

Lab 3 – Mobile Web Services

Prerequisites

Before you begin, you will need to have the following installed on your computer:

- 1) BlackBerry MDS Studio
- 2) MDS Services
- 3) Microsoft SQL 2005

Note: Without MDS Services and MS SQL 2005 you will still be able to create and test applications however you will not be able to publish your applications.

Part 1: Creating a Length Conversion Application using the Quick Start Approach

In this section, you will create a length conversion application that works as a request-response application: the user requests a conversion from one length unit to another unit and the Web service responds with the converted value. With the quick start approach, the BlackBerry MDS Studio creates and maps the screen, data, and message components. It also binds messages to the Web service and creates screen local and global variables. In this section, you complete the following tasks:

- Create a BlackBerry MDS Studio project
- Customize the user interface on the main screen
- Publish the application

Create a BlackBerry MDS Studio Project

Using the Create New Project wizard, you select the quick start design approach and length conversion web service

- 1) In the BlackBerry MDS Studio, on the File menu, click New Project.
- 2) Select the Quick Start Approach Wizard option. Click Next.
- 3) In the drop-down menu, make sure that “WebService Connector Plugin” is selected. Click Next.
- 4) Click Browse to select a WSDL file.
- 5) Click the MDS 4.1 Sample Web Services tab.

- 6) In the Web services list, click the Convert Web service. Click OK.

Note: This Web service is hosted on the BlackBerry website. You can view the WSDL in your Web browser at <http://www.blackberry.com/webservices/ConvertAxis/Convert.wsdl>.

- 7) Click Next.
- 8) In the Binding Information tree, check the convertLength box. Make sure that the convertTemperature, convertWeight, and convertData check boxes are cleared (unchecked).
- 9) Click Next.

Note: The BlackBerry MDS Studio analyzes the Web Service Description Language (WSDL) and shows the available operations. The wizard generates an application structure that matches the Web service definition and the selected operations. In this example, you need the convertLength operation only.

- 10) In the Project Name field, type QuickConversion.

- 11) Click Finish.

Change the Screen Title

- 1) In the Screen Editor pane, click Main Screen.
- 2) In the Properties pane, in the Title property, click “....”
- 3) In the edit field, change the title of the screen to Convert Length.
- 4) Click OK.

Change the Button Text

- 1) In the Screen Editor, click the Go button.
- 2) In the Properties, in the Caption property, click “....”
- 3) In the edit field, change the button text to Convert.
- 4) Click OK.

Save the project

- 1) In the Navigator pane, click the QuickConversion project.
- 2) On the File menu, click Save.

Test the Project

Testing the application installs it to the BlackBerry device simulator.

- 1) In the BlackBerry MDS Studio, in the Navigator pane, right-click the QuickConversion folder.
- 2) Click Test.
- 3) In the BlackBerry device simulator, in the BlackBerry Applications, click the BlackBerry “QuickConversion” MDS Application icon.

Publish the Project

Publishing the application places a description of the application on the registry list and deposits the application file into a repository. Users of BlackBerry devices that have the BlackBerry MDS Runtime can view and download a published application.

- 1) In the Navigator pane, click the QuickConversion folder.
- 2) On the toolbar, click Publish Wizard .
- 3) In the Description field, type sample quick start application.
- 4) Click Next.
- 5) In the File Repository drop-down list, click the location in which to store the application files.
- 6) In the Application Registry drop-down list, click a BlackBerry MDS Application registry to publish the description of this application to.
- 7) Click Next.
- 8) Select the Deployment Keywords check box.
- 9) In the Keyword field, type conversion.

10) Click Add.

11) Click Finish.

The BlackBerry MDS Studio saves the application files to the selected BlackBerry MDS Application repository and publishes the application description to the selected BlackBerry MDS Application registry. You can now download the BlackBerry MDS Unit Conversion application to a BlackBerry device.

