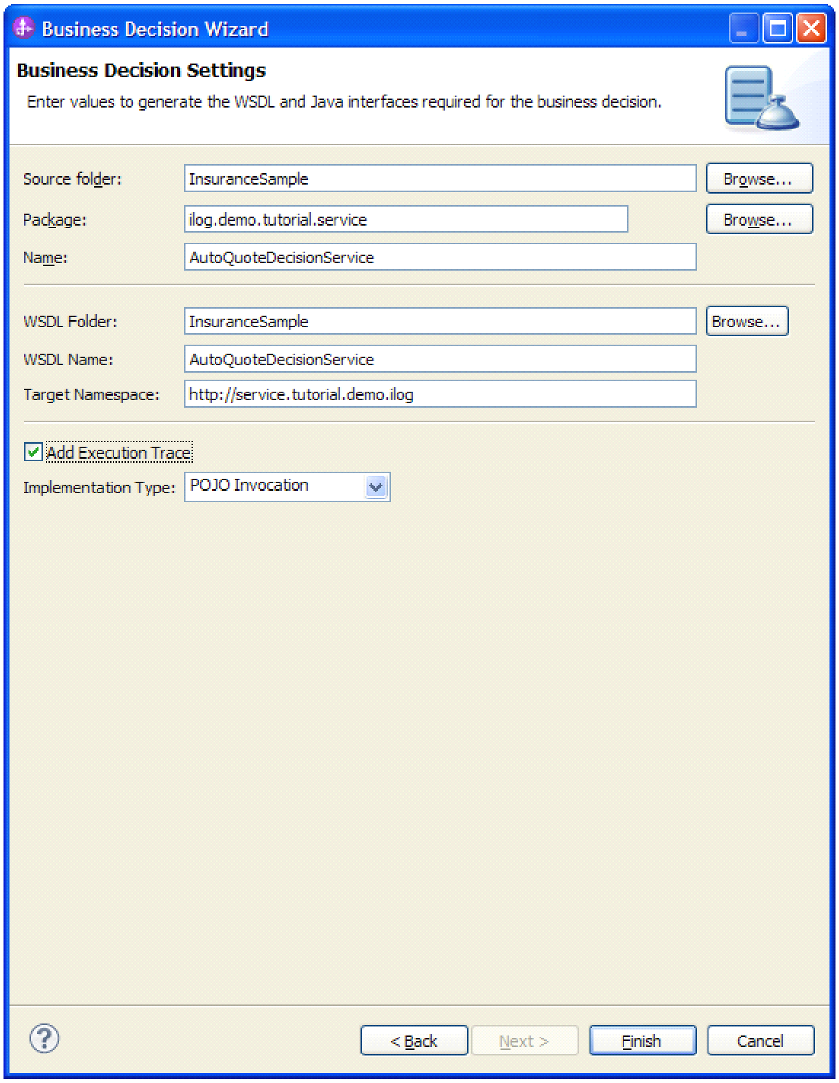
Description	Ruleset

__ g. Click **Next**.

__ h. In the final page of the wizard, for **Package** enter **ilog.demo.tutorial.service** and for the **Name** enter **AutoQuoteDecisionService.**

__ i. Check **Add Execution Trace**. With this option enabled when the rulesets are executed, detailed audit trails are logged through Common Event Infrastructure (CEI).

__ j. Insure **POJO Invocation** is selected for the Implementation Type. It is recommended to use the POJO invocation approach for this component since we have the Rule Execution Server installed on IBM Process Server and can take advantage of the proximity to make a direct Java call rather than going through the EJB Container.



Business Decision Settings

Enter values to generate the WSDL and Java interfaces required for the business decision.

Source folder: InsuranceSample

Package: ilog.demo.tutorial.service

Name: AutoQuoteDecisionService

WSDL Folder: InsuranceSample

WSDL Name: AutoQuoteDecisionService

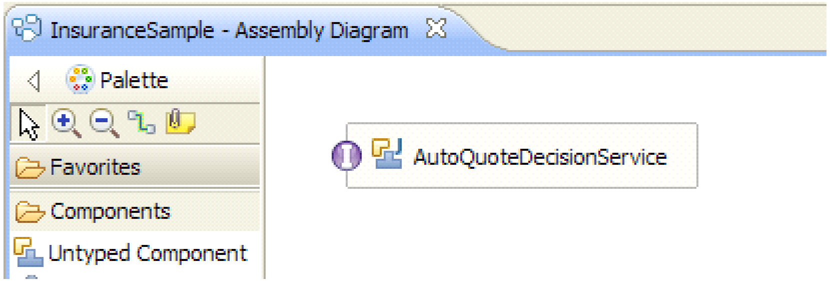
Target Namespace: http://service.tutorial.demo.ilog

☑ Add Execution Trace

Implementation Type: POJO Invocation

__ k. Click **Finish**.

__ l. Note that SCA component AutoQuoteDecisionService has been added to the module. If you open up the Assembly Diagram you will see the SCA component.

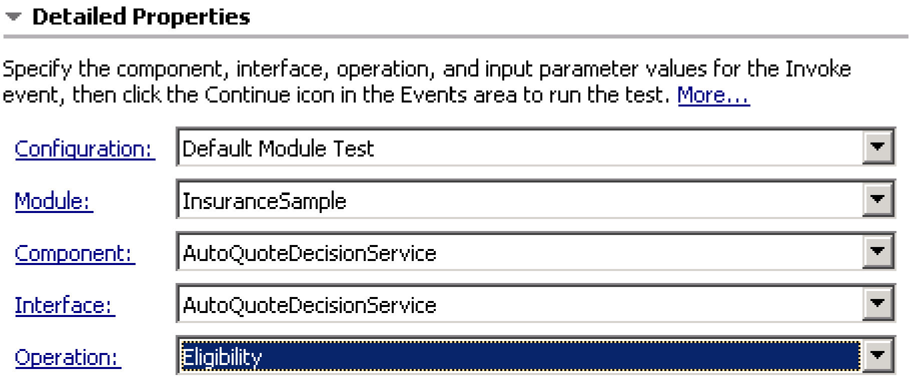


____ 3. With the AutoQuoteDecisionService SCA Component created, you can now test the calls to the RuleApp.

__ a. Open the Assembly Diagram if it is not open already.

__ b. Right-click on the **AutoQuoteDecisionService** and select **Test Component**.

__ c. For the operation, select **Eligibility**.

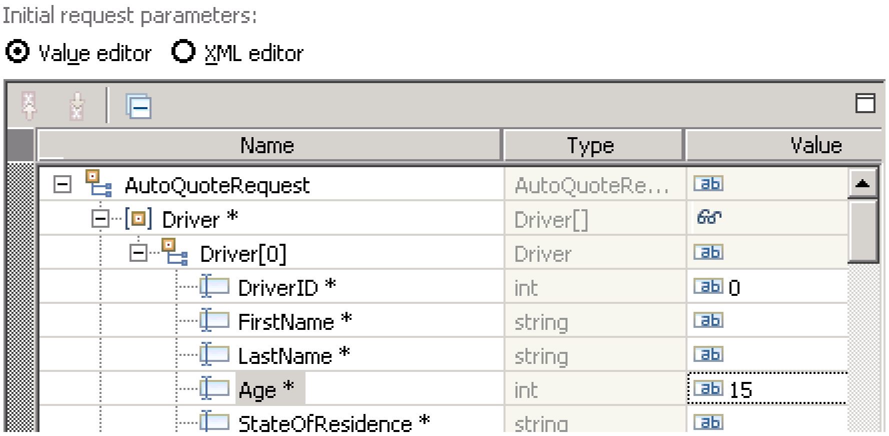


Detailed Properties

Specify the component, interface, operation, and input parameter values for the Invoke event, then click the Continue icon in the Events area to run the test. More...

Configuration: Default Module Test
Module: InsuranceSample
Component: AutoQuoteDecisionService
Interface: AutoQuoteDecisionService
Operation: Eligibility

__ d. For the Initial request parameters section, enter **15** for the driver **Age**

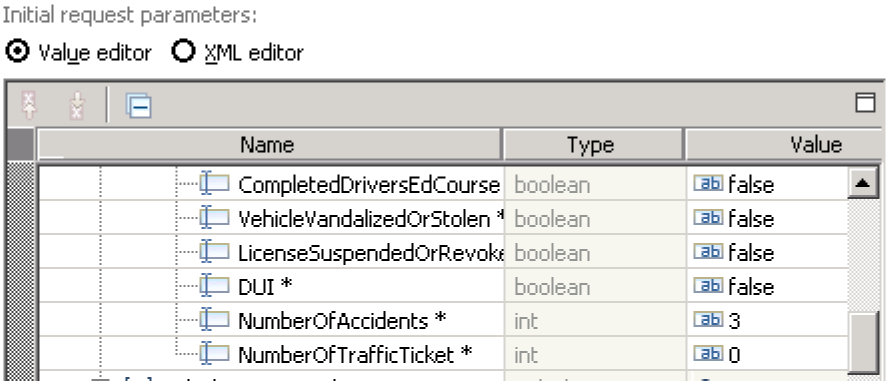


Initial request parameters:

● Value editor ○ XML editor

Name	Type	Value
AutoQuoteRequest	AutoQuoteRe...	
Driver *	Driver[]	
Driver[0]	Driver	
DriverID *	int	0
FirstName *	string	
LastName *	string	
Age *	int	15
StateOfResidence *	string	

