

IBM Integration Bus V9 Scenarios  
Version 1 Release 0

*Updating a library*

**IBM**

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## Chapter 1. Introduction to the "Updating a library" scenario

You can update a library that is referenced by a number of integration projects and applications. Review the topics in this section to understand what is covered in this scenario, the situations in which a business might want to follow the scenario, and an overview of the solution that is proposed by the scenario.

### About this task

Libraries can be used by both integration projects and applications. However, there are significant operational differences between how integration projects use libraries and how applications use libraries.

Once a library is deployed, you can modify the library to include updated or new resources. However, the steps you must take to make the modified library available to integration project resources are different from the steps you must take to make the modified library available to applications.

The scenario explains the differences between the use of libraries by integration project resources and the use of libraries by applications, and provides the steps that are required to make library updates available to integration project resources as well as the steps that are required to make the library updates available to applications. Read the following topics to understand the scenario and the concepts the scenario is intended to demonstrate.

1. "Context"
2. "Technical solution" on page 2
3. Chapter 3, "Comparison of libraries in applications and libraries in integration projects," on page 17

### What to do next

Implement the solution in a test environment. For more information, see Chapter 2, "Implementing the solution," on page 9.

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## Context

A company has developed a library that contains resources that are used in a number of IBM® Integration Bus integration solutions. The company now wants to update the library resources and make the updated resources available to a number of the deployed integration solutions.

The company uses IBM Integration Bus to develop and manage a number of integration solutions that transform and communicate payment data between source and target systems.

Some of the integration solutions were developed in WebSphere® Message Broker Version 7.0 and are implemented as integration projects (originally known as Message broker projects). An integration project is a container for all of the message flows and other resources that make up an integration solution. When you deploy an integration project to the runtime environment, the resources are deployed directly into the integration server. After an integration project is deployed, you can update and redeploy individual integration project resources

and the updates are immediately available to other resources in the integration project. For more information about integration projects, see Integration projects in the IBM Integration Bus information center.

The rest of the integration solutions were developed in WebSphere Message Broker Version 8.0 or later, and are implemented as applications. An application (a feature that was introduced in WebSphere Message Broker Version 8.0) is also a container for all of the resources that make up an integration solution. However, an application differs from an integration project in that, when you deploy an application, the resources are deployed to the integration server in a self-contained environment. The application's self-contained environment provides runtime isolation for the resources within the application. Runtime isolation means that an individual application can be stopped, restarted, or updated without affecting, or being affected by, other resources that are deployed in the integration server. With runtime isolation you can control whether, and when, applications pick up updates to any resources that are shared with other integration solutions. For more information about applications, see Applications in the IBM Integration Bus information center.

The company has developed a message map that describes how the payment data is mapped between the source and target systems. To make it easy to reuse the message map within all the integration solutions, the map and associated resources are stored in a library. A library is a container for a set of related resources that are typically used by more than one integration project or application. By using a library, you can define and develop a single instance of a resource and then reuse it in several integration solutions. The library that contains the map and associated resources is referenced in all of the integration solutions in the scenario. For more information about libraries, see Libraries in the IBM Integration Bus information center.

The company is about to start processing payments for a business partner, and the data structure of the business partner's payments is in a different format to other payments. A new message map is required to process these payments successfully. The new message map is developed and added to the library.

This scenario explains how to deploy the updated library so that the new message map is made available to the relevant integration solutions.

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## Technical solution

This scenario describes one way of managing the deployment of updated library resources when the library is referenced in a number of applications and integration project resources.

The following topics explain the initial configuration that is used to start the scenario, and the target configuration that is the result of completing the steps that are documented in the scenario:

- “Initial configuration for the scenario” on page 3
- “Target configuration for the scenario” on page 6



