

Web Services (using Java EE)

This tutorial introduces you to the development of Web services in Java. This document assumes that you will use NetBeans as development platform. If you have your own laptop, you may wish to install NetBeans prior to the lab session. NetBeans can be downloaded at <http://www.netbeans.org/downloads/>. Preferably, you should download the Web & Java EE version of Netbeans. During the installation, select the option to install the bundled Glassfish server together with the IDE. You can also complete the tutorial using another IDE (e.g. Eclipse), but the instructions below are given specifically for NetBeans.

Part A – Creating a Web Service Client to a Remote Web Service

- Use NetBeans to create a project of type “Java Application”. Once a project is created, you can add various types of items to the project by right-clicking on the project’s icon.
 - Add a new “Web Service Client ...” to the project (select the corresponding option from the pop-up menu activated when right-clicking the project icon). Set Package to “net.terraservice” and WSDL URL to “<http://terraservice.net/TerraService2.asmx?WSDL>”
 - In the method `main` of class `Main`, create an instance of the proxy class `TerraService`.
 - Call the method `getTerraServiceSoap` to get an instance of the interface `TerraServiceSoap`.
 - Create an object `Place` called `NY` and set its properties to “New York”, “New York”, “United States”.
 - Invoke the method `GetPlaceFacts` of the service to retrieve an object of type `PlaceFacts`, which provides some facts about New York.
 - Use `System.out.println` to write out the type of place that it is and the longitude and latitude its centre.
 - Compile and test your application.

- Invoke the method `GetTileMetaFromLonLatPt` of the service, passing the centre of New York, a theme of 1 and a scale of 8 metres.
 - If the tile metadata indicates that the tile exists, invoke the method `GetTile` of the service to retrieve the `tileId` contained in the metadata.
 - Create a new `java.io.FileOutputStream` to write to file name “`tile.bmp`”.
 - Invoke the stream’s method `write` to write the byte array to the file and then `close` the stream.
 - Compile and test your application.

Part B – Creating a Web Service (using WSDL first approach)

- Use NetBeans to create a project of type “Enterprise EJB Module” called `TemperatureConverter`
 - Add a new “Web Service from WSDL” with name `Converter` in Package `UT` using the WSDL file [ITempConverter.wsdl](#). Hint: When you right-click on the name of the project and then select “New”, it may happen that you are not able to see the option “Web Service from WSDL”. In this case, you need to select “Other”, look for the menu “Web Services” and then find the option “Web Service from WSDL”.
 - Implement the methods `CtoF` and `FtoC`:

- $F = C * 9/5 + 32$
- $C = (F - 32) * 5/9$
- Compile/build your web service.

Part C – Deploying the Web Service to a Remote Server

- A Glassfish server is available for your use in the ATS server. For security reasons, the URL to the admin console, the login and the password are not made available in this tutorial handout. They will be given to you by the lab assistant. Also, this server can only be accessed within the UT network (you can use SSH tunnelling if outside the UT network). If you want to work at home, you should consider installing a Glassfish server locally in your laptop or machine at home.
- Once you have logged onto the admin console, select the link “Applications” and click on button “Deploy...”
 - Upload the jar file containing your application. It is usually located in the directory `dist` of your project.
 - Set the Type of application to “EJB Jar”.
 - Change the “Application name” according the following naming convention: *yourLogin-TemperatureConverter*, where *yourLogin* is your UT user name. (This naming convention is intended to prevent clashes of your applications and those deployed by the other teams.). Finally, click on button Ok.
 - Once you have uploaded the jar file, the page for “Applications” will be updated showing the newly added EJB application. Click the link that corresponds to your application, and then select “View Endpoint” (right-hand side of the page). At this point, you should be at a page providing all the general information about your application. Select the link after Tester (i.e. “/ITempConverterservice/Converter?Tester”). Test the two conversion methods.