

# In-Process Consumer Activity Overview

Last Modified on 11/10/2021 1:46 pm EST

## V9.2

### Overview

In-Process Consumer activities enable you to pass complex objects between workflows, by consuming data from a Web Service Listener or an HTTP Listener. In-Process Consumer activities promote encapsulation and modularity, as they enable multiple workflows to consume the same service (Web or HTTP). The child workflow is then executed in-process, not through the HTTP protocol.

The In-Process Consumer activity works like a standard Web Service Consumer, except that it consumes a Web Service or HTTP Listener from another workflow.

While creating an In-process Service Consumer, you can choose from the New Listener Type drop-down the type of listener (Web Service or HTTP) you need to support the In-process consumer.

### Define the In-Process Consumer activity as blocking

You can define the In-Process Consumer Activity as a blocking activity. This means that the activity will wait for a response from the target workflow. If the response is received in the same execution, the behavior is not-blocking. If not, the activity status is set to Pending, and will wait until the target workflow returns an output by executing a Web Service/HTTP activity or fault activities.

To define the activity as blocking, in the Properties panel, under Behavior, select the **Blocking** check box.

### Important notes

- If you define the activity as Blocking and One Way, the activity fails to execute with the exception *Invalid operation*.
- If the source process was deleted or aborted, the output activity fails to execute.
- If the output returns the result to the parent workflow while it is in executing state, redirect is not executed.
- If there are two outputs in the function process, the output that is executed second will fail.
- The user that executes the output activity is the user that is defined in the *Update By* property for the In-Process Consumer Activity.

### General Procedure

1. Create a Web Service/HTTP Listener in workflow A.  
If you select the Blocking feature, you should also use a Web Service/HTTP Listener input and output.
2. Create an In-Process Consumer in workflow B.
3. Connect the In-Process Consumer in workflow B to the Web Service/HTTP Listener in workflow A.
4. Define data field bindings.

### In-process service consumer for Web Service listeners

The Web Service Listener that you need to bind with the In-process activity has its **Access Mode** property set to **In-Process**.

**Web Service Listener Details** ?

Properties Methods XML Schema External XML Schemas View WSDL

Name \*  
StockManagement

Access Modes

- Remote Server  
Allows the listener to run from a remote server.
- Local Server  
Allows the listener to run from a local server.
- In-Process  
Allows the listener to run an In-Process Consumer from the same Sequence application process.

Virtual Path  
~/SequenceServices/StockManagement.asmx

Local Path  
/Administration/SequenceServices/StockManagement.asmx

Target Namespace  
http://

OK Cancel

## Procedure

1. Add an In-Process Consumer activity to the main workflow.
2. Double-click the In-Process Consumer activity to define its properties.
3. Enter an activity **Name**, **Alias** and **Description**. Click **Next**.

**Select In-Process Consumer**

Select from the list or create a new In-Process Consumer

- GetPriceConsumer
- IPCalculatorService
- IProcessListenerTest
- IProcessListenerTest1
- MarinaList
- NewWebServiceListener

New...  
Edit...  
Delete  
Refresh

Back Next Cancel

4. Click **New**.
5. Enter a **Name** for the In-Process Consumer, and select a Web Service from the list of available Listeners.  
You can create or edit a Web Service Listener at **Administration > Global Settings > Web Service Listeners**.
6. Click **OK**.
7. Do one of the following:
  - o If the Listener is at the start of the second workflow:  
In the **Headers > ActivityMetadataHeader > WorkflowSpaceName** field, enter the Workflow

- Space name of the second workflow.
- o If the Listener is in the middle of the second workflow:
  - In the **Headers > ActivityMetadataHeader**, enter a unique identifier of the listener. For example, enter its **ActivityInstancelid**.
- 8. In the *In-Process Service Consumer Request Bindings* screen, in the **Body** section, define input values for the data fields.
  - You can enter values manually, select workflow fields from the tree, or define values as the result of an expression.
- 9. Click **Finish**.

### In-process service consumer for HTTP listeners

All HTTP Listeners are by default set to "Public" (that can be consumed by all), and can be bind to the In-process activities without requiring any special configuration change.