**Related tasks:**

Chapter 2, “Implementing the solution,” on page 9

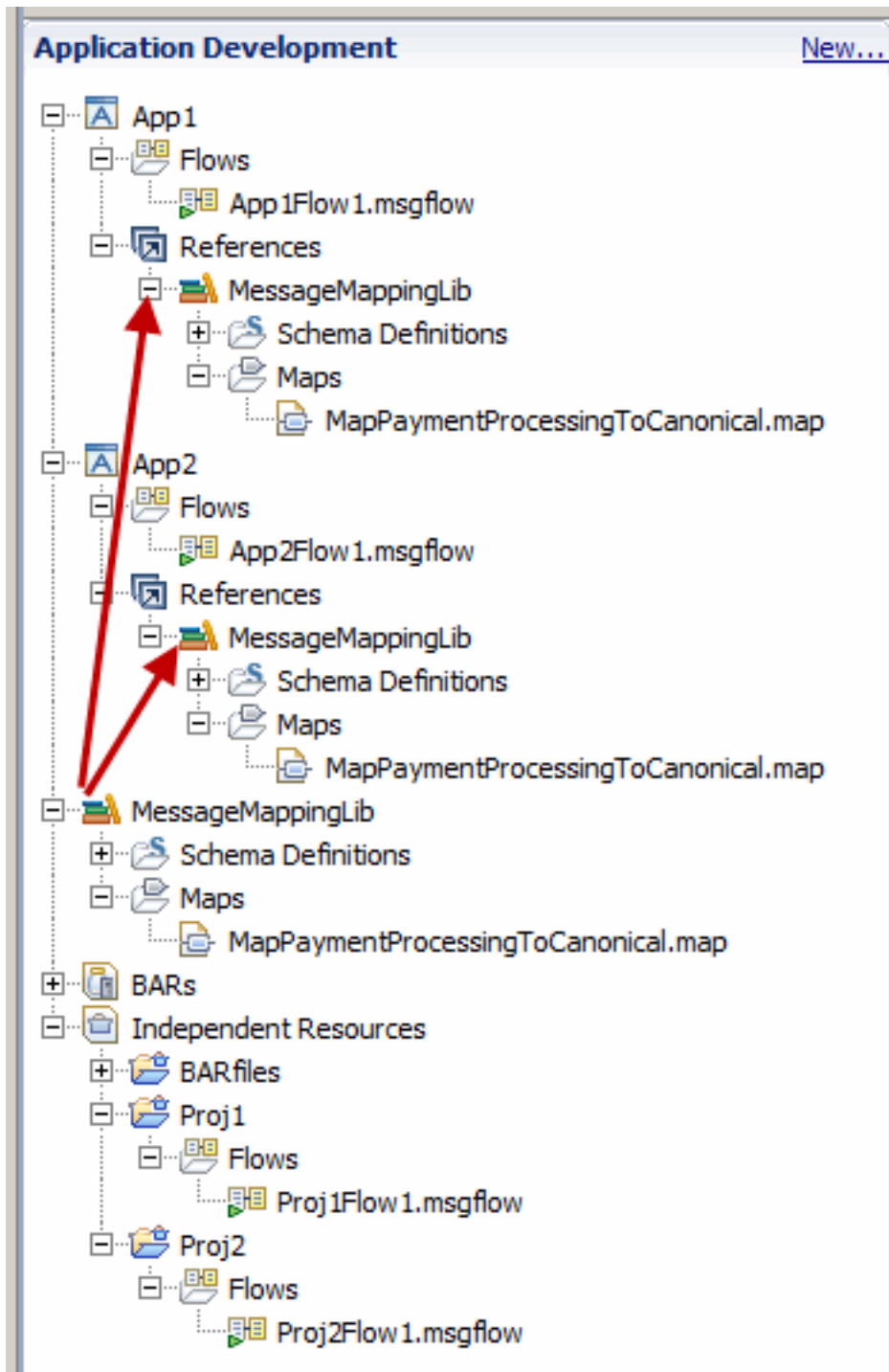
You implement the solution in this scenario by adding a new message map and associated resources to a library. Then you make the updated library available to the integration project resources and applications that reference the library.

**Initial configuration for the scenario**

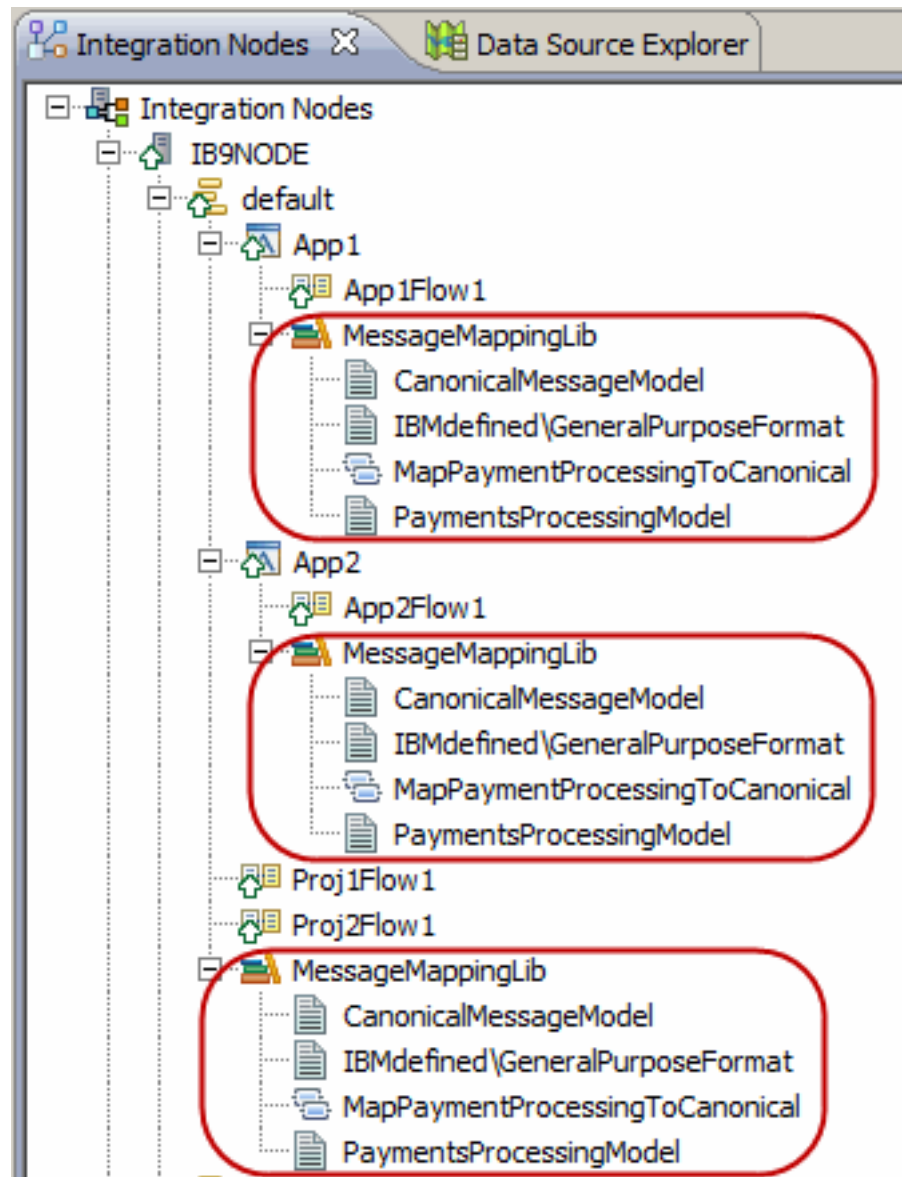
A company has a number of integration solutions that reference a single library that contains resources that are used by the integration solutions.

