

IBM Integration Designer
Version 7 Release 5

*Hello World for WebSphere DataPower
Appliance*



Note

Before using this information and the product it supports, read the information in “Notices” on page 23.

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Chapter 1. Introduction

This sample shows you how to use IBM Integration Designer to create a map for an XML Firewall. You also learn how to transfer the files that you created to the DataPower appliance, and test the service.

In the sample, you learn how to complete the following activities:

- Enable DataPower function in Integration Designer.
- Create a DataPower library.
- Create business objects.
- Create a simple XML map.
- Transfer files to a DataPower Appliance.
- Create an XML firewall service..
- Test the service from Integration Designer.

Prerequisite:

To run this sample, you must have access to a WebSphere DataPower Appliance.

Overview

In this sample, your goal is to create two simple business objects as input and output, and to map the input business object to the output business object by using an XML map. You then transfer the files that you created to a DataPower appliance and create and test an XML firewall service.

In this sample, you will map an input business object called **fullname** to an output business object called **title_firstname_lastname** by using an XML map.

The input business object **fullname** has three fields of type string, as shown below:

| | |
|----------------------|--------|
| fullname | |
| <Click to filter...> | |
| title | string |
| firstName | string |
| lastName | string |
| | |

The output business object **title_firstname_lastname** has a single field **name** of type string, as shown below:

| | |
|--------------------------|--------|
| title_firstname_lastname | |
| <Click to filter...> | |
| name | string |
| | |

Your goal is to take input data from the three fields of **fullname**, concatenate the strings, and populate the resulting string in the name field of **title_firstname_lastname**.

Chapter 2. Build it yourself

You can use the Business Object editor and the XML map editor in IBM Integration Designer to build the sample.

To build the sample, you will complete the following steps:

1. Set the DataPower capability.
2. Create a DataPower library.
3. Create the input and output business objects.
4. Map the business objects.
5. Transfer the XML map to a WebSphere DataPower Appliance.
6. Create an XML firewall service on a WebSphere DataPower Appliance.
7. Test the service using the Generic Service Client in Integration Designer.

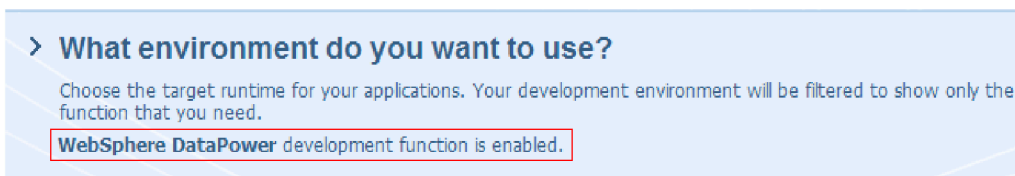
Set the DataPower Capability

Integration Designer is the development environment for many different runtimes. If all of the tooling is shown the business integration view can get cluttered. In order to make it easy for users to find the tools that they need, Integration Designer provides a filtering function known as capabilities.

With capabilities, you can choose to hide the tools that you do not use. At any time, you can choose to show those tools again. To use tools for the DataPower Appliance, you must enable the DataPower capability.

To enable the DataPower capability follow these steps:

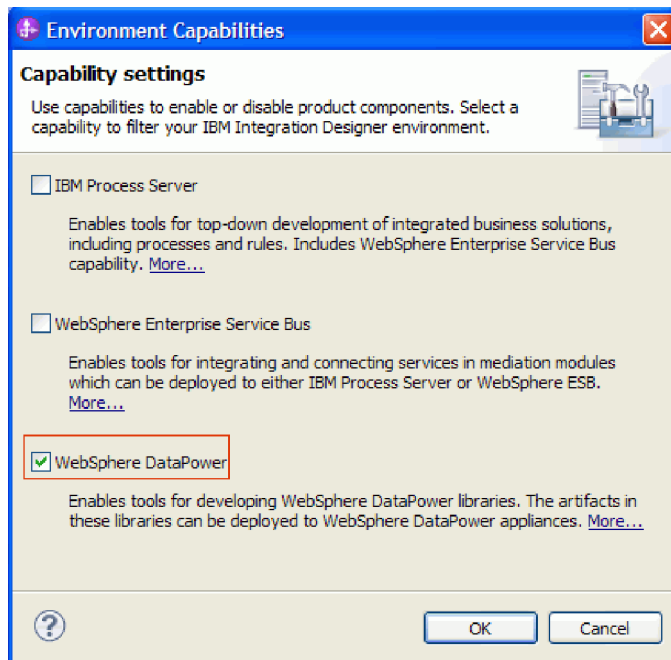
1. Go to the Getting Started page by **clicking Help > Getting Started with IBM® Integration Designer**.
2. If the section **What environment do you want to use?** shows that WebSphere DataPower function is enabled as shown below, you can proceed to the next task.



3. Otherwise, click the **Change Environment** button.

Change Environment

4. In the Environment Capabilities dialog, select the **WebSphere DataPower** option.



5. Click **OK**.

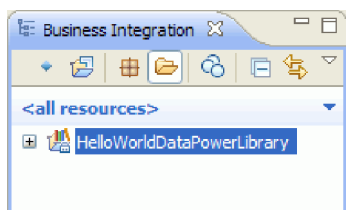
Create a DataPower library

You must use a special type of library called a **DataPower library** to create and store artifacts for deployment to the DataPower Appliance.

To create a DataPower library, follow these steps:

1. Click **File > New > Project**.
2. In the list of projects, select **DataPower Library** and click **Next**.
3. Name the library HelloWorldDataPowerLibrary.
4. Click **Finish**.