**NOTE:**

In case you need to explicitly define an operation as "Private" (that can only be consumed internally), change the AccessMode for listener to 'InProcess'.

### Procedure

1. Add an In-Process Consumer activity to the main workflow.
2. Double-click the In-Process Consumer activity to define its properties.
  - a. Enter an activity **Name**, **Alias** and **Description**. Click **Next**.
3. Click **New**.
4. Enter a **Name** for the In-Process Consumer, and select an HTTP from the list of available Listeners.
  - You can create or edit an HTTP Listener at **Administration > Global Settings > HTTP Listeners**.
5. Click **OK**.
6. In the *In-Process Service Consumer Request Bindings* screen, in the **Body** section, define input values for the data fields.
  - You can enter values manually, select workflow fields from the tree, or define values as the result of an expression.
7. Click **Finish**.

### Set the in-process activities to run unrestrictedly

You can configure whether in-process activities require permissions check, or if in-process activities run unrestrictedly. This configuration improves system performance as it reduces the number of database queries.

In the application **web.config** file, under `appSettings`, add the following key:

```
PNMsoft.Sequence.InProcessServiceConsumers.RunUnrestricted.
```

Value	Description
True	When set to true, <b>all</b> in-process activities run in unrestricted mode.
False	Default value. In-process activities require permission checks.

**NOTE:**

Use this configuration only if you need to improve system performance and there aren't potential security issues involved.

**Want to learn by doing?**

Check out [this hands-on exercise](#).  
*Note that only internal users can access the link.*

## V8.7

### Overview

In-Process Consumer activities enable you to pass complex objects between workflows, by consuming data from a Web Service Listener. In-Process Consumer activities promote encapsulation and modularity, as they enable multiple workflows to consume the same Web service. The child workflow is executed in-process, not through the HTTP protocol.

The In-Process Consumer activity works like a standard Web Service Consumer, except that it consumes a Web Service Listener from another workflow. The Web Service Listener's Access Mode property needs to be configured to allow In-Process activities to consume it.

### Define the In-Process Consumer activity as blocking

You can define the In-Process Consumer Activity as a blocking activity. This means that the activity will wait for a response from the target workflow. If the response is received in the same execution, the behavior is not-blocking. If not, the activity status is set to Pending, and will wait until the target workflow returns an output by executing a web service activity or fault activities.

To define the activity as blocking, in the Properties panel, under Behavior, select the **Blocking** check box.

### Important notes

- If you define the activity as Blocking and One Way, the activity fails to execute with the exception *Invalid operation*.
- If the source process was deleted or aborted, the output activity fails to execute.
- If the output returns the result to the parent workflow while it is in executing state, redirect is not executed.
- If there are two outputs in the function process, the output that is executed second will fail.
- The user that executes the output activity is the user that is defined in the *Update By* property for the In-Process Consumer Activity.

### Procedure

1. Create a Web Service Listener in workflow A.

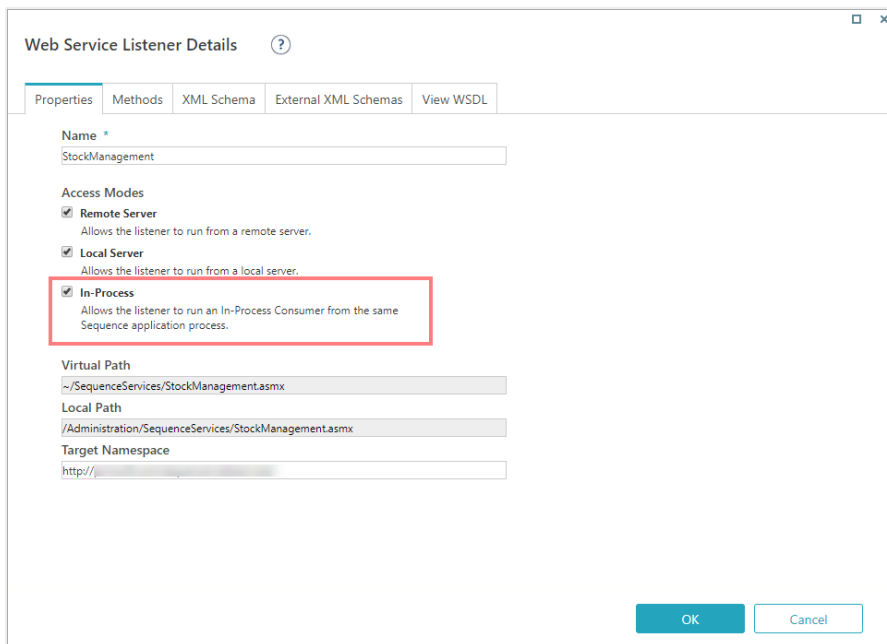
- If you select the Blocking feature, you should also use a Web Service Listener input and output.
2. Create an In-Process Consumer in workflow B.
  3. Connect the In-Process Consumer in workflow B to the Web Service Listener in workflow A.
  4. Define data field bindings.