The initial configuration for this scenario has two IBM Integration Bus applications (App1 and App2) and two IBM Integration Bus integration projects (Proj1 and Proj2). Each of the applications and integration projects has a message flow that references a library (MessageMappingLib).

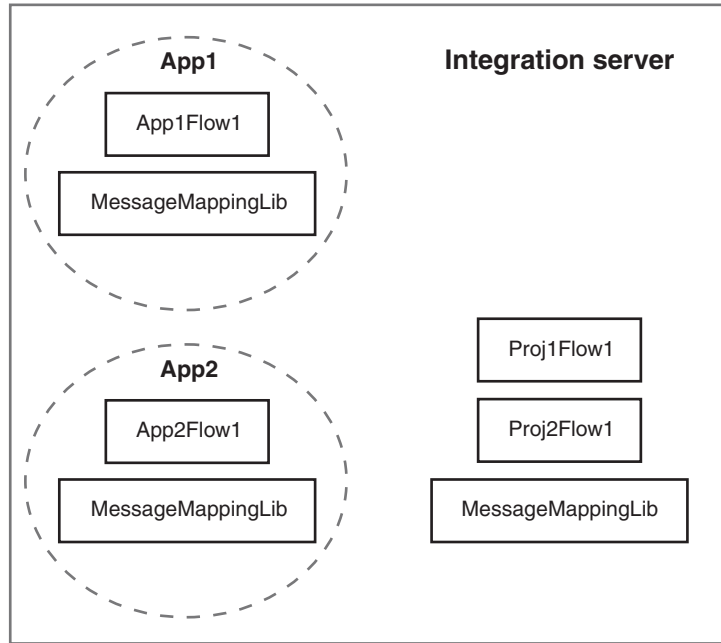
The following screen capture shows the development resources for the library, and the applications and integration projects that reference the library. At this stage, the library references are references to a single copy of the library. Any changes that are made to the library are immediately available in the development resources for the application.



The following screen capture shows the resources after the integration projects and applications are deployed to the integration server. After deployment, there are three copies of the MessageMappingLib library in the integration server.



Because of the runtime isolation that is provided by applications, the resources that are associated with the App1 application, including a copy of the MessageMappingLib library, are grouped under the application name and are only visible and available to the App1 application. Similarly, the resources that are associated with the App2 application are only visible and available to the App2 application. However, the resources for both of the integration projects (the Proj1Flow1 message flow from the Proj1 integration project, the Proj2Flow1 message flow from the Proj2 integration project, and another copy of the MessageMappingLib library) are stored directly in the integration server. These resources are available and visible to each other and to all other resources that are deployed directly in the integration server, but not available or visible to the applications.



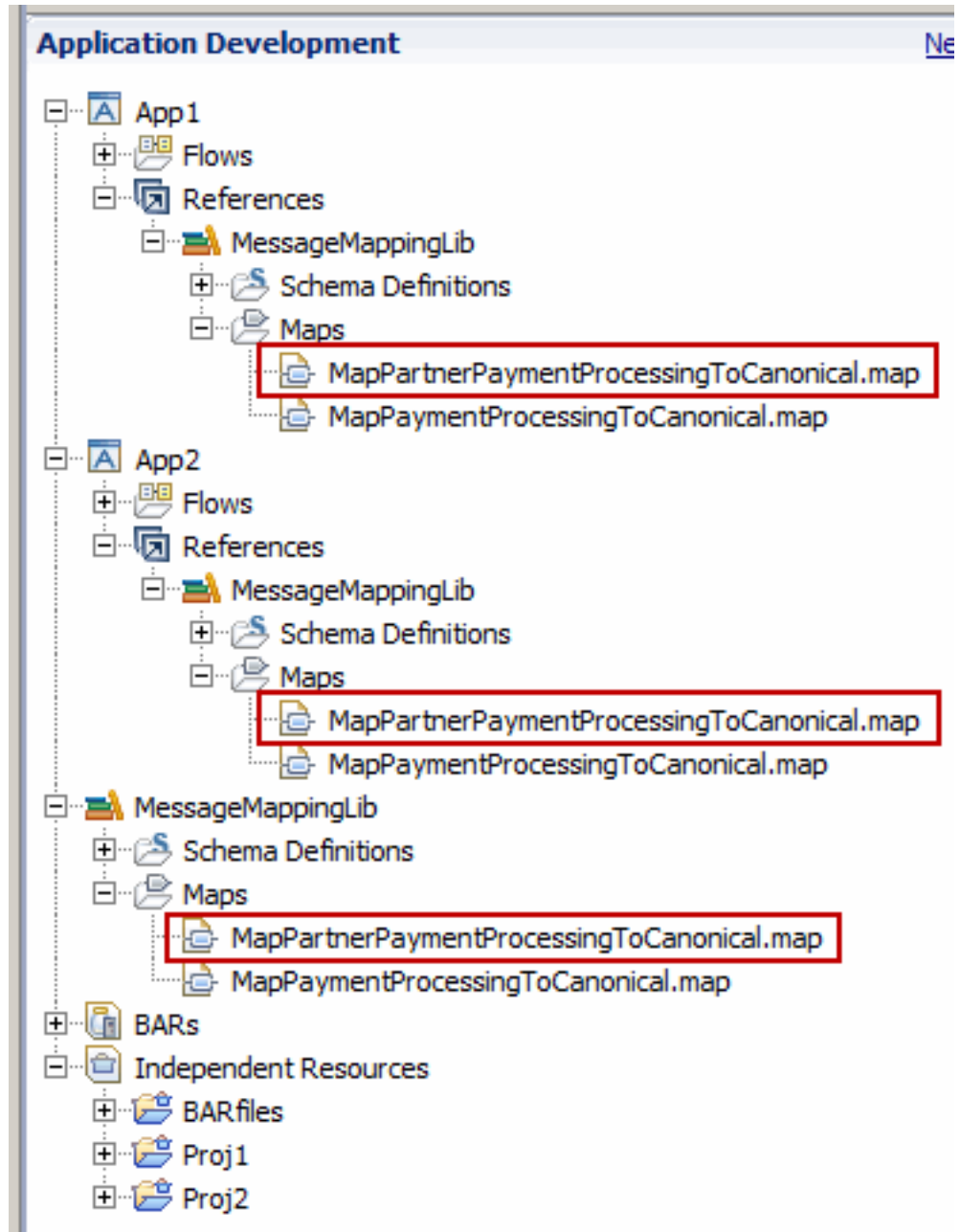
**Tip:** This scenario was developed by using a sample version of the initial configuration described. If you want to try out the scenario, set up a copy of the sample configuration as described in the following topic: “Creating the initial configuration” on page 9.