The library appears in the Business Integration view.



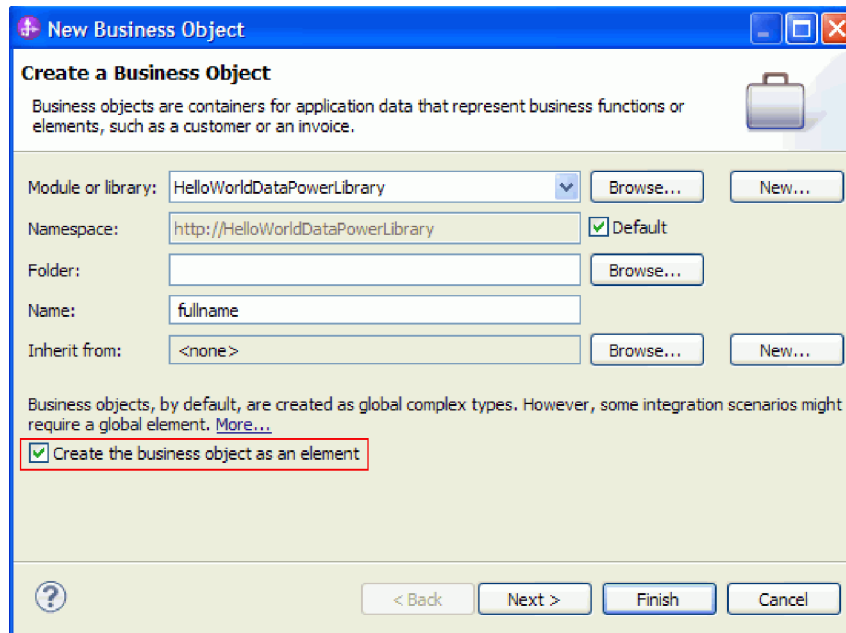
Create business objects

A business object is a container for application data, such as a customer or an invoice. The underlying structure of a business object is an XML schema definition (XSD).

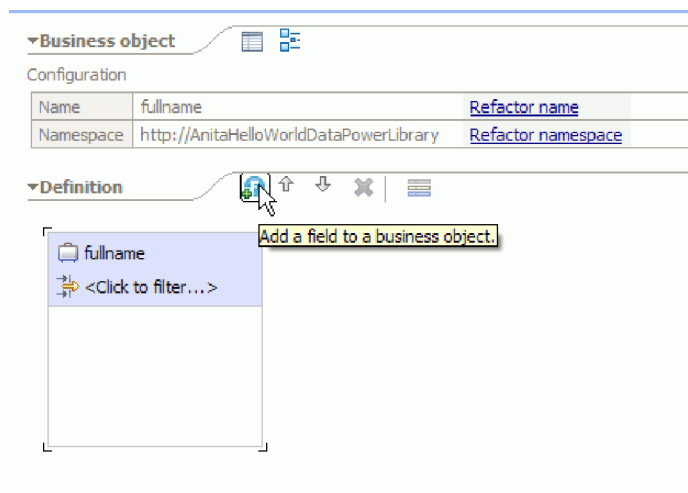
If you want to use existing XSDs you can import them into the workspace using **File > Import**. Business objects are automatically created for the XSDs and you can map them in the XML map editor. In this sample, you create the business objects.

To create the business objects for this sample, follow these steps:

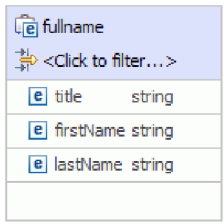
1. In the Business Integration view, within the **HelloWorldDataPowerLibrary**, right-click the **Data** category and select **New > Business Object**. The New Business Object wizard opens.
2. In the **Name** field, enter `fullname`.
3. Select the option **Create the business object as an element**.



4. Click **Finish**. The Business Object editor opens.
5. Add a source business object by clicking the **Add a field to a business object** icon in the local toolbar (or right-click the `fullname` box and select **Add Field**):



6. Type over the generated field's name of **field1** and replace it with `title`. If the name is not selected, then first click on it to select it.
7. Repeat the previous step to create two more fields; one named **firstName** and the other named **lastName**. The final business object should look like this:



Optional: Select one of the **string** cells in the **Type** column. A list of types appears. Although you only need fields of type **string** for this sample, this is where you can specify other types. Press the **Esc** key to close the list.

Optional: Select a field and look at the **Properties** view below the editor. Although you do not need to set any of these fields for this sample, this is where you can specify certain properties for fields, such as specifying field repetition or maximum length.

- Press **Ctrl-S** to save your work, and then close the business object editor.