__ e. For the Initial request parameters section, enter **3** for the driver **NumberOfAccidents**.

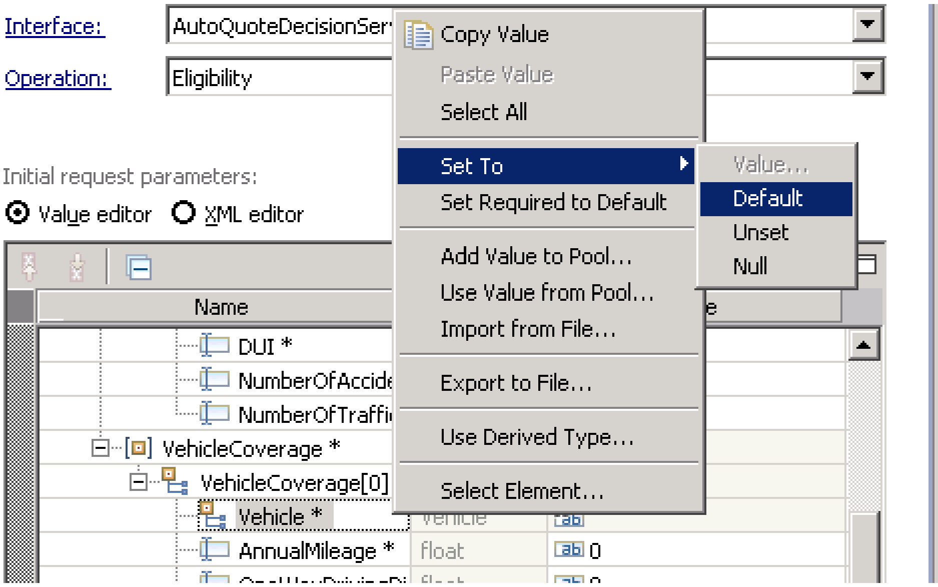


Initial request parameters:

● Value editor ○ XML editor

Name	Type	Value
CompletedDriversEdCourse	boolean	false
VehicleVandalizedOrStolen *	boolean	false
LicenseSuspendedOrRevoke	boolean	false
DUI *	boolean	false
NumberOfAccidents *	int	3
NumberOfTrafficTicket *	int	0

__ f. Under **VehicleCoverage**, right-click on **Vehicle** and select **Set To > Default**.



Interface: AutoQuoteDecisionSer

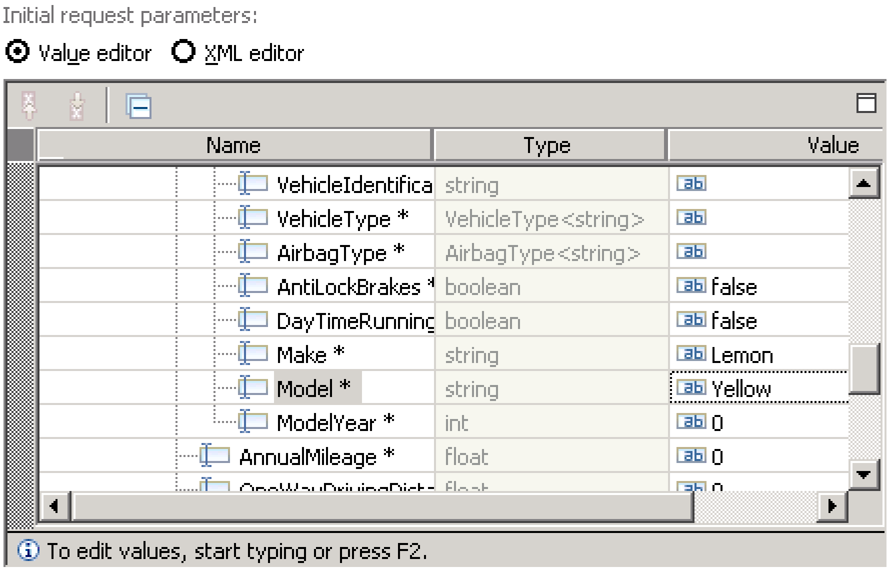
Operation: Eligibility

Initial request parameters:

● Value editor ○ XML editor

Name	Type	Value
DUI *		
NumberOfAccide		
NumberOfTraffi		
VehicleCoverage *		
VehicleCoverage[0]		
Vehicle *	Vehicle	
AnnualMileage *	float	0

__ g. Under Vehicle, for the Make enter **Lemon** and for the Model enter **Yellow**.



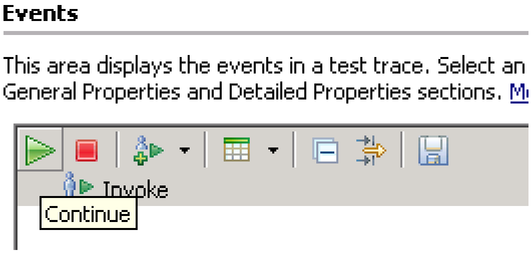
Initial request parameters:

● Value editor ○ XML editor

Name	Type	Value
VehicleIdentifica	string	
VehicleType *	VehicleType<string>	
AirbagType *	AirbagType<string>	
AntiLockBrakes *	boolean	false
DayTimeRunning	boolean	false
Make *	string	Lemon
Model *	string	Yellow
ModelYear *	int	0
AnnualMileage *	float	0

To edit values, start typing or press F2.

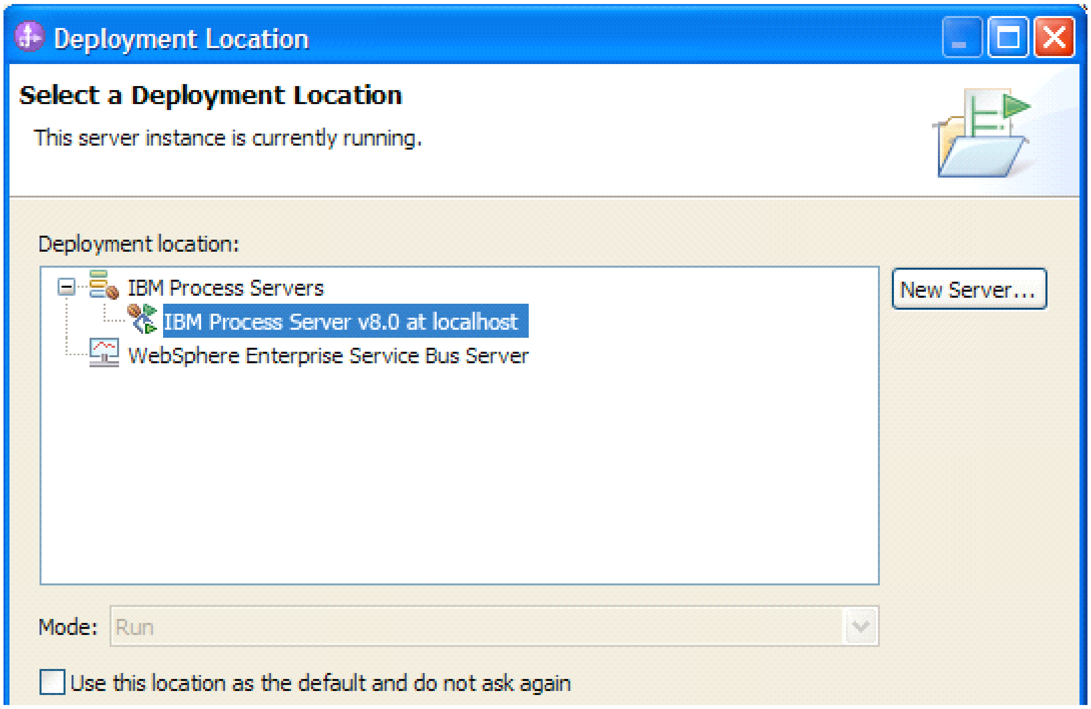
__ h. Click the **Continue** button.



Events

This area displays the events in a test trace. Select an
General Properties and Detailed Properties sections.

__ i. Insure the Deployment location is **IBM Process Server v8.0 at localhost** and click **Finish**.



Select a Deployment Location

This server instance is currently running.

Deployment location:

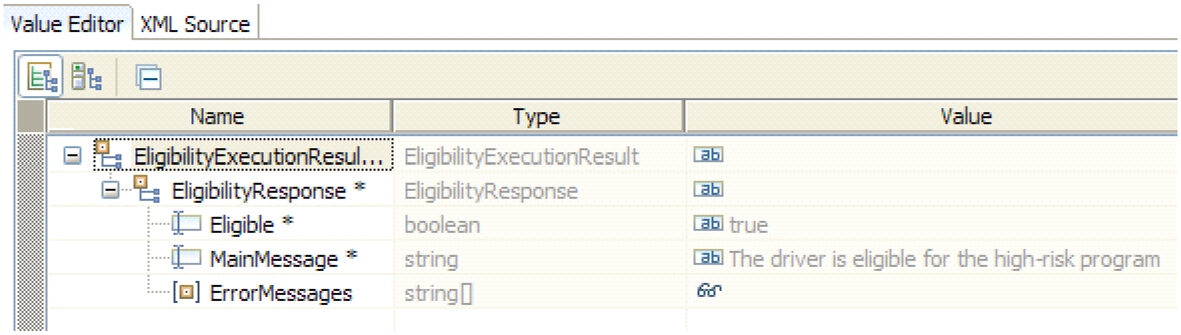
- IBM Process Servers
  - IBM Process Server v8.0 at localhost
- WebSphere Enterprise Service Bus Server

Mode: Run

☐ Use this location as the default and do not ask again

__ j. For the User Login screen, accept the existing values and click **OK**.

__ k. The AutoQuoteDecisionService is called and the Eligibility ruleset is also called. The response is returned indicating the driver IS eligible.



