Lesson: Providing a Web Service

Overview

Why is this lesson important to you?

You are designing an IBM FileNet BPM solution. You have a workflow process that you want to provide as a Web Service to users. To accomplish this, you must use Receive and Reply Web Services steps in the workflow definition. You enable the isolated region as a UDDI repository.

Activities

- Provide a Web Service in a workflow: Challenge
- Provide a Web Service in a workflow: Walkthrough

Lesson dependency

You must have successfully completed the previous lesson activities.

Requirements

The activities in this unit assume that you have access to the student system configured for these activities.

Virtual student system

Connect to your student system to complete these lab activities. See the Readme First file on the Materials tab if you need instructions to connect to the student system.

System startup and system check

IBM FileNet P8 software services on your student system must be started. If you have not already started the IBM FileNet P8 software on your system, do the procedures in *Appendix A: System startup and system check* before proceeding with the lessons in this unit.

Perform a system check whenever you start up an IBM FileNet P8 system or start working on a system that is in an unknown state. These activities assume that you have performed a system check when you begin an activity session.

User accounts

Type	User ID	Password
FileNet Workplace XT	p8admin	IBMFileNetP8

Note

Passwords are always case-sensitive. User names are not case-senitive. Many user names use only lowercase letters on the student system.

Provide a Web Service in a workflow: Challenge

Challenge

Enable the PELoanRegion isolated region as a UDDI repository.

Define a credit check workflow that provides a Web service to the isolated region UDDI repository. The workflow must contain Receive and Reply system steps. Use two different types of Reply steps, one Reply using message type Message and one Reply using message type Fault. The Reply step with fault must define a Fault called Bad Credit. Use the data in the table to complete this activity.

Data

<table>
<tr><th>Item</th><th>Value</th></tr>
<tr><td>UDDI Region Business Entity for PELoanRegion</td><td>Business name: <code>Credit Check Service</code>
Authorized name: <code>PE</code>
Operator: <code>IBM</code>
Business description: <code>This business provides a credit check service.</code>
Business Contact name: <code>Amy Agent</code>
Type: <code>Auditor</code>
Business Contact Description: <code>Amy handles all inquiries.</code></td></tr>
<tr><td>UDDI Registry list entry</td><td>Name: <code>Service Registry</code>
Business name: <code>Credit Check Service</code></td></tr>
<tr><td>Credit Check Service Workflow Properties</td><td>Workflow Name: <code>CreditCheckService</code>
Roster: <code>CreditRatingRoster</code>
Event Log: <code>CreditRatingLog</code>
Data Fields
<table>
<tr><th>Name</th><th>Type</th><th>Expression</th></tr>
<tr><td>name</td><td>String</td><td>""</td></tr>
<tr><td>account</td><td>String</td><td>""</td></tr>
<tr><td>rating</td><td>Integer</td><td>0</td></tr>
</table>
Web Services Partner Link
Type: Receive/Reply
Name: <code>CreditAgency</code>
Process Port Type: <code>CreditCheck</code></td></tr>
<tr><td>Starting file name in the Object Store</td><td>LoanProcess > Workflows > Loan Processing Collection - Invoke</td></tr>
</table>

<table>
<tr><th>Item</th><th>Value</th></tr>
<tr><td>Properties of Get Credit Rating step that invokes the Credit Check Workflow Web Service</td><td>

Step Name: <code>Get Credit Rating</code>
Partner Link: <code>CreditAgency</code>
Operation: <code>CreditCheck</code>
Message Type: Parameters
Outgoing Parameters

<table>
<tr><th>Name</th><th>Type</th><th>Expression</th></tr>
<tr><td>name</td><td>String</td><td>customer_name</td></tr>
<tr><td>account</td><td>String</td><td>government_id</td></tr>
</table>

Incoming Parameters

<table>
<tr><th>Name</th><th>Type</th><th>Expression</th></tr>
<tr><td>rating</td><td>Integer</td><td>credit_rating</td></tr>
</table>