## Example

In this example of a Mortgage Claim workflow, the In-Process Consumer of the main workflow consumes a Web Service Listener in a second workflow, which calculates the Credit Score. This score is returned to the main workflow.

## Prerequisite

- The Web Service Listener that you need to bind with the In-process activity has its **Access Mode** property set to **In-Process**.



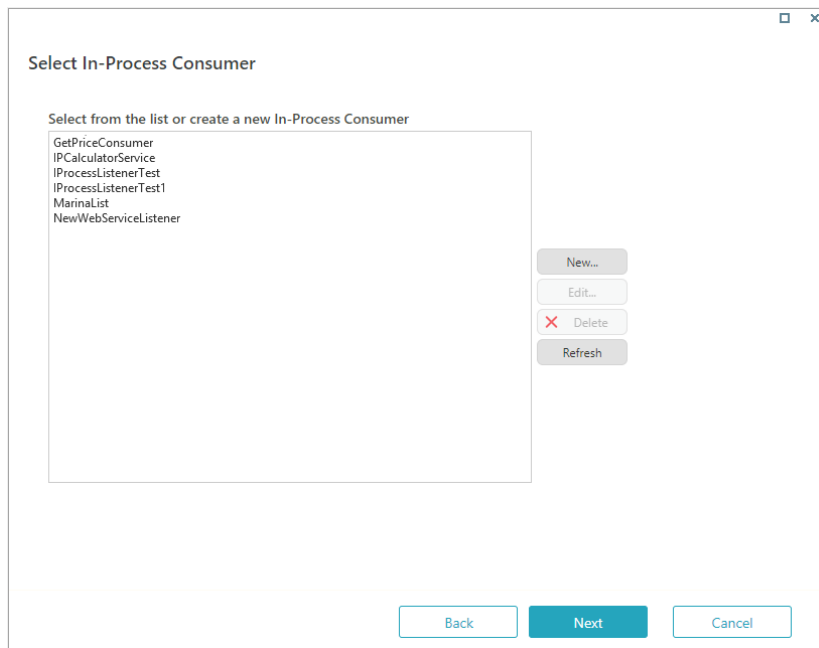
The screenshot shows the 'Web Service Listener Details' dialog box with the following fields and options:

- Name \***: StockManagement
- Access Modes**:
  - Remote Server**: Allows the listener to run from a remote server.
  - Local Server**: Allows the listener to run from a local server.
  - In-Process**: Allows the listener to run an In-Process Consumer from the same Sequence application process. (This option is highlighted with a red box in the image.)
- Virtual Path**: ~/SequenceServices/StockManagement.asmx
- Local Path**: //Administration/SequenceServices/StockManagement.asmx
- Target Namespace**: http://

Buttons: OK, Cancel

## Procedure

1. Add an In-Process Consumer activity to the main workflow.
2. Double-click the In-Process Consumer activity to define its properties.
  - a. Enter an activity **Name**, **Alias** and **Description**. Click **Next**.