Name	Type	Value
EligibilityExecutionResul...	EligibilityExecutionResult	
EligibilityResponse *	EligibilityResponse	
Eligible *	boolean	true
MainMessage *	string	The driver is eligible for the high-risk program
ErrorMessages	string[]	

__ l. Close the Integration Test Client without saving.

Part 5: Create Business Process

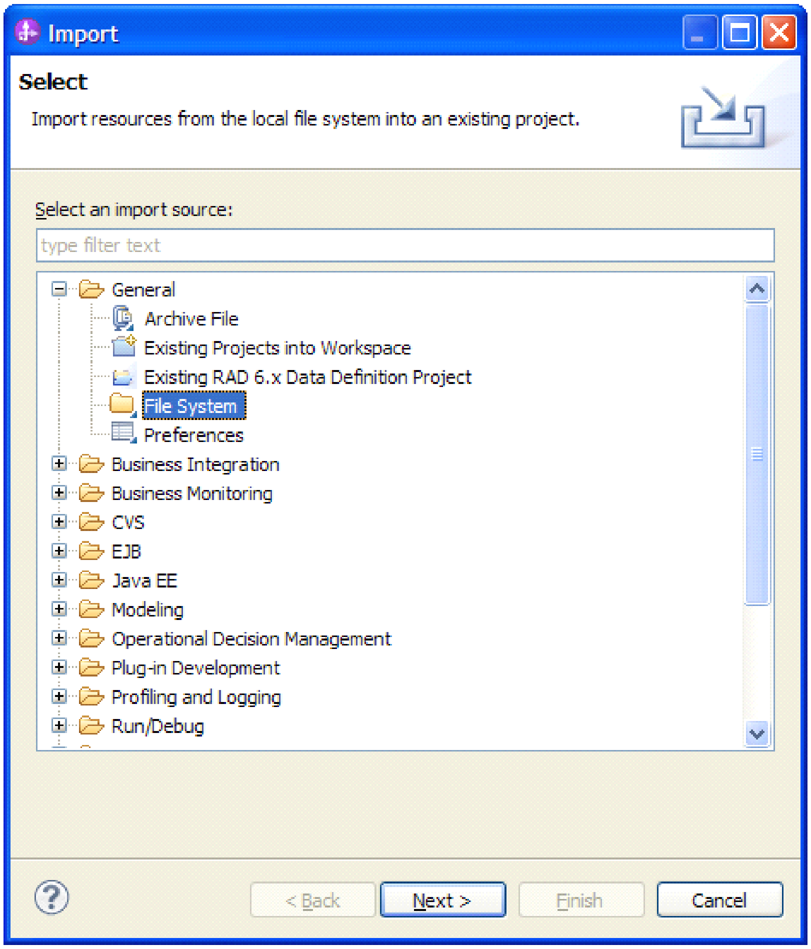
With the business rules created, the next step is to utilize this business logic in business processes. In our story here, a rule project (business decision) already exists and now a business process may take advantage of it. In this part you will create the business process with calls to the business rules. You will link the business process to the business rules in the next section.

____ 1. Except for InsuranceSample, remove all other modules from your workspace completed from **Part 4.**

____ 2. The business process will have an interface which can be called to start the quote process. Import the WSDL interface into the project.

__ a. Select **File > Import…**.

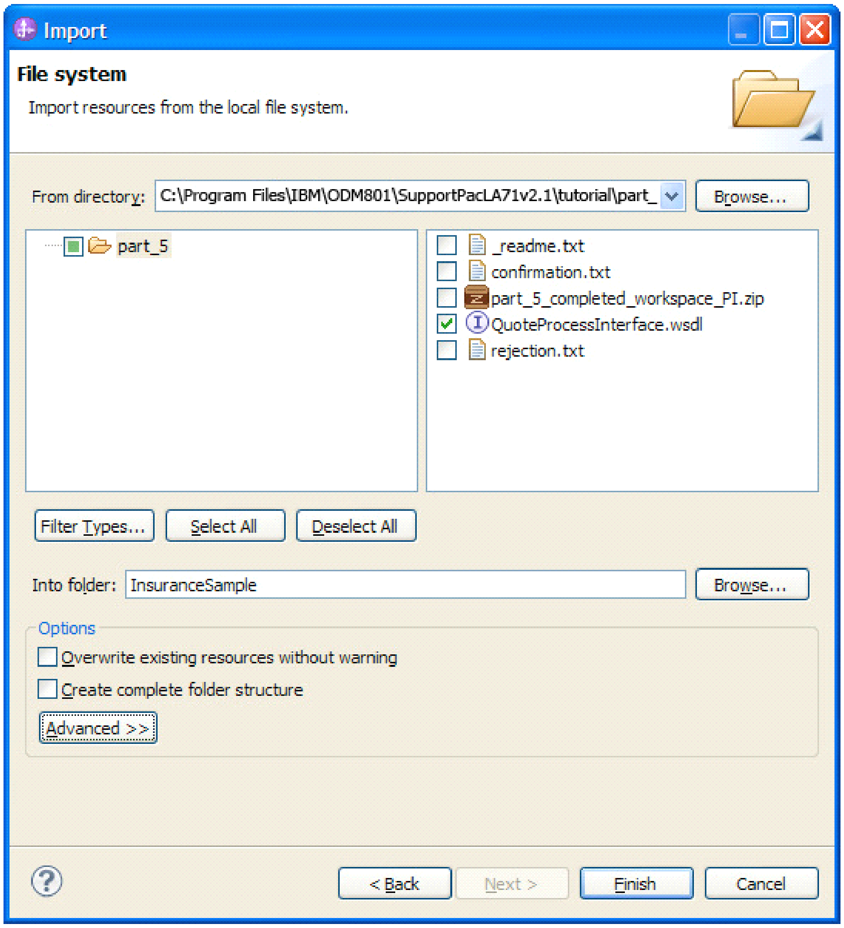
__ b. **General** and select **File System**.



__ c. Click **Next**.

__ d. For the From directory, click **Browse…** and select **[SupportPac LA71 Path]\tutorial\part_5**.

__ e. Check the box for **QuoteProcessInterface.wsdl**.


Import

File system

Import resources from the local file system.

From directory: C:\Program Files\IBM\ODM801\SupportPacLA71v2.1\tutorial\part_

☐ part_5

☐ _readme.txt
☐ confirmation.txt
☐ part_5_completed_workspace_PI.zip
☑ QuoteProcessInterface.wsdl
☐ rejection.txt

Into folder: InsuranceSample

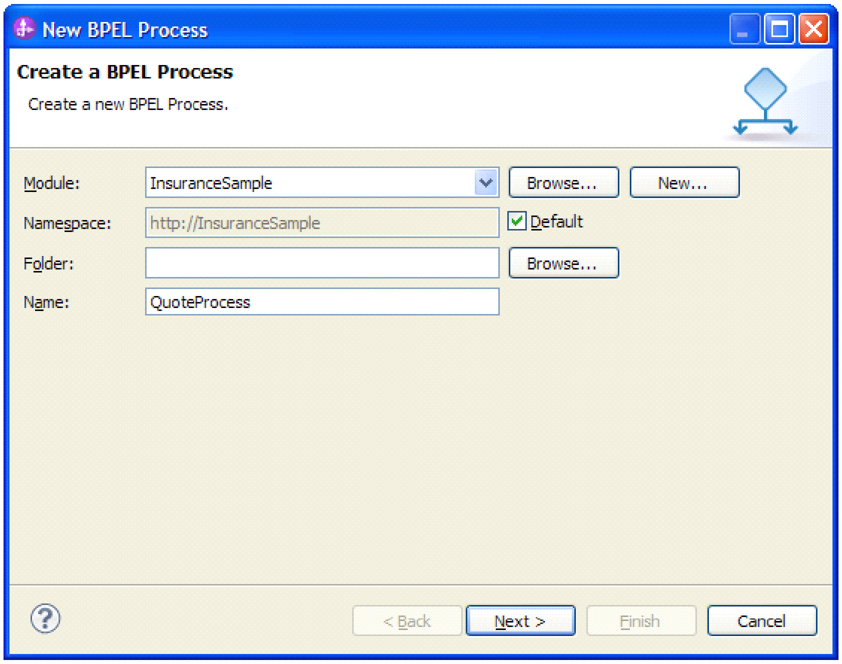
Options
☐ Overwrite existing resources without warning
☐ Create complete folder structure

__ f. Click **Finish**.

____ 3. Create business process for quotes.

__ a. Select **File > New > BPEL Process**.

__ b. For the Name, enter **QuoteProcess**.



Create a BPEL Process

Create a new BPEL Process.

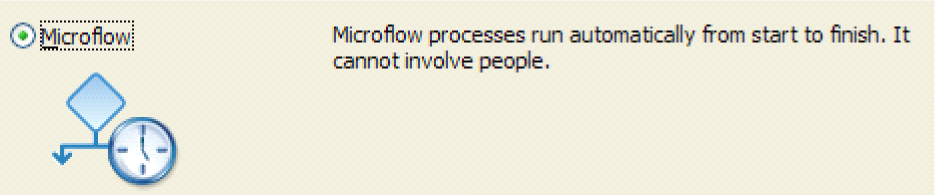
Module: InsuranceSample

Namespace: http://InsuranceSample ☑ Default

Folder:

Name: QuoteProcess

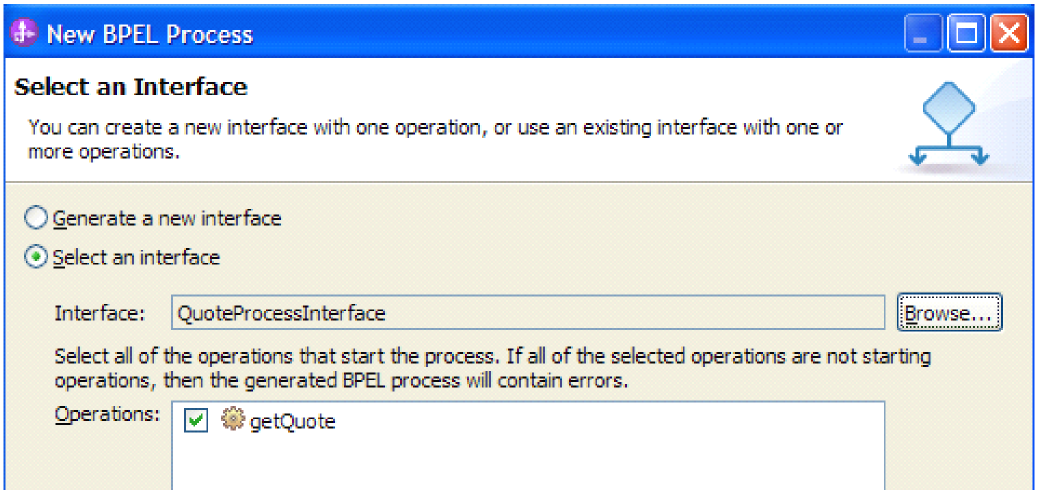
__ c. On the Business Process Type Selection screen, select **Microflow**. Select **Next**.