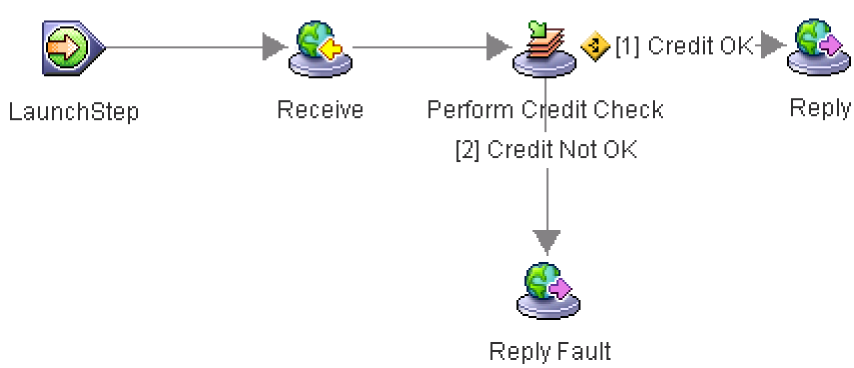
Faults - Specific Faults:

Name: Bad Credit
XML Data Type: status
Map: Malfunction

</td></tr>
</table>

Verification

- You must launch and process the Loan Processing workflow collection through to completion without error.
- The Workflow map of the Credit Check Service must look similar to the following diagram. This diagram includes Receive and Reply system steps.



Provide a Web Service in a workflow: Walkthrough

Introduction

This activity gives you practice in using Receive and Reply steps to provide a Web Service in a workflow definition. You enable an isolated region as a UDDI repository that can provide Web Services to other IBM FileNet P8 workflows and to external processes.

Procedure 1: Enable the region as a UDDI repository

In this procedure, you use Process Designer Configuration view to enable the PELoanRegion as a UDDI repository. You add a new region business entity and configure the region UDDI registry list. The system administrator typically performs this type of region configuration.

1. On your student Windows XP system, log in to FileNet Workplace XT using the p8admin user account listed in the “Lesson Overview” section.
2. Open Process Designer Configuration view of PELoanRegion.
   a. In Workplace XT, click Tools > Advanced Tools > Process Designer.
   b. Click View > Configuration.
   c. Select the PELoanRegion [8] node in the left pane.
3. Configure a UDDI Region Business Entity.
   a. Right-click PELoanRegion [8] and click Properties.
   b. In the Isolated Region Properties window, click Web Services > UDDI.
   c. Verify that the Region Business Entity tab is displayed.
   d. Select the check box “Enable isolated region as UDDI repository.”
   e. Type the following business information in the Region Business Entity tab:
      - Business name: `Credit Corp`
      - Authorized name: `PE`
      - Operator: `IBM`
      - Business description: `This business provides a credit check service.`
   f. In the Business Contact section, click Add.
   g. Type the following information in the Business Contact section:
      - Business Contact name: `Amy Agent`
      - Type: `Auditor`
      - Business Contact Description: `Amy handles all inquiries.`
   h. Copy the contents of the Inquiry URL text field to the clipboard by highlighting the field and pressing Ctrl + C.

4. Configure the UDDI registry list to include the new business entity.
   a. Click the UDDI Registry List tab.
   b. Click the Add icon to add a new row to the table.
   c. Paste the contents of the clipboard into the Inquiry URL column by pressing Ctrl + V.
   d. Type the following information in the UDDI Registry List table:
      - Name: `Service Registry`
      - Business name: `Credit Check Service`
   e. Click the Validate icon.
   f. Verify that validation is successful. If it is not successful, perform steps 3 and 4 again and make sure that you enter all information accurately.
   g. Click OK to close the Isolated Region Properties window.
5. Commit changes to the isolated region.
   a. Verify that the PELoanRegion [8] node is selected.
   b. Notice the pending changes listed in the bottom pane.
   c. Click Commit Changes on the Configuration view toolbar.
   d. Click Continue.
   e. Click Close.
6. Click the X in the Configuration tab to close to close the Configuration view.
7. Minimize Process Designer.

Procedure 2: Verify the state of Component Manager

In order to use Web Services in a workflow, the Component Manager for the WSRequest queue must be running. In this procedure, you verify the status of the Component Manager.

1. Switch to your student Linux system.
2. If Process Task Manager on the Application Engine is already running, return to the Process Task Manager window on the Linux desktop.

   Otherwise, double-click the *Launch Process Task Manager for AE.WPXT* shortcut on the Linux desktop.