4. Click **New**.
5. Enter a **Name** for the In-Process Consumer, and select a Web Service Listener from the list of available Listeners.  
You can create or edit a Web Service Listener at **Administration > Global Settings > Web Service Listener table**.
6. Click **OK**.
7. Do one of the following:
  - o If the Web Service Listener is at the start of the second workflow:  
In the **Headers > ActivityMetadataHeader > WorkflowSpaceName** field, enter the Workflow Space name of the second workflow.
  - o If the Web Service Listener is in the middle of the second workflow:  
In the **Headers > ActivityMetadataHeader**, enter a unique identifier of the listener. For example, enter its **ActivityInstancelid**.
8. In the *In-Process Consumer Request Bindings* screen, in the **Body** section, define input values for the data fields.  
You can enter values manually, select workflow fields from the tree, or define values as the result of an expression.
9. Click **Finish**.

### Set the in-process activities to run unrestrictedly

You can configure whether in-process activities require permissions checks, or if in-process activities run unrestrictedly. This configuration improves system performance as it reduces the number of database queries.

In the application **web.config** file, under `appSettings`, add the following key:

```
PNMsoft.Sequence.InProcessServiceConsumers.RunUnrestricted.
```

Value	Description
True	When set to true, <b>all</b> in-process activities run in unrestricted mode.

Value	Description
False	Default value. In-process activities require permission checks.

#### NOTE

Use this configuration only if you need to improve system performance and there aren't potential security issues involved.

## V8.4 - V8.6

### Context

Use the In-Process Consumer Activity to consume a Web service listener from another workflow, which enables you to pass complex objects between workflows. This activity also promotes encapsulation and modularity, which enables multiple workflows to consume the same Web service. The child workflow is executed in-process, not through HTTP protocol.

The In-Process Consumer works like a standard Web Service Consumer, except that it consumes a Web Service Listener from another workflow. The Web Service Listener is a standard Web Service Listener, except that its Access Mode property must be set to In-Process so that it can be consumed by an In-Process Consumer.

### Define the In-Process Consumer Activity as Blocking

You can define the In-Process Consumer Activity as a blocking activity. This means that the activity will wait for a response from the target workflow. If the response is received in the same execution, the behavior is not-blocking. If not, the activity status is set to Pending, and will wait until the target workflow returns an output by executing a web service activity or fault activities. To define the activity as blocking, select the **Blocking** check box in the Properties panel.

### Important Notes

- If you define the activity as Blocking and One Way, the activity fails to execute with the exception *Invalid operation*.
- If the source process was deleted or aborted, the output activity fails to execute.
- If the output returns the result to the parent workflow while it is in executing state, redirect is not executed.
- If there are two outputs in the function process, the output that is executed second will fail.
- The user that executes the output activity is the user that is defined in the *Update By* property for the In-Process Consumer Activity.

We'll walk you through an example to help understand how to set up and execute the In-Process Consumer.

