IBM BUSINESS PROCESS MANAGER 7.5.1 – LAB EXERCISE

Developing BPEL that invokes a BPD
Straight-through processing scenario

What this exercise is about

IBM Business Process Manager Advanced (BPM) V7.5.1 is a single BPM solution that combines the best of breed human-centric and integration-centric capabilities into a unified platform.

When developing a business process that uses services between Process Designer and Integration Designer, there are three main scenarios.

Top-down: In this scenario the process developer defines the interface for the service to be called and the integration developer will then create the implementation based on the interface provided. This *top down* approach works well when the service does not already exist.

Bottom-up: The integration developer creates the service interface and the service implementation and then makes them available to the process developer. This *bottom up* approach works well when there is already a mature SOA architecture with reusable services.

Straight-through processing (STP): The main point to the Straight-through processing scenario is for a BPEL process with human interaction to call a business process definition (BPD). For version 7.5.1, the STP scenario integrates both legacy WebSphere Process Server functionality (BPEL) and legacy WebSphere Lombardi Edition functionality (BPD) into one runtime. The integration of a WebSphere Process Server BPEL and WebSphere Lombardi Edition processes can be achieved with existing web service technology. However, the new integration capability offered with version 7.5.1 is the support of the Service Component Architecture (SCA) standard by WebSphere Lombardi Edition. The SCA integration between WebSphere Process Server and WebSphere Lombardi Edition is explained, demonstrated, and executed with the sample documented in the exercise.

Lab requirements

These following products are required to run this exercise:
- IBM Business Process Manager V7.5.1 Server with IBM Process Center V7.5.1 stand-alone profile
- IBM Process Designer V7.5.1
- IBM Integration Designer V7.5.1
- DB2 V9.7.3 or higher

Throughout the lab, references to these products drop the IBM prefix and the version, calling them Process Center, Process Designer and Integration Designer.

What you should be able to do

At the end of this lab you should be able to perform the following tasks:
- As the integration developer using the Integration Designer
  - Create a human centric BPEL process
  - Integrate a BPD into a BPEL process and work with SCA artifacts associated with the BPD
  - Refresh and Publish to the Process Center
  - Use the BPC Explorer to drive/start the STP scenario
- As the process developer using the Process Designer
  - Create a Process Application
  - Create a process application and simple business process that uses a Coach
  - Correctly pass data through the process
  - Test the process application using the Process Inspector.
  - Use the Process Portal to work with the Coach

Introduction

The development of a solution demonstrating the interaction of two different process development environments involves the development of processes by two user roles (personas). First, the Business Author or Process Designer named Bob, who uses the IBM Process Designer (IPD), formerly known as Lombardi Authoring Environment (AE). Second, the IT Developer or Integration Specialist named Igor, who uses the IBM Integration Designer, formerly known as WebSphere Integration Developer. IBM Integration Designer was enhanced in such a way that it provides a new perspective named Process Center perspective. This allows interacting with and retrieving artifacts from the Process Center by several developers for a given project rather having the project stored locally in a developers WebSphere Integration Developer workspace. The Process Center is the central repository to store, access, and manage process artifacts held together as a single project called a process application.

In this exercise you will learn how to use the *straight-through processing* approach for integrating a *Business Process Definition* into your human centric BPEL business process.

Part 1: IBM Process Designer – Build a human centric process

In this part of the lab exercise, you will start the Process Center and open the IBM Process Designer to start the scenario

A basic outline of this part is:

- Start the Process Center server
- Open the Process Designer development environment
- Build a human centric business process definition (with a Coach)

____ 1.   Start IBM Process Center V7.5.1

__ a. Select **Start → All Programs → IBM→ BPM Advanced 7.5 → Profiles → ProcCtr01 → Start the Server**
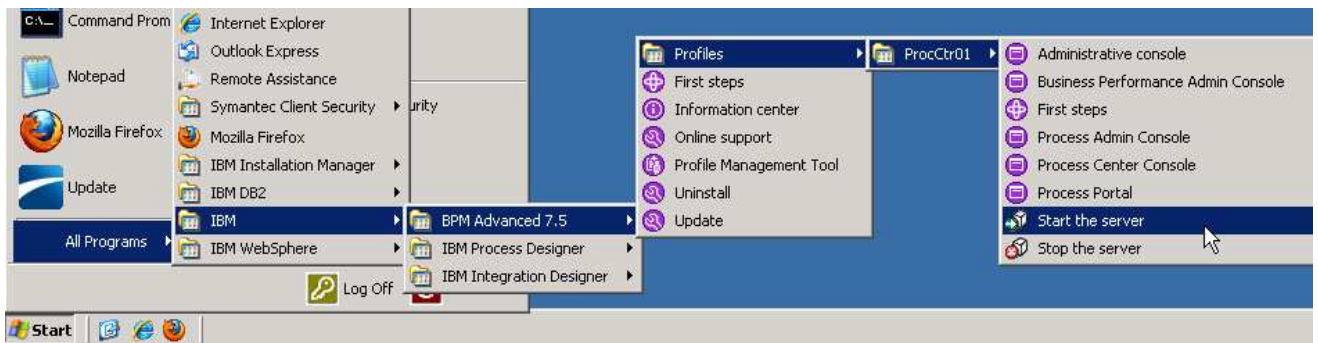
__ b. Wait for the server to start, which can take a few minutes. While it is starting, you should see the following window:
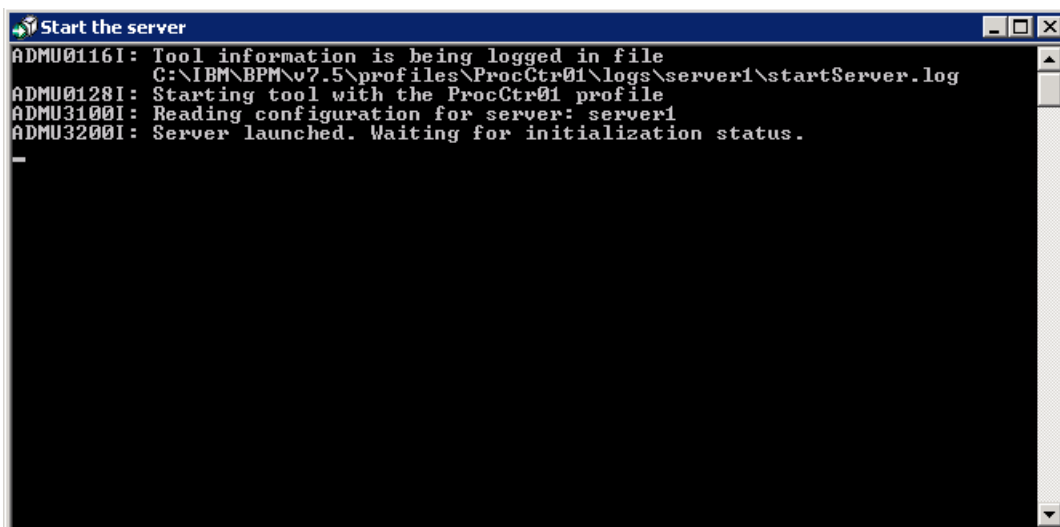
__ c. When the server startup completes, you will see some additional messages in the window and then it will then close automatically. When the window disappears, you are ready to continue.

_____ 2.   Start Process Designer

   __ a. Select **Start → All Programs → IBM → IBM Process Designer → IBM Process Designer 7.5.**
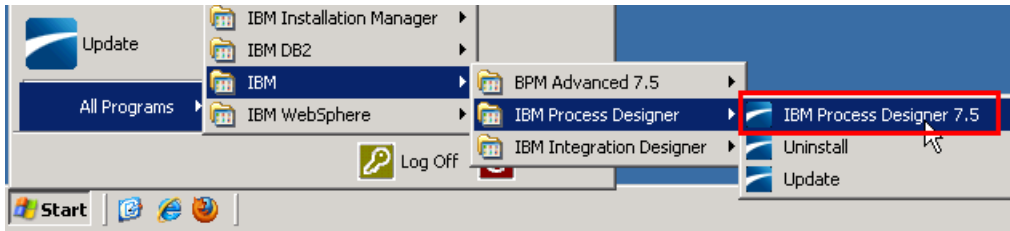
   __ b. Enter the credentials (admin/admin are the default credentials, enter appropriate credentials for your Process Center)

   User Name: **admin**
   Password: **admin**

   and then click **Login**.

   __ c. If this is the first time you launch the Process Designer, you may see a **SSL SIGNER EXCHANGE PROMPT** dialog pops up. This message occurs when the WebSphere Application Server SSL configuration has changed and the client does not trust the new or changed SSL certificate.

   Just click **y** to add singer to the trust store.

_____ 3.   Create new process application and open in Designer

__ a. On the right side task menu select **Create New Process App**
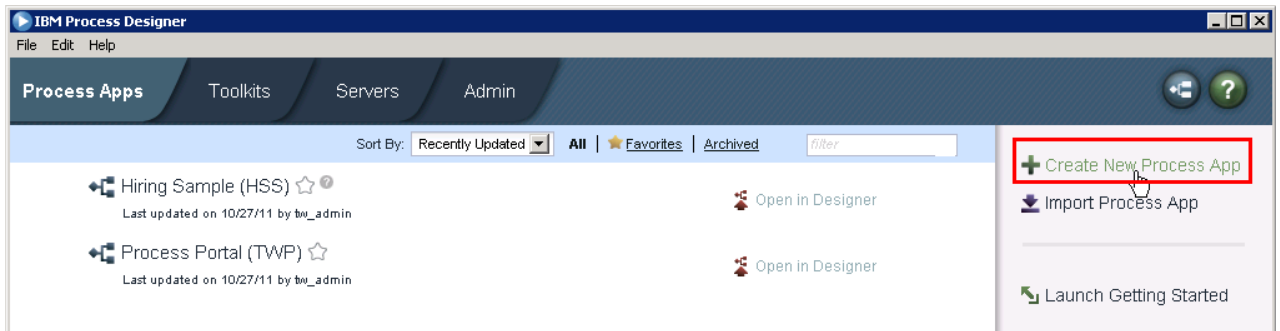
__ b. In the Create New Process App wizard, type in the Process App Name text box
RequestProcessApp1 and then **RPA1** in the Acronym text field. Click **Create**.
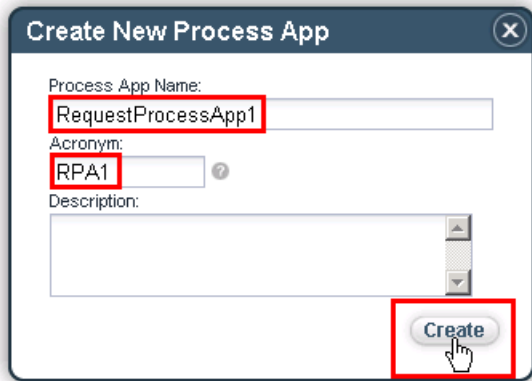
__ c. The first entry should be the RequestProcessApp1. Click the **Open in Designer** link parallel to
RequestProcessApp1.
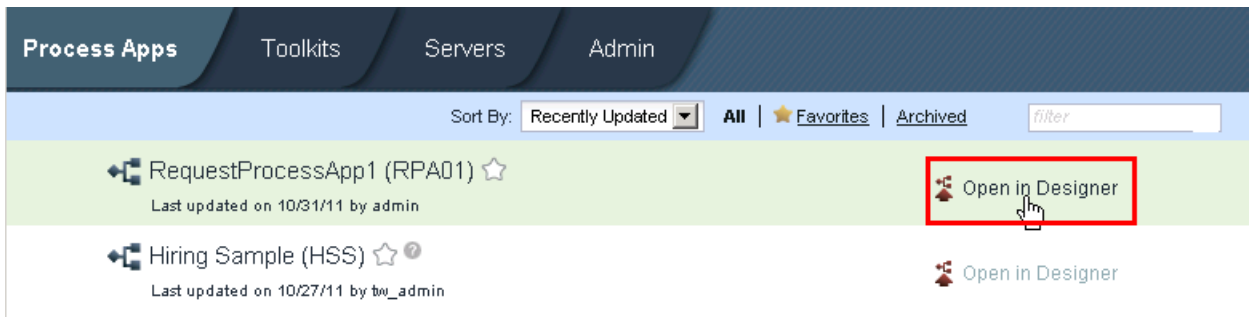
_____ 4.   Create a Business Object with parameters

    __ a. Once Process Designer is open, your first task is to define the business objects that will be passed in the process.

        Click the + sign icon next to Data in the list of options to bring up the Create New menu. Click **Business Object**.
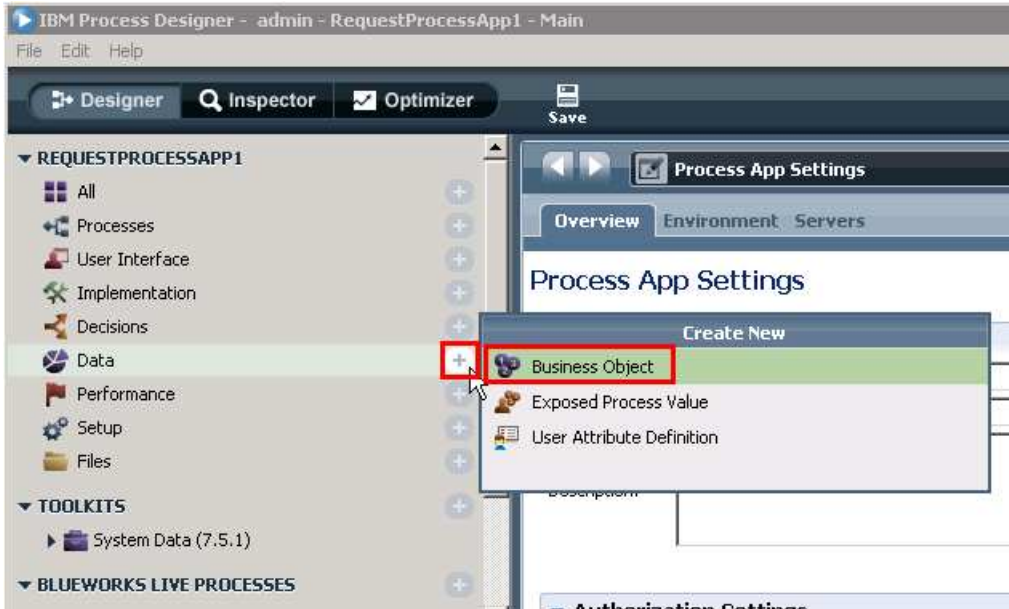
__ b. Name the new business object **RequestBO** and click **Finish**.
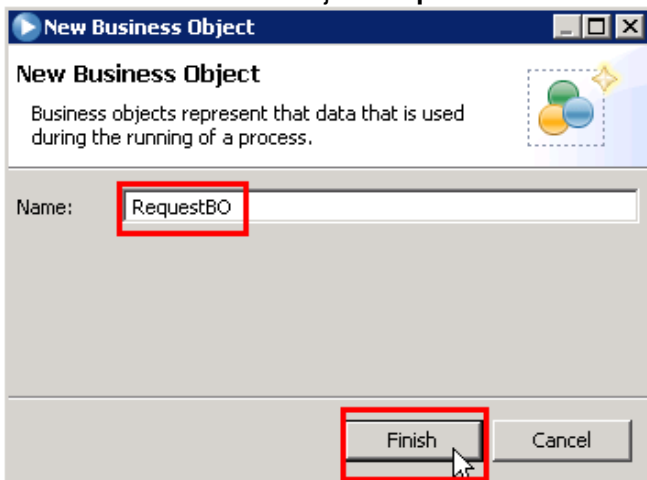
__ c. The Business Object editor opens. The main task in this editor is to define the structure and parameters to the business object. You will accept the default definition type of Complex Structure Type and add these parameters:

requestNumber (Integer)
requestDescription (String)
requestApproval (Boolean)

1) Click **Add** under Parameters and then type in **requestNumber** for the name in the parameter properties
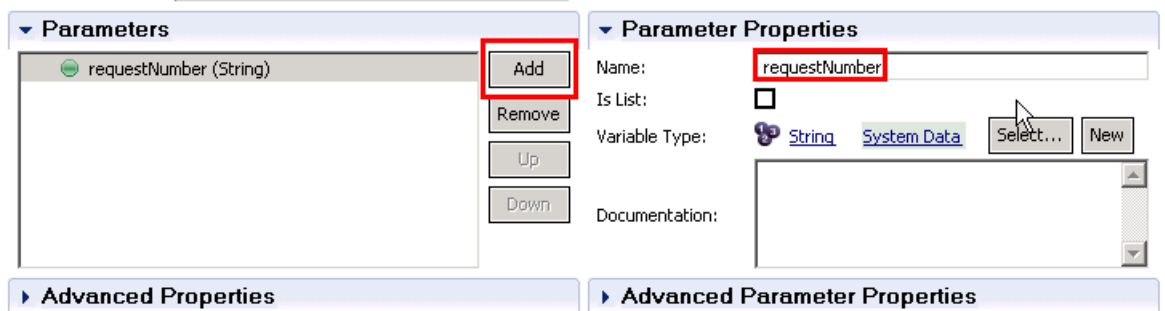
2) Underneath the Parameter Properties section, you want to change the type of the parameter from the default string to an integer.