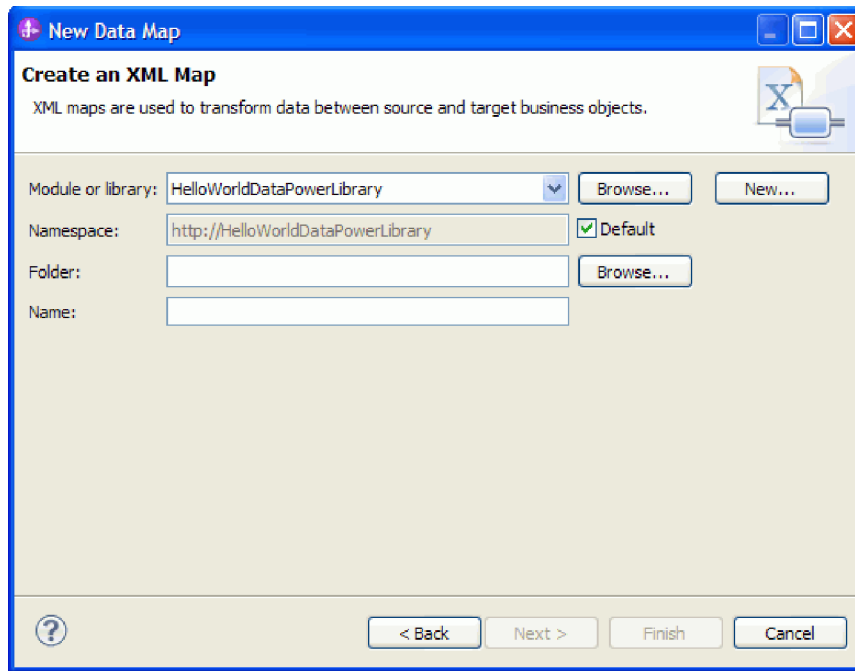
Optional: Under the covers, you have just created a new XSD or XML schema file with a complex type in it. If you are curious, you can see the file by right-clicking the FullName business object and selecting **Open With > XML Schema Editor**, then choosing the **Source** tab.

- Repeat the procedure starting with Step 1 to create another business object named `title_firstname_lastname`.
- Add a single field of type string to the business object and call the field name.
- Save and close the business object editor.

Create the XML map

Map the source business object **fullname** to the target business object **title_firstname_lastname**. When you save the map, an XSL file is generated.

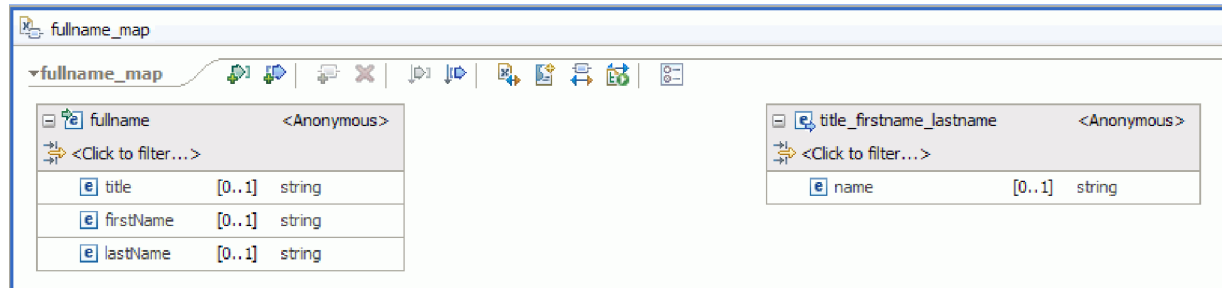
- In the Business Integration view, select HelloWorldDataPowerLibrary. Right-click and select **New > Data Map**. The New Data Map wizard opens showing the **Create an XML Map** page.



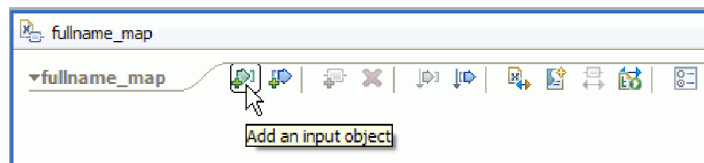
- In the **Name** field, enter `fullname_map` and click **Next**. The Select Input and Output Business Objects window opens.

3. Add the input business object by clicking the **Add** button. The Data Type Selection window opens.
4. Type **fullname** in the entry field.
5. Similarly add the output business object **title_firstname_lastname**. Click **Finish**.

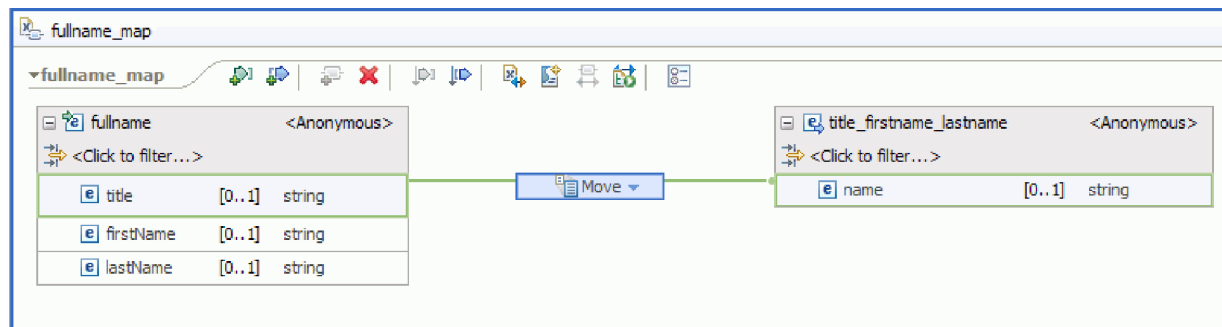
The XML Map editor opens, showing the input business object on the left side of the editor, and the output business object on the right:



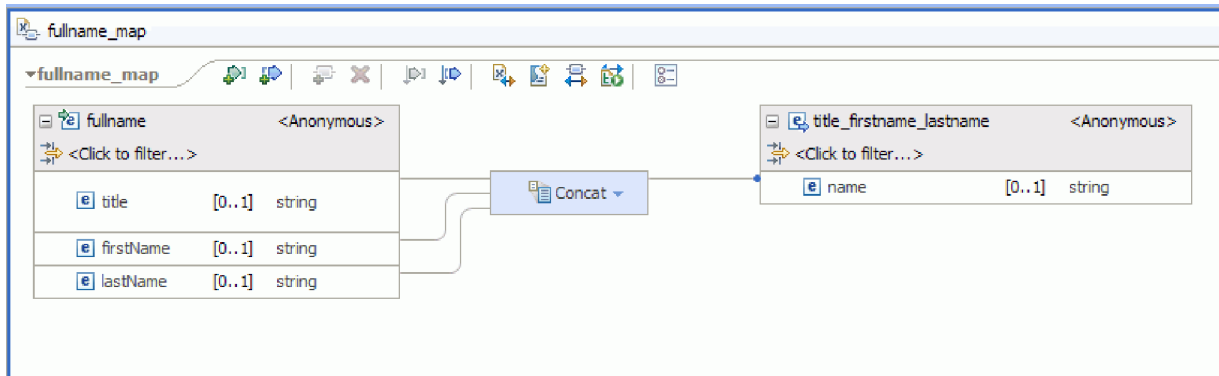
You can also add input and output objects by using the icons at the top of the XML Map editor, as shown below:



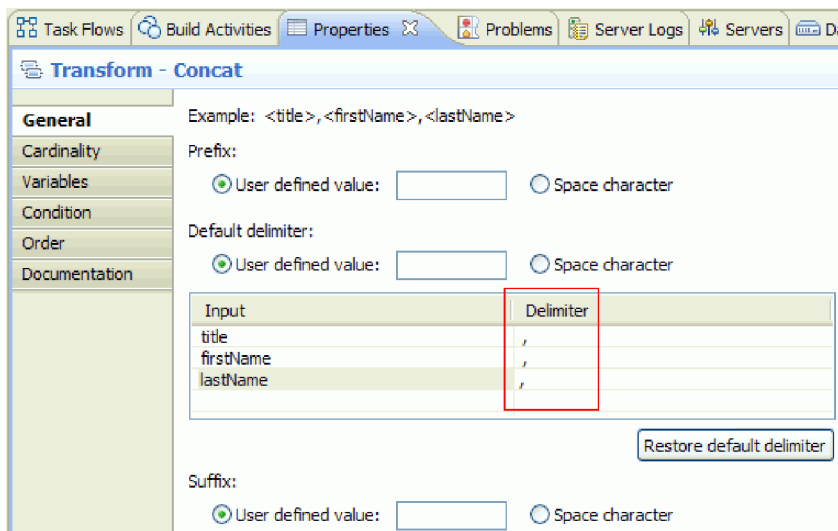
6. Wire the **title** element from **fullname** to the **name** element of **title_firstname_lastname** by dragging the cursor from **title** to **name**. This action creates a mapping with the default transform **Move** between the two elements:



7. Wire **firstName** to the **Move** transform in the middle.
8. In the Connection Selection Helper dialog, choose to create a primary transform. This changes the **Move** transform to a **Concat** transform.
9. Create another primary connection between **lastName** and **Concat**. The map is complete. The values of the elements **title**, **firstName**, and **lastName** will be input to the **Concat** transform, where the strings will be concatenated into a single result. The result will then be put into the output element **name**.



10. Optional: You can set properties to change the order in which the strings are concatenated, or to add delimiters. Right-click on Concat and select **Show In > Properties View**. For example, if you want commas between the input strings you can set the delimiter property as shown below:



11. Optional: The XML map editor provides a number of transforms and functions, including XPath, EXSLT and DataPower functions. To view the transforms and functions that are available, click the downward arrow in the transform box.

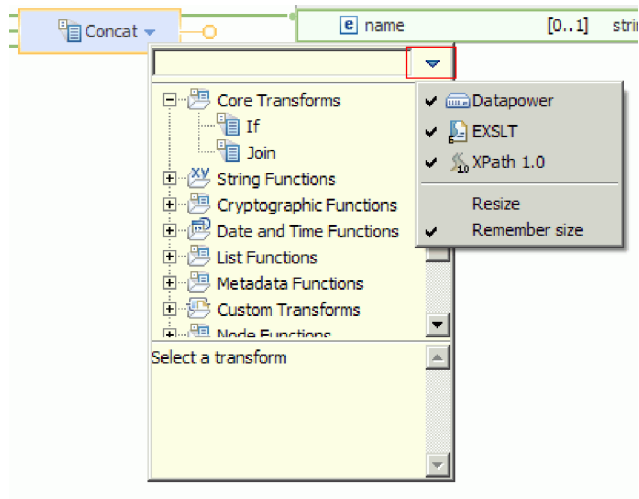


12. Optional: By default, the DataPower function set is enabled when you create a map in a DataPower library. You can choose to filter the function sets that you want to work with. To enable or disable function sets:

- a. Click the arrow in the transform box.



- b. In the list of available transforms, click the arrow on the upper right corner to view the available function sets.



- c. Click the function set you want to show or hide.

Chapter 3. Run the sample


After you have finished building the sample, you can test and run it.