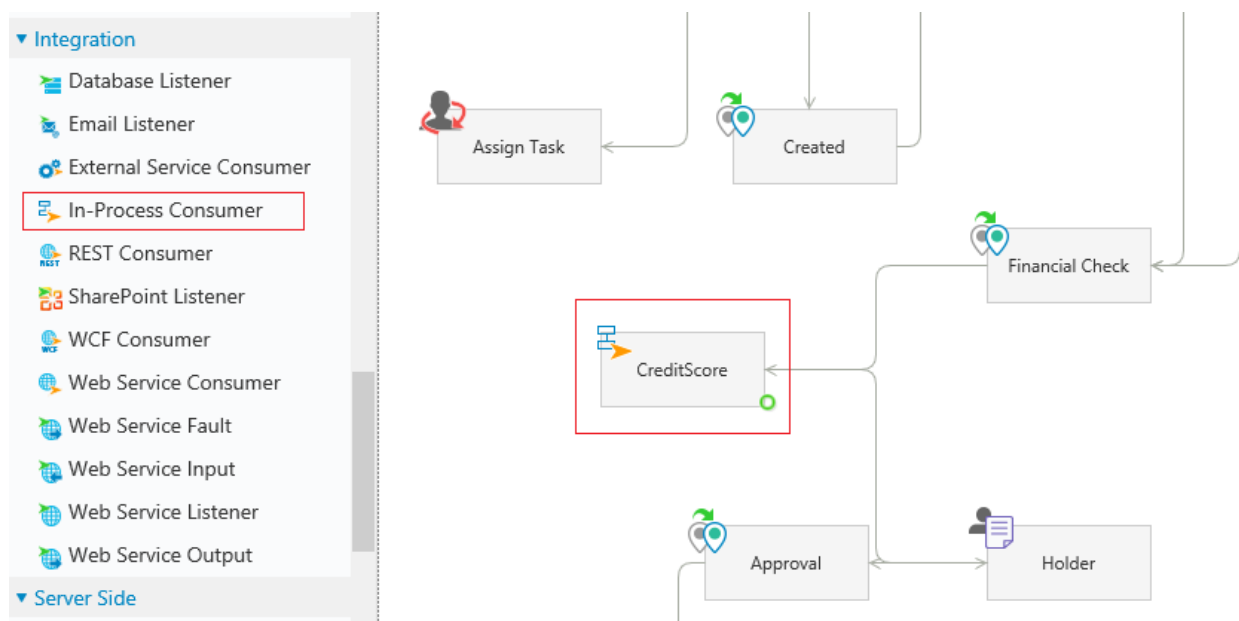
## Steps

1. Create a Web Service Listener in workflow A. (If you select the Blocking feature, you should also use a Web Service Listener input and output)
2. Create an In-Process Consumer in workflow B.
3. Connect the In-Process Consumer in workflow B to the Web Service Listener in workflow A.
4. Define data field bindings.

## Example

In this example of a Mortgage Claim workflow, the In-Process Consumer of the main workflow consumes a Web Service Listener in a second workflow, which calculates the Credit Score. This score is returned to the main workflow.

1. Add an In-Process Consumer activity to the main workflow.



2. Double-click the In-Process Consumer to define its properties. Provide an activity **Name**, **Alias** and **Description**. Click **Next**.



## Select In-Process Consumer

Select from the list or create a new In-Process Consumer

GetPriceConsumer  
IPCalculatorService  
IPProcessListenerTest  
IPProcessListenerTest1  
MarinaList  
NewWebServiceListener

New...

Edit...

Delete

Refresh

Back

Next

Cancel

3. Click **New**. The *In-Process Consumer Details* screen appears.

## In-Process Consumer Details

### Name

### Choose a Listener

You can create/edit a Listener from Administration > Global Settings

- CreditScore
- IPCalculatorService
- IProcessListenerTest
- MarinaListener
- NewWebServiceListener2
- NewWebServiceListener3
- PriceCalculation

4. Enter a **Name** for the In-Process Consumer, and select a Web Service Listener from the list of available Listeners. You can create or edit a Listener from **Administration > Global Settings > Web Service Listener table**. Click **OK**.

## In-Process Service Consumer "CheckCreditScore" Request Bindings

Services

Methods

Request

<ul style="list-style-type: none"><li>GetScore<ul style="list-style-type: none"><li>Headers<ul style="list-style-type: none"><li>ActivityMetadataHeader ActivityMetadata</li></ul></li><li>Body<ul style="list-style-type: none"><li>ScoreClaim Claim</li><li>ScoreRiskFactors RiskFactors</li><li>ScoreAttachments Attachments</li></ul></li></ul></li></ul>	<p>General</p> <table><tr><td>(Name)</td><td>GetScore</td></tr><tr><td>IsOneWay</td><td><input type="checkbox"/></td></tr></table>	(Name)	GetScore	IsOneWay	<input type="checkbox"/>
(Name)	GetScore				
IsOneWay	<input type="checkbox"/>				

Back Finish Cancel

5. If the Web Service Listener is at the start of the second workflow:

In the **Headers > ActivityMetadata > WorkflowSpaceName** field, enter the Workflow Space name of the second workflow.