   Tip: Process Task Manager might take several seconds to start.
3. In the left pane of the Process Task Manager, select Application Engine.WPXT > Component Managers.
4. Select the PELoanRegion. ALL node found under Component Managers.
5. Verify that PELoanRegion.ALL Component Manager and all components under it are started (do **not** have a red X symbol next to the name of the component).

If necessary, start the PELoanRegion.ALL Component Manager and components.

6. Minimize Process Task Manager.

Procedure 3: Define a workflow to provide a Web Service

In this procedure, you define a new workflow that provides a credit check Web Service. You use Receive and Reply Web Services system steps in the new workflow. You transfer the workflow to the isolated region to make it available to other workflows as a Web Service.

1. Return to Process Designer on your student Windows XP system.
2. Define Workflow Properties, including a Receive/Reply partner link.
   a. In Workflow Properties click Web Services > Partner Links.
   b. Under Partner Links, select the Name field.
   c. Select the Receive/Reply check box.
   d. Type the following information in the Partner Links tab to define a Receive/Reply link:
      - Name: `CreditAgency`
      - Process Port Type: `CreditCheck`
   e. Click the Data Fields tab and define new fields using the following information:

Name	**Type**	**Merge Type**	**Expression**
name	String	Override	""
account	String	Override	""
rating	Integer	Override	0

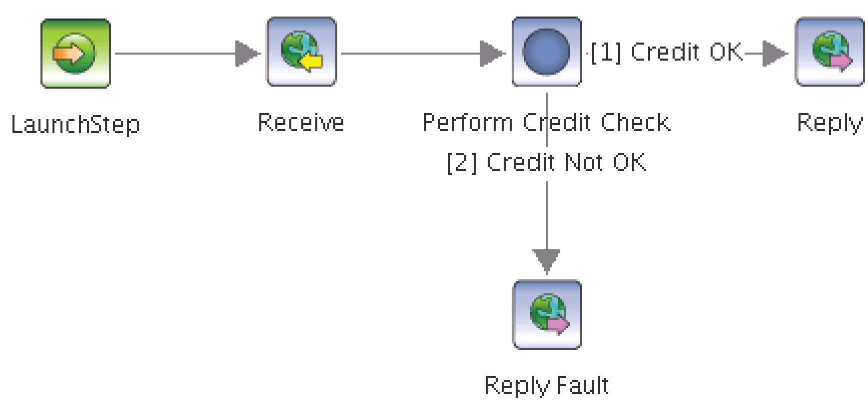
   f. Click the General tab and define the following workflow properties:
      - Workflow Name: CreditCheckService
      - Workflow Subject: Credit Check Service

Information

A workflow that is intended to be published as a Web Service must **not** contain any blanks in the workflow name as specified in Workflow Properties. You must type the workflow name exactly as shown in step 3f.

   g. Click the Advanced tab and define the following workflow properties:
      - Roster: CreditRatingRoster
      - Event Log: CreditRatingLog
      - Enabled Email Notification check box: Cleared

3. Add steps and routes to define the Workflow main map.
   a. Drag a Receive step from the Web Services Palette and place it to the right of LaunchStep.
   b. Draw a route from LaunchStep to the Receive step.
   c. Right-click the map area to the right of the Receive step and click New > Activity Step.
   d. Replace the default step name with the following text: `Perform Credit Check`
   e. Draw a route from the Receive step to the Perform Credit Check step.
   f. Drag a Reply step from the Web Services Palette and place it to the right of the Perform Credit Check step.
   g. Draw a route from the Perform Credit Check step to the Reply step.
   h. Replace the default route name with the following text: `Credit OK`
   i. Drag a Reply step from the Web Services Palette and place it below the Perform Credit Check step.
   j. Replace the default step name with the following text: `Reply Fault`
   k. Draw a route from the Perform Credit Check step to the Reply Fault step.
   l. Replace the default route name with the following text: `Credit Not OK`
   m. Verify that your Workflow map looks similar to the following diagram. This diagram includes Receive and Reply system steps.



