## Getting the Exchange Rate from an External Web Service



To implement the currency calculations, you need the exchange rate from USD to CHF. As mentioned before, you now will get this exchange rate from an external Web service, the E2E Education Exchange Rate Provider.

Web services are self-contained applications that can be published and invoked across the Web using XML-based protocols. The E2E Bridge has a "Simple Object Access Protocol" (SOAP) adapter ready, which enables you to use any other Web service as backend for the Bridge. Instead of reading data from a database, the SOAP adapter sends a request to the other Web service and gets back a SOAP response message. This message then is mapped to data items.



The steps involved in calling a Web service through the Bridge are as follows:

- 1. A client requests the Bridge Web service.
- 2. The E2E Runtime makes a HTTP/SOAP call to the linked Web service.
- 3. The result is mapped to the defined data structure.
- 4. The output is returned.

Each Web service has its own distinct interface, defined by the names of the operations and their parameters. Before an external Web service can be used, its interface definition must be imported to the UML model or from a "Web Services Description Language" (WSDL) document. This functionality is implemented in E2E Builder (also see the Builder User's Guide).

During the importing process of the WSDL, you can decide whether to create a test model to test the external service or whether to import it into an existing UML model. The WSDL file provides all necessary information to create an UML model, so the test model contains all necessary building blocks for you to test the imported service.

### Importing the WSDL and Creating a Test Service

You can create a test model while importing a WSDL or XML Schema file (XSD) directly from a file or via a URL. You can import the WSDL from the attached file ExchangeRateProvider.wsdl or from the E2E Cloud Server.

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#### On this Page:

- Importing the WSDL and Creating a Test Service
- Creating the Logical View of the Test Model with the E2E Components Wizard
- Testing the Service
  Importing the WSDL into the Lesson 3 Model

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Within Builder project Education, a new xml file ExchangeRateProviderService.wsdlTest.xml was created. You can switch between the test model and lesson3.xml using Switch Projects in the toolbar.

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But the new xUML service is not ready to be compiled yet, because the component diagram is missing. During the import, the Model Compiler read all necessary components and instances from the WSDL file and created the package Component View where all elements of a component diagram will be saved.

As ExchangeRateProviderService.wsdlTest.xml has no component diagram yet, it is only visible in the File View of the E2E Compiler window. To create the component diagram, use the E2E Components Wi zard.

# Creating the Logical View of the Test Model with the E2E Components Wizard

Now, start to create the logical view of the imported Web service with the help of the E2E Component Wizard.

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The component diagram is drawn in MagicDraw and the generated diagram **Test Components** is displayed.

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Save 🔚 the UML test model.

### **Testing the Service**

Now, the test service is ready to be compiled and run.



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Run the test case getExchangeRate without entering any values in the Request tab.

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The **Response** tab opens. If the test case runs without any error, the gearwheel in front of the test case turns green **3**. Running the test case without an error means, that the service was reached, proceeded the request without errors and returned information to the client.

As you did not fill in any values in the **Request** tab, the Exchange Rate Provider service returned the flag **validRequest** as **false** and the **exchangeRate** as **0**.

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Switch back to the **Request** tab, enter the values **USD** and **CHF** as shown below and run the test case again.

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The **Response** tab shows the **exchangeRate 1.0658** (or whatever exchange rate is actually provided) and the flag **validRequest** is **true**, as this was a valid request of the Exchange Rate Provider service.

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As you now know how to handle the Exchange Rate Provider service, you can continue with lesson 3 and import the service into your lesson 3 model.

Save 🔜 the UML model ExchangeRateProviderService.wsdlTest.xml.

### Importing the WSDL into the Lesson 3 Model

Switch back to **lesson3.xml** and start the importer again. This time, you will import the WSDL file directly into your lesson 3 model.





In the E2E Compiler Messages window, you can see whether the import was successful or not.



Now, the hard coding of the exchange rate in class **CurrencyCalculator** can be substituted by a call of the Web service.

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Now, your activity diagram should look like this:



Three parameters of the operation getExchangeRate are still missing : fromCurrency, toCurrency and the flag validRequest.

Name	Туре	Direction
fromCurrency	String	in
toCurrency	String	in
validRequest	Boolean	out





The SOAP operation call is implemented.

Alternatively, you could have copied the operation call out of your test model ExchangeRateProviderSer vice.wsdlTest.xml from diagram Test Services/GetExchangeRatePortType /GetExchangeRatePortType/getExchangeRate. Simply select the diagram element from the test model and use copy & paste to insert it to the lesson 3 model.

Save 🔚 the UML model.