

# Instructions for writing Web Services using Java and Axis:

## Pre-requisites:

**Java Runtime:** JRE 1.4 or later

**JDK:** J2SE 1.4 or later

<http://java.sun.com/javase/downloads/index.jsp>

**Axis Toolkit:** Axis version 1.4 Recommend

[http://www.apache.org/dyn/closer.cgi/ws/axis/1\\_4ed](http://www.apache.org/dyn/closer.cgi/ws/axis/1_4ed)

**Application Server / Web Server:** Apache Tomcat 5.5.x (Recommended)

Download link: <http://tomcat.apache.org/download-55.cgi>

Installation instructions: <http://tomcat.apache.org/tomcat-5.5-doc/setup.html>

**IDE:** I would recommend using Eclipse for IDE.

<http://www.eclipse.org/downloads/>

**Setting JAVA\_HOME:** Set JAVA\_HOME environment variable to the Java installation directory. Typically C:\Program Files\Java\jdk1.4\ on Windows. On UNIX typically at /usr/Java/jdk1.4/

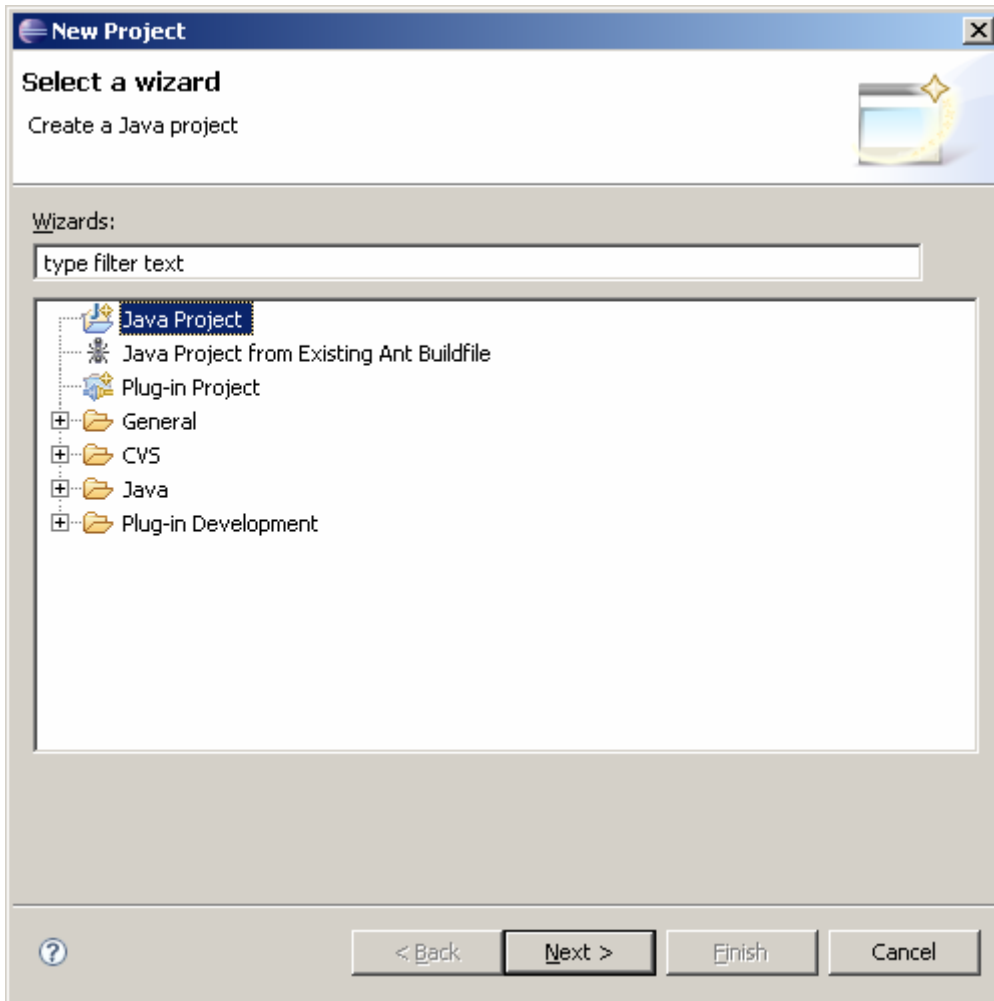
## Setting up Axis:

1. Un-compress the zip or tar to C:\axis-1\_4 on Windows or /home/<user\_name>/axis-1\_4/
2. Set **AXIS\_HOME** environment variable to C:\axis-1\_4
3. Copy the jar files with in \$AXIS\_HOME\lib to lib folder in Tomcat installation directory. Typically it is located at C:\Program Files\Apache Software Foundation\Tomcat 5.5\common\lib. Or /usr/tomcat5.5/common/lib on UNIX
4. Download **activation.jar** from <http://java.sun.com/products/javabeans/jaf/downloads/index.html> and copy it to the above location.
5. Copy folder C:\axis-1\_4\webapps\axis to C:\Program Files\Apache Software Foundation\Tomcat 5.5\webapps\axis
6. Restart the tomcat service
7. Now point your browser to <http://localhost:8080/axis/>  
*[The port number for tomcat is 8080 by default]*

Follow the guidelines mentioned under **Validating Axis** heading to see if everything is fine. Or point your browser to <http://localhost:8080/axis/happyaxis.jsp> to review and validate your current installation. Do not worry about optional components; they are not needed for us as of now.