Click **Select** and then click **Integer** in the list

*hint: you can start typing the name of the type that you want and the list will auto-filter.
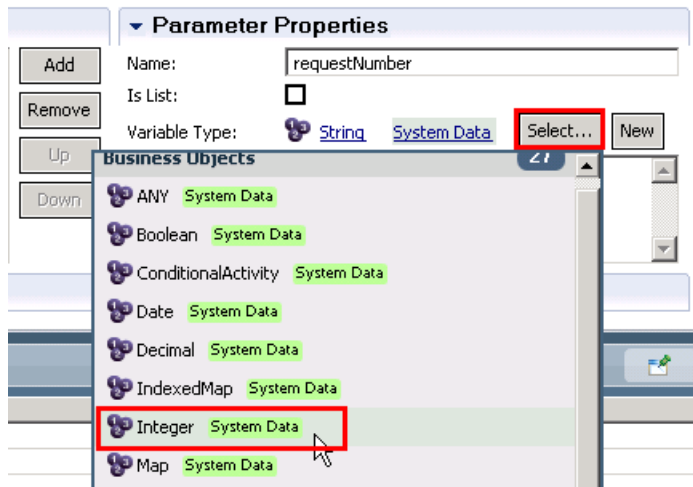
3) Repeat steps 1 and 2 from above (click **Add**, name parameter, select parameter type) in order to add two more parameters.

Click **Add**, type requestDescription for the name and leave the default type of String.

Click **Add**, type requestApproval for the name. Click **Select** for the parameter type and click Boolean.

At the end you should see these three parameters
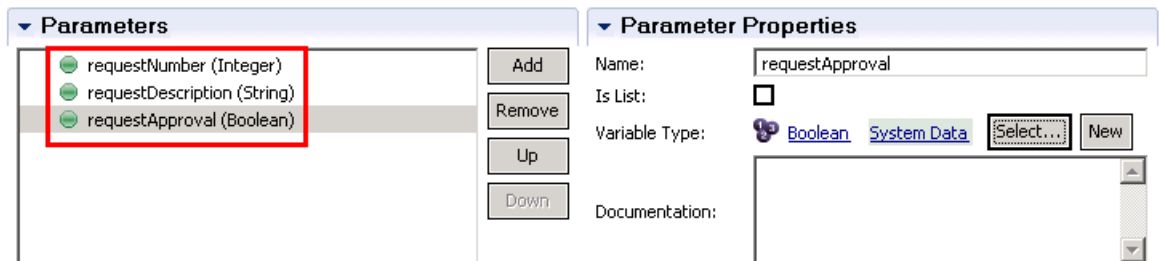
4) Click **Save** to save the business object and its parameters.
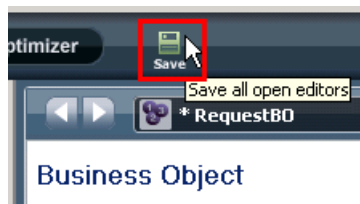
_____ 5.   Create a Business Process Definition (BPD) to wrap the initial approval coach.

__ a. Click on the **+ sign next to Processes** and click **Business Process Definition**
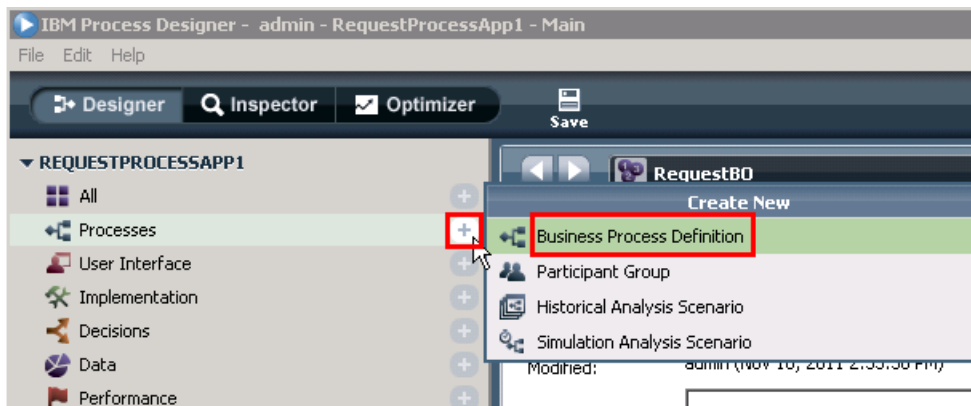
__ b. Enter **InitialApprovalBPD** for the name of the new Business Process Definition. Click **Finish**.
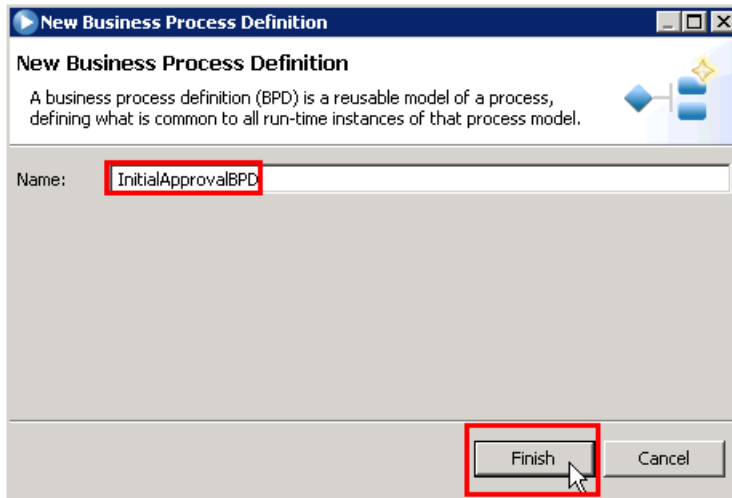
__ c. The BPD Diagram opens, however the first thing you need to do is set the data that the BPD will be transferring through the process. In order to take action on setting the data, click the **Variables tab** to add input and output variables.
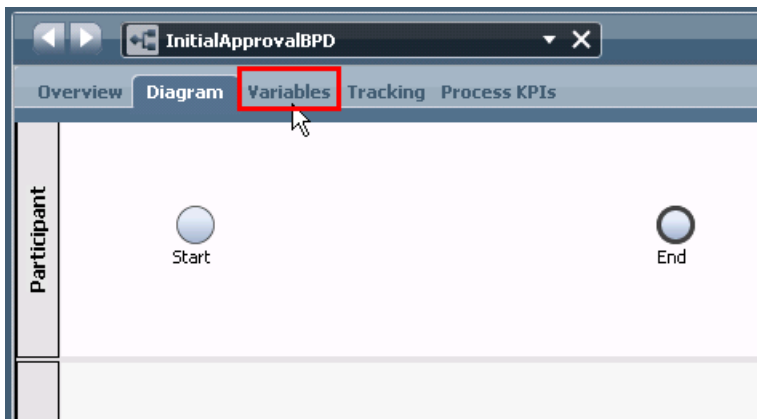
__ d. Under the Variables tab, click **Add Input**.
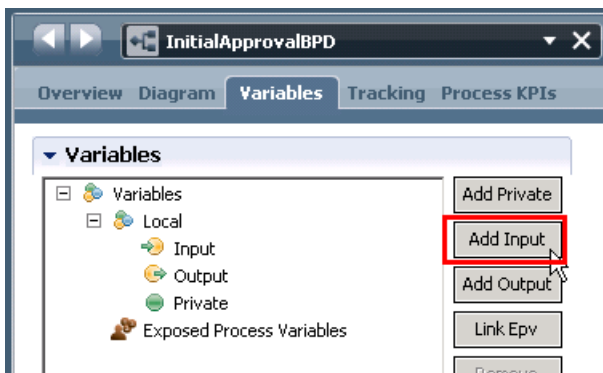
__ e. Type **reqBO** for the name, click **Select…**, and click **RequestBO**
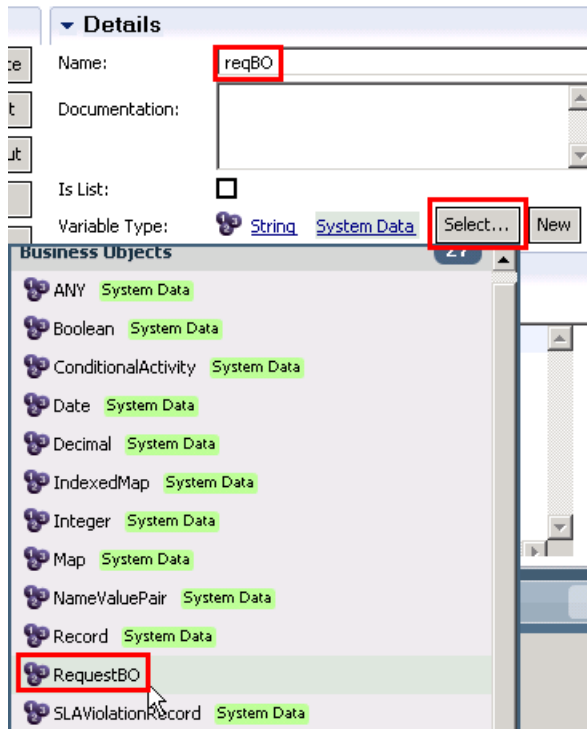
__ f. Click **Add Ouput**, and again type in **reqBO** for the name (since in this process you want to pass the same data through the process), click **Select…** and click **RequestBO** again.