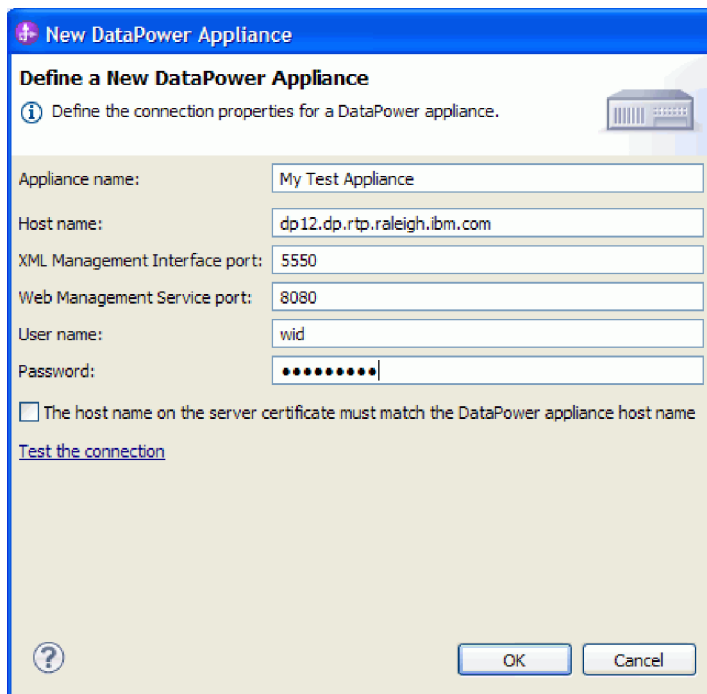
To run the sample, complete the following steps:

- Transfer files to the DataPower appliance.
- Create an XML Firewall service and create a style policy for the service.
- Test the service.

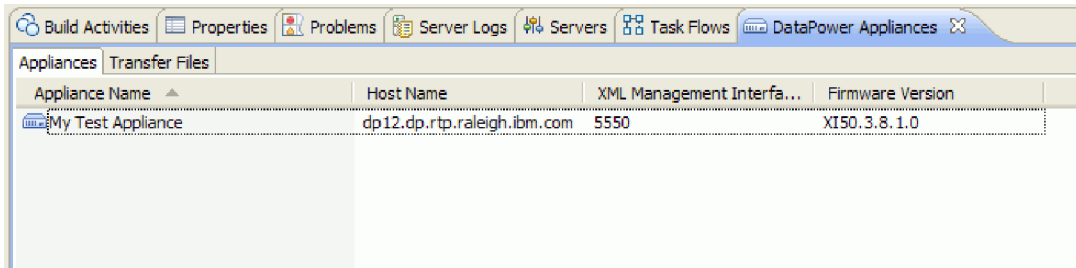
Transfer files to the DataPower Appliance

Configure a DataPower appliance and transfer files to it.

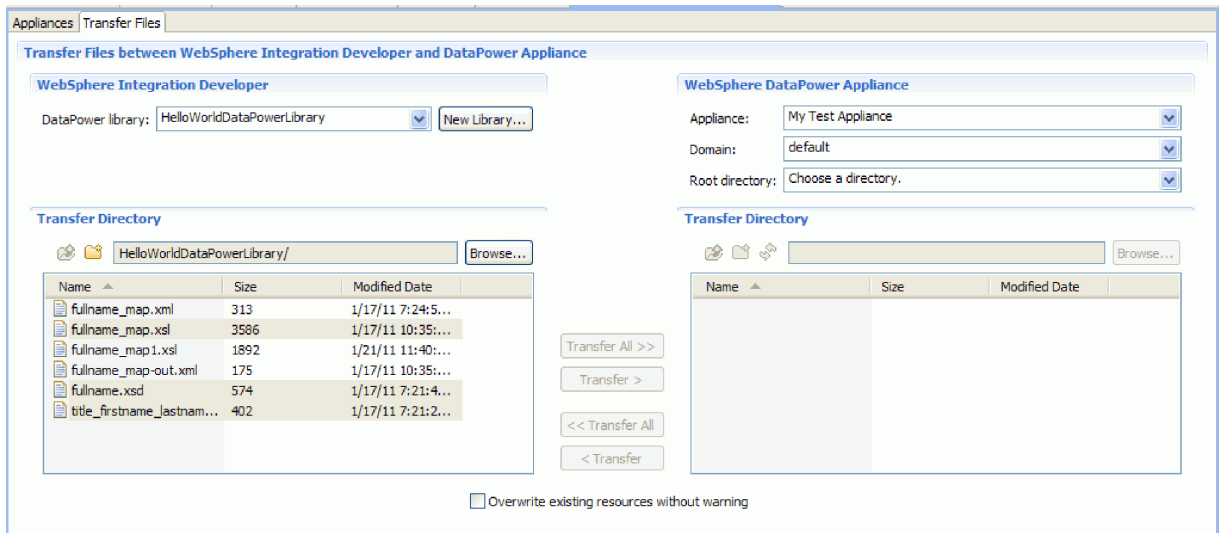
1. Switch to the DataPower view, which is typically below the editor area. If you do not see the view, you can launch it from **Window > Show View > DataPower Appliances**. The DataPower appliances view opens.
2. In the DataPower Appliances view, click **New DataPower Appliance....**
3. In the New DataPower Appliance window, enter your credentials. For a detailed description of each of the fields, click the information icon 