If the Web Service Listener is in the middle of the second workflow:

In the **Headers > ActivityMetadata >** , enter a unique identifier of the listener, for example enter its **ActivityInstancelid**.

## In-Process Service Consumer "CheckCreditScore" Request Bindings

Services

Methods

Request

GetScore

- Headers
  - ActivityMetadataHeader ActivityMetadata
    - Guid? WorkflowSpaceId = null
    - string WorkflowSpaceName = "Credit Score"
    - Guid? WorkflowId = null
    - string WorkflowName = null
    - int? WorkflowInstanceId = null
    - Guid? ActivityId = null
    - string ActivityName = null
    - int? ActivityInstanceId = null
    - int? CallerId = null
    - XmlAttribute[] AnyAttr = null
    - string EncodedMustUnderstand = null
    - string EncodedMustUnderstand12 = null
    - bool MustUnderstand = False
    - string Actor = null
    - string Role = null
    - bool DidUnderstand = False

Type

DataSource

Value

IsNull

<> (metadata)

- Applicant Form
- Approval
- Assign Task
- Claim Triage
- Consumer1
- Created
- End
- Financial Check
- Holder
- Holder Copy1
- Initialized Components

Back Finish Cancel

Ensure that in the second workflow, the Web Service Listener has its **Access Mode** property set to **In-Process**. (The Remote Server and Local Server options may also be checked if needed).

Web Service Listener Details -- Webpage Dialog

### Web Service Listener Details

**Properties** | Methods | [XML Schema](#) | [View WSDL](#)

**Name**  
CreditScore

**Access Modes**

- Remote Server**  
Allows the listener to run from a remote server.
- Local Server**  
Allows the listener to run from a local server.
- In-Process**  
Allows the listener to run an In-Process Consumer from the same Sequence application process.

**Virtual Path**  
~/SequenceServices/CreditScore.asmx

**Local Path**  
/Sequence5.5/SequenceServices/CreditScore.asmx

OK Cancel

6. In the *In-Process Consumer Request Bindings* screen, in the **Body** section, define input values for the data fields. You can enter values manually, select workflow fields from the tree, or define values as the result of an expression.

## In-Process Service Consumer "CheckCreditScore" Request Bindings

The screenshot shows the configuration for an In-Process Service Consumer. At the top, the 'Services' dropdown is set to 'CreditScore' and the 'Methods' dropdown is set to 'System.Nullable`1[System.Int32] GetScore(GetScoreClaim, GetScoreRiskFactors, GetScoreAttachments)'. Below this, the 'Request' section is expanded to show the 'GetScore' method. The request body is defined as follows:

```
GetScore
├── Headers
└── Body
    ├── ScoreClaim Claim
    │   ├── string CustomerName = "ASDA"
    │   ├── string CustomerID = "OPW45782"
    │   └── decimal CustomerLastBalance = {Approval}.Balance
    ├── ScoreRiskFactors RiskFactors
    └── ScoreAttachments Attachments
```

On the right side, a 'Value' field is set to '{Approval}.Balance'. Below this, a list of metadata items is shown, including 'Approval', 'ActivityAlias', 'ActivityId', 'ActivityInstanceId', 'ActivityName', 'CompletedAt', 'CreatedAt', 'CreatedBy', 'SourceActivityInstanceId', 'Status', 'UpdatedAt', and 'UpdatedBy'.

At the bottom of the configuration window, there are three buttons: 'Back', 'Finish', and 'Cancel'. The 'Finish' button is highlighted in blue.

7. Click **Finish**.

### V8.3 and earlier

#### Context

Use the In-Process Consumer Activity to consume a Web service listener from another workflow, which enables you to pass complex objects between workflows. This activity also promotes encapsulation and modularity, which enables multiple workflows to consume the same Web service. The child workflow is executed in-process, not through HTTP protocol.

The In-Process Consumer works like a standard Web Service Consumer, except that it consumes a Web Service Listener from another workflow. The Web Service Listener is a standard Web Service Listener, except that its Access Mode property must be set to In-Process so that it can be consumed by an In-Process Consumer.