Your BPD input and output should now look like this:
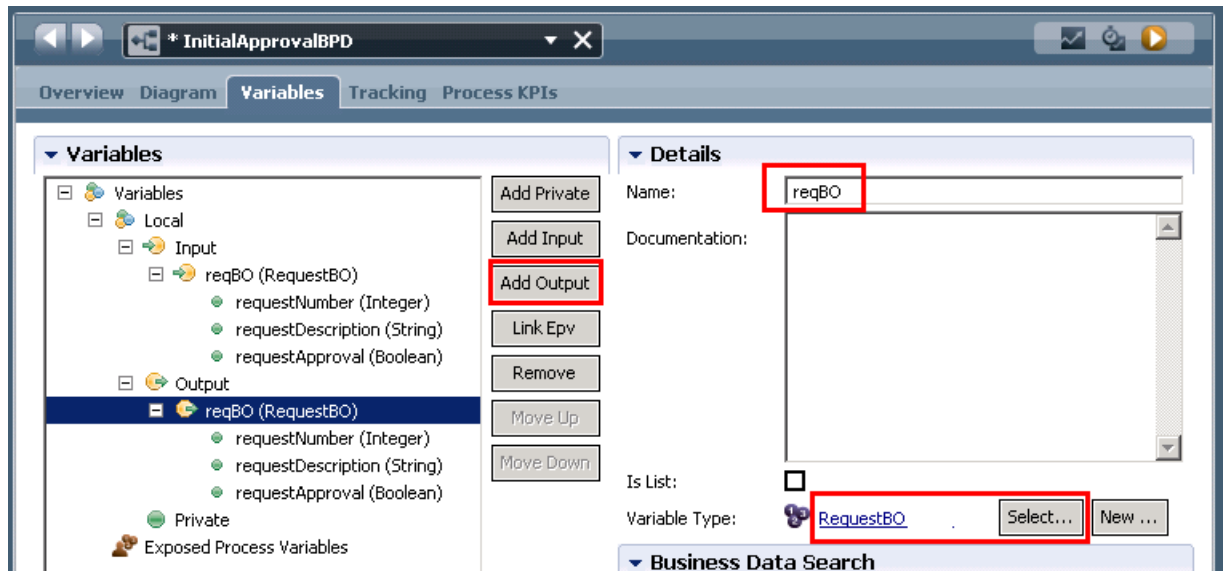
__ g. Click back on the **Diagram tab** and click the **Activity** icon from the right palette. Click in the middle of the editor between the Start and End activities in the Participant swim lane.
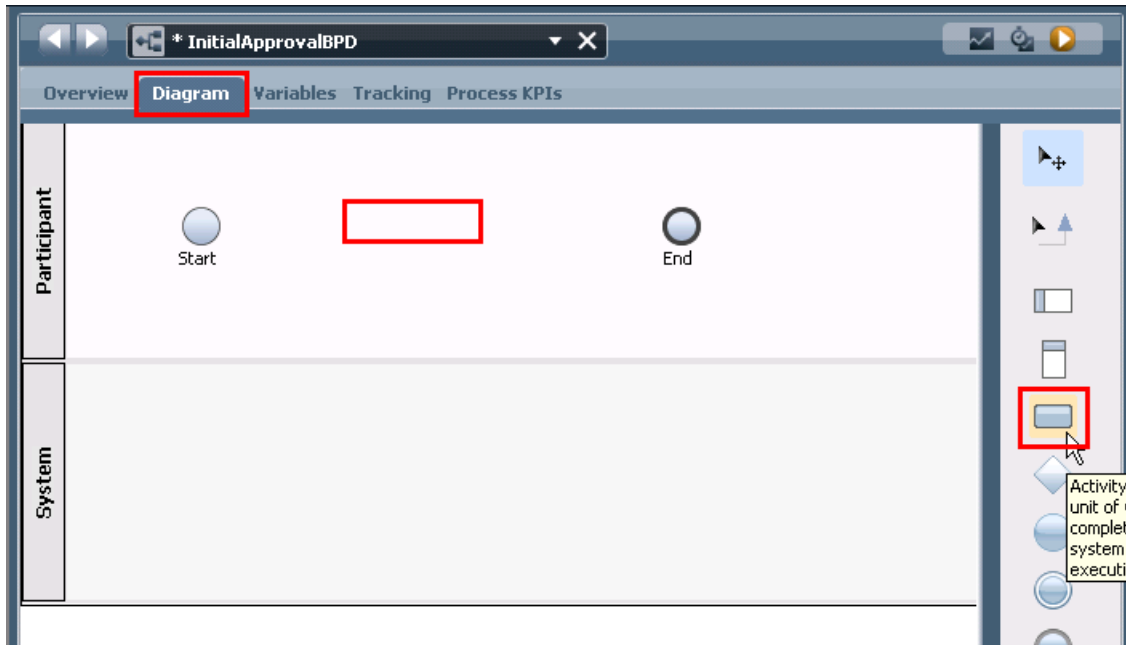
__ h. This action will drag an Activity and drop it on the BPD editor. Once the activity is dropped on the editor, the direct name editor highlights the default "**Untitled**" name, enter "**InitialApprovalCoach"** as new name.
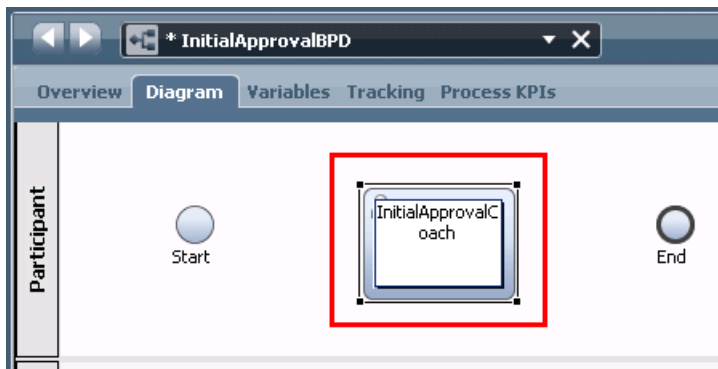
__ i. In the properties tab at the bottom of Process Designer, change the presentation color of the activity to **Green**.
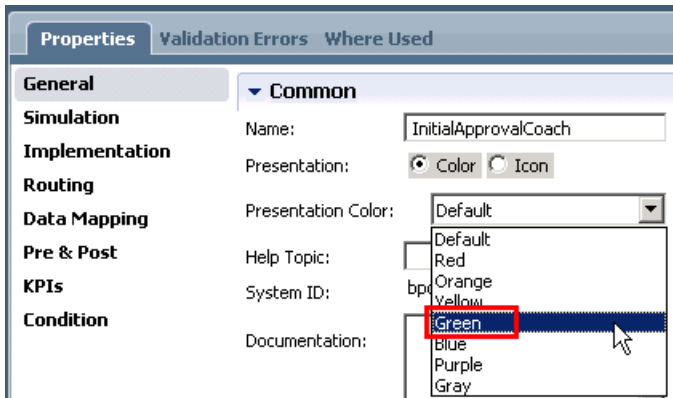
__ j. Once you have set the properties, it is time to connect or wire the business process together. Select the **Sequence Flow** icon in the right palette..
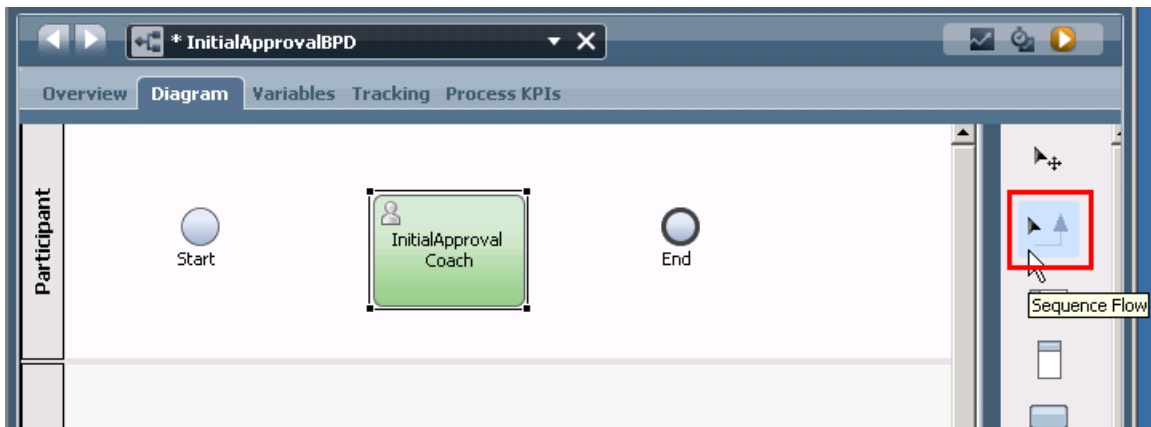
__ k. Click the right side of the **Start** icon to start the wire, then move the pointer to the left side of the **InitialApprovalCoach** and click to complete the wire, connecting the two.
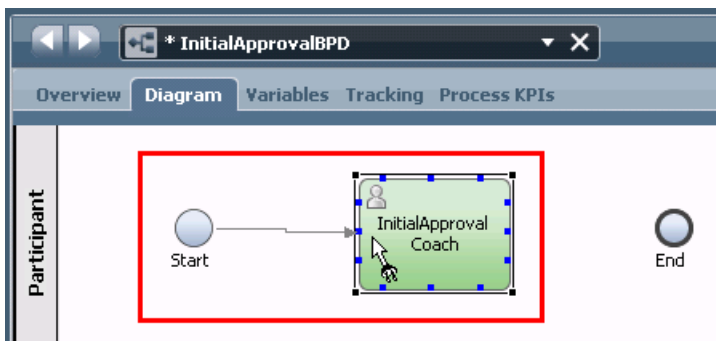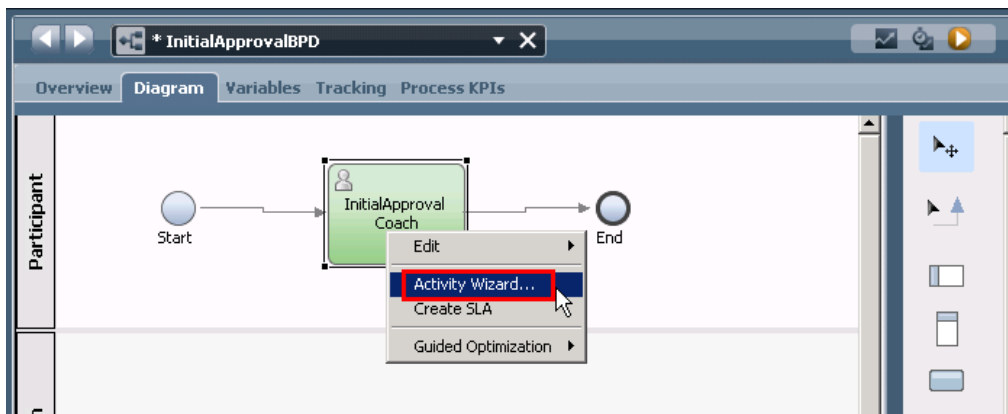

__ l. In the same fashion, click the right side of the **InitialApprovalCoach** and then the left side of the End icon.
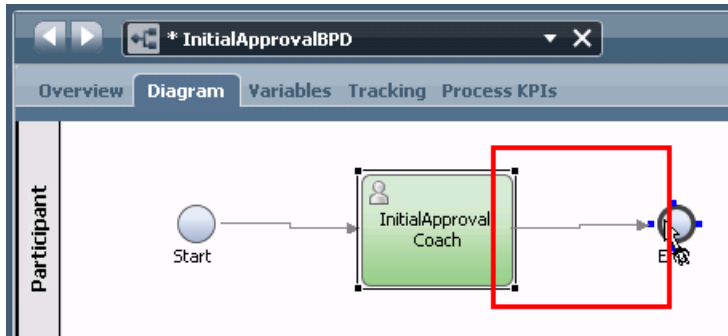
__ m. Click the **selection tool** to be able to select items in the editor and to prepare for the next step
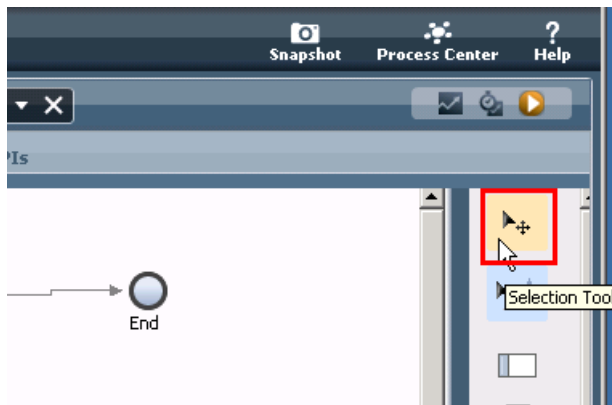
__ n. Right-click **InitialApprovalCoach** and select **Activity Wizard…**

__ o. Since you named the Activity appropriately in the previous step, you will see that the Activity Name and New Service Name are already filled in.

For the **Activity Type**, you will leave the default of a **User Task** because you want this initial approval to be approved by a human being and not automated with a business rule.

For the **Library Element Selection**, leave the default of **Create a New Service or Process** selected because you want to create this new initial approval coach. Click **Next**.
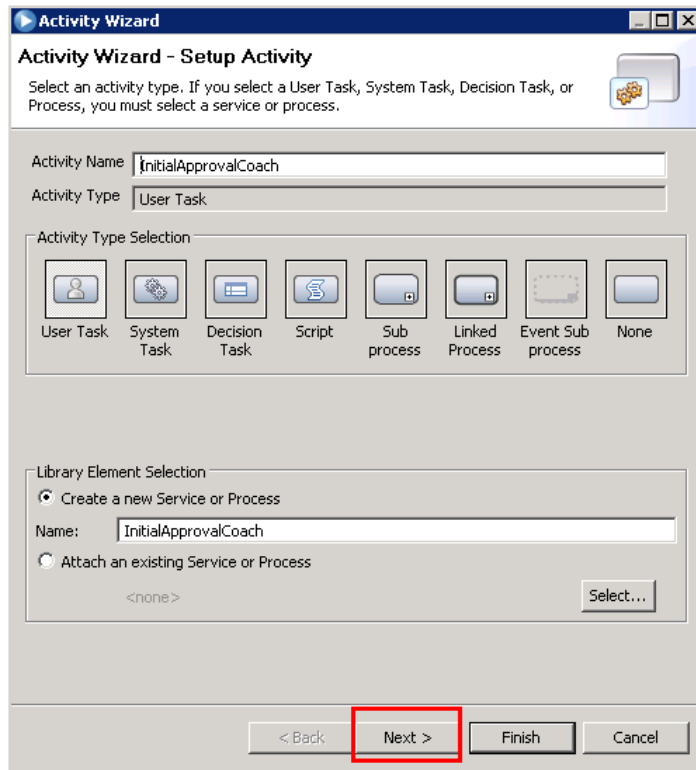
__ p. The second screen of the Activity Wizard is where you need to define the business objects that a BPD will use before designing the process. The input and output business objects have already been defined in the wizard due to your previous work. Leave the defaults of the inputs and outputs both being true for this business activity since you want the business object to be passed into the activity and out of the activity.
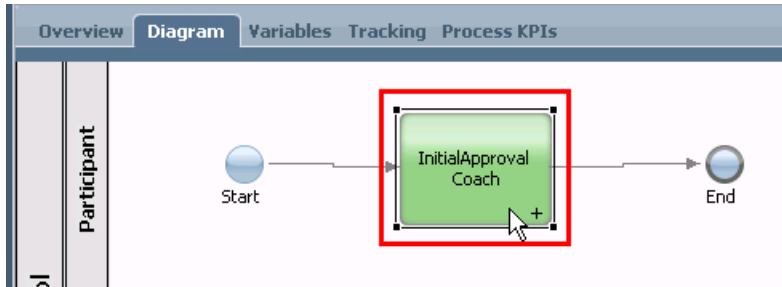Click **Finish**.
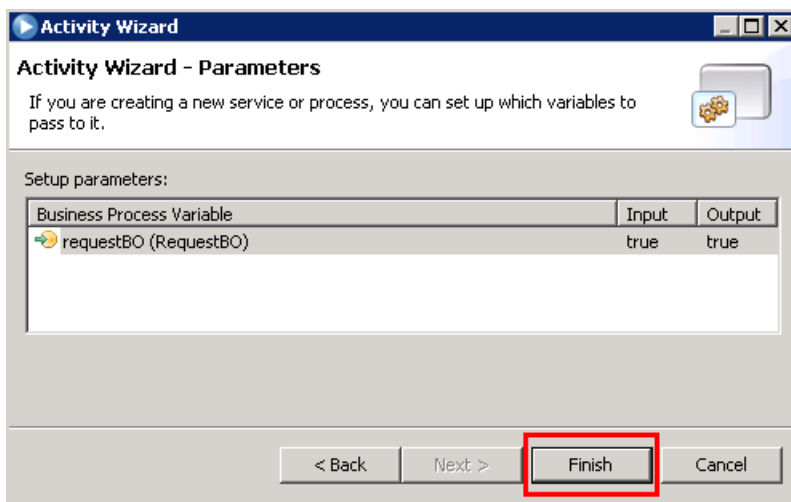
NOTE: You can click the "true" to change to false if needed. It is not needed in this scenario.

__ q. In the Properties view, select the Data Mapping tab. The Activity Wizard should automatically generate the mapping for both **input** and **output**.