Part 2: Creating a Length Conversion Application using the Bottom-up Approach

In this section, you create a length conversion application using the bottom-up approach. For a description of the application, see “Creating a length conversion application using the quick start approach” on page 3. Applying the bottom-up approach instead of quick start allows you the flexibility of designing and creating the user interface without having to create the underlying data and message structure. At the end of this section, comparing the quick start and bottom-up length conversion application will enable you to distinguish between the two approaches and select the most appropriate one for your next application.

In this section, you complete the following tasks:

- Create a BlackBerry MDS Studio project
- Design the main screen and user interface
- Create communication between the user interface and the length conversion web service
- Optimize wireless bandwidth using message binding
- Test the project
- Publish the project

Create a BlackBerry MDS Studio project

- 1) In the BlackBerry MDS Studio, on the File menu, click New Project.
- 2) Select the Bottom Up Approach Wizard option.
- 3) Click Next.
- 4) Click Browse.
- 5) Click the MDS4.1 Sample Web Services tab.

- 6) In the web services list, click the Convert web service.
- 7) Click OK.
- 8) In the Binding Information tree, clear the convertTemperature, convertWeight, and convertData check boxes.
- 9) Click Next.
- 10) In the Project name field, type BottomUpConversion.
- 11) Click Finish.

The BlackBerry MDS Studio generates the application based on the Web service definition. The bottom-up wizard creates an application, including the data and message components. The BlackBerry MDS Studio binds messages to the data source. Once generated, the datasource visualizer and data view open.

Design the Main Screen and User Interface

The BlackBerry MDS Studio generates the main screen, which is the default entry point into your application. Use the Screen Editor to create controls such as labels, lists, and text boxes.

Tip: To design the user interface in full screen mode, from the toolbar, click the Change Screen Editor Skin drop down list. Select Fullscreen.

The screenshot displays a user interface for a conversion application. It features four input fields arranged vertically, each with a label to its left. The first three fields are grouped within a dashed rectangular border. The first field is labeled 'From:' and contains the text '@LengthUnit' with a downward arrow. The second field is labeled 'To:' and also contains '@LengthUnit' with a downward arrow. The third field is labeled 'Value:' and is an empty text box. Below this group is a horizontal line. The fourth field is labeled 'Result:' and contains the text '@result.toValue'. At the bottom of the interface is a blue button with the text 'Convert' in white.

Figure 1 - Final BottomUpConversion Interface

Remove the Default Region

- 1) In the Navigator pane, expand Screens.
- 2) Double-click scrMain.
- 3) In the Outline pane, click regionMain.

- 4) Press DELETE.

Create a New Region to Group the Screen Controls

- 1) In the Screen Editor pane, on the Screen Editor palette, click Region.
- 2) Place the region on the screen canvas.
- 3) In the Properties pane, in the Layout drop down list, click Grid.

Add Labels to the Region

- 1) In the Screen Editor, on the Screen Editor palette, click Label.
- 2) Place the Label in the region.
- 3) In the Properties pane, in the Caption property, click “....”
- 4) In the edit field, type “From:”.
- 5) Click OK.
- 6) Add two more labels to the right of the previous label with the following captions:
 - To:
 - Value:

Add drop-down Lists

- 1) On the Screen Editor palette, click Choice.
- 2) Place the choice control to the right of the From label.
- 3) Expand Enumerations.
- 4) Click LengthUnit.
- 5) Click Apply.
- 6) Click OK.
- 7) In the Properties pane, in the Appearance drop-down list, click dropdown.

- 8) To refresh the choice control, click the screen.
- 9) To the right of the To label, add another choice control. Repeat steps 3 to 8.

Add a Text Box to Enter Length Value

- 1) Right of the Value label, create an EditBox control.
- 2) In the Properties pane, in the Entry type drop-down list, click number.

Add a Button

- 1) Under the region, create a button control.
- 2) In the Workflow Wizard, in the Button Caption edit box, enter Convert.
- 3) Click Define later.
- 4) Click Finish.

Add a Separator

- 1) Under the region, create a Separator control.

Add a Region

- 1) Under the separator, create a region control.
- 2) Make it a Grid layout.

Add a Response Label

- 1) In the region, create a label control with the Caption property set to Result.