We'll walk you through an example to help understand how to set up and execute the In-Process Consumer.

#### Important Notes

- If the source process was deleted or aborted, the output activity fails to execute.
- If the output returns the result to the parent workflow while it is in executing state, redirect is not executed.
- If there are two outputs in the function process, the output that is executed second will fail.
- The user that executes the output activity is the user that is defined in the *Update By* property for

the In-Process Consumer Activity.

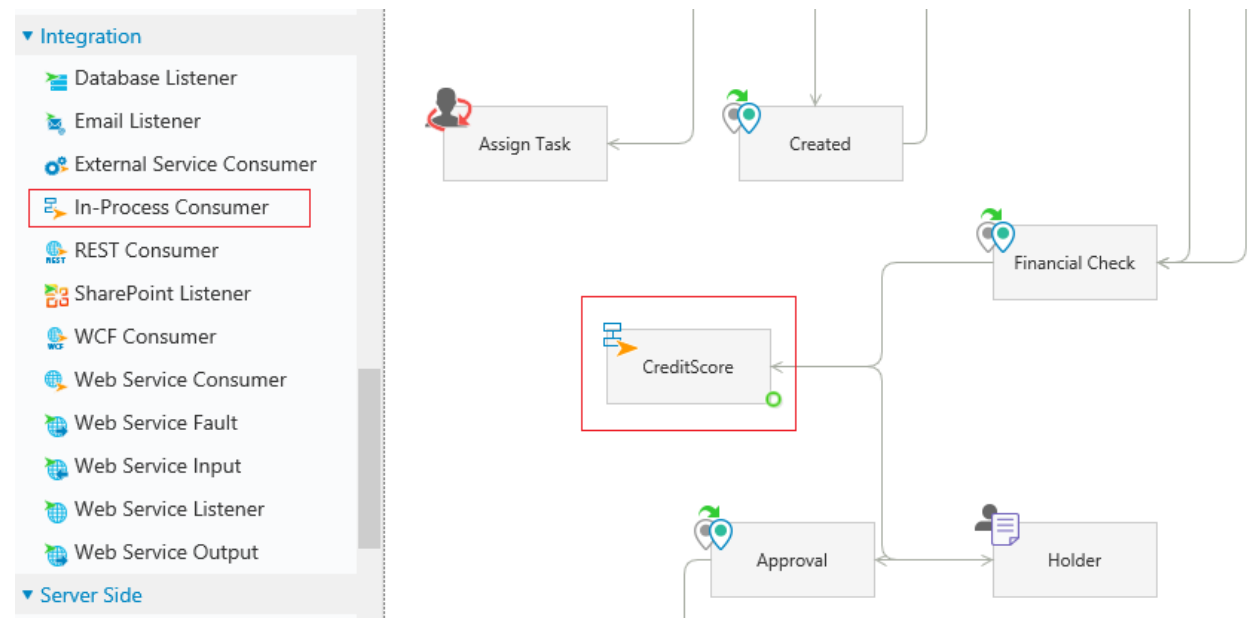
## Steps

1. Create a Web Service Listener in workflow A.
2. Create an In-Process Consumer in workflow B.
3. Connect the In-Process Consumer in workflow B to the Web Service Listener in workflow A.
4. Define data field bindings.

## Example

In this example of a Mortgage Claim workflow, the In-Process Consumer of the main workflow consumes a Web Service Listener in a second workflow, which calculates the Credit Score. This score is returned to the main workflow.

1. Add an In-Process Consumer activity to the main workflow.



2. Double-click the In-Process Consumer to define its properties. Provide an activity **Name**, **Alias** and **Description**. Click **Next**.

## Select In-Process Consumer

Select from the list or create a new In-Process Consumer

GetPriceConsumer  
IPCalculatorService  
IPProcessListenerTest  
IPProcessListenerTest1  
MarinaList  
NewWebServiceListener

New...

Edit...