__ r. Double click the **InitialApprovalCoach** activity to look at the Coach

__ s. The Activity added one Coach. Take a look at variables that will end up passing through the Coach by clicking on the **Variables** tab.
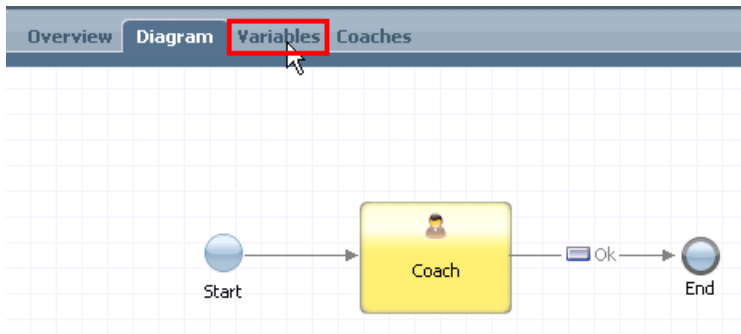

__ t. In the variables tab, you will notice the same input and output variables you defined for the BPD. Take a look at what the coach will look like by clicking on the **Coaches** tab.
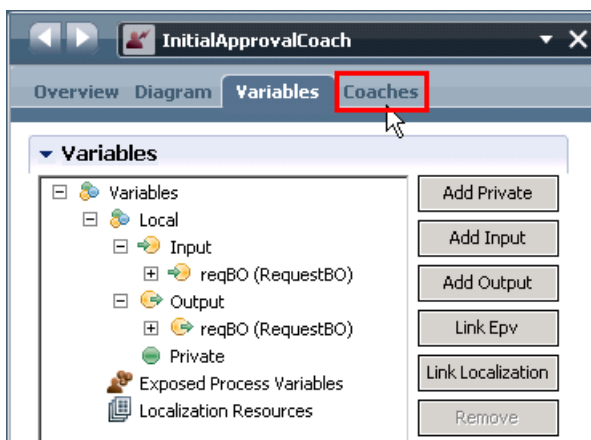
__ u. On the Coaches tab, click the **Coach** icon on the left of the editor to see and customize your human task form. (it may take a few seconds for the human task form to appear)
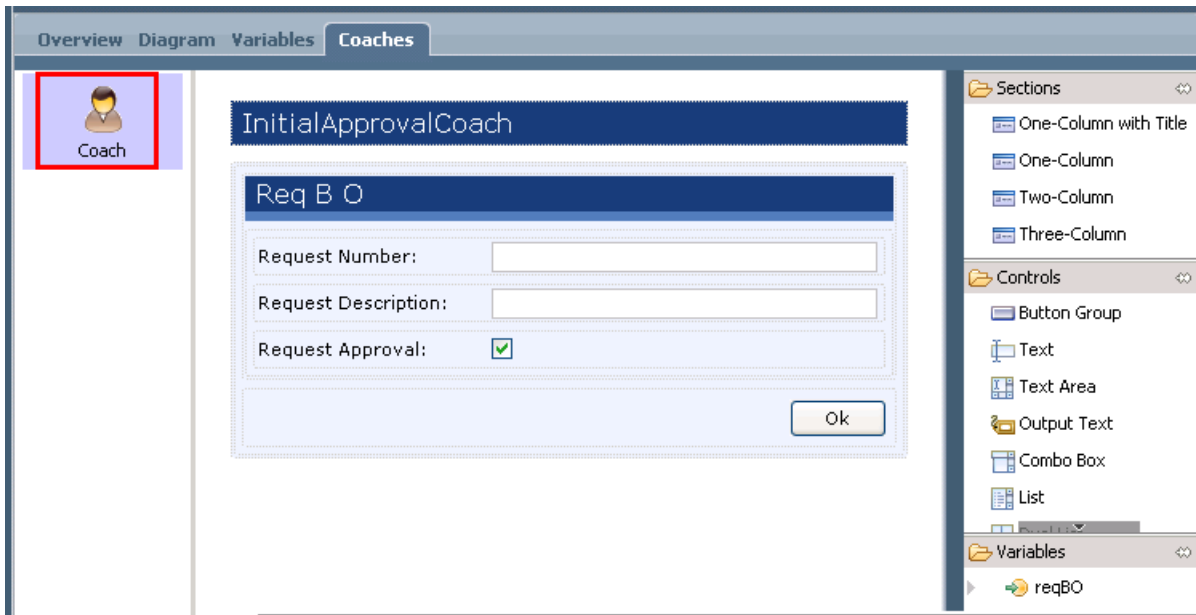
__ v. Click **X** that on the right side of **InitialApprovalCoach** human service, and get back to InitialApprovalBPD. Then click **Save**.
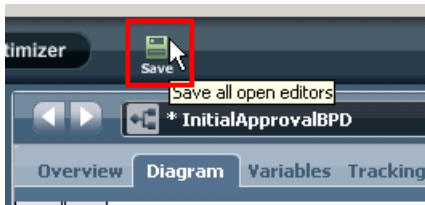
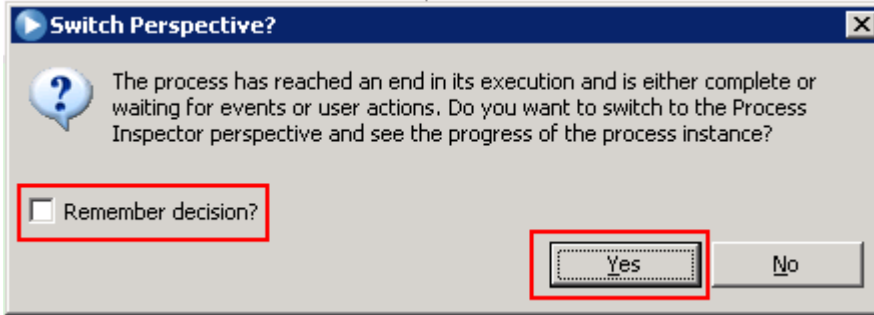
You are now done with building a Business Process Definition that has one human service (coach).
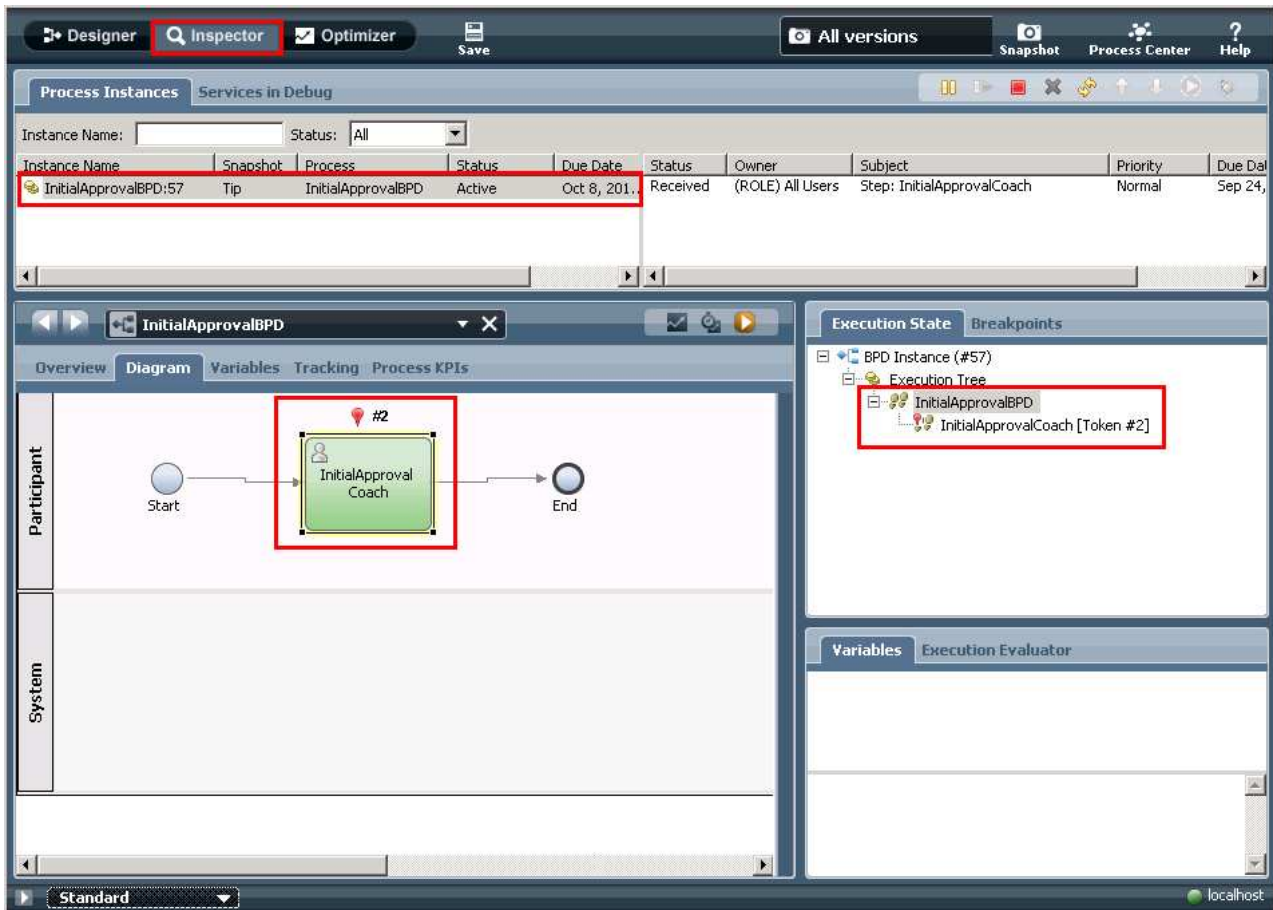
____ 6.   Test the BPD before integrating into a BPEL process
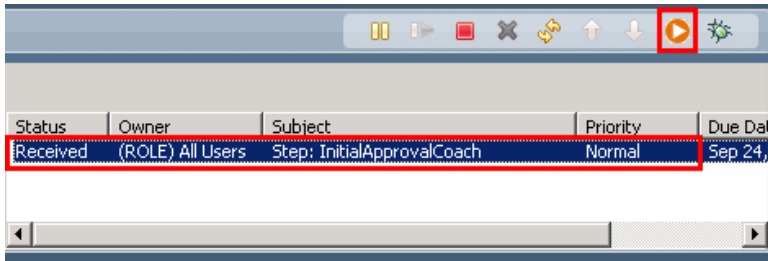__ a. Click **Run Process** to playback your current BPD.
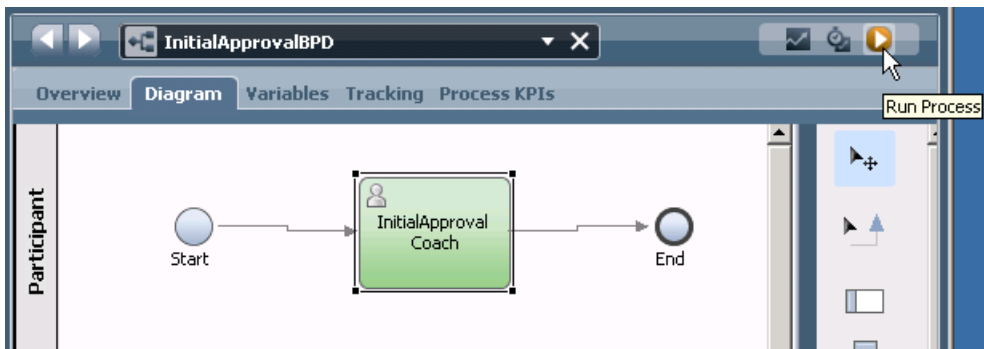
__ b. On the **Switch Perspective?** pop-up dialog select **Yes.** You also check **Remember decision?** if you want to switch to Inspector view for all BPD tests in the future.
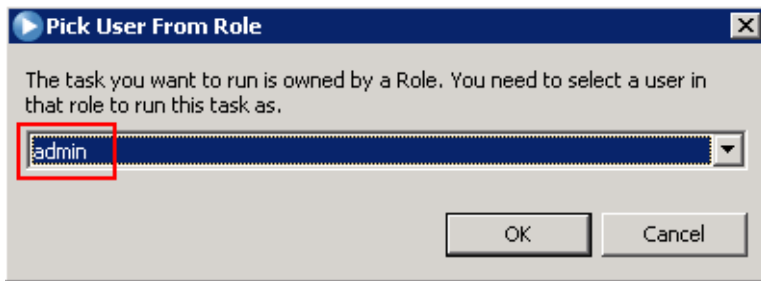
After you click **Yes** the **Inspector** view will open

__ c. In the task list select the **InitialApprovalCoach** task and click **Run the selected task** icon.

__ d. Select the user that should execute this task. For the purposes of this lab, select **admin** and **select OK.**

__ e. A browser pops up to enter the request details. Enter **1** for the requestNumber, **test** for requestDescription, and leave the requestApproval unchecked. Click **Ok.**
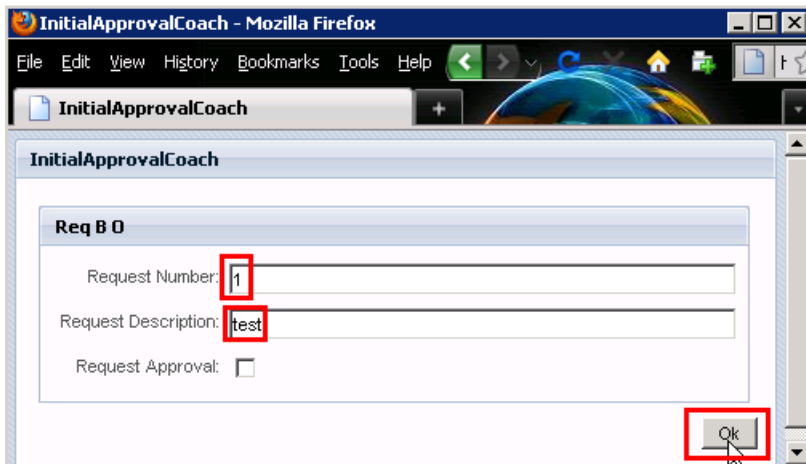
__ f. You should see "**The service has finished**" on the browser. Close the browser window by clicking the **X** at the top right of the browser.

____ 7.   You are finished building your BPD and Coach and ready to close Process Designer and open IBM Integration Designer to build and associate the BPEL that will call this BPD.

Close IBM Process Designer by clicking the **X** at the top right.

# Part 2: IBM Integration Designer – Implementing the STP process application

In this part of the lab exercise, you play the role of the integration developer, Igor, and work within the IBM Integration Designer development environment. A basic outline of this part is:

- Start IBM Integration Designer, connect to Process Center, and import Process App
- Create a human centric BPEL application to call both a BPD and Human Task.
- Synchronize with Process Center

____ 1.   Start IBM Integration Designer in a new workspace, connect to the Process Center and import the Process App
   __ a. Start IBM Integration Designer by selecting **Start → All Programs → IBM Integration Designer → IBM Integration Designer 7.5.**
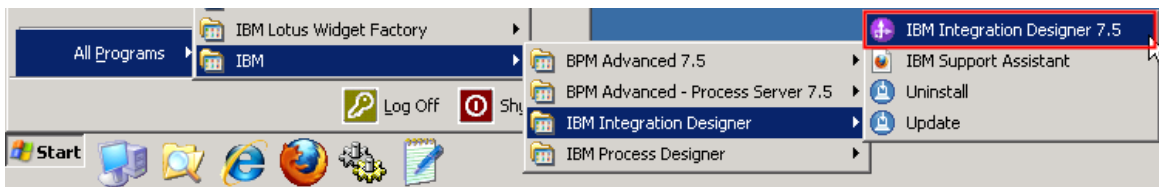

   __ b. In the Workspace Launcher dialog, enter **C:\AppDev\WorkSpaces\Tutorial-STP** for the workspace location and select **OK**.
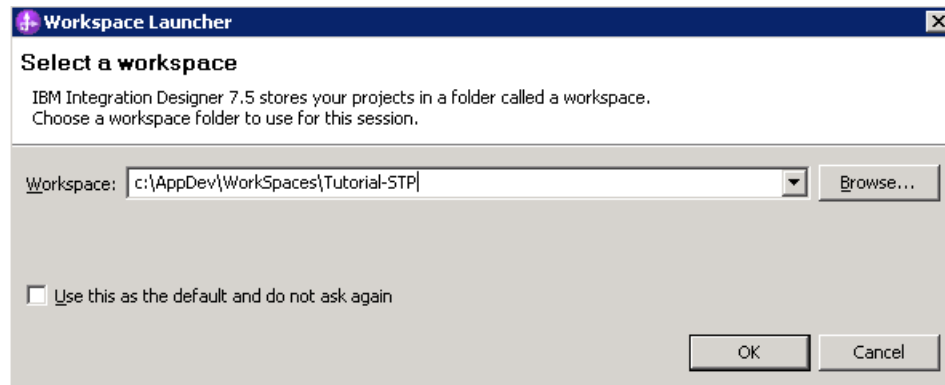

When opening with a new workspace, Integration Designer will initially open to the default Business Integration perspective but quickly switches to the Process Designer perspective in order to login to the Process Center. Logging into the Process Center first is important because you need to connect to the Process Center in order to have a target for where your work will be published. The Process Center server must be running to perform this step.