● Microflow

Microflow processes run automatically from start to finish. It cannot involve people.

__ d. Select the radio button **Select an interface**.
__ e. Click **Browse…** and select **QuoteProcessInterface**. Click **OK**.



Select an Interface

You can create a new interface with one operation, or use an existing interface with one or more operations.

○ Generate a new interface

● Select an interface

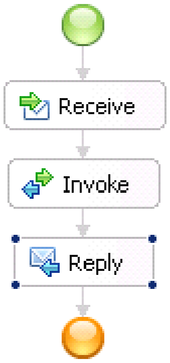
Interface: QuoteProcessInterface

Select all of the operations that start the process. If all of the selected operations are not starting operations, then the generated BPEL process will contain errors.

Operations: ☑ getQuote

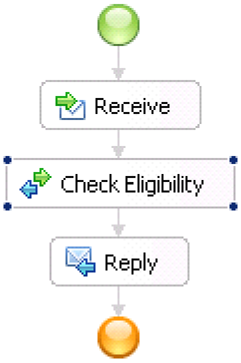
__ f. Click **Finish**.

____ 4. Add logic for checking eligibility before confirming the quote.
__ a. In the process editor, from the Palette under Basic Actions, select **Invoke**.
__ b. Click between the **Receive** activity and the **Reply** activity.

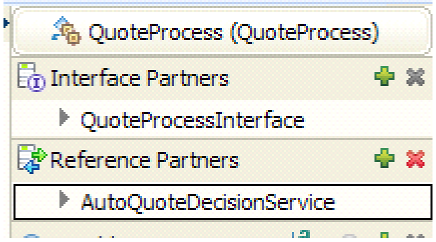


__ c. Select the Invoke activity and select the **Properties** view.

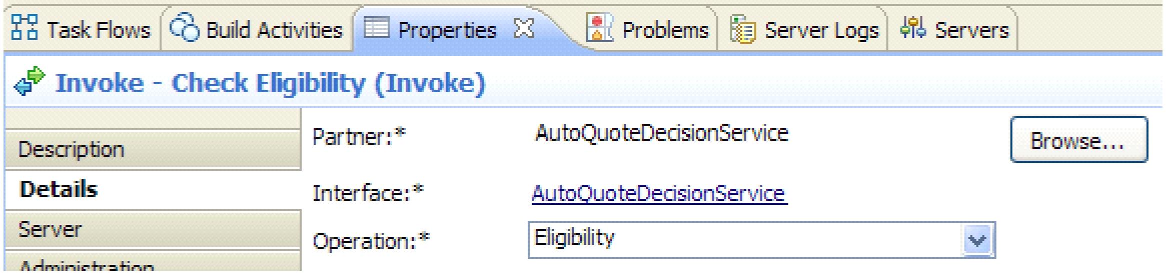
__ d. Change the Display name to **Check Eligibility**. This node will make the call to the Check Eligibility Decision Service to determine if the individual is eligible for insurance.



__ e. The Decision Service is called through a Reference Partner defined for the process. Select the add symbol for **Reference Partners**.
__ f. For the name enter **AutoQuoteDecisionService**.
__ g. In the Matching interface select **AutoQuoteDecisionService**. Click **OK**.



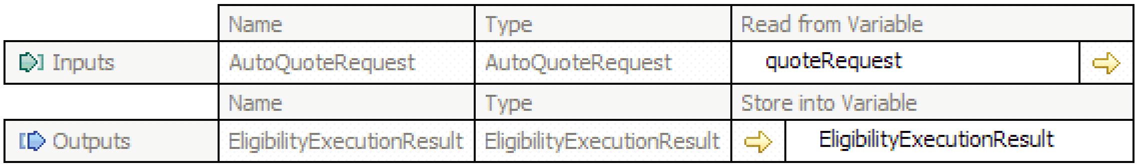
__ h. Select the Check Eligibility node again and the Properties view, select the **Details** tab.
__ i. For the Partner, select **Browse…** and select **AutoQuoteDecisionService**. Click **OK**.
__ j. Change the Operation to be **Eligibility**.



Partner:* AutoQuoteDecisionService
Interface:* AutoQuoteDecisionService
Operation:* Eligibility

__ k. Scroll down the Details tab. For the Input, under the Read from Variable column, click (***none***).
__ l. Select **quoteRequest**.
__ *m.* For the Output, under the Read from Variable column, click ***(none)***.

__ n. Click **New** and for the Variable Name accept the value **EligibilityExecutionResult**. Click **OK**.

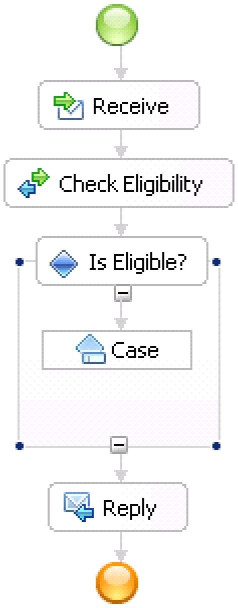


	Name	Type	Read from Variable
Inputs	AutoQuoteRequest	AutoQuoteRequest	quoteRequest ⇨
	Name	Type	Store into Variable
Outputs	EligibilityExecutionResult	EligibilityExecutionResult	⇨ EligibilityExecutionResult

_____ 5. Add logic for using the eligibility result to compute price and specify confirmation message.

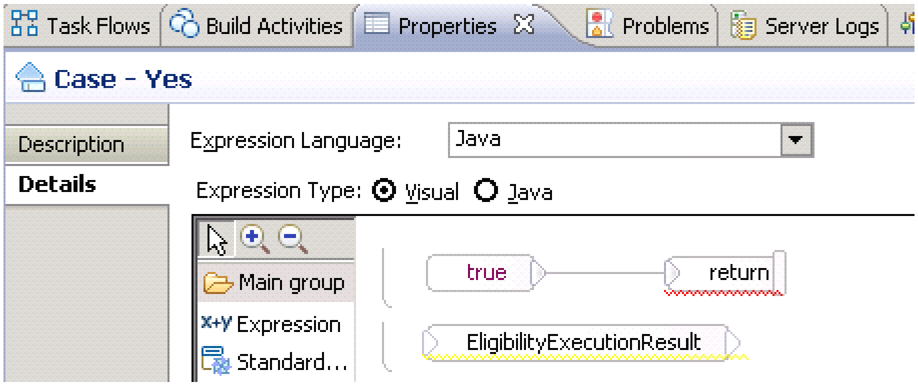
Combining a call to an **Invoke** (representing a decision) followed a **Choice** node is a common design pattern which reduces the amount of hard-coded logic. The decision is reused from the ODM but the "Choice" enforces the decision in the context of the process. The logic can be captured in business rules with the result checked by the Choice and different cases.

__ a. From the Palette under Structures, select **Choice**.
__ b. Click between the **Check Eligibility** node and the **Reply** node.
__ c. Select the Choice node and in the Properties view change the Name to **Is Eligible?.**



__ d. A case is created by default. Change the Display name in the Properties view to **Yes**.
__ e. The "Yes" condition is executed if the result from the Check Eligibility invoke is true. To specify the condition, select the Details tab.
__ f. For the Expression Language select **Java**.

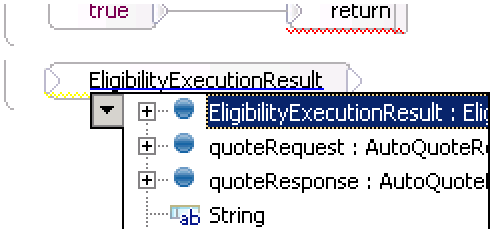
__ g. From the list of Variables, drag and drop **EligibiltyExecutionResult**.



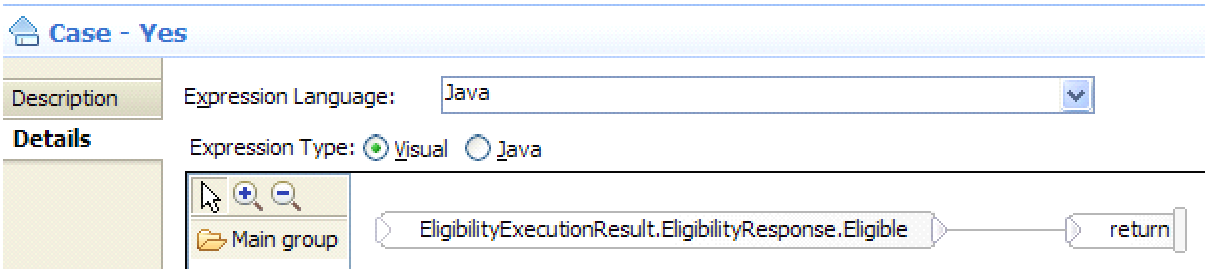
Expression Language: Java

Expression Type: ● Visual ○ Java

__ h. Click EligibilityExecutionResult to see the attributes for the variable.


true
return
EligibilityExecutionResult
EligibilityExecutionResult : Elig
quoteRequest : AutoQuoteR
quoteResponse : AutoQuote
String

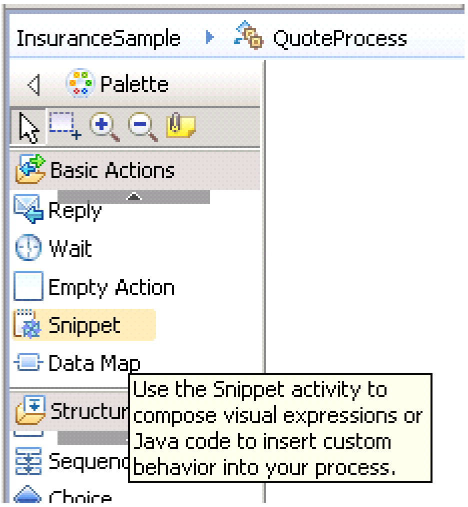
__ i. Expand and select **EligibilityExecutionResult.EligibilityResponse.Eligible**.
__ j. Delete the true value and wire the **EligibilityExecutionResult** variable to the **return**. Note that the wire will not operate until the fully qualified value is used.