4. Set step properties.
   a. Select the Receive step and assign the following General step properties.
      - Partner Link: CreditAgency
      - Operation: `CreditCheck`
      - Message Type: Parameters
      - Operation Parameters

Name	Type	Field Name
name	String	name
account	String	account

   b. Select the Reply step and assign the following General step properties.
      - Partner Link: CreditAgency
      - Operation: CreditCheck
      - Message Type: Message
      - Operation Parameters

Name	Type	Field Name
rating	Integer	rating

   c. Select the Reply Fault step and assign the following General step properties.
      - Partner Link: CreditAgency
      - Operation: CreditCheck
      - Message Type: Fault
      - Fault Name: `Bad Credit`
      - Outgoing Message: `"Account " + account + " has credit problems."`
   d. Select the Perform Credit Check step and assign the following step properties.
      - Step Destination: LoanOperation Work Queue
      - Selected Parameters:
        - account [Read]
        - name [Read]
        - rating [Read/Write]
      - Routing Responses:
        - OK
        - Not OK
5. Define routing properties.
   a. Select the Credit OK route.
   b. Define the following Conditional Routing property:
      - Condition: `All(OK)`
6. Validate and transfer the workflow definition.
   a. Validate the workflow and correct validation errors, if any.
   b. Click File > Transfer Workflow Collection.

c. When prompted, complete the “Save the workflow definition to an object store” wizard using the following information.
   - Object store: `LoanProcess > Workflows`
   - Document Title: `Credit Check Service Workflow`
   - Security: <Accept default values>

7. Close the workflow definition file.

   a. Click File > Close.

   b. Select Cancel the checkout.

   c. Leave Process Designer open for the next procedure.

Procedure 4: Modify a workflow to invoke the Web Service

In this procedure, you modify the Loan Processing workflow collection to consume the Credit Check Service Web Service workflow, which you transferred to PELoanRegion in the previous procedure. The transferred workflow is available as a Web Service because of the Receive step in the workflow.

1. Open the workflow collection file you checked in to the object store.

   a. In Process Designer, click File > FileNet > FileNet Open/Checkout.

   b. Locate and select the following file:

   LoanProcess > Workflows > Loan Processing Collection - Invoke

   c. Select “Open As Checkout” and click Open.

Important

This workflow collection is the one that you built and saved to the object store in the previous lesson. If you did **not** successfully complete all steps in the previous lesson activity, then you must open the following starting file located on the local system:

C:\Labs\F145\Solutions\Web Services\
Loan Processing Collection - Web Services - Invoke solution.xpdl

   d. If necessary, explore the main workflow definition in the collection to refamiliarize yourself with the process flow.

   In this activity, you work only with the Process Loan Map submap of the main workflow. The Prepare Loan and Complete Loan submap steps are assigned to the EMPTY MAP submap, which contains no steps.

2. Define a new Invoke partner link in Workflow Properties.

   a. In Workflow Properties, click Web Services > Partner Links.

   b. Select CreditCorp found under Partner Links and click Delete.

c. Select the Invoke check box.

d. Click the ellipsis (...) icon to browse for the WSDL URL.

e. In the Web Services Explorer window, select Web Services workflows.

   You can also search for the workflow in UDDI registries, because you previously enabled the region as a UDDI repository.

f. In the Name field, type the following text: `Credit`

g. Click Execute.

h. In the tree, select the CreditCheckService node.

   Notice that the WSDL URL is displayed.

i. Click OK.

j. Notice that in the Partner Links tab the Port Type is selected for you (CreditCheck) and that the WSDL URL is filled in.

k. Select the Name field in the Partner Links table and type the following in the Name field: `CreditCorp`

   Tip: After you type `CreditCorp` in the Name field, press Enter or tab off of the field to ensure your entry remains in the field.

3. Add a new data field required by CreditCheckService.

   a. Click the Data Fields tab.

   b. Define a new data field using the following information:

Name	Type	Merge Type	Expression
government_id	String	Override	""

   c. Click Field Usage.

   d. Verify that the Workflow submap is selected.

   e. Move LaunchStep from the list of Available Steps to the list of Selected Steps.

   f. Click Close to close the Field Usage window.

4. Replace the existing Get Credit Rating step.

   a. On the map toolbar, select Process Loan Map.

   b. Right-click the Get Credit Rating step and click Delete.

   c. Drag an Invoke step from the Web Services Palette and place it between the Split Process and Verify Information steps.

d. Assign the following step properties to the new Invoke step.