Add a Text Box to Display the Converted Length

- 1) Right of the Result label, create an edit box control.
- 2) In the Properties pane, in the Entry Type drop-down list, click number.

- 3) In the Properties pane, in the Read Only drop-down list, click true.

Create the Communication between User interface and Web Service

To transmit data to the web service, create a screen local variable and map data to it for storage. Data selected or entered from the drop-down lists and text box can be mapped to this local variable before being sent as a message to the web service. A request message bound to the web service and containing the data from the local variable enables the conversion Web service.

- 1) Click the screen canvas.
- 2) In the Properties pane, in the Local Variables property, click “....”
- 3) In the Local Variables dialog box, click +.
- 4) Click OK.

Note: MDS Studio guesses to automatically name lengthParameter by analyzing the WSDL file.

Assign Controls to the lengthParameter Local Variable

- 1) On the screen canvas, click the choice1 control.
- 2) In the Properties pane, in the Mapping property, click “....”
- 3) Expand Local Variables.
- 4) Expand lengthParameters.
- 5) Click fromUnit.
- 6) Click OK.
- 7) On the screen canvas, click the choice2 control.
- 8) Repeat steps 2 through 4.
- 9) Click toUnit.
- 10) Click OK.
- 11) On the screen canvas, click the editBox1 control.

- 12) Repeat steps 2 through 4.
- 13) Click fromValue.
- 14) Click OK.

Set the Convert Button to Send Data to the Web Service

Using the button, the user can activate the web service. When pressed, the BlackBerry MDS Application sends data on the main screen to the lengthParameters local variable. The convertLengthRequest message sends the local variable information to the web service. The conversion web service converts the length value.

- 1) Click the Convert button control.
- 2) In the Wizards menu, select Workflow Wizard.
- 3) Select the Send a message check box.
- 4) Click Next.
- 5) In the list of data types, expand Local Variables.
- 6) Click lengthParameters.
- 7) Click Next.
- 8) Click convertLengthRequest.
- 9) Click Next.
- 10) In the left pane, click lengthParameters to assign a screen parameter.
- 11) In the right pane, click parameters to assign a message parameter.
- 12) Click Assign.
- 13) Click Finish.

Tip: You can view the script the BlackBerry MDS Studio generates in Navigator > Scripts. Double-click script_Onscr_Mainbutton1Click. The script displays the syntax for sending a message to the web service when the user clicks the Convert button.

Create a Global Variable to Receive Data from the Web Service

When the Web service converts the length, it generates a response message containing the converted length data. The LengthConverter application stores this data in a global variable. To display the converted length to the user you map the Result edit box to the global variable.

- 1) In the Navigator pane, expand Data.
- 2) Right-click Globals.
- 3) Click New Global.
- 4) In the Create New Global dialog box, in the Name field, type result.
- 5) Click Finish.
- 6) In the Global Variable Editor, click the Data Type arrow.
- 7) Expand data component.
- 8) Click Result.
- 9) Click OK.

Map the Web Service Response Message to the Result Global Variable

- 1) In the Navigator pane, expand Messages.
- 2) Double-click the convertLengthResponse message.
- 3) In the Message Editor, click the Fields tab.
- 4) Click the first Data Mapping cell.
- 5) Click "..."
- 6) In the Choose Data Mapping dialog box, select the Is Mapped check box.
- 7) Click the result global variable.
- 8) Click OK.

Map the Result Global Variable to the Edit Box

1. In the Navigator pane, expand Screens.
2. Double-click scrMain.
3. On the screen canvas, click editbox2.
4. In the Properties pane, in the Initial Value property click “....”
5. In the Initial Value dialog box, expand Globals.
6. Expand result.
7. Click toValue.
8. Click Apply.
9. Click OK.

Refresh the Main Screen When Receiving the Response Message

The LengthConverter application receives the converted length in the Web service response message. To display the converted length, the main screen must refresh when the application receives the response message.

1. Click the screen canvas.
2. In the Properties pane, in the Refresh Messages property, click “....”
3. Click Add.
4. Click OK.