## Target configuration for the scenario

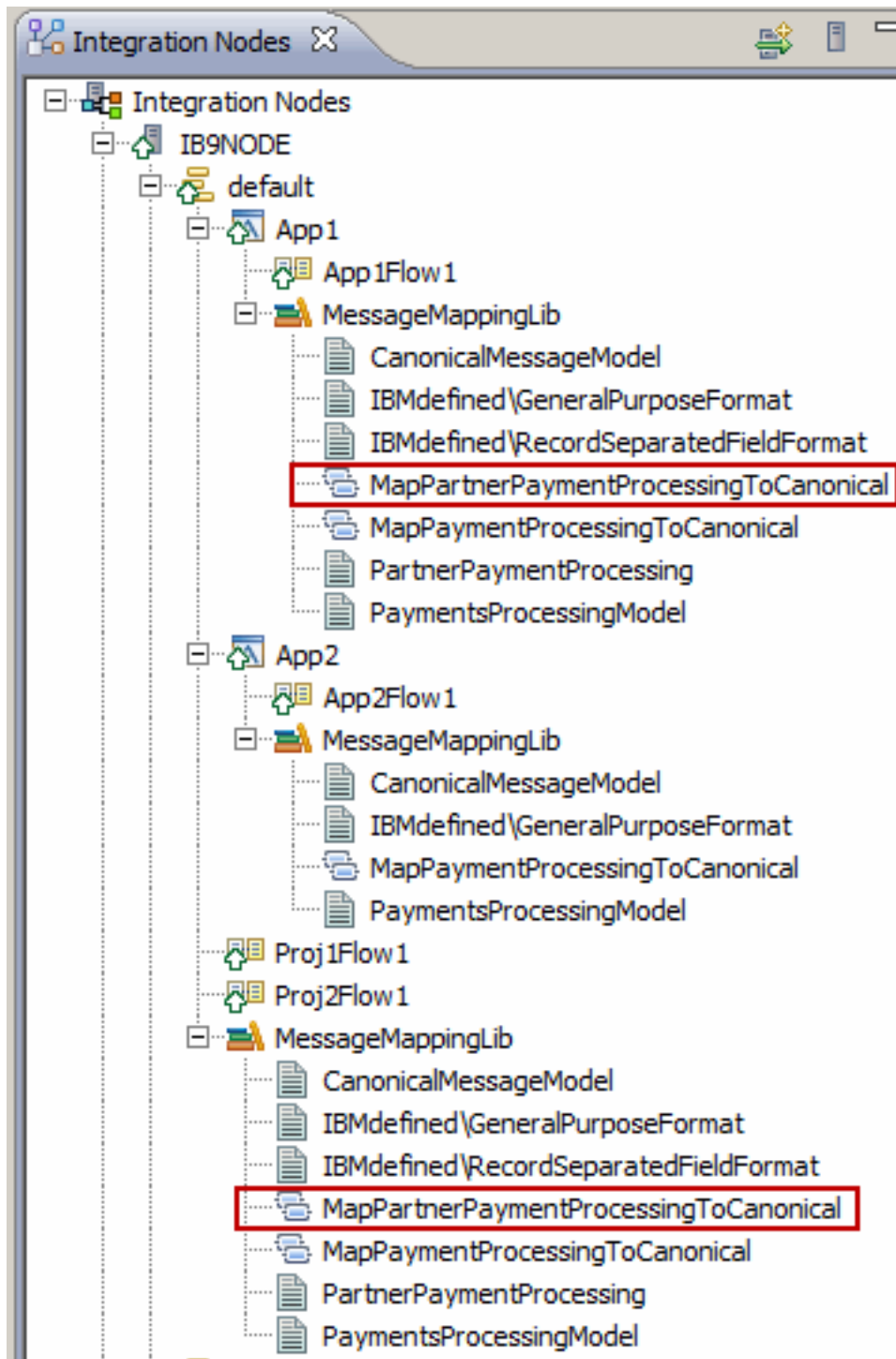
The company adds a new mapping routine to the library and makes the updated library available to a number of the integration solutions.

The company begins processing payments on behalf of a business partner. The business partner's payments use a different data format and so a new map, `MapPartnerPaymentProcessingToCanonical.map` is added to the `MessageMappingLib` library. The integration projects and the `App1` application are all expected to process the business partner's payments. However, the `App2` application is not connected to the business partner system and so there is no urgency to make the updated library available to the `App2` application. The library is updated and redeployed so that the updated resources are available to only the `Proj1` and `Proj2` integration projects and the `App1` application.