NOTE: The Process Center perspective in the Integration Designer is the integration developers' interface to the Process Center. When a process application is opened in the Integration Designer workspace, it is represented from the implementation point of view. This is different than the process application representation from the modeling point of view when it is opened in the designer view of the Process Designer.

__ c. **Type this URL and these credentials** into the Process Center Connection Details prompt and click **Login.** (enter the appropriate URL and credentials for your Process Center)
Process Center URL: http://localhost:9080/ProcessCenter
Username: admin
Password: admin
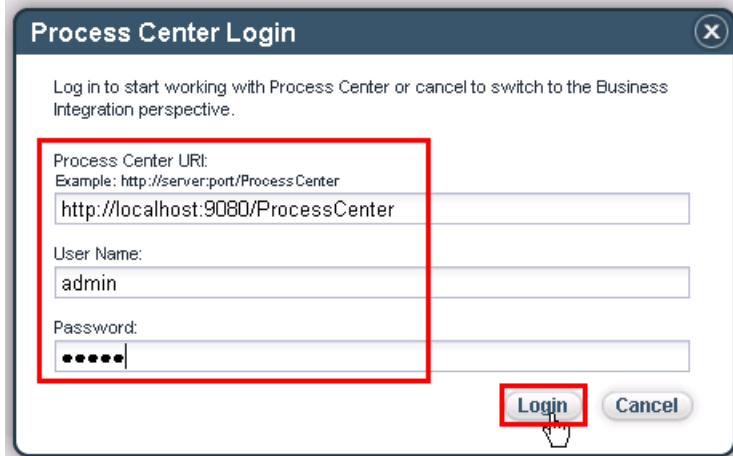
Note: If you see **Security Storage** dialog after clicking **Connect**, select **No**.
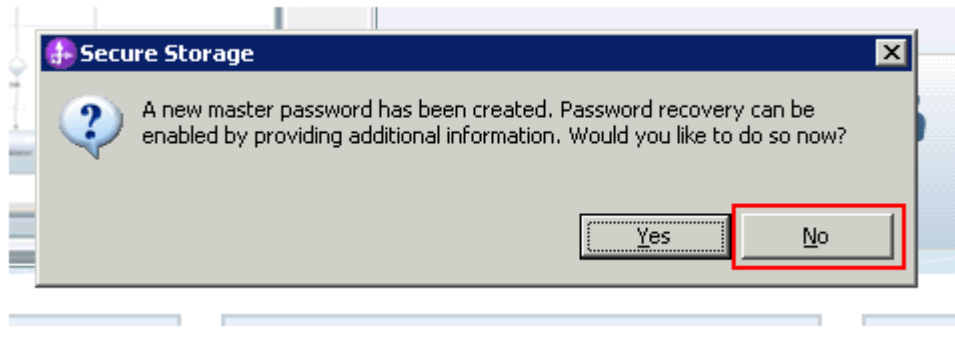
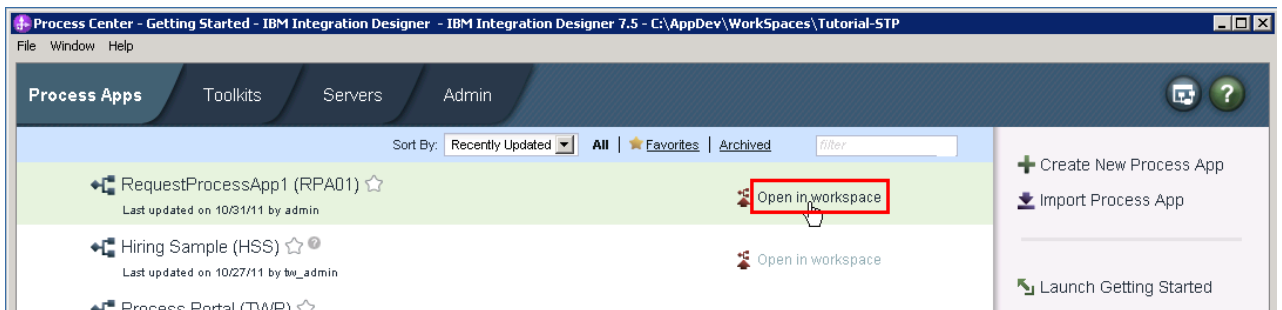__ d. Click the **X** on the welcome dialog in the Process Center perspective to close the welcome dialog.
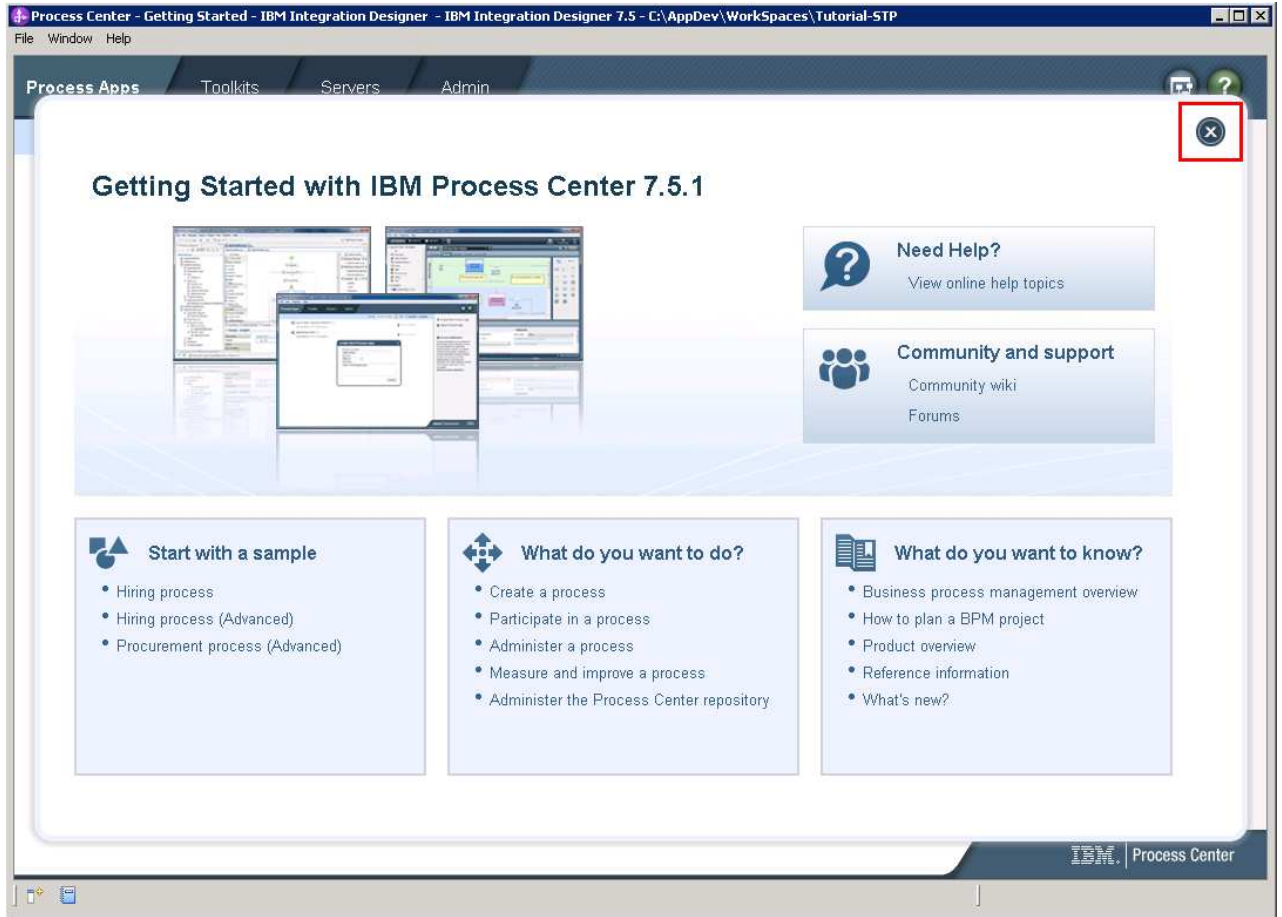
__ e. This next step is important. There will be a good amount of work going on in the background after your selection

Click on the **Open in workspace** link parallel to RequestProcessApp1 (RPA1).

What this action does is connect to the Process Center and imports content from the process application you created in the previous step. You will see the following dialog while the import takes place
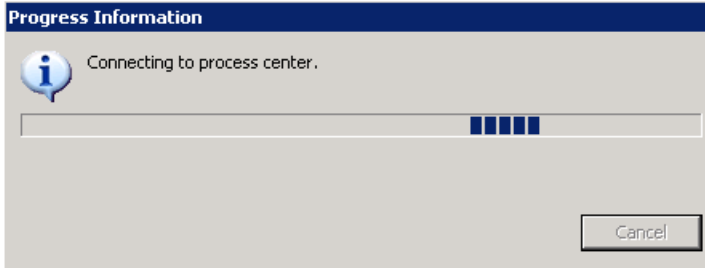
__ f. You will be prompted to choose which Process Applications or Toolkits associated with the
RequestProcessApp1 you want to open in the workspace.
Keep defaults and click **OK.**
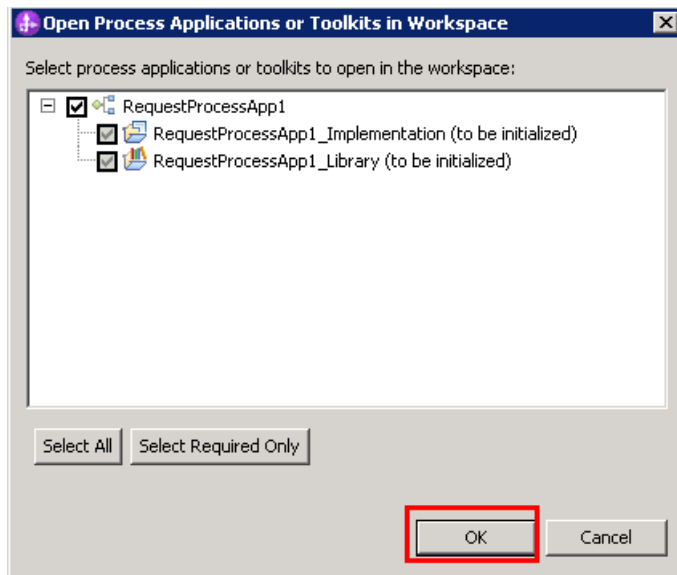
__ g. Switch to **Detailed Mode**. This step is important to be able to work with BPEL content.
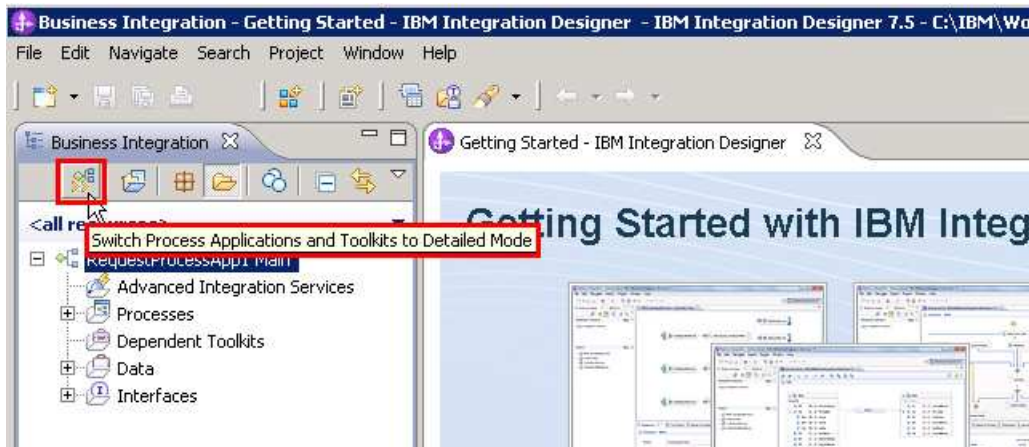
__ h. Inspect what was imported by expanding all.
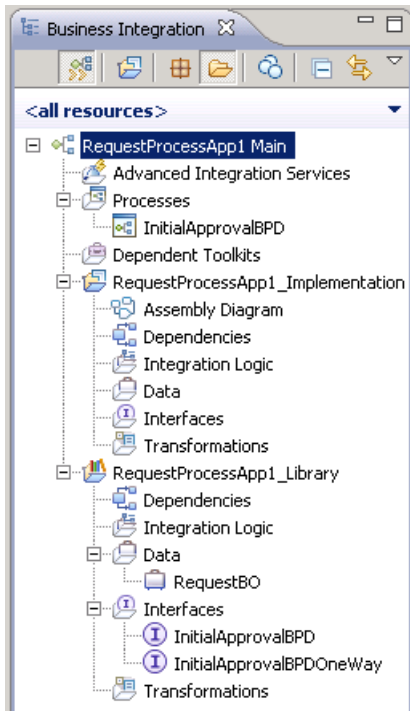
Process App is the top-level project.
No Advanced Integration Services (AIS) or dependent toolkits in this scenario.
BPD was imported successfully as part of the Process App.
The Process App has two automatically generated projects.
RequestProcessApp1_Implementation will hold the BPEL.
RequestProcessApp1_Library holds the interface and business objects used by the implementation project.