- Step Name: `Get Credit Rating`
- Partner Link: `CreditCorp`
- Operation: `CreditCheck`
- Message Type: Parameters
- Outgoing Parameters

Name	**Type**	**Expression**
name	String	customer_name
account	String	government_id

- Incoming Parameters

Name	**Type**	**Expression**
rating	Integer	credit_rating

- Select the Faults tab and assign the following in the Specific Faults area:

Name	**XML Data Field**	**Map**
Bad Credit	status	Malfunction

5. Draw new routes.

a. Draw a new route from the Split Process step to the Get Credit Rating step.

b. Draw a new route from the Get Credit Rating step to the Verify Information step.

Procedure 5: Launch and test the workflow definitions

1. Launch and save the workflow definition to the object store.

a. Validate the workflow and correct validation errors, if any.

b. Click File > Launch Main Workflow.

c. Click OK in the Check workflow name window, if the window is open.

d. When prompted, complete the “Checkin Workflow Definition” wizard using the following information.

- Document Title: `Loan Processing Collection - Process Orchestration`
- Security: <Accept default values>

2. Complete the Launch Step processor.

a. In the Launch Step window, click Data Fields.

b. In the Data Fields view, type the following values in the fields.

- customer_name: `Polly Otto`
- down_payment: `14000.`
- government_id: `ID12345`
- loan_date: <a future date and time>
- loan_id: `P123`
- loan_term: `30`
- purchase_price: `132000.`

c. In the Attachments view, assign an attachment from the LoanProcess > Loans folder on the object store.

In order to process the Content Extended Operation used in the Terminate map, you must assign an attachment from the object store that contains a document property called Status.

d. Click Launch.

3. Use Process Administrator to locate the work item for the Loan Processing workflow.

a. In Process Designer, select Tools > Process Administrator.

b. Construct and execute a filtered search of LoanRoster by using the loan_id exposed field and the data in the following table.

Search criteria	**Value**
Look for	Work Items
In	Workflow Roster
Select one	LoanRoster
Search mode	Edit (all fields)
Criteria	`loan_id = 'P123'`

c. Notice the three work items, which are located in the following queues:

- One item in the Delay(0) queue
- One item in the WSRequest queue
- One item in the LoanOfficer queue

The item in the WSRequest queue is waiting for a reply from the CreditCheckService.

4. Complete the CreditCheckService workflow.

a. Construct and execute a filtered search of CreditRatingRoster by using the data in the following table.

Search criteria	**Value**
Look for	Work Items
In	Workflow Roster
Select one	CreditRatingRoster

Search criteria	Value
Search mode	Edit (all fields)

b. In the results pane, select the row containing the work item in the LoanOperation queue.

c. Click Open Step Processor on the results pane toolbar.

d. Type an integer number of your choice in the rating field.

e. Select the OK response.

f. Click Complete.

5. Continue processing the Loan Processing workflow and complete the Get Home Valuation step.

a. Construct and execute a filtered search of LoanRoster by using the loan_id exposed field and the data in the following table.

Search criteria	Value
Look for	Work Items
In	Workflow Roster
Select one	LoanRoster
Search mode	Edit (all fields)
Criteria	`loan_id = 'P123'`

b. Notice the two work items, which are located in the following queues:

- One item in the Delay(0) queue
- One item in the LoanOfficer queue

If there are three work items listed and one is waiting in the WSRequest queue, then wait one minute and reexecute the roster search.

c. In the results pane, select the row containing the work item in the LoanOfficer queue.

d. Click Open Step Processor on the results pane toolbar.

e. Type a value of your choice in the home_value field.

f. Click Complete.

6. Verify that the Invoke step was processed.

a. In Process Administrator, click Find Now to reexecute the roster search.

b. Notice the one work item in the results pane, which is in the LoanOfficer queue. A work item is no longer in the Delay system queue.

c. In the results pane, select the row containing the work item in the LoanOfficer queue.

d. Click Open Tracker.

e. Click Workflow History to view the workflow history.

f. Notice that the current step is Verify Information and that the Get Credit Rating and Get Home Valuation steps were completed.

g. Close Process Tracker.