The following screen capture shows the resulting development environment when the library is updated with a new message map and associated resources. Because both of the applications contain a reference to the library, the new map is shown in the library references for the development resources of both applications.



The following screen capture shows the runtime environment after the updated library and the App1 application are deployed to the integration server. You can see that the updated library is available to the two integration projects and to the App1 application. However, because the App2 application has not been redeployed, the App2 application is still using the original version of the library.



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## Chapter 2. Implementing the solution

You implement the solution in this scenario by adding a new message map and associated resources to a library. Then you make the updated library available to the integration project resources and applications that reference the library.

### Before you begin

The starting point for this scenario is a development environment with a library that is referenced by two applications and two integration projects. The applications and integration projects are also deployed to a single integration server. To make the instructions easy to follow, the steps in the scenario assume that all configuration is done by a single person who is using the IBM Integration Toolkit. However, in a production environment, it is likely that the development tasks would be performed by a developer and the deployment tasks by an administrator.

If you want to try out the scenario, you can set up a copy of the sample initial environment as described in the following topic: “Creating the initial configuration.”

### About this task

To implement the solution, you must complete the following steps:

1. Create the initial configuration. See “Creating the initial configuration.”
2. Update the library. See “Updating the library” on page 10.
3. Make the updates available to the relevant integration solutions. The following steps can be completed in any order:
  - To make the updated library available to the integration project resources, deploy the library to the integration server. See “Making a new version of a library available to integration project resources” on page 12.
  - To make the updated library available to an application, redeploy one of the applications. See “Making a new version of a library available to an application” on page 14.

#### Related reference:

Chapter 3, “Comparison of libraries in applications and libraries in integration projects,” on page 17

A summary of the differences that are associated with the use of libraries within applications and the use of libraries within integration projects.

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## Creating the initial configuration

This scenario was developed by using a sample initial configuration. You can set up the sample initial IT configuration to try out the scenario in the same way as it was originally developed.

### Before you begin

- Download a copy of the file `InitialConfig.zip` from the IBM Integration Community.

- Make sure you have access to an IBM Integration Bus runtime environment and an IBM Integration Toolkit installation with the default configuration deployed. For more information about installing IBM Integration Bus components, see [Installing](#).

## About this task

Complete the following steps to set up the sample initial configuration that was used to develop the scenario.

## Procedure

1. From the IBM Integration Toolkit menu, click **File > Import > Other > Project Interchange** and then click **Next**. The Import Projects dialog box opens.
2. Next to the drop-down menu for the "From zip file" field, click **Browse**, navigate to the `InitialConfig.zip` file and click **Open**. The Import Projects dialog box is populated with the list of resources from the `InitialConfig.zip` file.
3. Ensure that all the resources are selected and click **Finish**. In the Application Development pane you should see the following entries:
  - Two applications, App1 and App2, each of which contains a message flow and a reference to the MessageMappingLib library.
  - The MessageMappingLib library, which contains a number of schema definitions and a single map called `MapPaymentProcessingToCanonical.map`
  - A BAR file named `InitialConfig.bar`.
  - In the Independent Resources folder, two integration projects, Proj1 and Proj2, each of which contains a message flow, and which references the MessageMappingLib library.

**Note:** To see the library reference, right-click the integration project name and click **Manage Library references**.
4. To deploy the `InitialConfig.bar` BAR file, right-click on the BAR file name, click **Deploy**, select an integration server, and click **Finish**. The resources (the App1 and App2 applications, the Proj1Flow1 and Proj2Flow1 message flows from the two integration projects, and the MessageMappingLib library) are deployed to the integration server.

## Results

You have deployed the initial configuration. For screen captures that show the expected initial development and runtime environments, see "Initial configuration for the scenario" on page 3.

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## Updating the library

You update the library with a new message map.

### Before you begin

- Set up the initial configuration. See "Creating the initial configuration" on page 9.
- Download a copy of the file `MessageMappingLibAfterModification.zip` from the IBM Integration Community.



## About this task

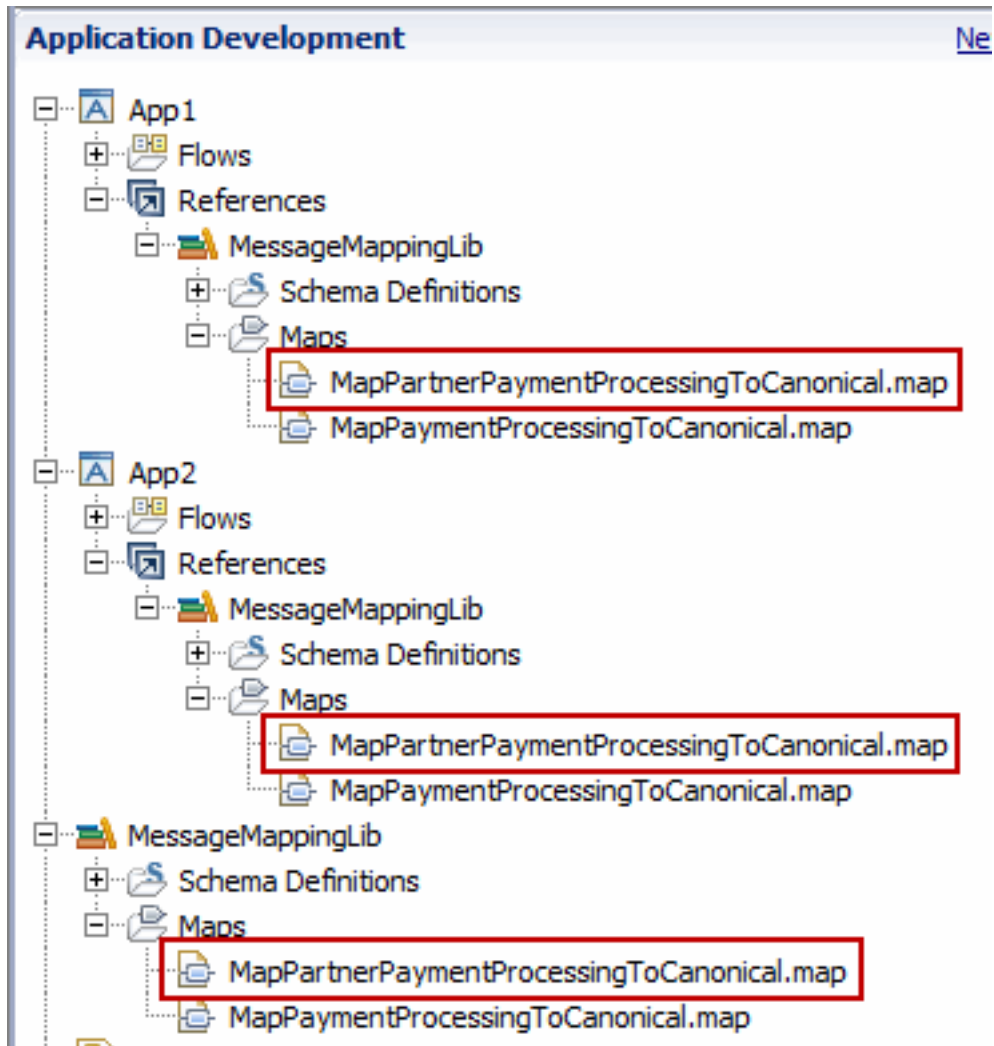
Complete the following steps to add a new message map to the library by importing an updated copy of the library.