_____ 2.   Create a human centric BPEL application to call both a BPD and Human Task.
   __ a. Right click **Integration Logic** beneath **RequestProcessApp1_Implementation** and select **New > BPEL Process**
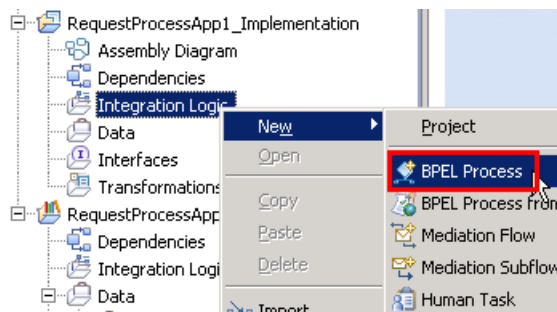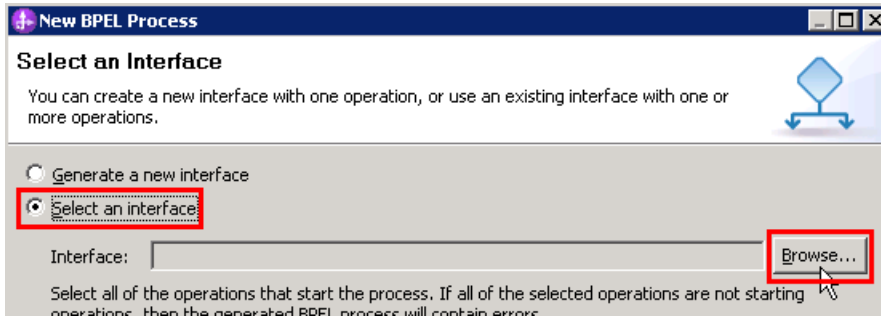
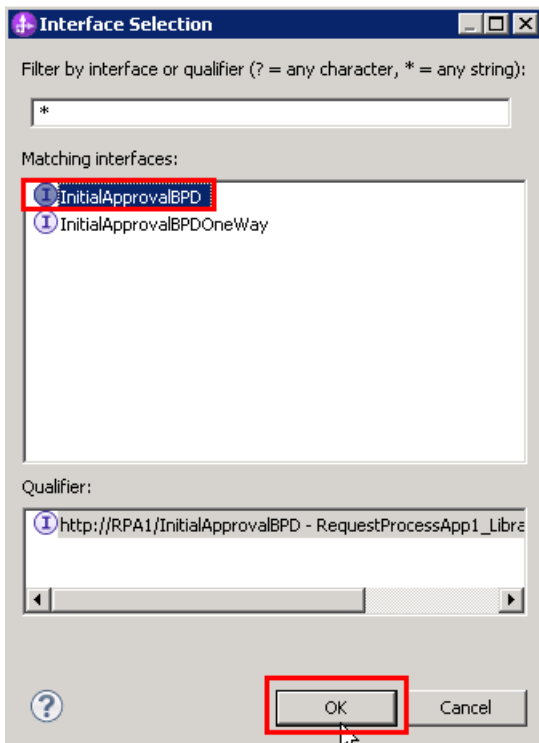__ b. Enter **RequestBPEL** as the Name and click **Next**.
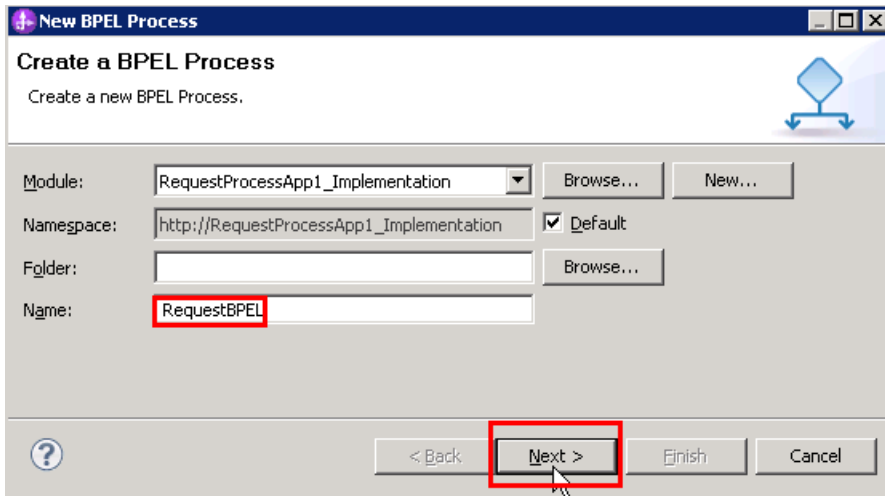
__ c. Click **Next** to keep the default of a long-running process for this example.
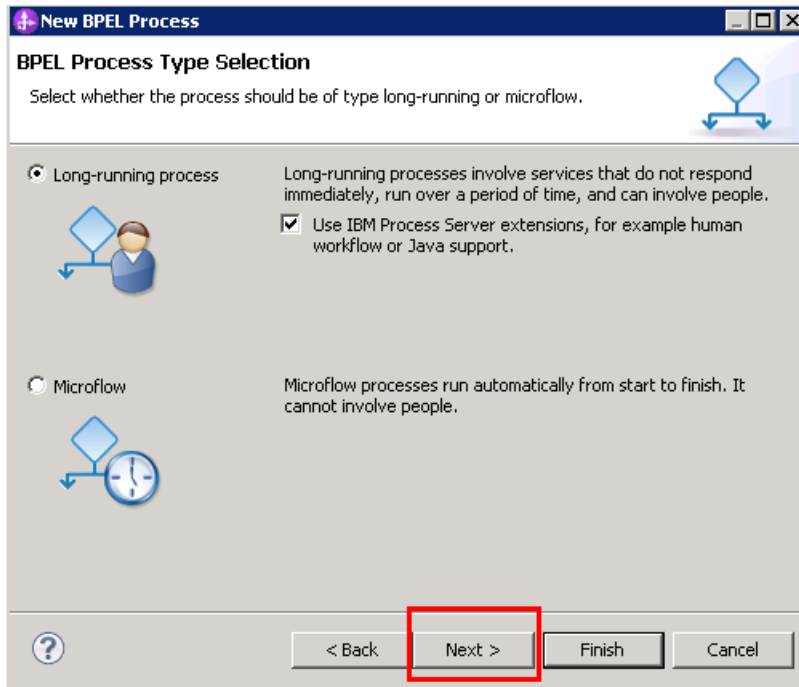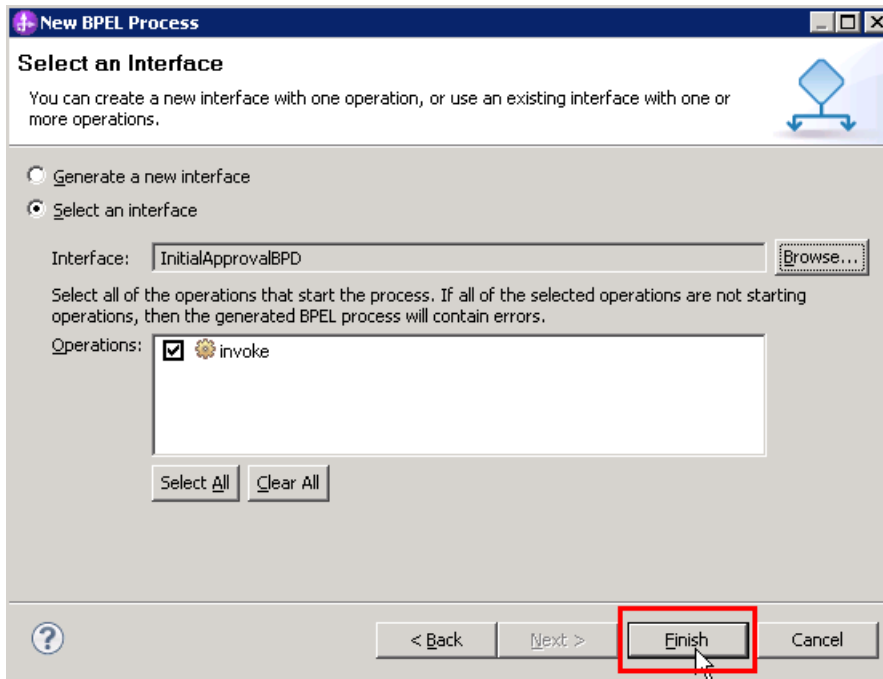
__ d. For this BPEL process, you want to use the interface that was imported from Process Center. Select the **Select an interface** option and click **Browse** to find the interface.
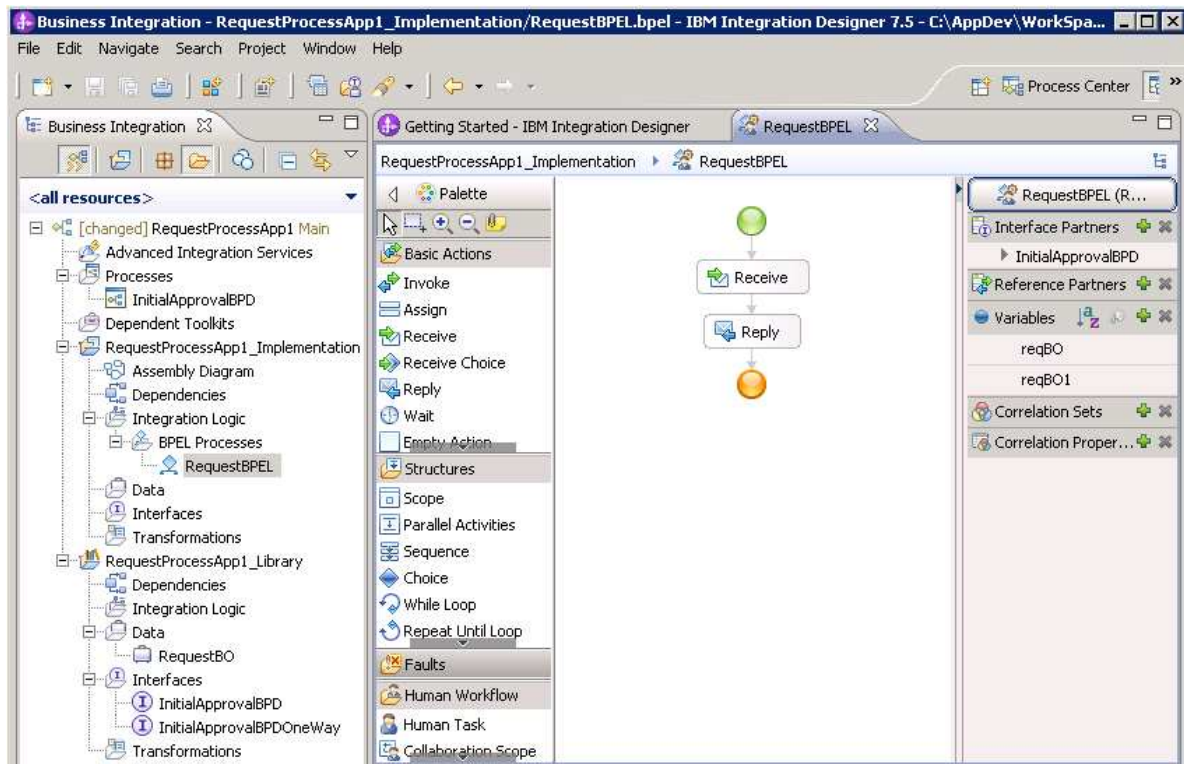
__ e. Select the **InitialApprovalBPD** interface and click **OK**.

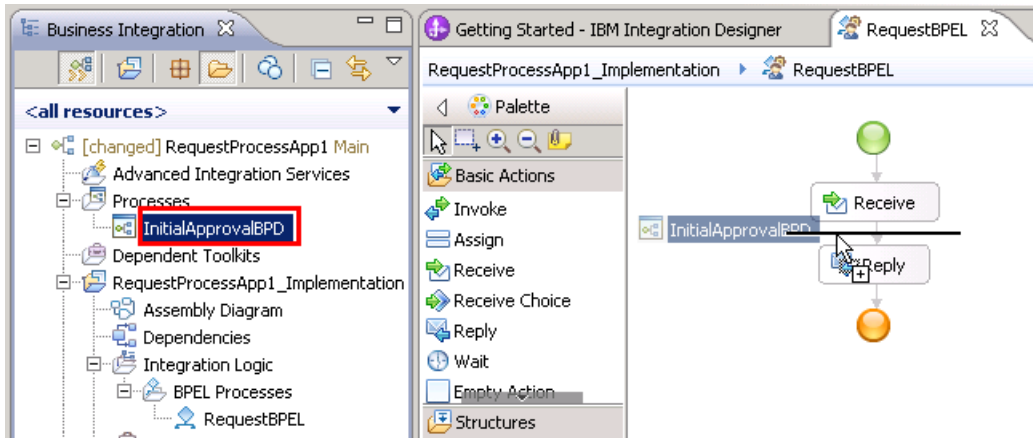__ f. Click **Finish** to finish selecting InitialApprovalBPD interface.
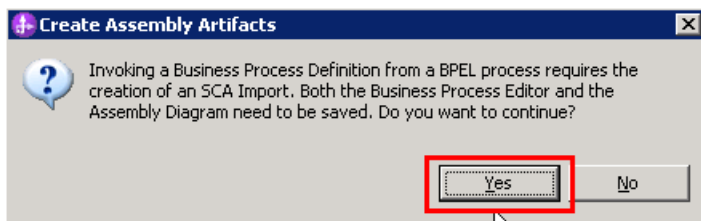

__ g. Inspect what was generated

_____ 3. **Drag and drop the BPD into BPEL**

__ a. Click and drag the **InitialApprovalBPD** in the Business Integration view to the BPEL diagram and unclick between the Receive and Reply activities.

__ b. Click **Yes**

__ c. Error markers appear after the project builds because the input and output variables have yet to be identified, similar to Process Designer where you defined the input and output parameters for the BPD.
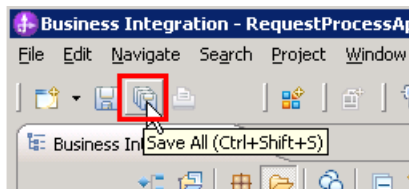
Select the **InitialApprovalBPDInvoke** → **Properties** → **Details**. Inside **Inputs** row **Read from Variable** field, click **none**. Change to **reqBO** because you want to pass through the same business object throughout this example process.
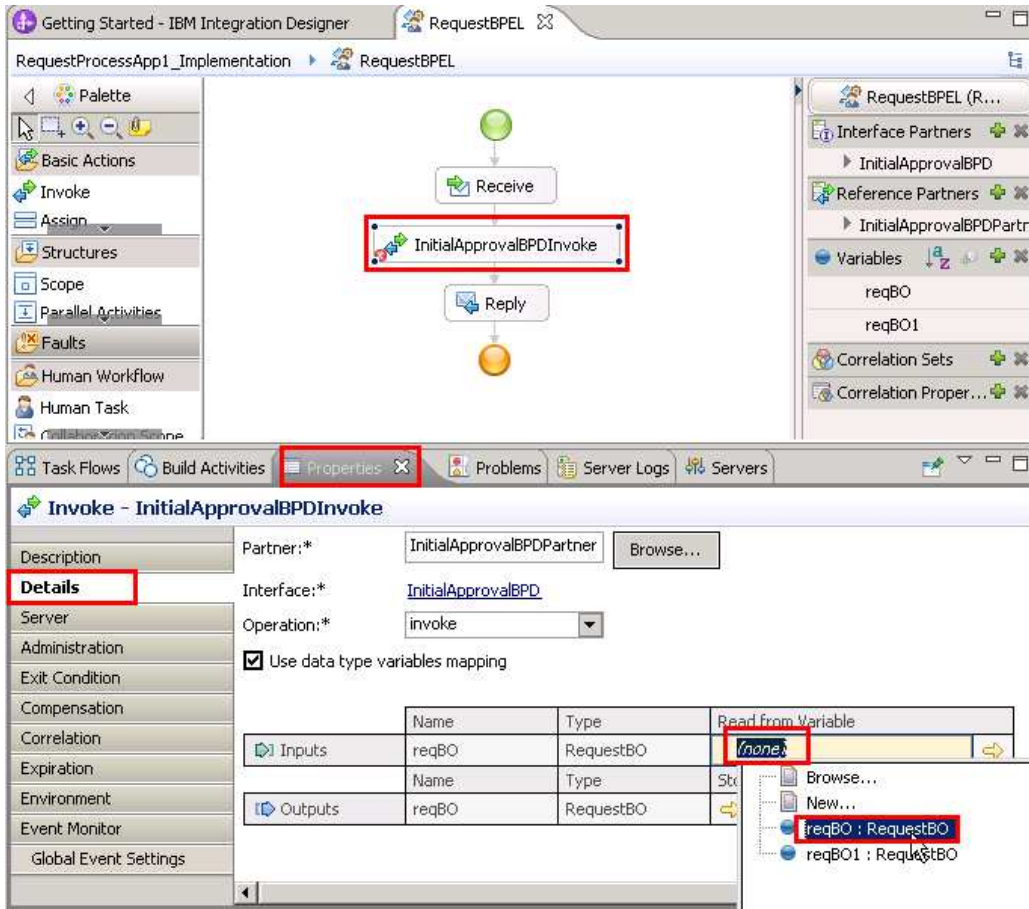
Set the output to **reqBO** as well. Now you should have this…
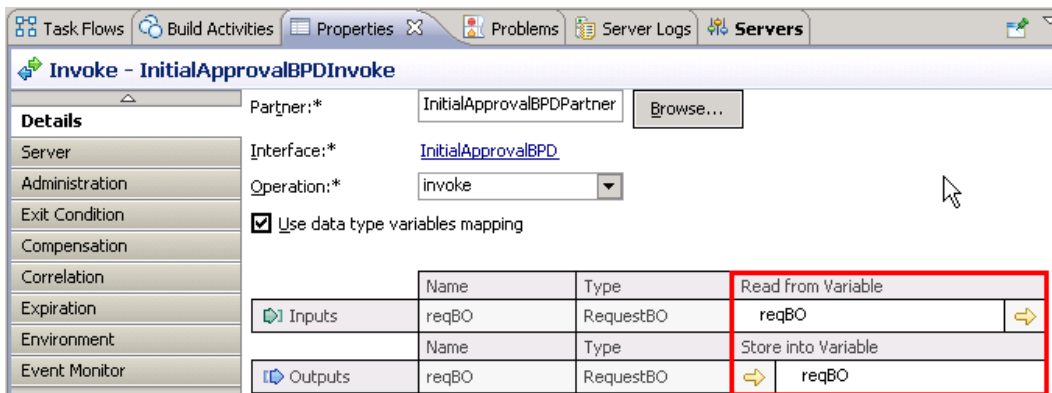
__ d. Save the BPEL in order to clear the error markers.