7. Process the Verify Information step.

a. In the Process Administrator results pane, select the row containing the work item in the LoanOfficer queue waiting.

b. Click Open Step Processor on the results pane toolbar.

c. Verify that the credit_rating field contains the integer number you entered in step 4b.

d. Replace the value of the status field with the following text: `Information is verified for Polly Otto.`

e. Select the Verified response.

f. Click Complete.

8. Complete the Authorize Loan step from the Process Loan Map submap.

a. In Process Administrator, click Find Now to reexecute the roster search.

b. In the results pane, select the row containing the work item in the Loan Manager queue.

c. Click Open Step Processor.

d. Notice that the interest_rate and monthly_payment fields are zero because you did not complete the Prepare Loan Map submap where these values are set.

e. Click Complete.

9. Verify that the Set Loan Document Status step from the Terminate submap was completed.

a. In Process Administrator, click Find Now to reexecute the roster search.

b. Verify that the work item is no longer listed in the results pane.

Tip: Depending on the Component Manager polling and how quickly you execute the roster search, you might see a work item waiting in the CE_Operations queue. The Terminate system map contains a component step that uses CE_Operations to set the property of the loan_document. If there is a work item in the CE_Operations queue, wait a few seconds and execute the roster search again.

10. Launch the workflow again to test the Web Service Reply Fault.

a. Return to Process Designer.

b. Click File > Launch Main Workflow.

c. Click OK in the Check workflow name window, if the window is displayed.

11. Complete the Launch Step processor.
    a. In the Launch Step window, click Data Fields.
    b. In the Data Fields view, type the following values in the fields.
        - customer_name: `Frank Ford`
        - down_payment: `9000.`
        - government_id: `ID5678`
        - loan_date: <a future date and time>
        - loan_id: `F123`
        - loan_term: `15`
        - purchase_price: `92000.`
    c. In the Attachments view, assign an attachment from the LoanProcess > Loans folder on the object store.
    d. Click Launch.
    e. Switch to Process Administrator.
12. Complete the CreditCheckService workflow with a Reply Fault.
    a. Construct and execute a filtered search of CreditRatingRoster by using the data in the following table.

Search criteria	Value
Look for	Work Items
In	Workflow Roster
Select one	CreditRatingRoster
Search mode	Edit (all fields)

    b. In the results pane, select the row containing the work item in the LoanOperation queue.
    c. Click Open Step Processor on the results pane toolbar.
    d. Type an integer number of your choice in the rating field.
    e. Select the Not OK response.
    f. Click Complete.
13. Process the Loan Processing workflow and complete the Get Home Valuation step.

    Tip: If needed, use Process Tracker to help you follow the flow of work.
    a. Construct and execute a filtered search of LoanRoster by using the loan_id exposed field and the data in the following table.

Search criteria	Value
Look for	Work Items
In	Workflow Roster
Select one	LoanRoster

Search criteria	Value
Search mode	Edit (all fields)
Criteria	`loan_id = 'F123'`

b. Notice the three work items, which are located in the following queues:

- One item in the Delay(0) queue
- One item in the LoanOfficer queue
- One item in the LoanManager queue

Because a Fault was returned from the Web Service invoked in the Get Credit Rating step, the work item was sent to the Malfunction map and is waiting in the LoanManager queue at the Review Exception step.

c. In the results pane, select the row containing the work item in the LoanOfficer queue.

d. Click Open Step Processor on the results pane toolbar.

e. Type a value of your choice in the home_value field.

f. Click Complete.

g. Click Find Now to reexecute the roster search.

h. In the results pane, select the row containing the work item in the LoanManager queue.

i. Click Open Step Processor on the results pane toolbar.

j. Verify that the status field contains `Account ID5678 has credit problems.`

k. Select the Terminate loan response.

l. Click Complete.

m. Click Find Now to reexecute the roster search.

n. Verify that the work item is no longer listed in the results pane.

14. Close all applications.

a. Close Process Administrator.

b. Return to Process Designer.

c. If you have not already done so, check in your final version of the workflow definition. Otherwise, close the file and cancel the checkout.

d. Exit Process Designer.

e. Log out of Workplace XT and close the browser.