### Procedure

1. From the IBM Integration Toolkit menu, click **File > Import > Other > Project Interchange** and click **Next**. The Import Projects dialog box opens.
2. Next to the drop-down menu for the "From zip file" field, click **Browse**, navigate to the MessageMappingLibAfterModification.zip file and click **Open**. The Import Projects dialog box displays the MessageMappingLib library.
3. Ensure that the MessageMappingLib library is selected and click **Finish**.
4. Click **OK** to confirm that you want to overwrite the existing MessageMappingLib library.

### Results

You now have an updated MessageMappingLib library that includes a new message map. The new message map is available in only the development environment at this stage. Because the applications contain references to the single copy of the library, the references also reflect the changes that are made to the MessageMappingLib, as shown in the following screen capture.



### What to do next

Deploy the updated library to the runtime environment. See “Making a new version of a library available to integration project resources.”

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## Making a new version of a library available to integration project resources

You make the updated library available to the integration projects by deploying the library to the runtime environment.

### Before you begin

- Set up the initial configuration. See “Creating the initial configuration” on page 9.
- Update the library. See “Updating the library” on page 10.

## About this task

The company identifies an appropriate maintenance period during which they can update the integration projects by deploying the updated library to the runtime environment.

**Note:** It is not possible to update resources that are associated with just one of the integration projects. If the company wants only one of the integration projects to use the new library, they must move one of the integration projects to another integration server, or convert one of the integration projects to an application. For more information, see [Converting an integration project to an application](#) in the IBM Integration Bus information center.

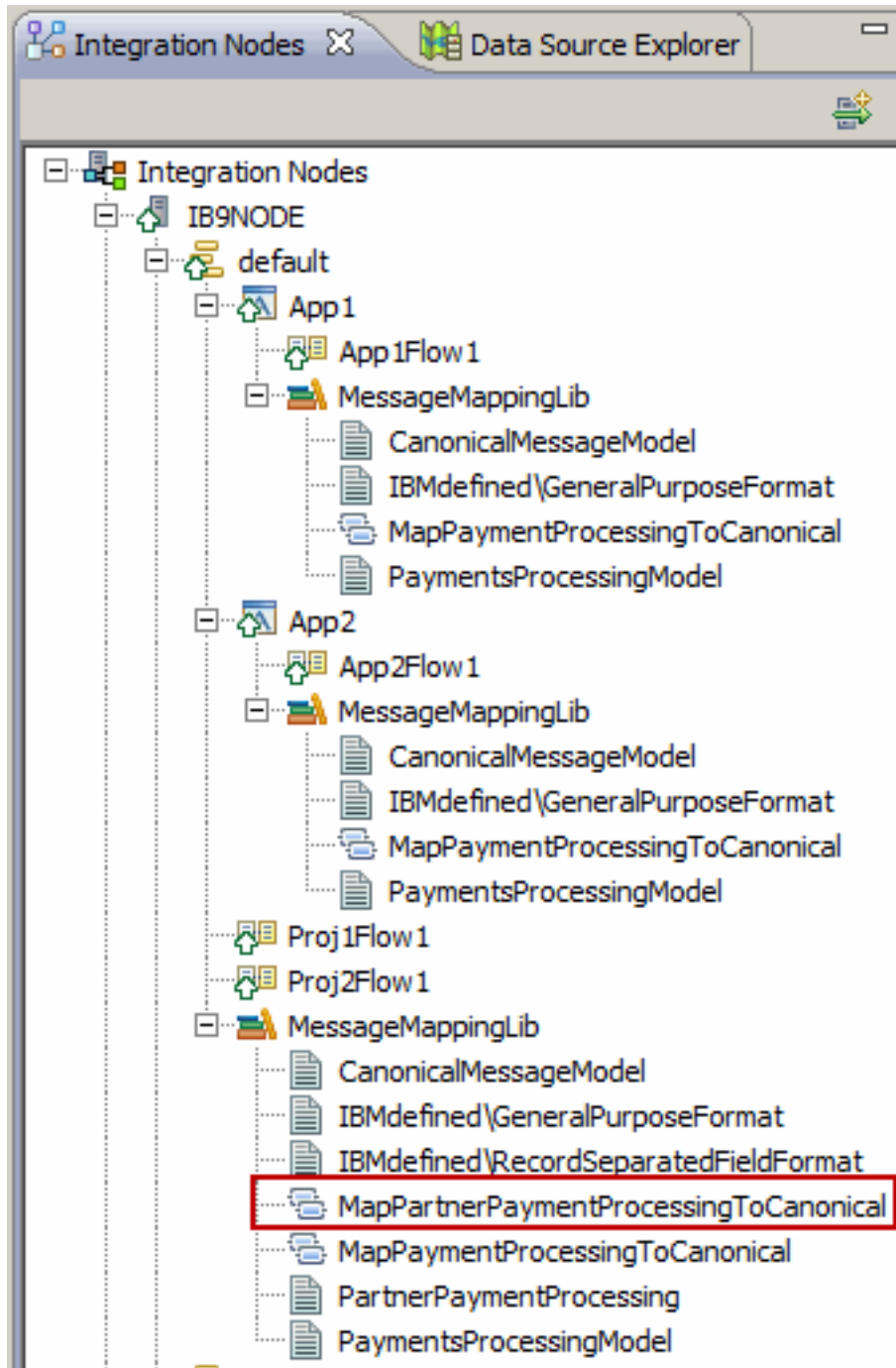
Complete the following steps to create a BAR file that contains just the MessageMappingLib library and deploy it to the integration server.