____ 4. See what was generated for you in the Assembly diagram. Double click **Assembly Diagram** in the Business Integration view.

An SCA component for the BPEL and a matching SCA Import for the BPD you are calling within the BPEL, both with the InitialApprovalBPD interface.
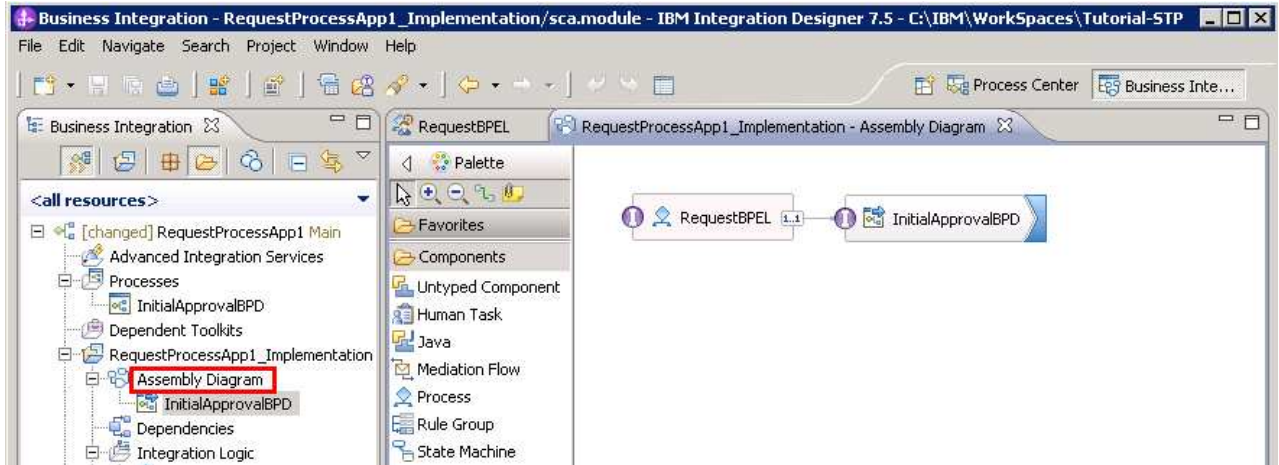

____ 5. Add an inline human task to the BPEL process
__ a. Click the **RequestBPEL** tab to return to the BPEL editor.
__ b. Click the Human Task in the BPEL Editor palette, drag to the BPEL flow, and release between InitialApprovalBPDInvoke and the Reply activity
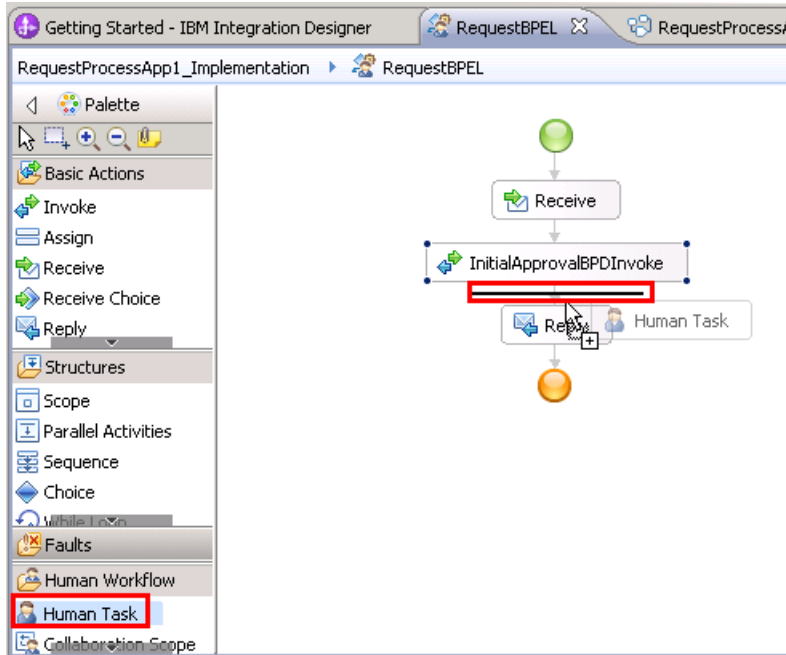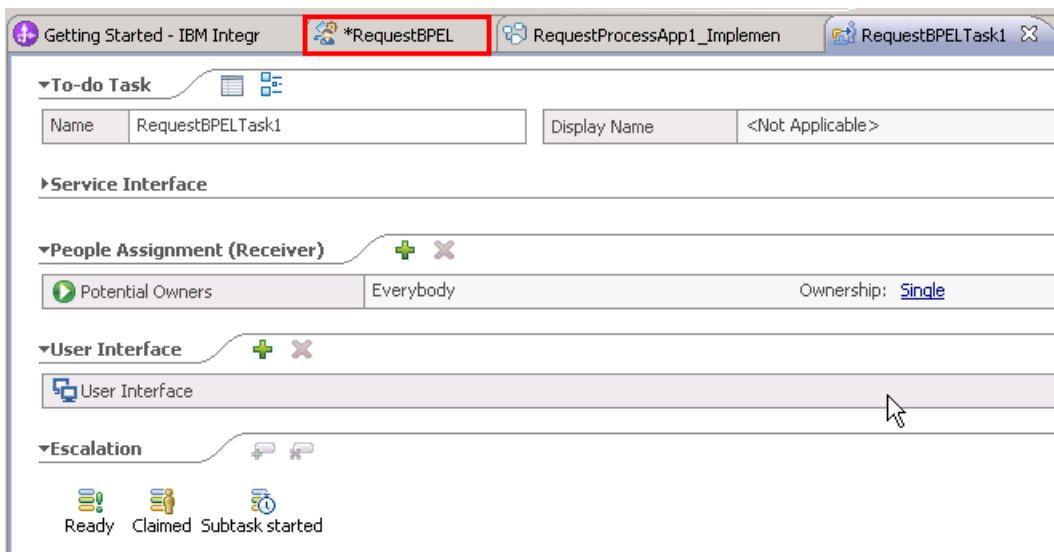
__ c. The **Add a Human Task** wizard prompts you for an appropriate name and for the interface.

Accept the generated name RequestBPELTask1, clicking **OK** at the prompt
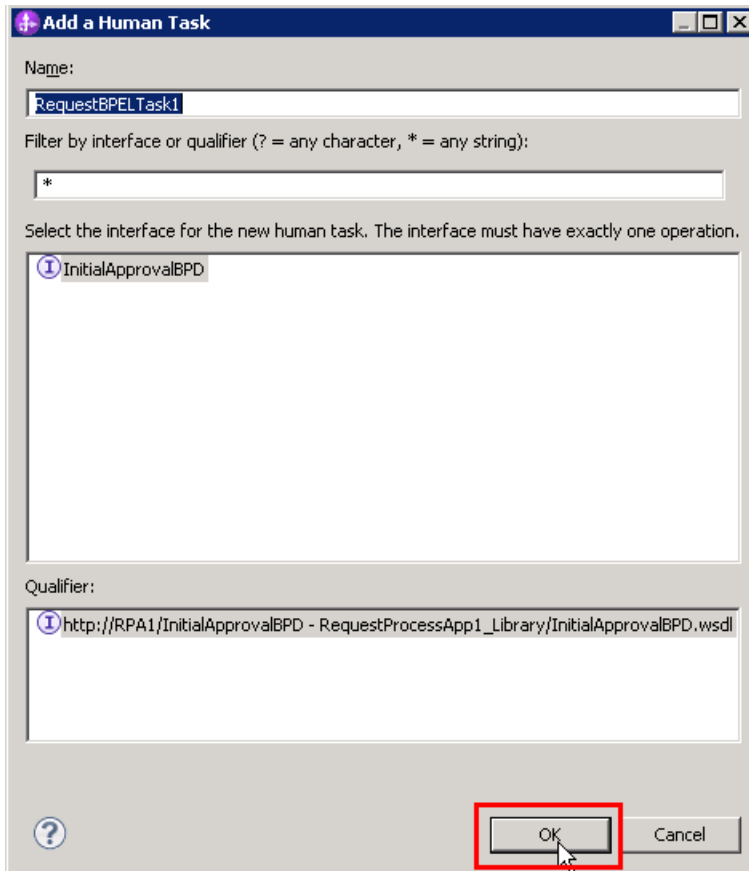

__ d. The human task editor opens. Inspect what was generated for you. Click the **RequestBPEL** tab to finish the BPEL.

__ e. Select the HumanTask → Properties → Details, In the **Inputs** row **Read from Variable** field, click **none** and change to **reqBO**.
Also do this for the Outputs. You are doing this because you want to pass through the same business object throughout this example process.
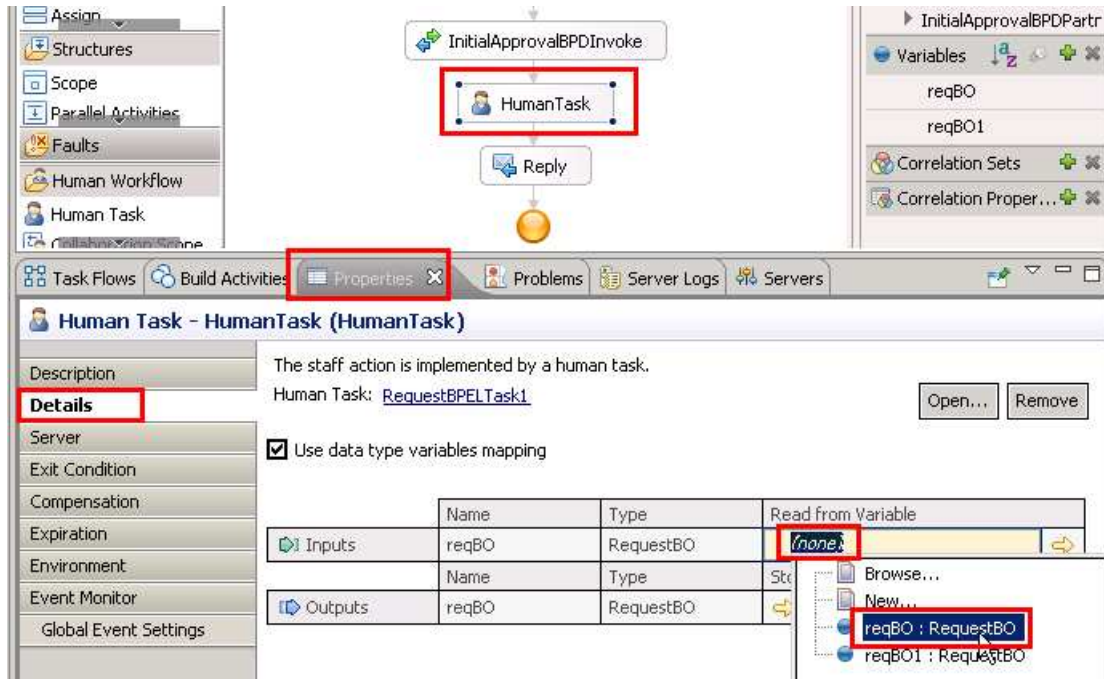
__ f. Change the name for the inline human task. You are already in the properties for the human task, so click the Description sub-tab and change both the name and Display name from Human Task to **FinalApprovalHumanTask**.
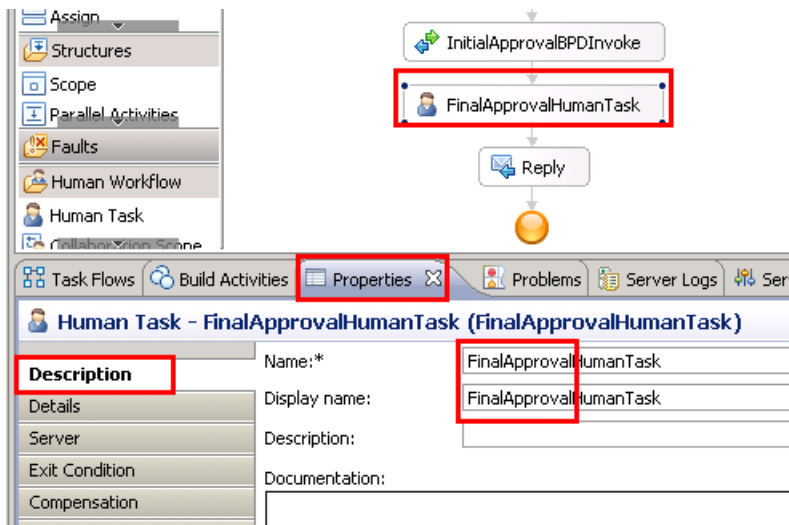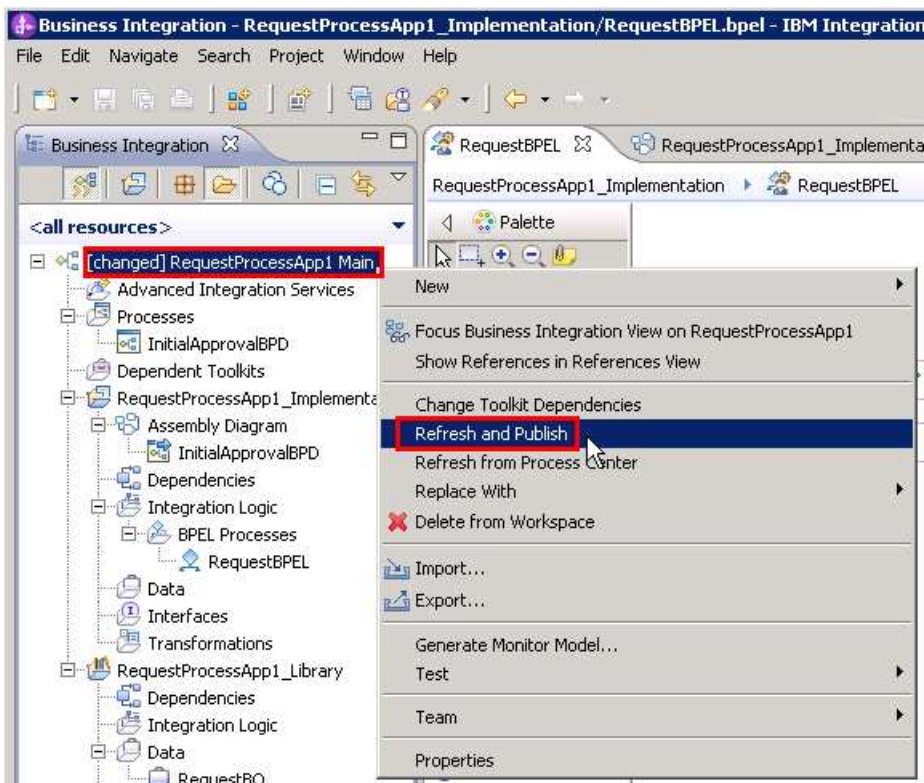
__ g. **Save** the BPEL
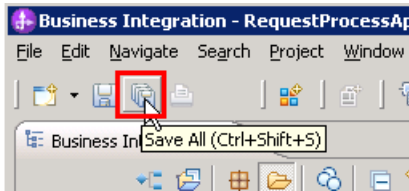
____ 6.   Synchronize with the Process Center.