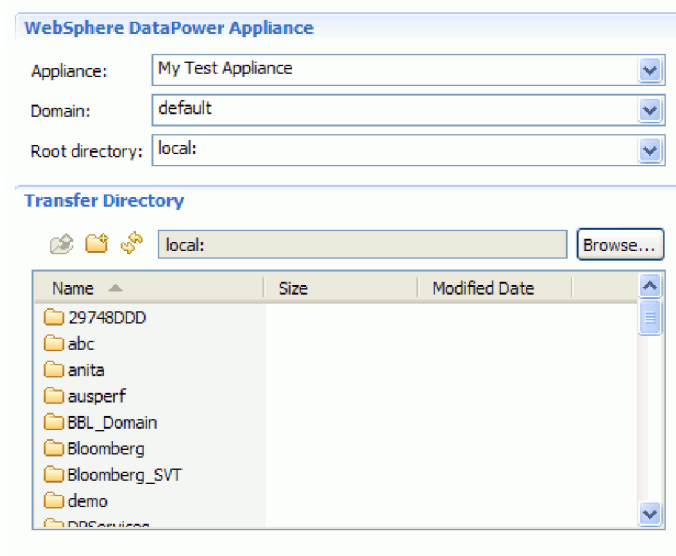
4. Optional: Click **Test the connection** to make sure the connection is working.
5. Click **OK**. An entry for the connection is shown in the Appliances tab:



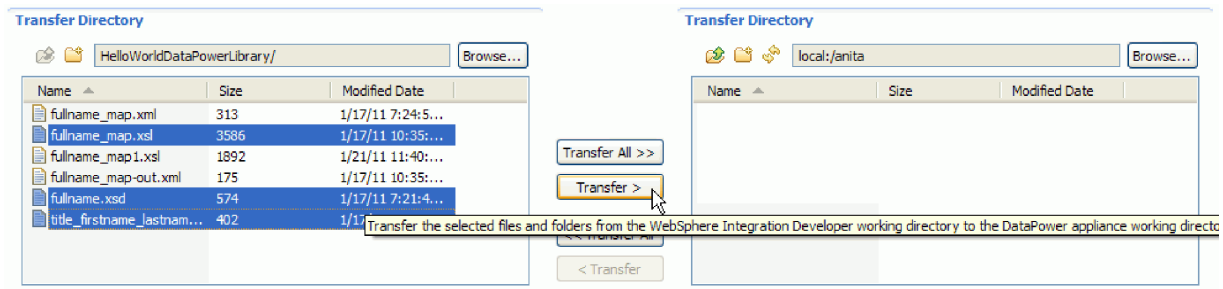
- Switch to the **Transfer Files** tab. The left side of the pane shows the files in Integration Designer, and the right side shows the files on the appliance.



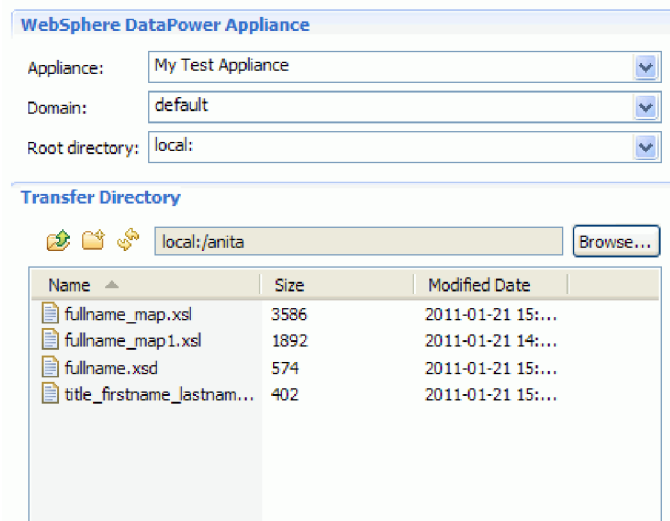
- In the WebSphere DataPower Appliance section on the right, select **local:** as the root directory.
- The directory list from the appliance will be loaded into the transfer directory list.



- In the appliance's transfer directory list, navigate to the directory in which you want to transfer files, or create a new one.
- From the list of files in Integration Designer, select the ones that you want to transfer, which are fullname_map.xml, fullname.xsd and title_firstname_lastname.xsd. Click **Transfer**.



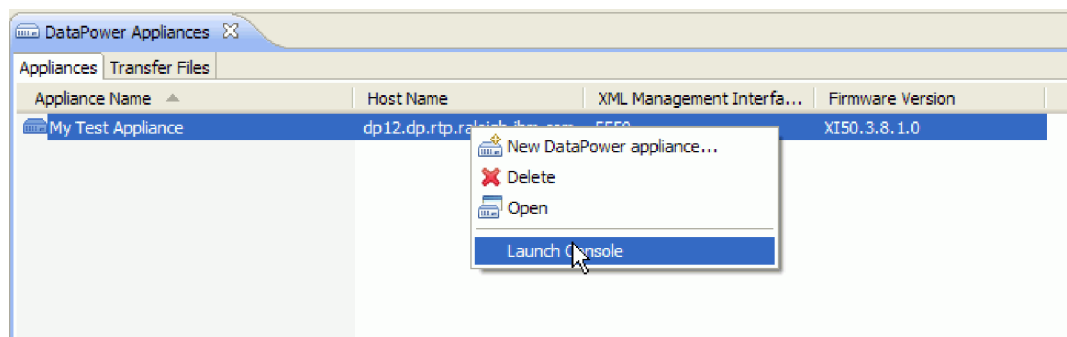
- When the transfer is complete, you will see the transferred files listed in the target directory.



Create an XML firewall service

Launch the DataPower console and create an XML firewall service. Then create a style policy for the service.

- Switch to **Appliances** tab of the **DataPower Appliance** view.
- Select the appliance that you created earlier, right-click, and select **Launch Console**.



- If you are prompted by a security alert, click **Yes** to proceed.
- At the WebSphere DataPower login prompt, provide a userid and password and click **Login**.