## Procedure

1. From the IBM Integration Toolkit menu, select **File > New > Bar File**. The New Bar File dialog box opens.
2. In the Name field, type MappingLib and click **Finish**. The BAR File editor opens.
3. Click the **Message flows, libraries and other message flow dependencies** radio button. Any libraries and integration project resources in the workspace are displayed.
4. Select the MessageMappingLib check box and then click the **Build and Save** button. The message: Operation completed successfully is displayed.
5. Click **OK**. The MappingLib.bar file is added to the BAR Files in the Application Development pane.
6. Stop the Proj1Flow1 message flow in the runtime environment by right-clicking the message flow in the Integration Nodes pane and clicking **Stop**. The Proj1Flow1 message flow is stopped.
7. Stop the Proj2Flow1 message flow in the runtime environment by right-clicking the message flow in the Integration Nodes pane and clicking **Stop**. The Proj2Flow1 message flow is stopped.
8. Right-click the MappingLib.bar file, click **Deploy**, select the integration server and click **Finish**. The MessageMappingLib library is updated in the runtime environment.
9. Restart the Proj1Flow1 message flow in the runtime environment by right-clicking the message flow in the Integration Nodes pane and clicking **Start**. The Proj1Flow1 message flow is restarted.
10. Restart the Proj2Flow1 message flow in the runtime environment by right-clicking the message flow in the Integration Nodes pane and clicking **Start**. The Proj2Flow1 message flow is restarted.

## Results

You have deployed your updated library to the runtime environment. You can see that the new map is included in the library that is deployed directly in the integration server. As a result, the new map is now available to both of the message flows from the integration projects. However, the new map is not included in the libraries that are associated with the applications, and the applications do not have access to the new map within the library that is deployed directly in the integration server.



### What to do next

Redeploy one of the applications so that the application can use the updated library. See "Making a new version of a library available to an application."

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## Making a new version of a library available to an application

You redeploy an application so that the application can use the updated library.

## Before you begin

- Set up the initial configuration. See “Creating the initial configuration” on page 9.
- Update the library. See “Updating the library” on page 10.

## About this task

The company plan to update both the App1 and App2 applications to use the new library but both of these applications are in constant use and have different maintenance periods. The App1 application is the most urgent to update because there are immediate plans to connect this application to the partner's environment. Because of the runtime isolation that is provided by applications, the App1 application can be redeployed without affecting the operation of the App2 application.

