Chapter 41 Web Services

Objectives

- To describe what a Web service is (§41.1).
- To create a Web service class (§41.2).
- To publish and test a Web service (§41.3).
- To create a Web service client reference (§41.4).
- To explain the role of WSDL (§41.4).
- To pass object type of arguments in a Web service (§41.5).
- To discover how a client communicates with a Web service (§41.5).
- To describe what are SOAP request and SOAP response (§41.5).
- To track a session in Web services (§41.6).

What is a Web Service?

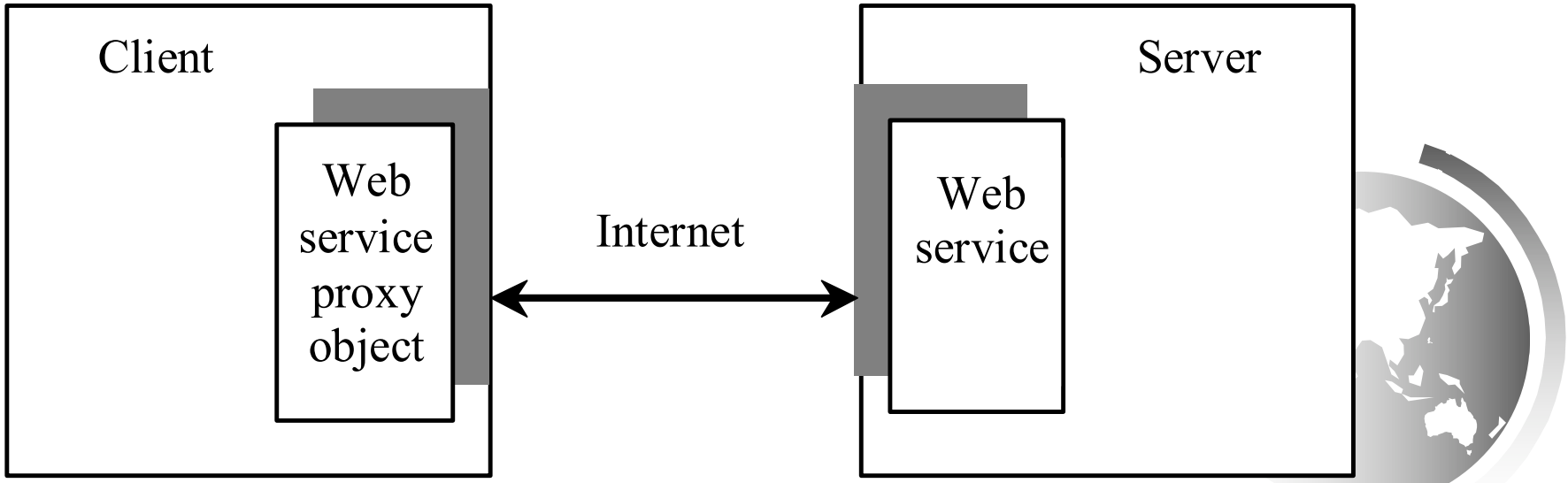
Web service is a technology that enables programs to communicate through HTTP on the Internet. Web services enable a program on one system to invoke a method in an object on another system. You can develop and use Web services using any languages on any platform. Web services are simple and easy to develop.

What is SOAP?

Web services run on the Web using HTTP. There are several APIs for Web services. A popular standard is the *Simple Object Access Protocol* (SOAP), which is based on XML. The computer on which a Web service resides is referred to as a *server*. The server needs to make the service available to the client, known as *publishing a Web service*. Using a Web service from a client is known as *consuming a Web service*.