Expression Language: Java

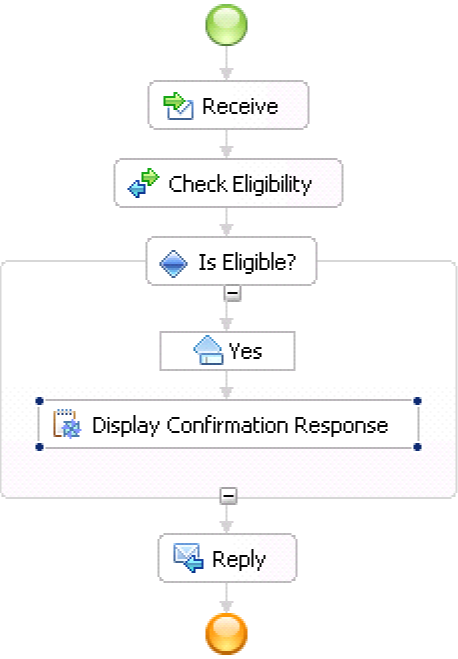
Expression Type: ● Visual ○ Java

__ k. A confirmation needs to be returned to the customer. For this process, a snippet will be used to specify a confirmation message. From the Palette, select **Snippet** from the list of Basic Actions.



Use the Snippet activity to compose visual expressions or Java code to insert custom behavior into your process.

__ l. Click beneath the **Yes** case node.
__ m. Change the Display name to **Display Confirmation Response**.



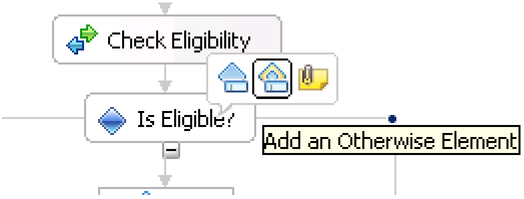
__ n. The confirmation message will be set with a small amount of Java code. In the Properties view, select the **Details** tab.
__ o. Select the Java radio button. Select **Yes** to the warning message.

__ p. Type in the following code or copy from the file **[SupportPac LA71 Path]\tutorial\part_5\confirmation.txt**, copy and paste the code into the Java window.

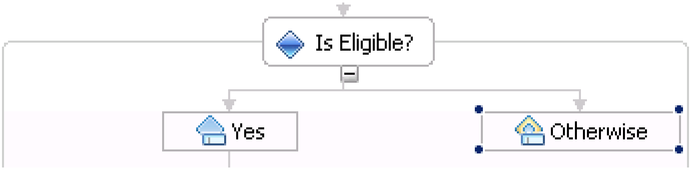
```
commonj.sdo.DataObject eligibilityResp =
this.EligibilityExecutionResult.getDataObject("EligibilityResponse");

com.ibm.websphere.bo.BOFactory boFactory = (com.ibm.websphere.bo.BOFactory)
com.ibm.websphere.sca.ServiceManager.INSTANCE

      .locateService("com/ibm/websphere/bo/BOFactory");

this.quoteResponse = boFactory.create("http://www.ilog.com/InsuranceSample",
"AutoQuoteResponse");

java.util.List messages  = new java.util.Vector();

String msg = eligibilityResp.getString("MainMessage");

messages.add(msg);

this.quoteResponse.setList("Messages", messages);

String result = "Congratulations! Your application was accepted. We can offer
you the coverage you requested.";

System.out.println(result);
```

____ 6. Besides the Yes case, a case is needed to handle a customer that is not eligible. Add logic to produce a rejection message.

__ a. Click the **Is Eligible** choice node.

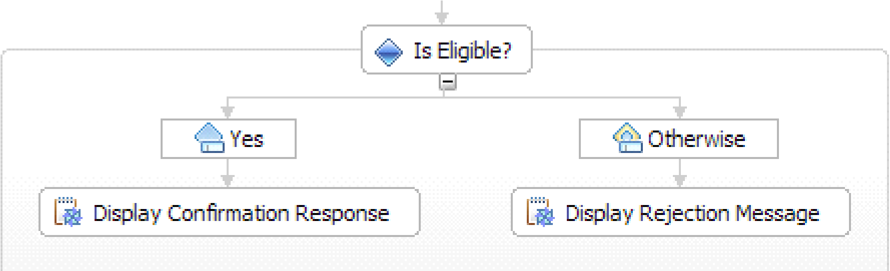


__ b. Select the **Otherwise** icon. An otherwise case will be added.



__ c. Just as the confirmation message, the logic for the rejection message will be specified with a Snippet. In the palette from the list of Basic Actions, select **Snippet**.

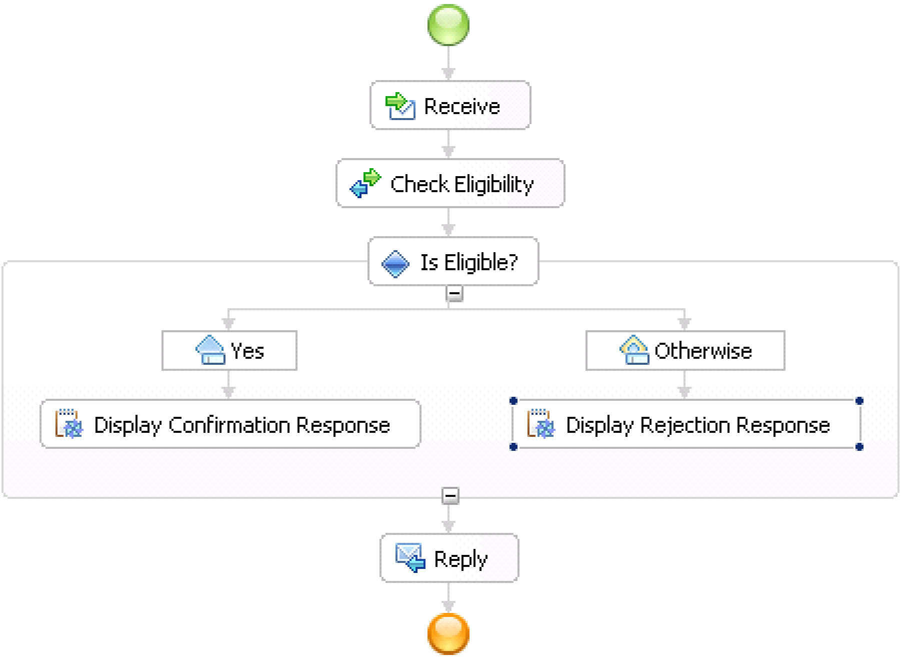
__ d. Click beneath the **Otherwise** case.
__ e. Change the Display name to **Display Rejection Message**.



__ f. The rejection message will also be set with a small amount of Java code. In the Properties view, select the Details tab.
__ g. Select the Java radio button. Select **Yes** to the warning message.
__ h. From the file **[SupportPac LA71 Path]\tutorial\part_5\rejection.txt**, copy and paste the code into the Java window.

```
commonj.sdo.DataObject eligibilityResp =
this.EligibilityExecutionResult.getDataObject("EligibilityResponse");

com.ibm.websphere.bo.BOFactory boFactory = (com.ibm.websphere.bo.BOFactory)
com.ibm.websphere.sca.ServiceManager.INSTANCE
  .locateService("com/ibm/websphere/bo/BOFactory");

this.quoteResponse = boFactory.create("http://www.ilog.com/InsuranceSample",
"AutoQuoteResponse");

java.util.List messages = eligibilityResp.getList("ErrorMessages");

String errors = "";

if ( messages != null && messages.size() > 0)

{

   this.quoteResponse.setList("Messages", messages );

   int size = messages.size();

   for(int i =0; i<size; i++)

   {

     errors += messages.get(i);

     if(i<size-1)

       errors +="; ";

   }
}

else {

   messages = new java.util.Vector();

   errors = eligibilityResp.getString("MainMessage");

   messages.add(errors);

   this.quoteResponse.setList("Messages", messages);

}

String result = "We're sorry, your application was rejected for the following
reason:\n\t" + errors;

System.out.println(result);
```

__ i. The process is now complete. Save the process. Check that no errors in the Problems view.

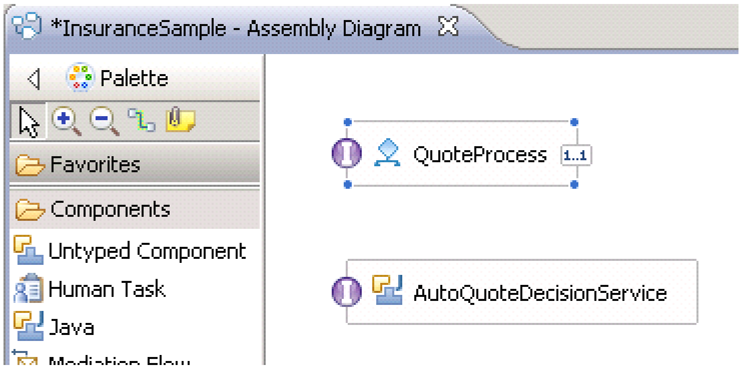


Part 6: Assembling BPM Application

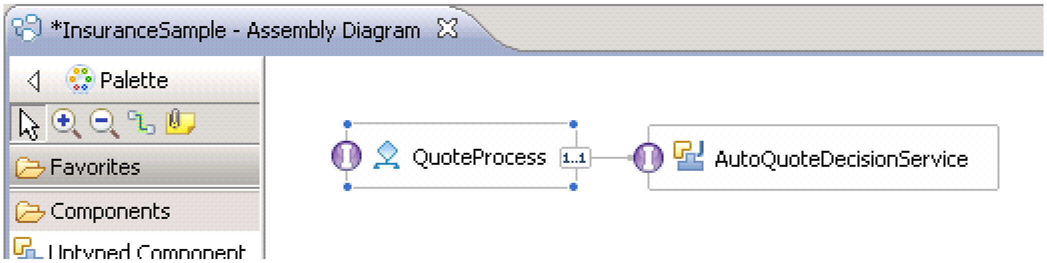
With the business rules and the business process created, the full solution can now be assembled.