Delete

Refresh

Back

Next

Cancel

3. Click **New**. The *In-Process Consumer Details* screen appears.



## In-Process Consumer Details

### Name

### Choose a Listener

You can create/edit a Listener from Administration > Global Settings

- CreditScore
- IPCalculatorService
- IProcessListenerTest
- MarinaListener
- NewWebServiceListener2
- NewWebServiceListener3
- PriceCalculation

4. Enter a **Name** for the In-Process Consumer, and select a Web Service Listener from the list of available Listeners. You can create or edit a Listener from **Administration > Global Settings > Web Service Listener table**. Click **OK**.

## In-Process Service Consumer "CheckCreditScore" Request Bindings

Services

Methods

Request

- GetScore
  - Headers
    - ActivityMetadataHeader ActivityMetadata
  - Body
    - ScoreClaim Claim
    - ScoreRiskFactors RiskFactors
    - ScoreAttachments Attachments

General	
(Name)	GetScore
IsOneWay	<input type="checkbox"/>

Back Finish Cancel

5. If the Web Service Listener is at the start of the second workflow:

In the **Headers > ActivityMetadata > WorkflowSpaceName** field, enter the Workflow Space name of the second workflow.

If the Web Service Listener is in the middle of the second workflow:

In the **Headers > ActivityMetadata >** , enter a unique identifier of the listener, for example enter its **ActivityInstancelid**.

## In-Process Service Consumer "CheckCreditScore" Request Bindings

Services

Methods

Request

GetScore

- Headers
  - ActivityMetadataHeader ActivityMetadata
    - Guid? WorkflowSpaceId = null
    - string WorkflowSpaceName = "Credit Score"
    - Guid? WorkflowId = null
    - string WorkflowName = null
    - int? WorkflowInstanceId = null
    - Guid? ActivityId = null
    - string ActivityName = null
    - int? ActivityInstanceId = null
    - int? CallerId = null
    - XmlAttribute[] AnyAttr = null
    - string EncodedMustUnderstand = null
    - string EncodedMustUnderstand12 = null
    - bool MustUnderstand = False
    - string Actor = null
    - string Role = null
    - bool DidUnderstand = False

Type

DataSource

Value

IsNull

(metadata)

- Applicant Form
- Approval
- Assign Task
- Claim Triage
- Consumer1
- Created
- End
- Financial Check
- Holder
- Holder Copy1
- Initialized Components

Back Finish Cancel

Ensure that in the second workflow, the Web Service Listener has its **Access Mode** property set to **In-Process**. (The Remote Server and Local Server options may also be checked if needed).

Web Service Listener Details -- Webpage Dialog

### Web Service Listener Details

**Properties** | Methods | [XML Schema](#) | [View WSDL](#)

**Name**  
CreditScore

**Access Modes**

- Remote Server**  
Allows the listener to run from a remote server.
- Local Server**  
Allows the listener to run from a local server.
- In-Process**  
Allows the listener to run an In-Process Consumer from the same Sequence application process.

**Virtual Path**  
~/SequenceServices/CreditScore.asmx

**Local Path**  
/Sequence5.5/SequenceServices/CreditScore.asmx

OK Cancel

6. In the *In-Process Consumer Request Bindings* screen, in the **Body** section, define input values for the data fields. You can enter values manually, select workflow fields from the tree, or define values as the result of an expression.

## In-Process Service Consumer "CheckCreditScore" Request Bindings

Services

Methods

### Request

Type	Decimal
Value	{Approval}.Balance

GetScore	
Headers	
Body	
ScoreClaim Claim	
string CustomerName = "ASDA"	
string CustomerID = "OPW45782"	
decimal CustomerLastBalance = {Approval}.Balance	
ScoreRiskFactors RiskFactors	
ScoreAttachments Attachments	

<> (metadata)	
Applicant Form	
Approval	
<> (metadata)	
ActivityAlias	
ActivityId	
ActivityInstanceId	
ActivityName	
CompletedAt	
CreatedAt	
CreatedBy	
SourceActivityInstanceId	
Status	
UpdatedAt	
UpdatedBy	

Back

Finish

Cancel

7. Click **Finish**.

The In-Process Consumer is defined, and will call the Web Service Listener when it is reached in the flow.