__ a. You now have a BPEL process that calls a BPD and a human task. In order to run the BPEL application in a test, you must Refresh and Publish to the Process Center.

Right click the top-level process application **RequestProcessApp1** and select **Refresh and Publish**

You will notice processor activity (for example, in Task Manager on Windows) and Integration Designer will show at the bottom-right corner it is working on updating Process Center.
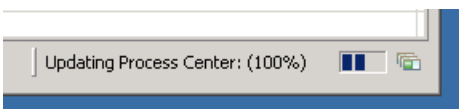
Once the content from the workspace has finished publishing to the Process Center, you will no longer see the "changed" prefix for the top-level Process App
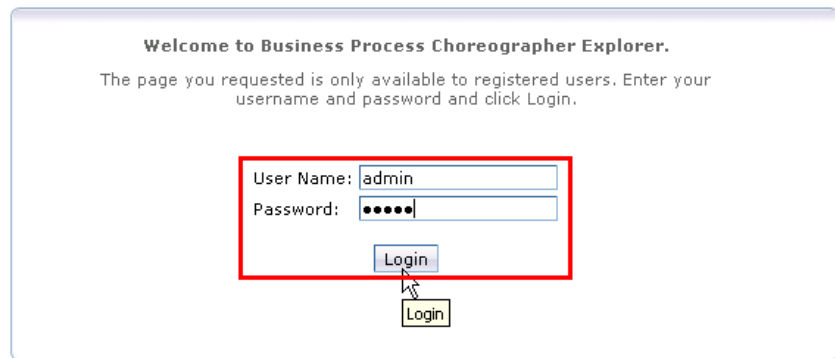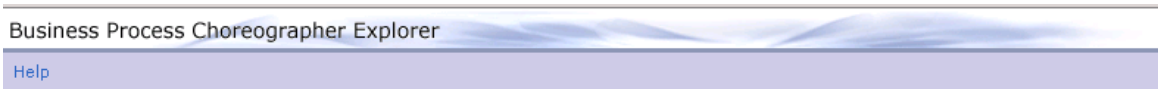
Part 3: Run the STP process application

In this part of the lab exercise, you will run the STP scenario. A basic outline of this part is:

- Open the BPC Explorer to start the scenario
- Use the Process Portal to see and run the Coach
- Use the BPC Explorer again to see and run the Human Task

____ 1.   Start the STP scenario

    __ a. Open a browser and type the following URL, http://localhost:9080/bpc, and press enter. This accesses the BPC Explorer application that you use to drive this application. Type the following credentials and hit Login

        User Name: admin
        Password: admin

Business Process Choreographer Explorer

Help

Welcome to Business Process Choreographer Explorer.
The page you requested is only available to registered users. Enter your username and password and click Login.

User Name: admin
Password: •••••

Login

Login

__ b. Once in, click Currently Valid, click the checkbox for RequestBPEL, and click start instance.
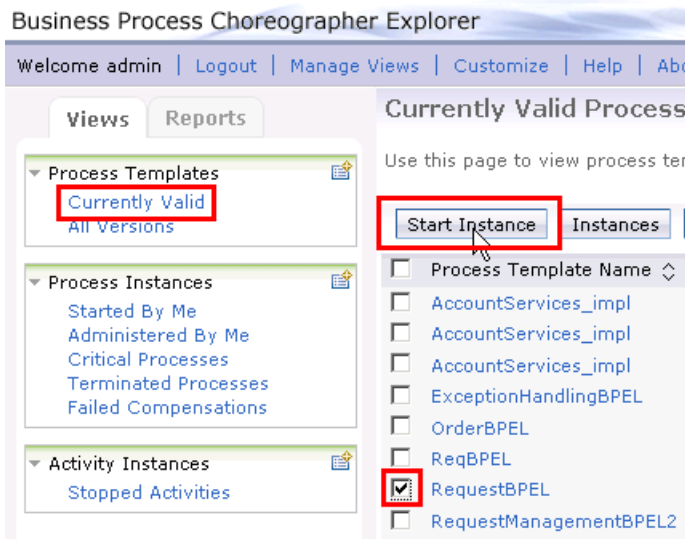
__ c. Add a process, providing a name and values for the reqBO elements requestNumber and requestDescription. For example:
   Process Name – testprocess1
   requestNumber – 1
   requestDescription - description
Click **Submit** to start the process instance.
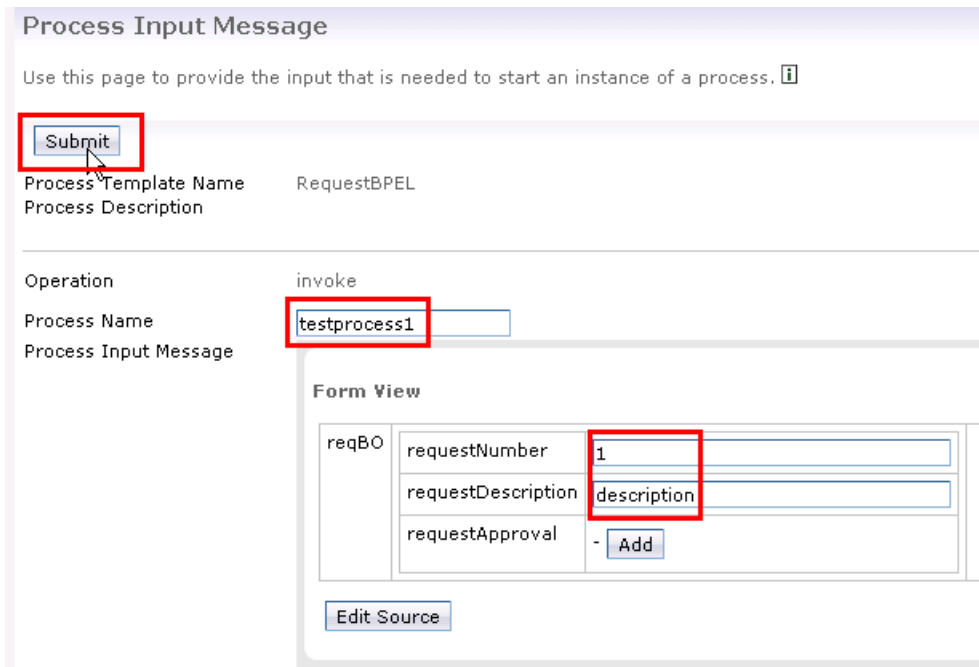
Keep BPC Explorer open. You will use it again in a minute.

_____ 2. Open Process Portal to see and work on initial approval coach

    __ a. Open URL to http://localhost:9080/portal

    __ b. Notice the coach is waiting for the initial approval in your Inbox. Select the check box for the coach and click **Run** (green triangle).
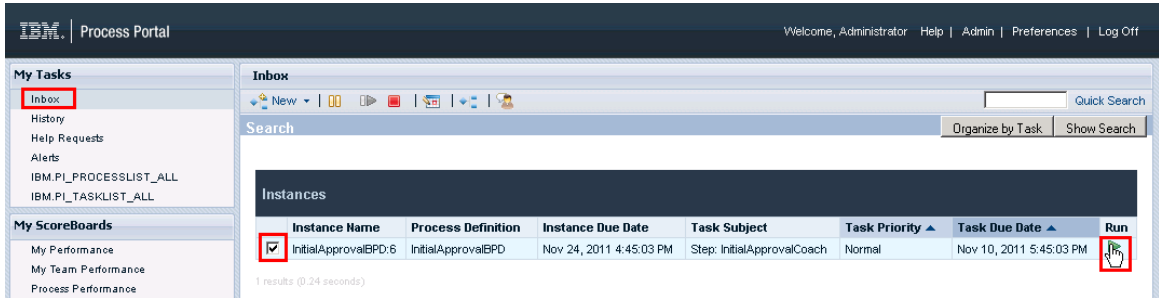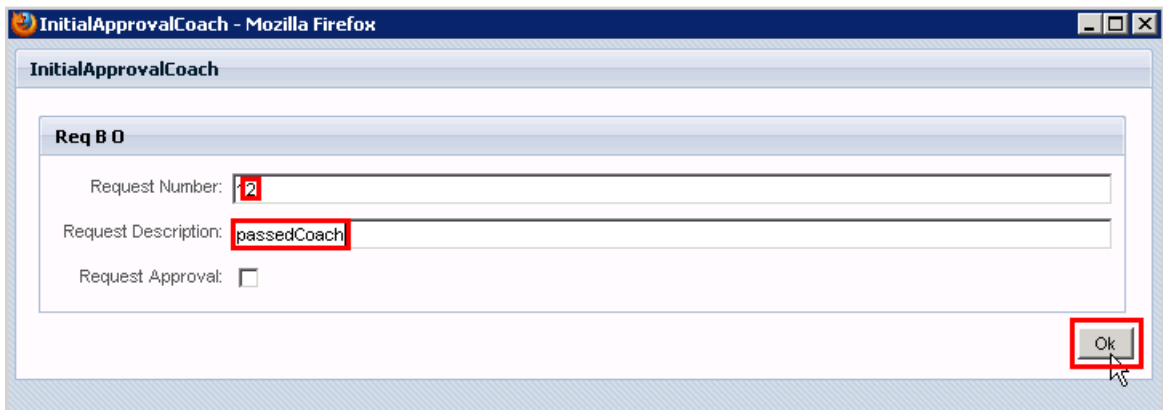

   __ c. Click **OK** at the prompt to assign it to you.
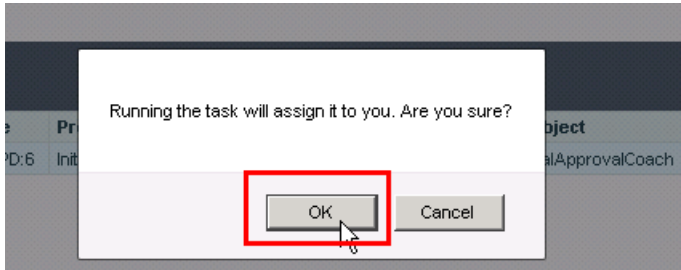
    __ d. Another browser window will open with the Coach form.

        Change the request number (for example change it to 12)
        Change the description to **passedCoach**
        Click **OK**

    __ e. The Coach will now disappear from your Inbox. Therefore, the business process has left the BPD and should now be waiting on for the BPC human task to be completed.

____ 3.   Return to the BPC Explorer to see and work on the final approval human task

   __ a. To see the task, click **My To-dos** under **Task Instances** section, select the checkbox for
   FinalApprovalHumanTask, and click **Work on**.
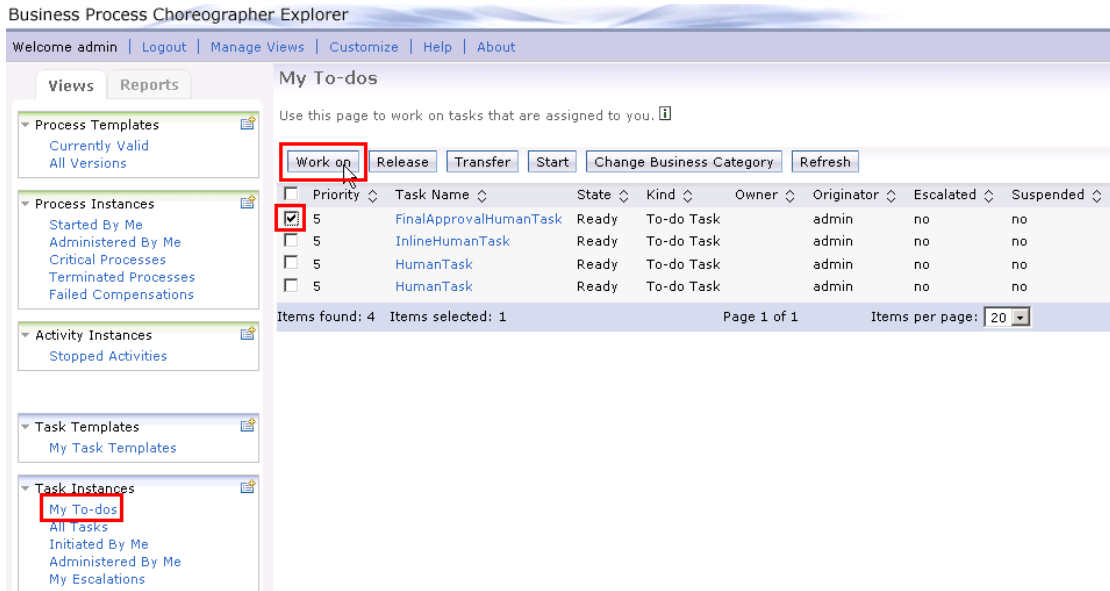
__ b. Once the task is open, see the updated content that came from the BPD.

Change the requestNumber (like **123**)
Change the requestDescription to **passedHumanTask**
Click **Add** to verify the approval
Click **Complete**

__ c. You have now finished the straight through processing scenario.

What you did in this lab exercise

In this exercise you…

- As the integration developer using the Integration Designer
    - Created a human centric BPEL process
    - Integrated a BPD into a BPEL process and worked with SCA artifacts associated with the BPD
    - Refreshed and Published to the Process Center
    - Used the BPC Explorer to drive/start the STP scenario
- As the process developer using the Process Designer
    - Created a Process App
    - Create a process application and simple business process that uses a Coach
    - Correctly passed data through the process
    - Tested the process application using the Process Inspector
    - Used the Process Portal to work with the Coach