____ 1. Assemble the business rules and business process.

- __ a. Open the **Assembly Diagram** to open the assembly editor if it is not already opened.
- __ b. In the Business Integration view, under **InsuranceSample > Integration Logic > BPEL Processes**, select the **QuoteProcess** process.
- __ c. Drag and drop the QuoteProcess process onto the assembly editor.



- __ d. Connect the reference on the **QuoteProcess** to the **AutoQuoteDecisionService** component by dragging the connector from the reference to the interface of the component.



- __ e. Save the assembly editor. Check for any errors in the Problems view and resolve.

Your application is complete and ready for a full test of the process and rules.

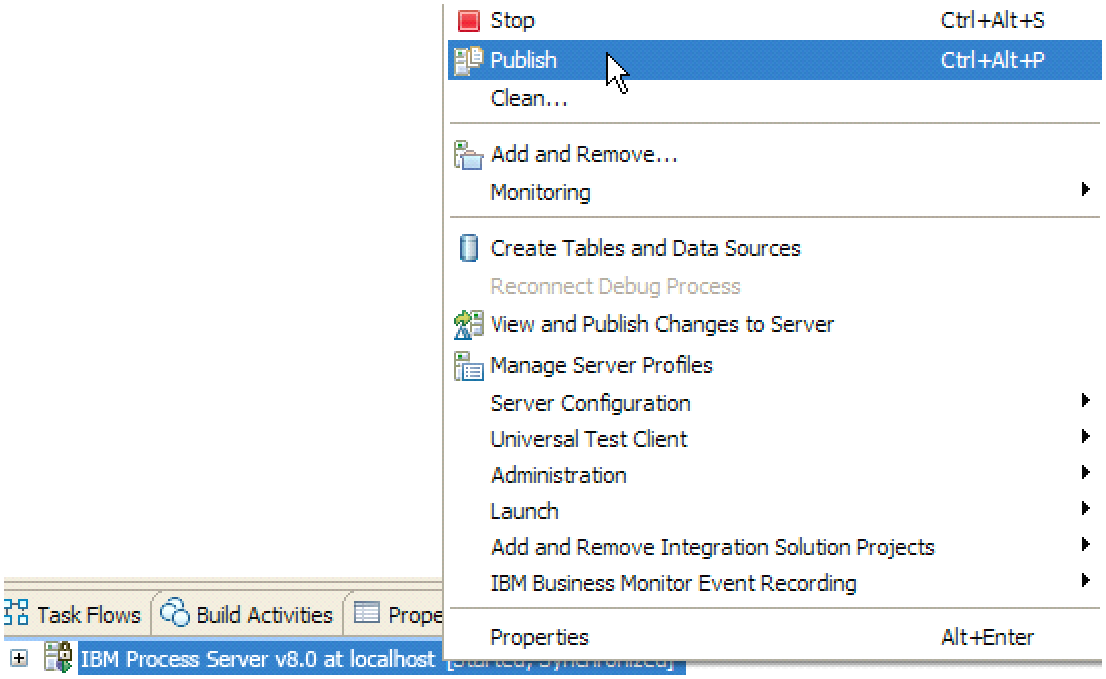
Part 7: Deploy and Test BPM Application

Just as the business rules, the business process can be deployed as an application to the IBM Process Server. Unlike the business rules, deployment is simply installing the application on the server. Once deployed, the process can be tested using the Test Component facility, Business Process Choreographer Explorer, or Business Space. You will test the process and the rules using the Test Component.

____ 1. The application deployed to the server needs to be updated with the business process. Republish the application.

__ a. In the Servers view, select **IBM Process Server v8.0 at localhost**.

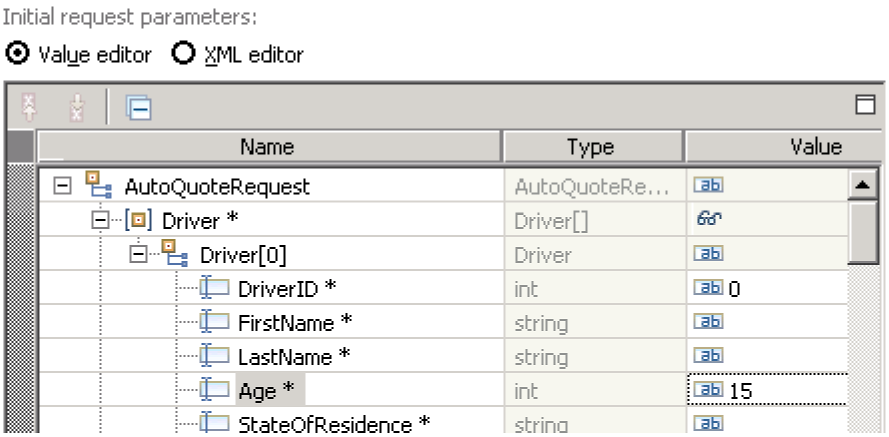
__ b. Right-click and select **Publish**.



____ 2. Test business process using the Test Component.

__ a. In the Assembly Diagram, right-click on the **QuoteProcess** and select **Test Component**.

__ b. For the Initial request parameters section, enter **15** for the driver **Age**

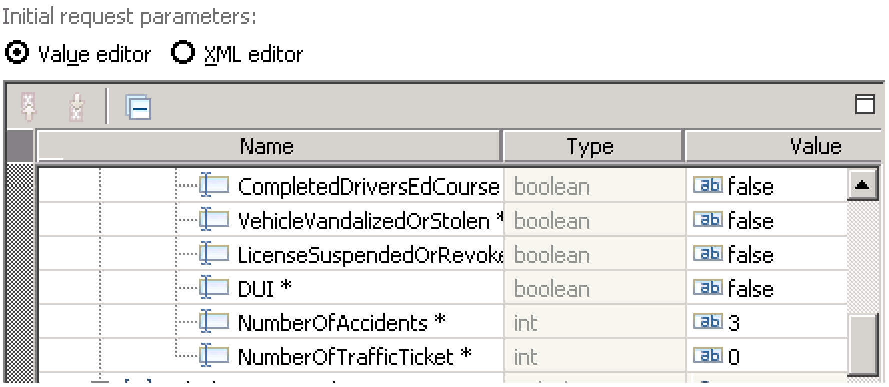


Initial request parameters:

● Value editor ○ XML editor

Name	Type	Value
AutoQuoteRequest	AutoQuoteRe...	
Driver *	Driver[]	
Driver[0]	Driver	
DriverID *	int	0
FirstName *	string	
LastName *	string	
Age *	int	15
StateOfResidence *	string	

__ c. For the Initial request parameters section, enter **3** for the driver **NumberOfAccidents**.

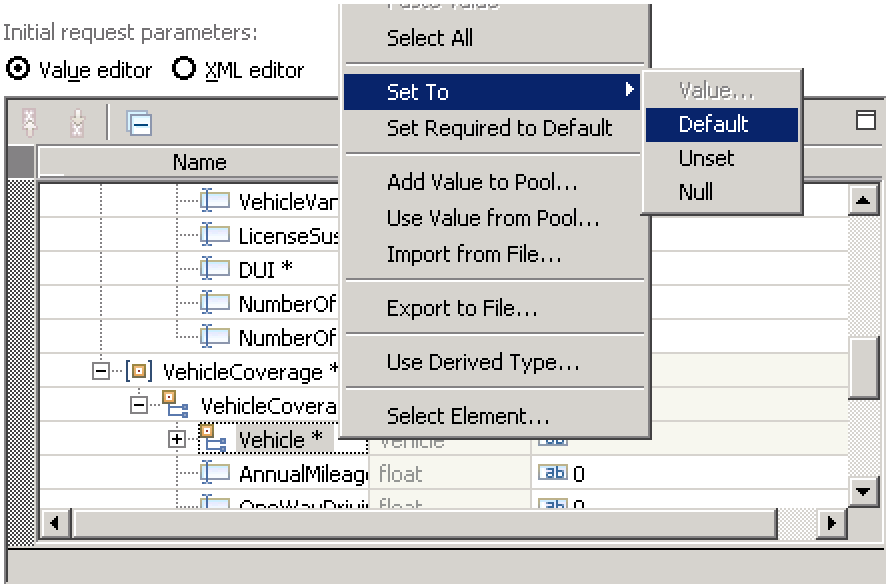


Initial request parameters:

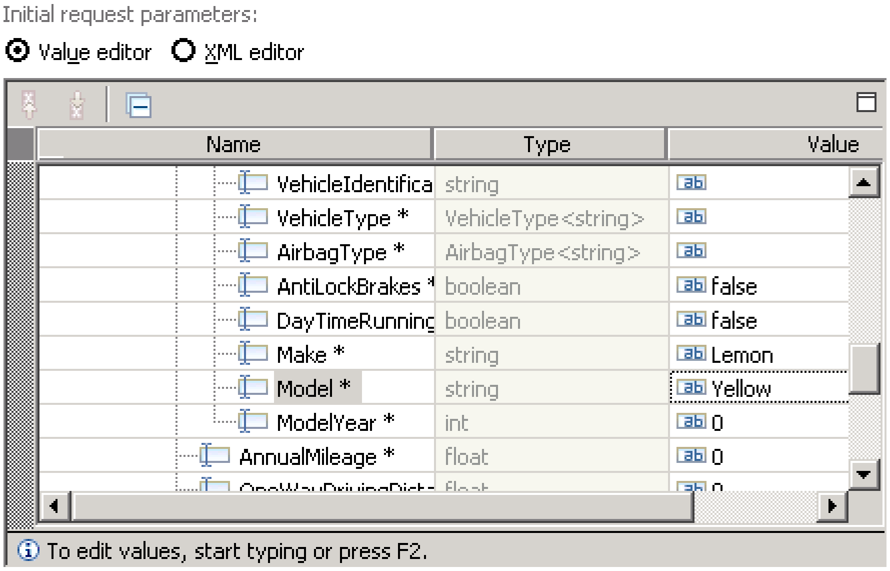
● Value editor ○ XML editor

Name	Type	Value
CompletedDriversEdCourse	boolean	false
VehicleVandalizedOrStolen *	boolean	false
LicenseSuspendedOrRevoke	boolean	false
DUI *	boolean	false
NumberOfAccidents *	int	3
NumberOfTrafficTicket *	int	0

__ d. Under **VehicleCoverage**, right-click on **Vehicle** and select **Set To > Default**.



__ e. Under Vehicle, for the Make enter **Lemon** and for the Model enter **Yellow**.

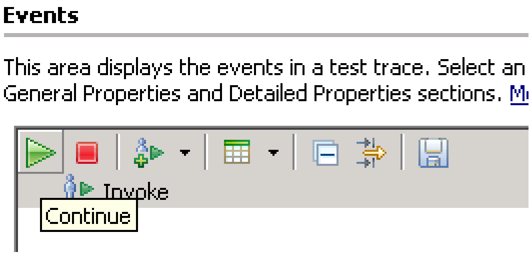

Initial request parameters:

● Value editor ○ XML editor

Name	Type	Value
VehicleIdentifica	string	
VehicleType *	VehicleType<string>	
AirbagType *	AirbagType<string>	
AntiLockBrakes *	boolean	false
DayTimeRunning	boolean	false
Make *	string	Lemon
Model *	string	Yellow
ModelYear *	int	0
AnnualMileage *	float	0

To edit values, start typing or press F2.

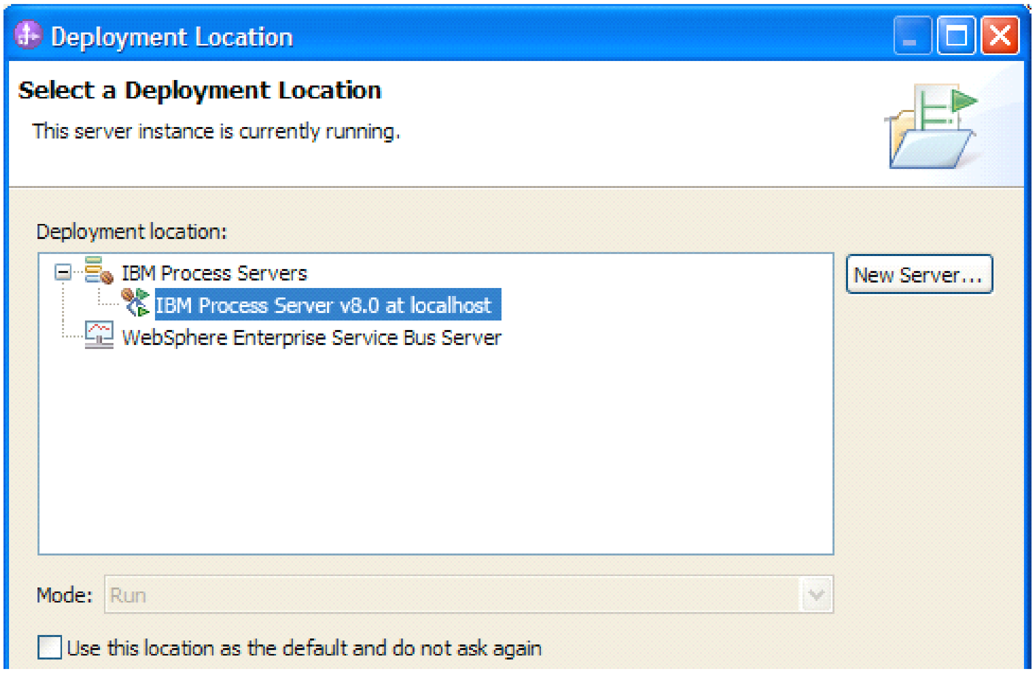
__ f. Click the **Continue** button.



Events

This area displays the events in a test trace. Select an
General Properties and Detailed Properties sections. M

__ g. Insure the Deployment location is **IBM Process Server v8.0 at localhost** and click **Finish**.



Select a Deployment Location

This server instance is currently running.

Deployment location:

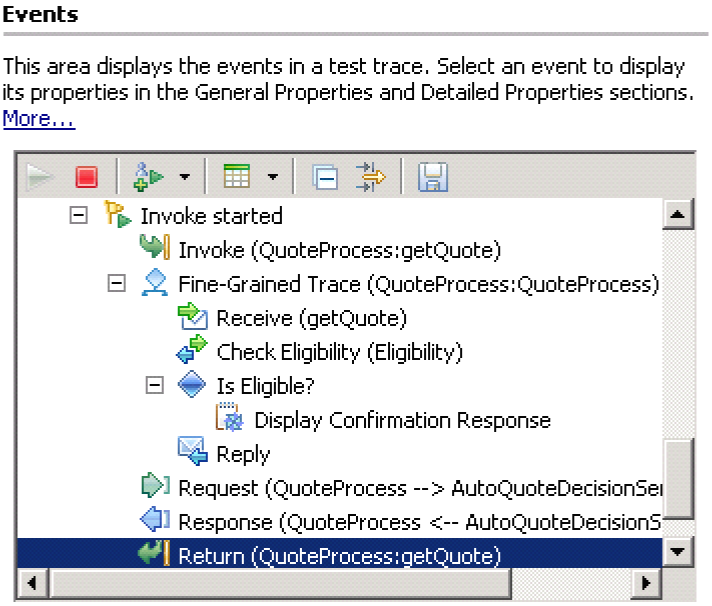
IBM Process Servers
IBM Process Server v8.0 at localhost
WebSphere Enterprise Service Bus Server
New Server...

Mode: Run

☐ Use this location as the default and do not ask again

__ h. For the User Login screen, accept the existing values and click **OK**.

__ i. The QuoteProcess business process component is be called and then the AutoQuoteDecisionService component is called.

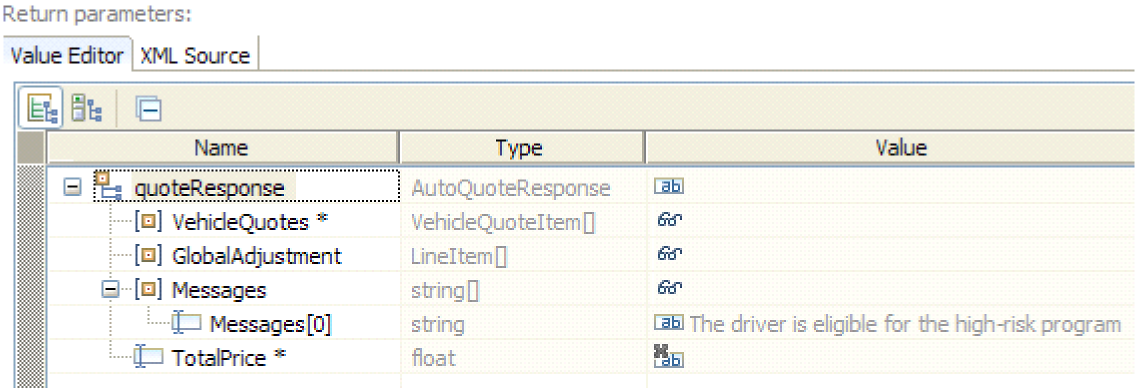


Events

This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. More...