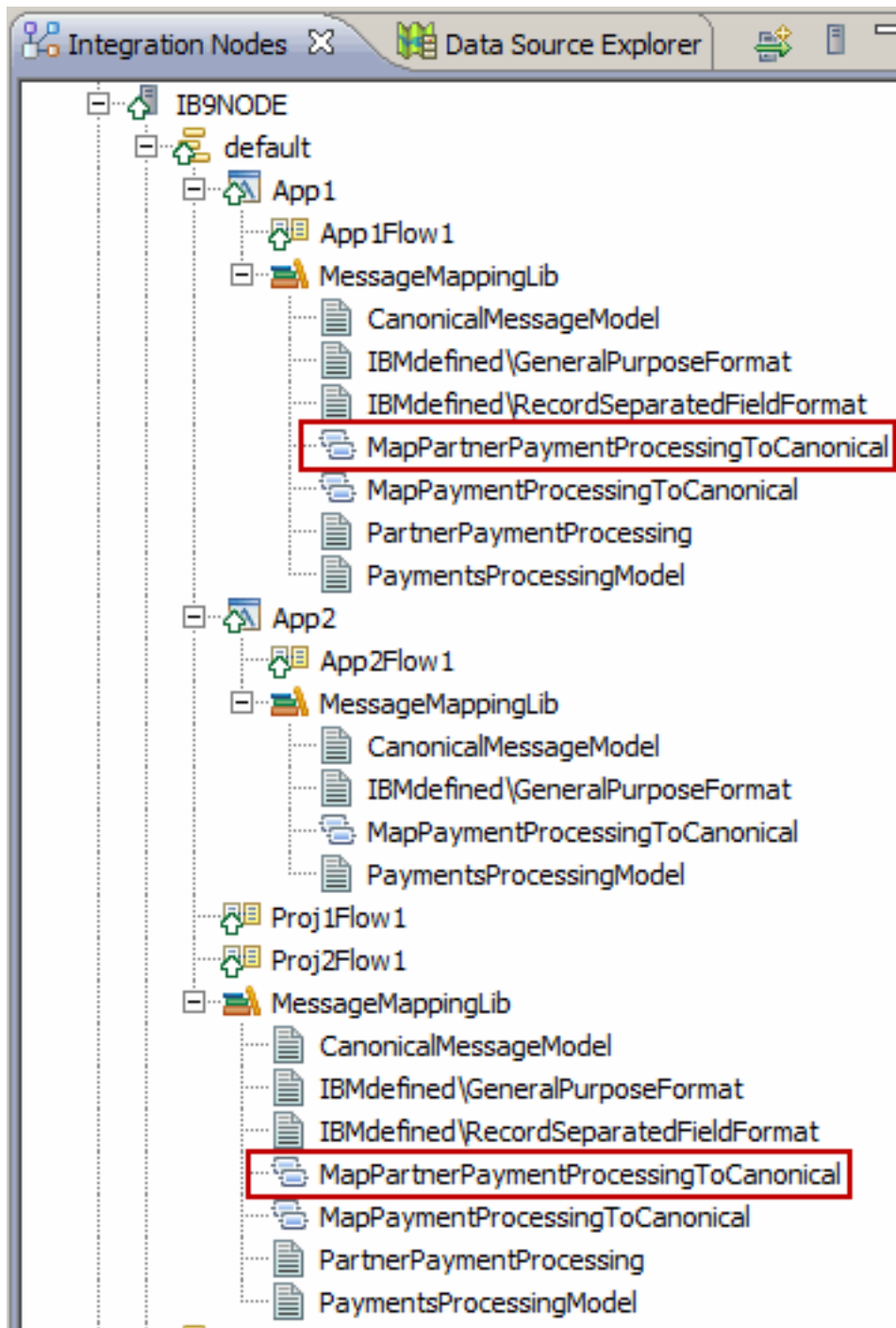
Complete the following steps to redeploy the App1 application so that the application can use resources from the updated library.

## Procedure

1. From the IBM Integration Toolkit menu, select **File > New > Bar File**. The New Bar File dialog box opens.
2. In the Name field, type App1NewLib and click **Finish**. The BAR File editor opens to display the applications that can be added to the BAR file.
3. Select the App1 check box and then click the **Build and Save** button. The message Operation completed successfully is displayed.
4. Click **OK**. The App1NewLib.bar file is added to the BAR Files in the Application Development pane.
5. Stop the App1 application in the runtime environment by right-clicking the application in the Integration Nodes pane and clicking **Stop**. The App1 application is stopped.
6. Right-click the App1NewLib.bar file, click **Deploy**, select the integration server and click **Finish**. The App1 application remains stopped but the new library resources can be seen in the runtime environment.
7. Start the App1 application in the runtime environment by right-clicking the application in the Integration Nodes pane and clicking **Start**. The App1 application is restarted.

## Results

You have redeployed the App1 application and the new library resources are now available to that application. You can see that the new map is now included in the library that is contained in the App1 application and the library that is deployed directly in the integration server. However, the new map is not included in the App2 application.



## Chapter 3. Comparison of libraries in applications and libraries in integration projects

A summary of the differences that are associated with the use of libraries within applications and the use of libraries within integration projects.

The following table compares ways in which tasks associated with managing libraries are implemented when you are working with applications and when you are working with integration projects.

Task	Applications	Integration Projects
Adding library references during resource creation.	You can add references to libraries when an application is created by selecting library names from the "Specify dependencies on libraries" panel.	You can add references to libraries when an integration project is created by selecting library names from the "Specify dependencies on other libraries" panel.
Adding library references to existing resources.	You can add references to libraries by right-clicking an existing application name and clicking <b>Manage Library references</b> in the Application Development pane in the IBM Integration Toolkit.	You can add references to libraries by right-clicking an existing integration project name and clicking <b>Manage Library references</b> in the Application Development pane in the IBM Integration Toolkit.
Viewing library references in the development environment.	You can see the libraries that are referenced in an application from the application's References section in the Application Development pane in the IBM Integration Toolkit.	You can see the libraries that are referenced by an integration project by right-clicking the integration project and clicking <b>Manage Library references</b> in the Application Development pane in the IBM Integration Toolkit.
Viewing library references in the runtime environment.	You can see the libraries that are referenced in a deployed application listed below the application name in the Integration Nodes pane of the IBM Integration Toolkit.	You cannot see whether libraries are referenced by deployed integration project resources. However, if a library is deployed directly to the integration server, the library's resources are available to any integration project resources that are deployed to the same integration server.
Updating a referenced library in a single application or integration project.	Because of the runtime isolation that is provided by applications you can update and deploy the library in an application without affecting any other runtime resources (applications or integration projects) that use the same library.	If you update and deploy a library that is used by multiple integration project resources, the updated library is automatically available to all of the integration project resources in an integration server. To make updates to a library so that the updates are only available to a single integration project, you must do one of the following: <ul style="list-style-type: none"> <li>• Move the integration project to an integration server that does not have any other integration projects that reference the library.</li> <li>• Convert the integration project to an application. See <i>Converting an integration project to an application</i> in the IBM Integration Bus information center.</li> </ul>

Task	Applications	Integration Projects
Deploy an updated library so that the updates are available to every application or integration project that references the library.	Because of the runtime isolation that is provided by applications, you cannot deploy an updated library and have the updates available to every application. Instead you must rebuild and redeploy each application individually.	You can create a BAR file that contains just the updated library and deploy that to the integration servers where the integration projects are deployed.



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