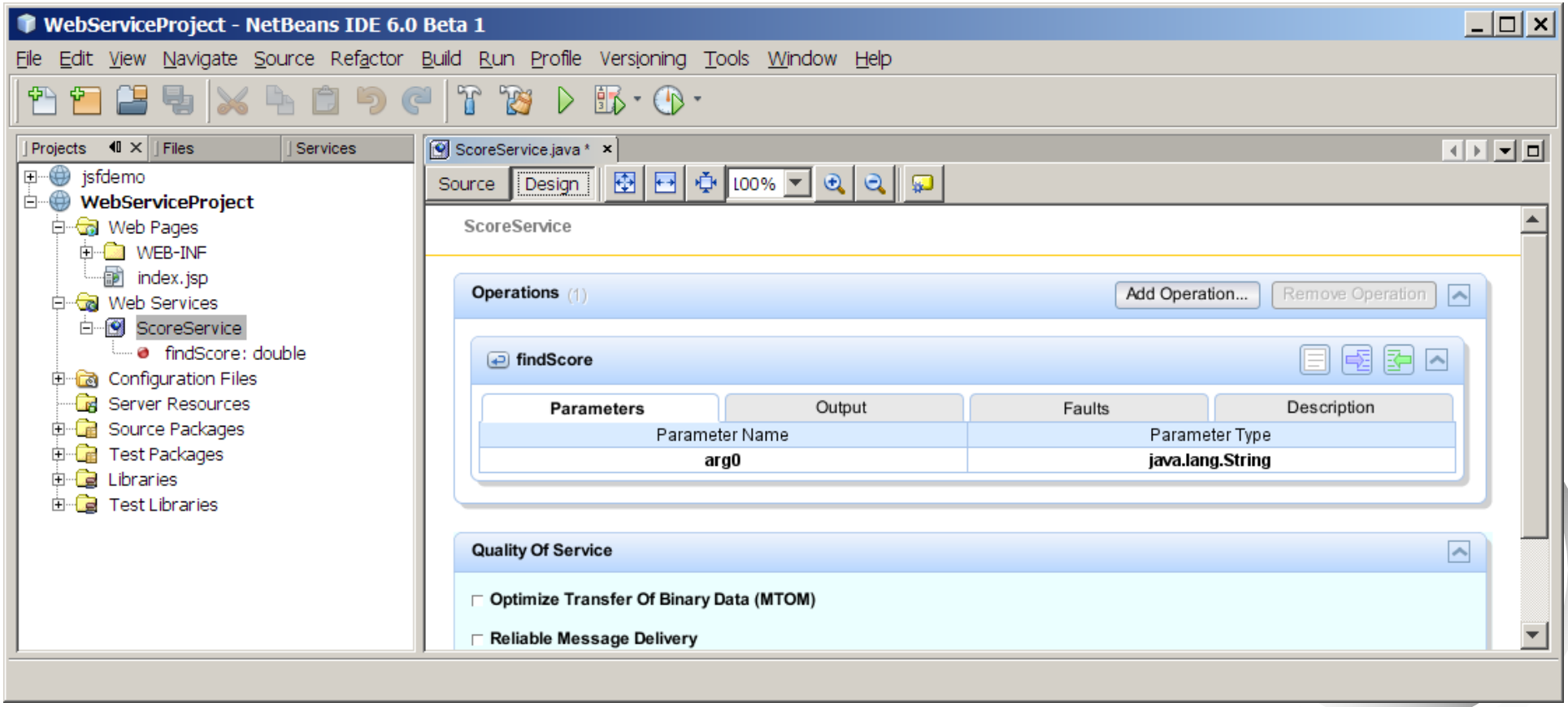
How does a client communicate with a Web service

A client interacts with a Web service through a *proxy object*. The proxy object facilitates the communication between the client and the Web service. The client passes arguments to invoke methods on the proxy object. The proxy object sends the request to the server and receives the result back from the server, as shown in Figure 41.1.