- Invoke started
  - Invoke (QuoteProcess:getQuote)
  - Fine-Grained Trace (QuoteProcess:QuoteProcess)
    - Receive (getQuote)
    - Check Eligibility (Eligibility)
    - Is Eligible?
      - Display Confirmation Response
    - Reply
  - Request (QuoteProcess --> AutoQuoteDecisionSe
  - Response (QuoteProcess <-- AutoQuoteDecisionS
  - Return (QuoteProcess:getQuote)

__ j. The response is returned indicating that the driver is eligible for the high-risk program.



Return parameters:

Value Editor | XML Source

Name	Type	Value
quoteResponse	AutoQuoteResponse	
VehicleQuotes *	VehicleQuoteItem[]	
GlobalAdjustment	LineItem[]	
Messages	string[]	
Messages[0]	string	The driver is eligible for the high-risk program
TotalPrice *	float	

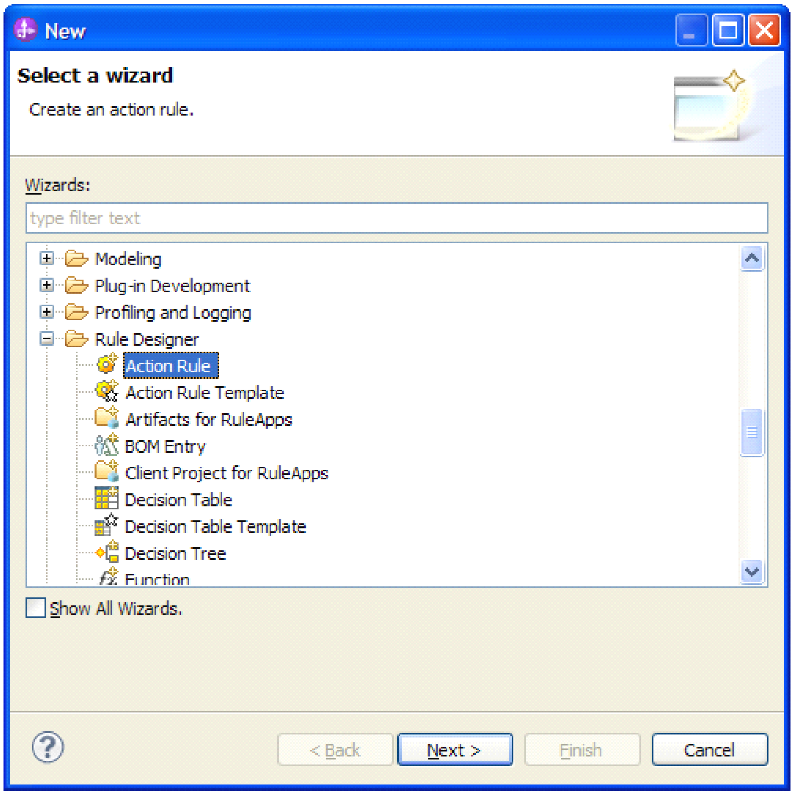
Part 8: (Optional) Create a Business Rule for the Return Message

In this optional part 8, rules will be updated and retested from IID. Most all of the steps to accomplish this have been completed; however, versioning will be introduced.

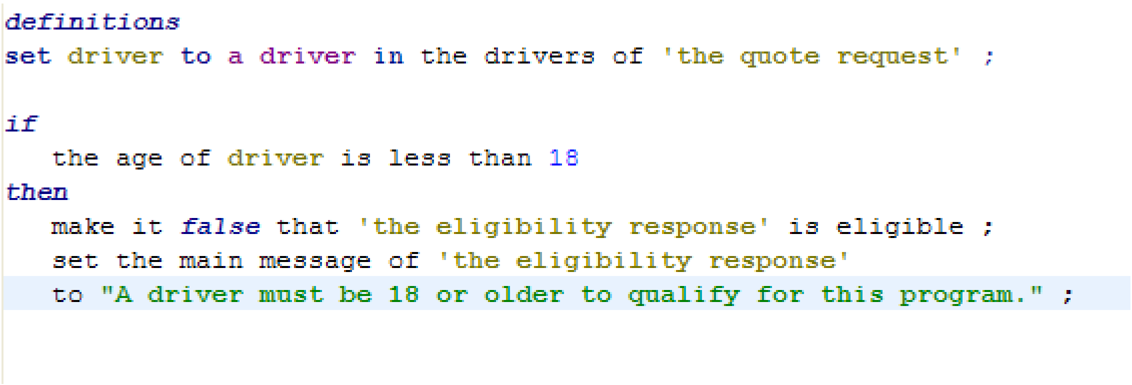
Since the WSDL used always pulls the latest version of the "Eligibility" ruleset, the updated will be deployed as a ruleset version 1.1 without changing the process.

____ 1. Update the "Eligibility" decision with a new rule for enforcing age.

- __ a. While still in the Business Integration perspective, navigate to the "Eligibility" module→Rules→Rule Module.
- __ b. Right click on the **Rule Package** and navigate to **New→ Other**.
- __ c. Select **Rule Designer → Action Rule**

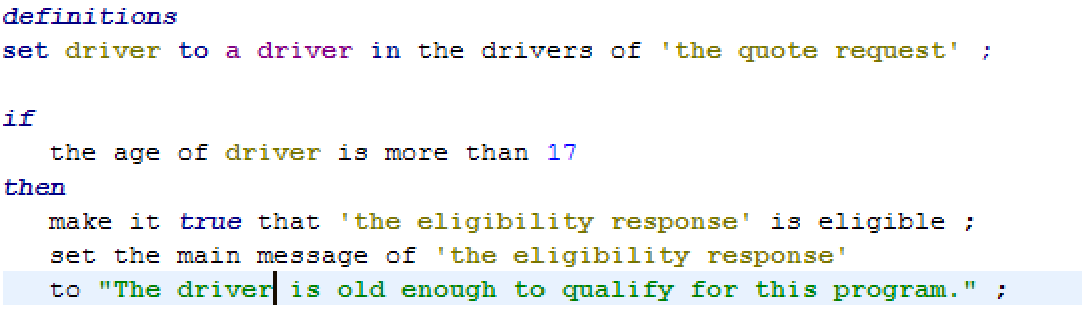


- __ d. Click **Next**.
- __ e. In the next window type in the name **EnforceDriverAgeBelow18**.
- __ f. Accept the defaults and click **Finish.**
- __ g. Type in the following rule:



```
definitions
set driver to a driver in the drivers of 'the quote request' ;

if
   the age of driver is less than 18
then
   make it false that 'the eligibility response' is eligible ;
   set the main message of 'the eligibility response'
   to "A driver must be 18 or older to qualify for this program." ;
```

__ h. Add another rule with the name: **EnforceDriverAgeAbove17** like the following:

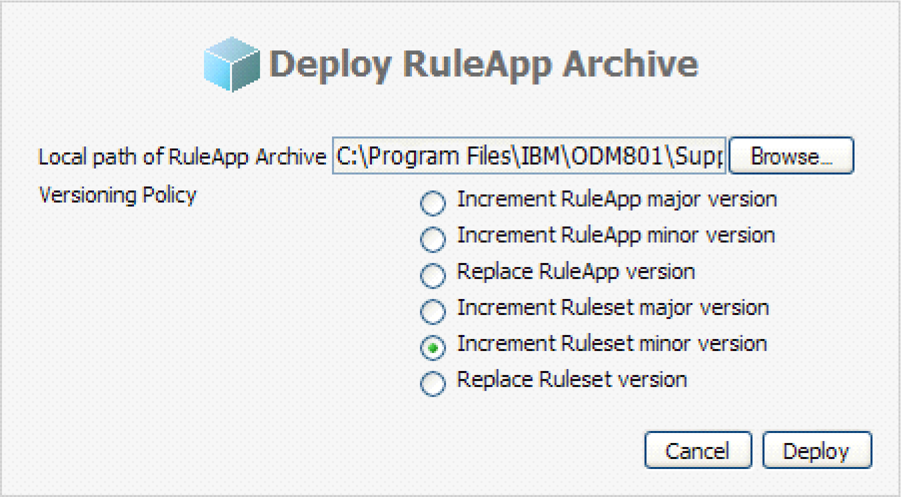


```
definitions
set driver to a driver in the drivers of 'the quote request' ;

if
   the age of driver is more than 17
then
   make it true that 'the eligibility response' is eligible ;
   set the main message of 'the eligibility response'
   to "The driver is old enough to qualify for this program." ;
```

__ i. Navigate to the **InsurnaceSampleRuleApp** module and double click on the **archive.xml** file.
__ j. Confirm that the version is 1.0
__ k. Export the decision to the file system.

____ 2. Load the ruleapp archive to Rule Execution Server
__ a. Open the Rule Execution Server console as in previous steps and navigate to the **Explorer** tab.
__ b. Click on **Deploy RuleApp Archive**.

__ c. Enter information as follows:



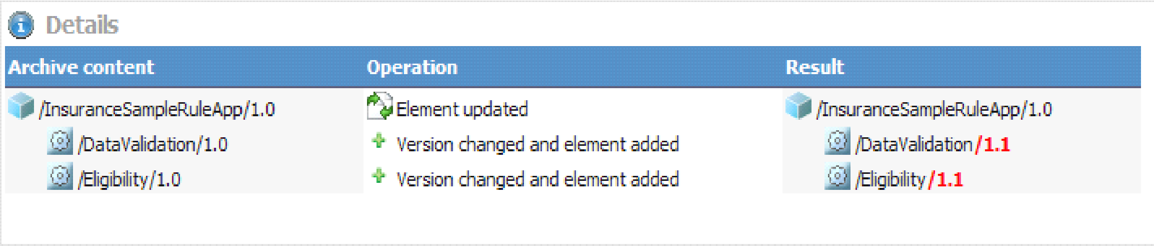
Deploy RuleApp Archive

Local path of RuleApp Archive: C:\Program Files\IBM\ODM801\Supp

Versioning Policy

- ○ Increment RuleApp major version
- ○ Increment RuleApp minor version
- ○ Replace RuleApp version
- ○ Increment Ruleset major version
- ● Increment Ruleset minor version
- ○ Replace Ruleset version

__ d. Click **Deploy**. Since the ruleset already exists, the version policy will increment the ruleset version to a 1.1.



Details

Archive content	Operation	Result
/InsuranceSampleRuleApp/1.0	Element updated	/InsuranceSampleRuleApp/1.0
/DataValidation/1.0	Version changed and element added	/DataValidation/**1.1**
/Eligibility/1.0	Version changed and element added	/Eligibility/**1.1**

__ e. Test the decision from IID as in Part 3 or test the business process using the decision as in Part 6 and add test data related to age.

What you did in this tutorial

In this tutorial, you simulated multiple roles in the development of a highly dynamic business process application. You started as the rule developer, capturing your business logic in business rules. You tested these business rules as decision services. Next you were the IT developer who defined the business process that used the business rules as a means of making your process more flexible. You finished by testing the entire BPM application.