WebSphere DataPower Login
 XI50 console at dp12.dp.rtp.raleigh.ibm.com

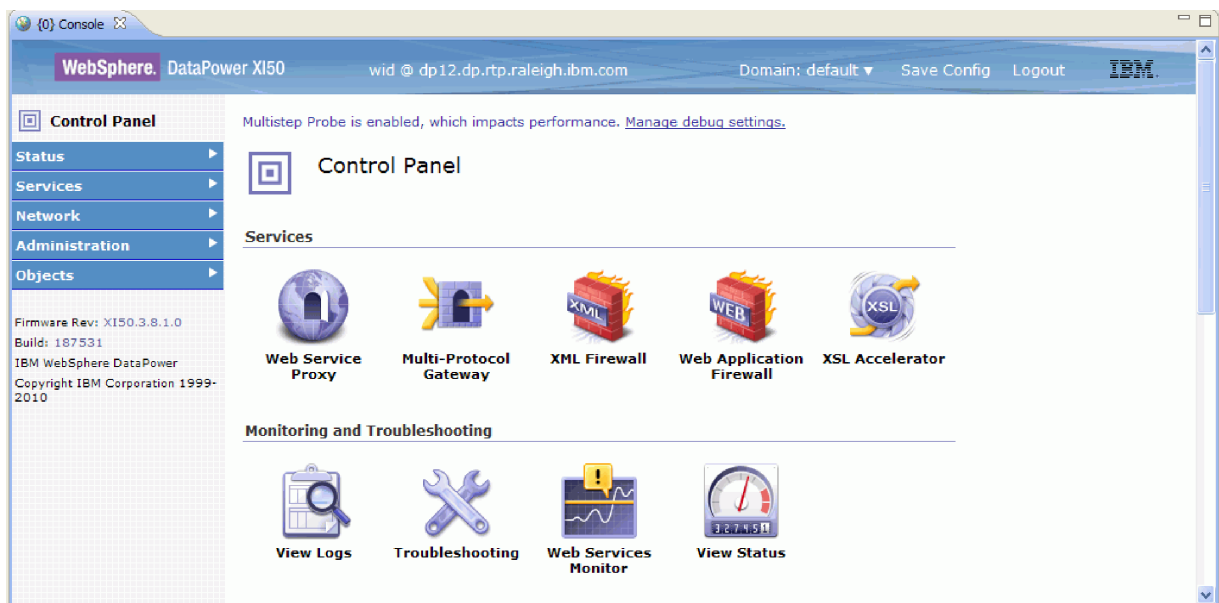
User Name:

Password:

Domain:

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The WebSphere DataPower console opens showing the control panel.



5. Configure a pass thru XML firewall with the following properties:

| Option | Description |
|---------------|---|
| Firewall Name | SampleHelloWorldDataFirewall |
| Firewall type | loopback-proxy |
| Request type | XML Note: You may need to edit the XML Firewall after you create it, in order to set the request type to XML. |

The following image shows the configured XML firewall.

Configure XML Firewall

General Advanced Stylesheet Params Headers Monitors XML Threat Protection

Apply Cancel Delete

Clone | Export | View Log | View Status | Show | Probe | Validate Conformance | Help

XML Firewall Service status: [up]

General Configuration

Firewall Name
SampleHelloWorldDataFirewall *

Summary
an example XML Firewall Service

Firewall Type
Loopback *

XML Manager
default + ... *

Firewall Policy
SampleHelloWorldDataFirewall + ... *

URL Rewrite Policy
(none) + ...

Back End
With a loopback proxy back end type, there is no back end server; the device is responding to the client.

Front End

Device Address
0.0.0.0 Select Alias *

Device Port
2058 *

With this type, there is no back end server which needs credentials from the device.

SSL Server Crypto Profile
(none) + ...

With this type, the response type is always "unprocessed".

Request Type
XML

6. Configure a style policy and a rule for the XML service. Create a new rule with the direction **Client to Server** and the following actions in order from client to server: validate, transform and validate.

Policy:

Policy Name: SampleHelloWorldDataFirewall * [up]

Apply Policy Cancel Delete Policy

Export | View Log | View Status |

Rule:

Rule Name: SampleHelloWorldDataFirewall_rule_0 Rule Direction: Client to Server

New Rule Delete Rule

Create rule: Click New, drag action icons onto line. Edit rule: Click on rule, double-click on action

Filter Sign Verify Validate Encrypt Decrypt Transform Route AAA Results Advanced

CLIENT

ORIGIN SERVER

7. Configure the first **Validate** action with the following properties:

| Property | Value |
|--------------------------|--|
| Input | INPUT |
| Schema Validation Method | Validate Document via schema URL |
| Schema URL | A path to the library that you uploaded to DataPower (for example local:///anita); fullname.xsd . |
| SOAP Validation | body |
| Asynchronous | off |

8. Configure the Transform action with the following properties:

| Property | Value |
|----------------------------------|--|
| Input | auto |
| Document Processing Instructions | Use XSLT specified in this action |
| Processing Control File | A path to the library that you uploaded to DataPower (for example local:///anita); fullname_map.xsl . |
| URL Rewrite Policy | none |
| Asynchronous | off |
| Output | auto |

9. Configure the last Validate action with the following properties:

| Property | Value |
|----------------------------------|--|
| Input | auto |
| Document Processing Instructions | Validate Document via schema URL |
| Processing Control File | A path to the library that you uploaded to DataPower (for example local:///anita); title_firstname_lastname.xsd . |
| SOAP Validation | Body |
| Asynchronous | off |
| Output | OUTPUT |