Optimize Wireless Bandwidth using Message Binding

In this section, you learn how to optimize your bottom-up application using the message binding wizard. The response message generated by the bottom-up wizard contains fields for fromUnit, fromValue, toUnit and toValue. Instead of including each field within the response message, only the final converted length toValue is needed to convey the response to the user. By binding less data to the response message, the web service uses less wireless bandwidth.

Remove a Field from the Response Message

- 1) In the Navigator pane, expand Messages.
- 2) Double-click convertLengthResponse.
- 3) Click the Fields tab.
- 4) Click the first Data Mapping cell.
- 5) Click “....”
- 6) Clear the Is Mapped check box.
- 7) Click OK.

Change the Data Type that the Response Message Uses

- 1) In the Type cell, click “....”
- 2) Click decimal.
- 3) Click Next.
- 4) Click OK.
- 5) From the relationship canvas, click the Result icon.
- 6) Press DELETE.

Assign the Response Message to the Converted Length Value in the Web Service

- 1) In the Navigator pane, expand Messages.
- 2) Right-click convertLengthResponse.
- 3) Click Message Binding Wizard.
- 4) Click Next.
- 5) Click the convertLengthResponse output message.
- 6) Click Next.

- 7) In the list of BlackBerry MDS Application message fields in the left pane, click the convertLengthReturn: decimal field.
- 8) In the list of WSDL message fields in the right pane, click the toValue: double field.
- 9) Click Bind Field.
- 10) Click Finish.

Change the Global Variable to Match the Response Message Data Type

- 1) In the Navigator pane, expand Data → Globals.
- 2) Double-click result.
- 3) Click the drop-down arrow beside the Data Type field.
- 4) Click decimal.
- 5) Click Next.
- 6) Click OK.

Note: After changing the global variable data type, controls and messages previously mapped to it must be reassigned.

Assign the Global Variable to the Edit Box to Display the Converted length

- 1) In the Navigator pane, double-click scrMain.
- 2) Click the Result edit box.
- 3) In the Properties pane, in the Initial Value property, click “....”
- 4) Expand Globals.
- 5) Click result: decimal.
- 6) Click Apply.
- 7) Click OK.

Assign the Response Message Data to the Result Global Variable

- 1) In the Navigator pane, double-click the convertLengthResponse message.
- 2) In the Message Editor, click the Fields tab.
- 3) In the Data Mapping cell, click
- 4) Select the Is Mapped check box.
- 5) Click the result: decimal global variable.
- 6) Click OK.

Remove the Result Data Component

- 1) In the Navigator pane, expand Definitions.
- 2) Right-click Result.
- 3) Click Delete.
- 4) Click OK.

Test the Project

Testing the application installs it to the BlackBerry device simulator.

- 1) In the BlackBerry MDS Studio, in the Navigator pane, right-click the BottomUpConversion folder.
- 2) Click Test.
- 3) In the BlackBerry device simulator, in the BlackBerry Applications, click the BlackBerry “BottomUpConversion” MDS Application icon.

Publish the Project

Publishing the application places a description of the application on the registry list and deposits the application file into a repository. Users of BlackBerry devices that have the BlackBerry MDS Runtime can view and download a published application.

- 1) In the Navigator pane, click the BottomUpConversion folder.

- 2) On the toolbar, click Publish Wizard .
- 3) In the Description field, type sample bottom-up application.
- 4) Click Next.
- 5) In the File Repository drop-down list, click the location in which to store the application files.
- 6) In the Application Registry drop-down list, click a BlackBerry MDS Application registry to publish the description of this application to.
- 7) Click Next.
- 8) Select the Deployment Keywords check box.
- 9) In the Keyword field, type conversion.
- 10) Click Add.
- 11) Click Finish.

The BlackBerry MDS Studio saves the application files to the selected BlackBerry MDS Application repository and publishes the application description to the selected BlackBerry MDS Application registry. You can now download the BlackBerry MDS Unit Conversion application to a BlackBerry device.

References

BlackBerry MDS Studio
Version 4.1
Getting Started Guide