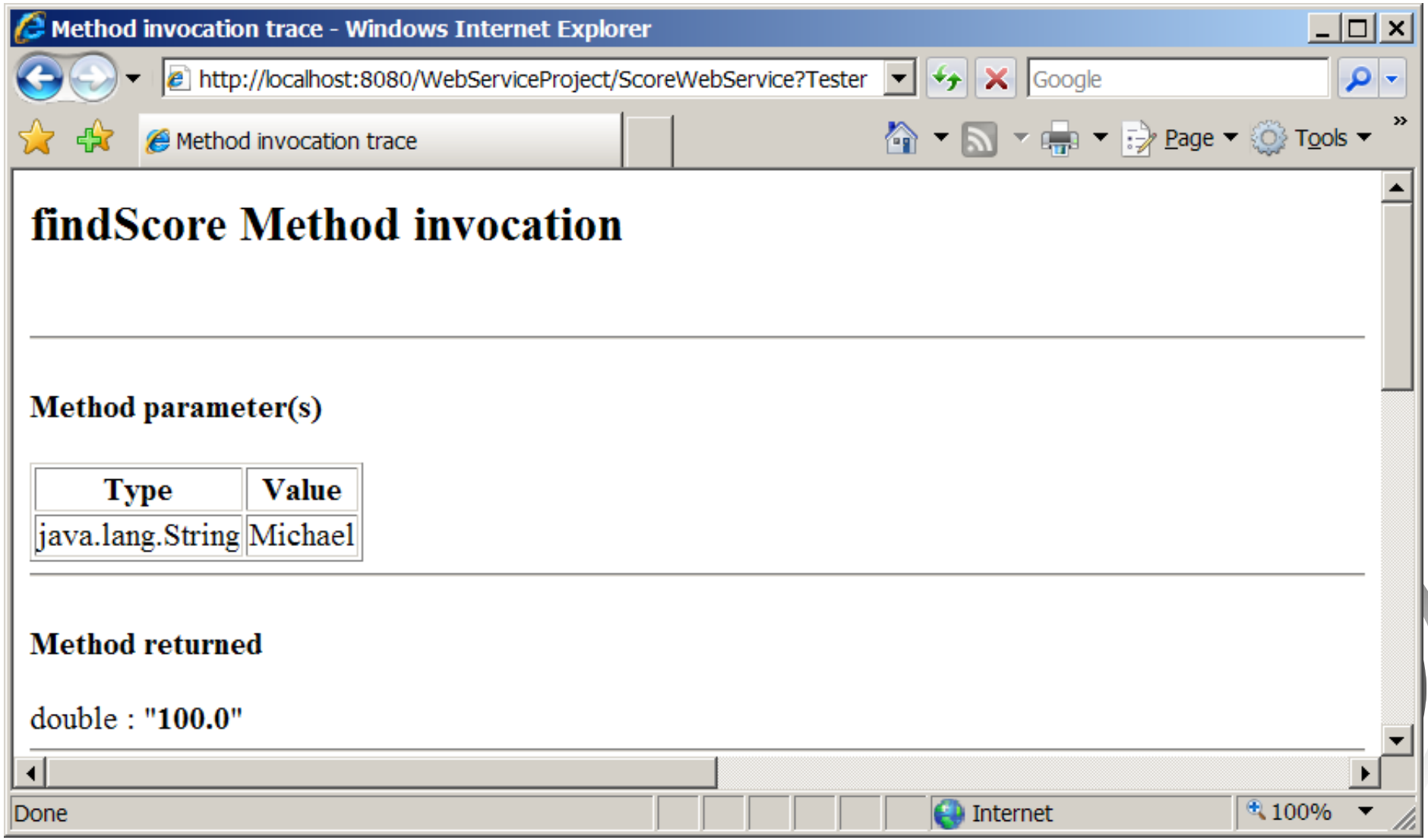
Creating Web Services Using NetBeans

Create a Web project, Create a Web service, deploy Web service



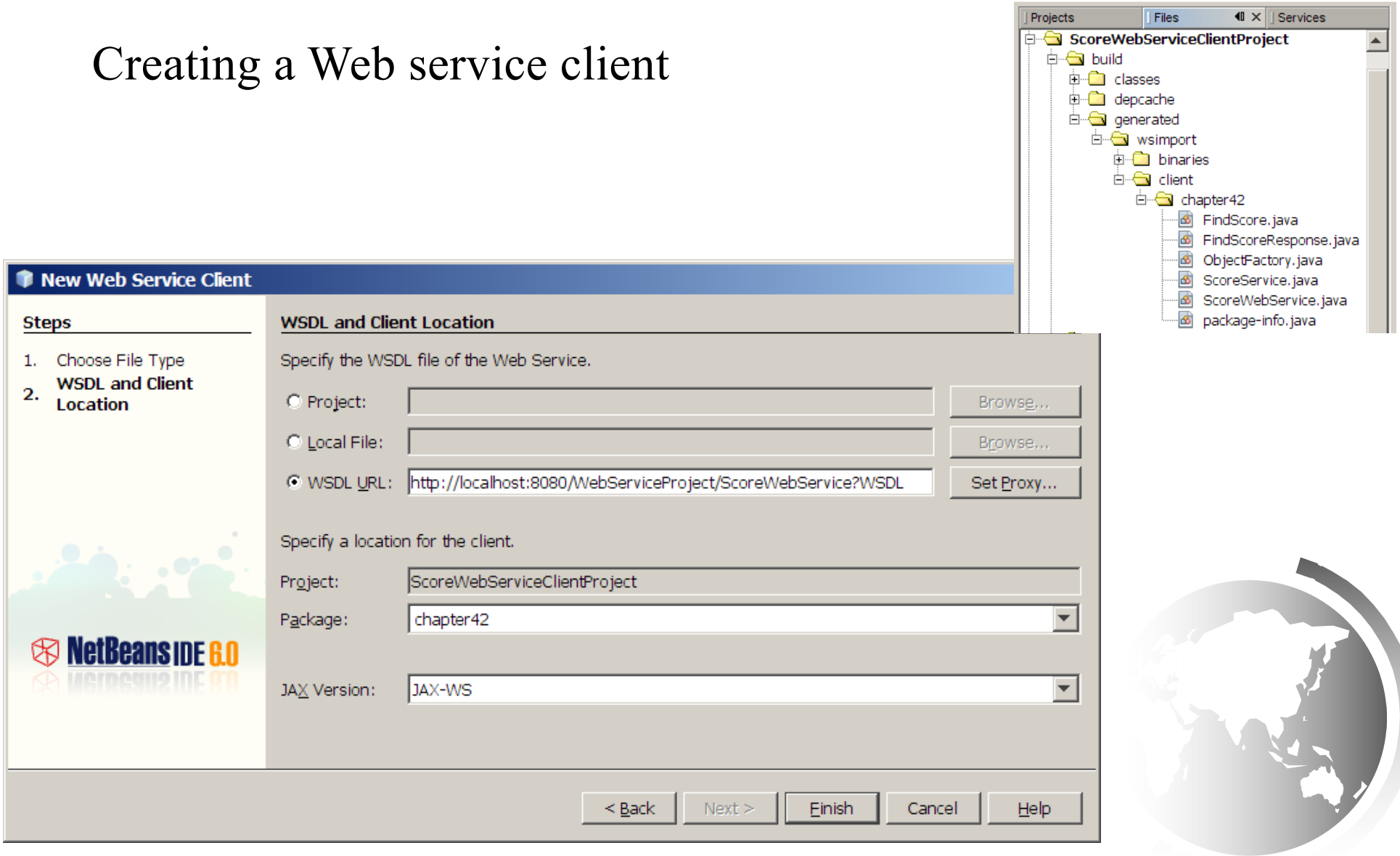
Testing Web Services

Testing Web Services



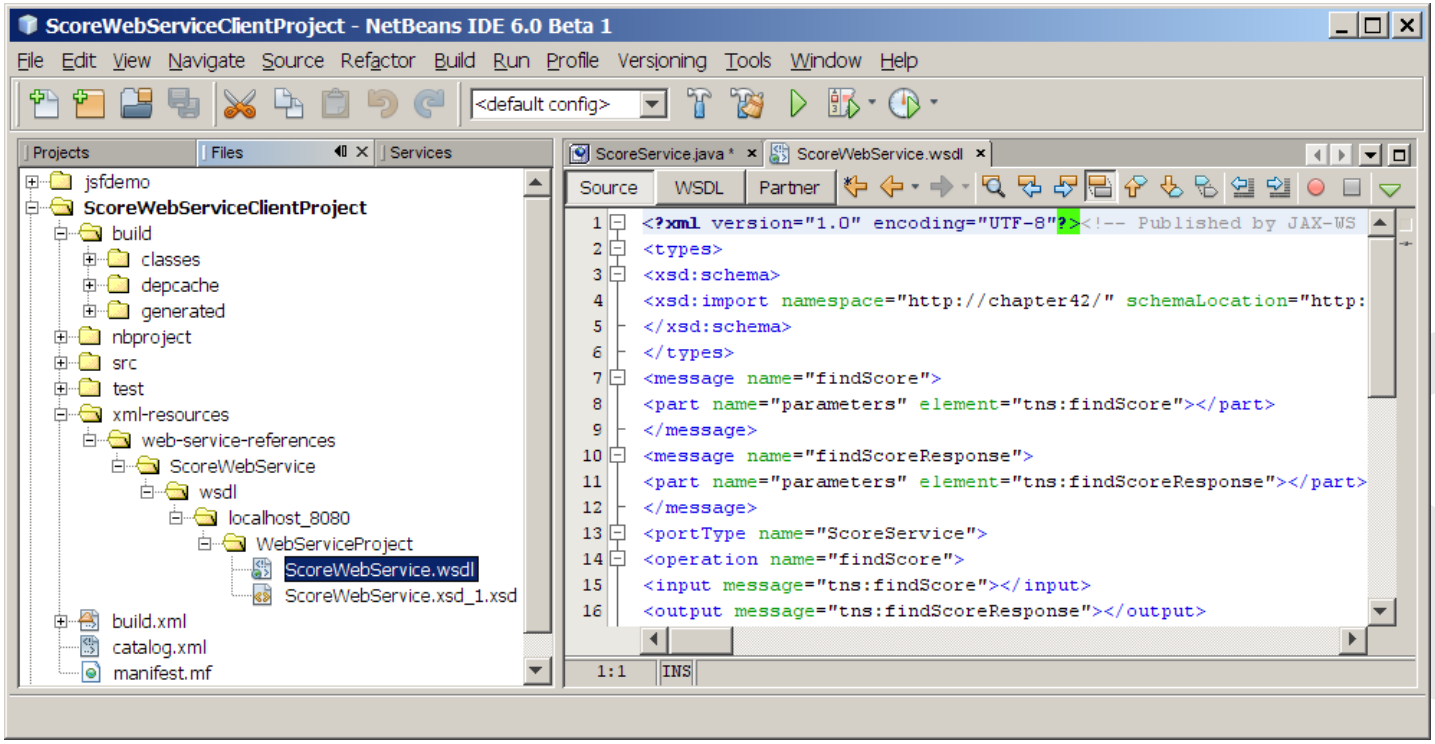
Consuming Web Services

Creating a Web service client

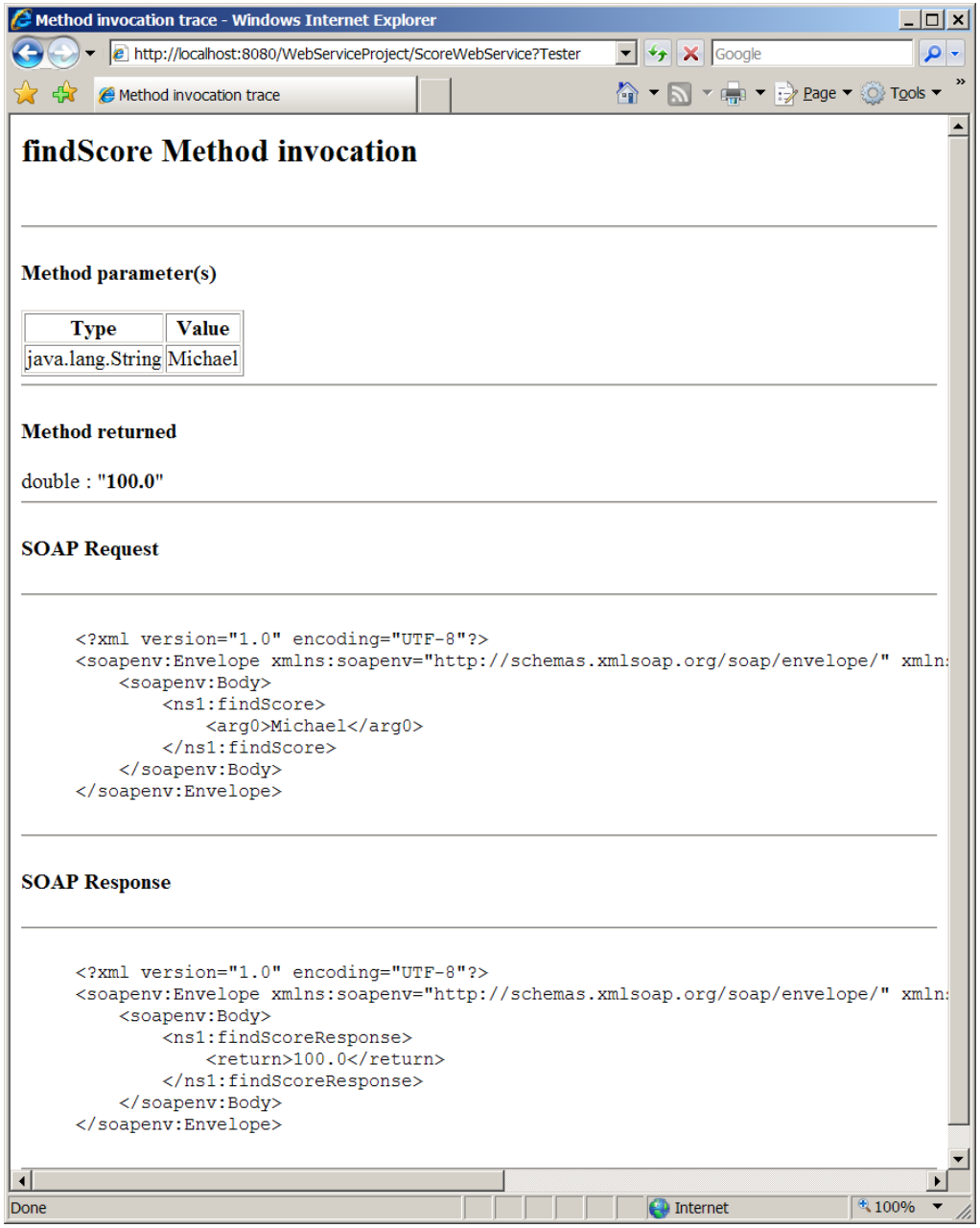


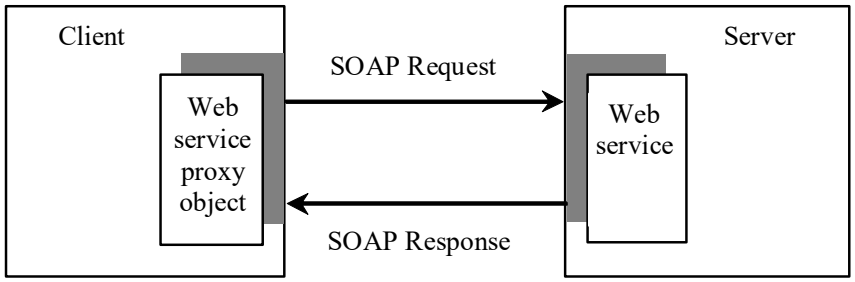
What is WSDL?

When you created a Web service reference, you entered a WSDL URL, as shown in Figure 41.6. A .wsdl file is created under the xm-resources folder, as shown in Figure 41.8. So *what is WSDL*? WSDL stands for *Web Service Description Language*. A .wsdl file is an XML file that describes the available Web service to the client, i.e., the remote methods, their parameters, and return value types, etc.



Passing and Returning Arguments





XML serialization/deserialization

Can you pass an argument of any type between a client and a Web service? No. SOAP only supports primitive types, wrapper types, arrays, String, Date, Time, List, and several other types. It also supports certain custom classes. An object that is sent to or from a server is serialized into XML. The process of serializing/deserialization objects, called *XML serialization/deserialization*, is performed automatically. For a custom class to be used with Web methods, the class must meet the following requirements:

- The class must have a no-arg constructor.
- Instance variables that should be serialized must have public get and set methods. The classes of these variables must be supported by SOAP.

Web Service Session Tracking

§37.8.3, "Session Tracking Using the Servlet API," introduced session tracking for servlets using the javax.servlet.http.HttpSession interface. You can use HttpSession to implement session tracking for Web services. To demonstrate this, consider an example that generates random True/False questions for the client and grades the answers on these questions for the client.