10. Apply the policy.

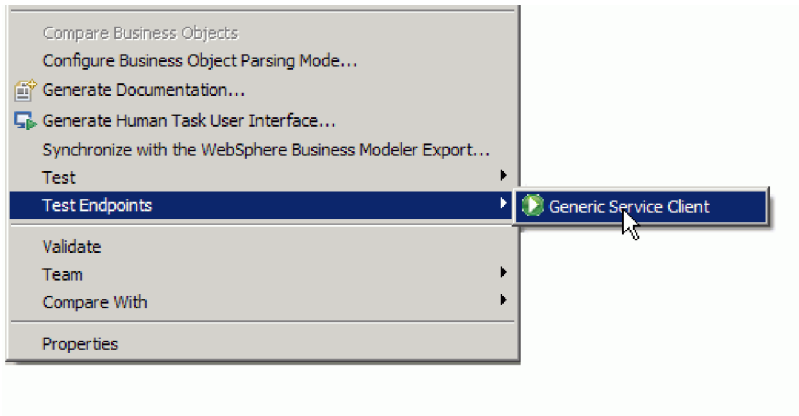
11. Verify that the policy and the firewall are up and running.

Test the service in Integration Designer


After you create the XML Firewall service and policy, you can test the service in Integration Designer using the Generic Service Client.

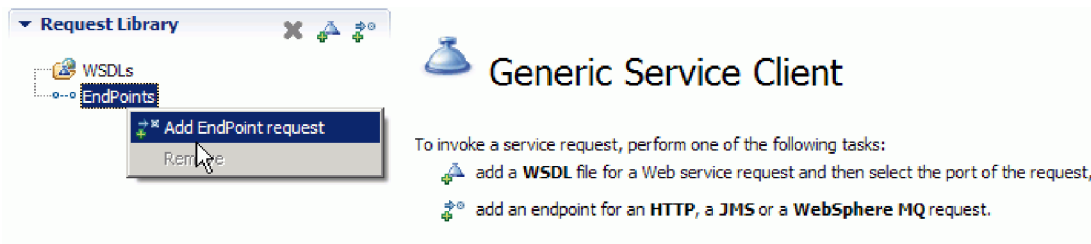
To test the service using the Generic Service Client, follow these steps:

1. Right click **HelloWorldDataPowerLibrary** and select **Test Endpoints > Generic Service Client**.



Note: If you do not see the **Test Endpoints** option, enable the IBM Process Server or WebSphere ESB capability by following these steps:

- a. Launch the Getting Started page from **Help > Getting Started > IBM Integration Designer**.
 - b. Click the **Change Environment** button. 
 - c. In the Environment Capabilities window, select IBM Process Server or WebSphere Enterprise Service Bus.
 - d. Click OK.
2. In the Generic Service Client page, add an endpoint request by selecting **Endpoints > Add EndPoint request**



3. In the Configure Protocol window, enter the URL of the service that is running on the DataPower appliance. Click **Next**.

Add EndPoint request

Configure Protocol
Choose protocol and set the corresponding configuration options.

☒ HTTP
 ☐ JMS
 ☐ WebSphere MQ

Protocol configuration: Default HTTP Protocol New...

URL: http://dp12.dp.rtp.raleigh.ibm.com:2058

Method: POST

Version: 1.1

Header:

| Name | Value |
|------|-------|
| | |
| | |
| | |

Add Edit Remove

Cookies:

| Name | Value |
|------|-------|
| | |
| | |
| | |

Add Edit Remove

?
< Back
Next >
Finish
Cancel

4. Select **fullname** as the root element of the request, and click **Finish**.

Add EndPoint request

Select Root Element
Select the request input element. First select a schema (XSD file) to view available elements.

XSD file: /HelloWorldDataPowerLibrary/fullname.xsd Browse...

Namespace defined by this schema: http://HelloWorldDataPowerLibrary

Root element:

type filter text

fullname

☐ Show derived types

?
< Back
Next >
Finish
Cancel

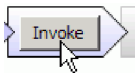
5. Click the edit data button.



6. In the message form, select title, firstName and lastName and enter their values, as shown below:

The screenshot shows the "Edit Data" button selected. Below it, the "Request" field contains the URL: `*http://dp12.dp.rtp.raleigh.ibm.com:2058("Mr.", "Neel", "Cargill")`. The "Invoke" button is highlighted. The "Message" tab is active, showing a form with three checked fields: "title" (Mr.), "firstName" (Neel), and "lastName" (Cargill). The "Form" view is selected in the toolbar.

7. Click the **Invoke** button.



8. The concatenated message is returned in the response, as shown below:

The screenshot shows the "View Response" button selected. The "Request" field contains the same URL as before. The "View Response" button is highlighted. The "Message" tab is active, showing a form with a single field "name" containing the concatenated string "Mr. Neel Cargill". The "Form" view is selected in the toolbar.

Chapter 4. Import

You can either import a complete ready-made version of the sample, or you can build the sample yourself.

To import the sample:

1. Open IBM Integration Designer.
2. If the Getting Started page is not open in the workspace, select **Help > Getting Started > IBM Integration Designer**. The Getting Started page opens.
3. On the **Getting Started - IBM Integration Designer** page, select the **Go to Samples and Tutorials** link, as shown in the following figure:



The Samples and Tutorials page opens.

4. Under the **Hello World for WebSphere DataPower** section, click the **Import** link.
5. You will see the project HelloWorldDataPowerLibrary in the Business Integration view.

Instructions for running the sample are found in the topic "Run the sample".

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