Writing an add service in Java.

1. Create a simple java project in Eclipse and click on Next



Name the project as CalculateTest as shown and click on Finish

**New Java Project**

**Create a Java project**  
Create a Java project in the workspace or in an external location.

Project name:

Contents

- Create new project in workspace
- Create project from existing source

Directory:

JRE

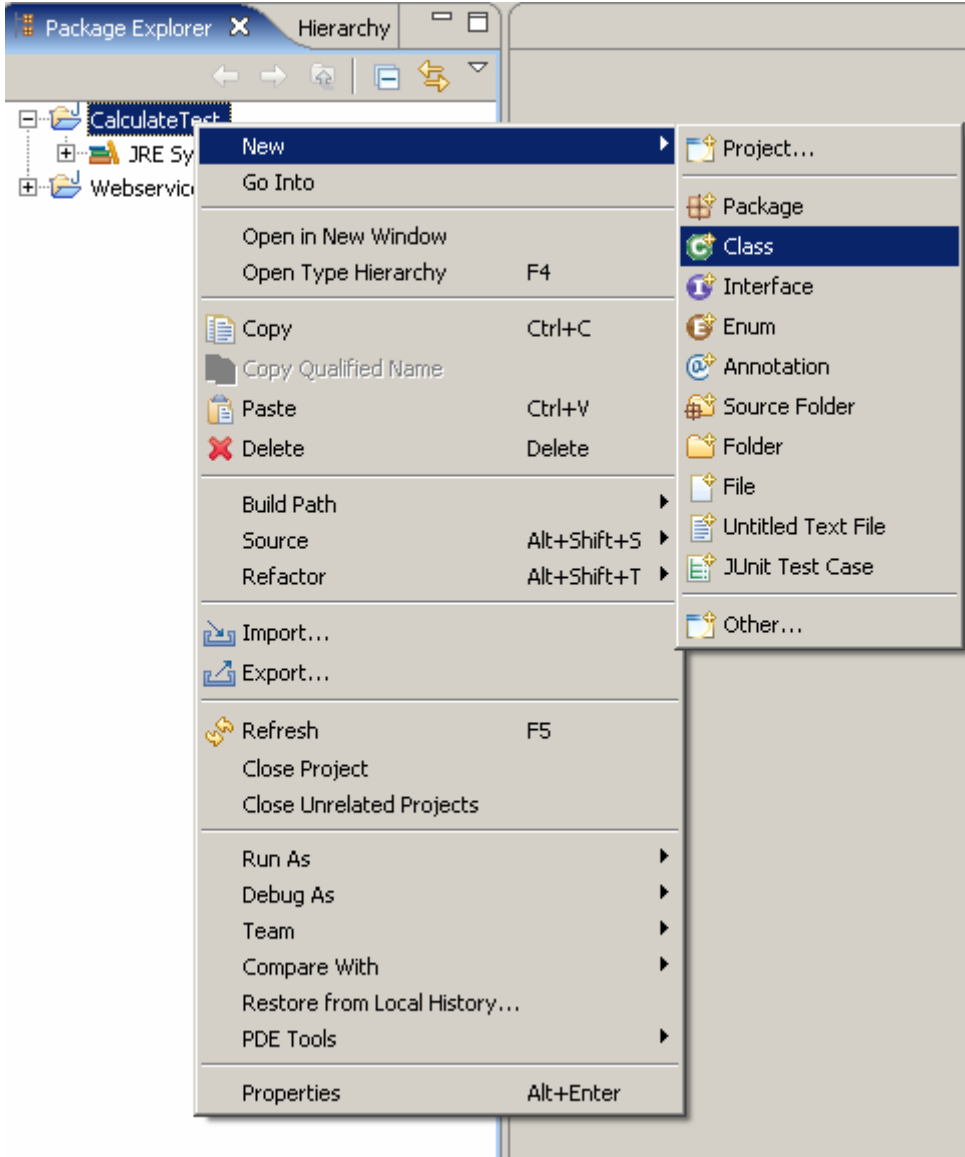
- Use default JRE (Currently 'jre1.6.0') [Configure JREs...](#)
- Use a project specific JRE:

Project layout

- Use project folder as root for sources and class files
- Create separate source and output folders [Configure default...](#)

Using a 1.6 JRE with compiler compliance level 1.4 is not recommended. [Configure compliance...](#)

2. Now you should see CalculateTest in Package Explorer. Create a new class as shown



3. Create a class called CalculateTest.java as shown



4. Write a simple CalculateTest.java class with just one public method to add two integers

```
public class CalculateTest
{
    public int add(int x, int y)
    {
        return x + y;
    }
}
```

5. Just save the file and Eclipse compiles it for you.

6. Now copy the source file CalculateTest.java to C:\Program Files\Apache Software Foundation\Tomcat 5.5\webapps\axis\CalculateTest.jws

7. Copy CalculateTest.class to C:\Program Files\Apache Software Foundation\Tomcat 5.5\webapps\axis\WEB-INF\jwsClasses\CalculateTest.class

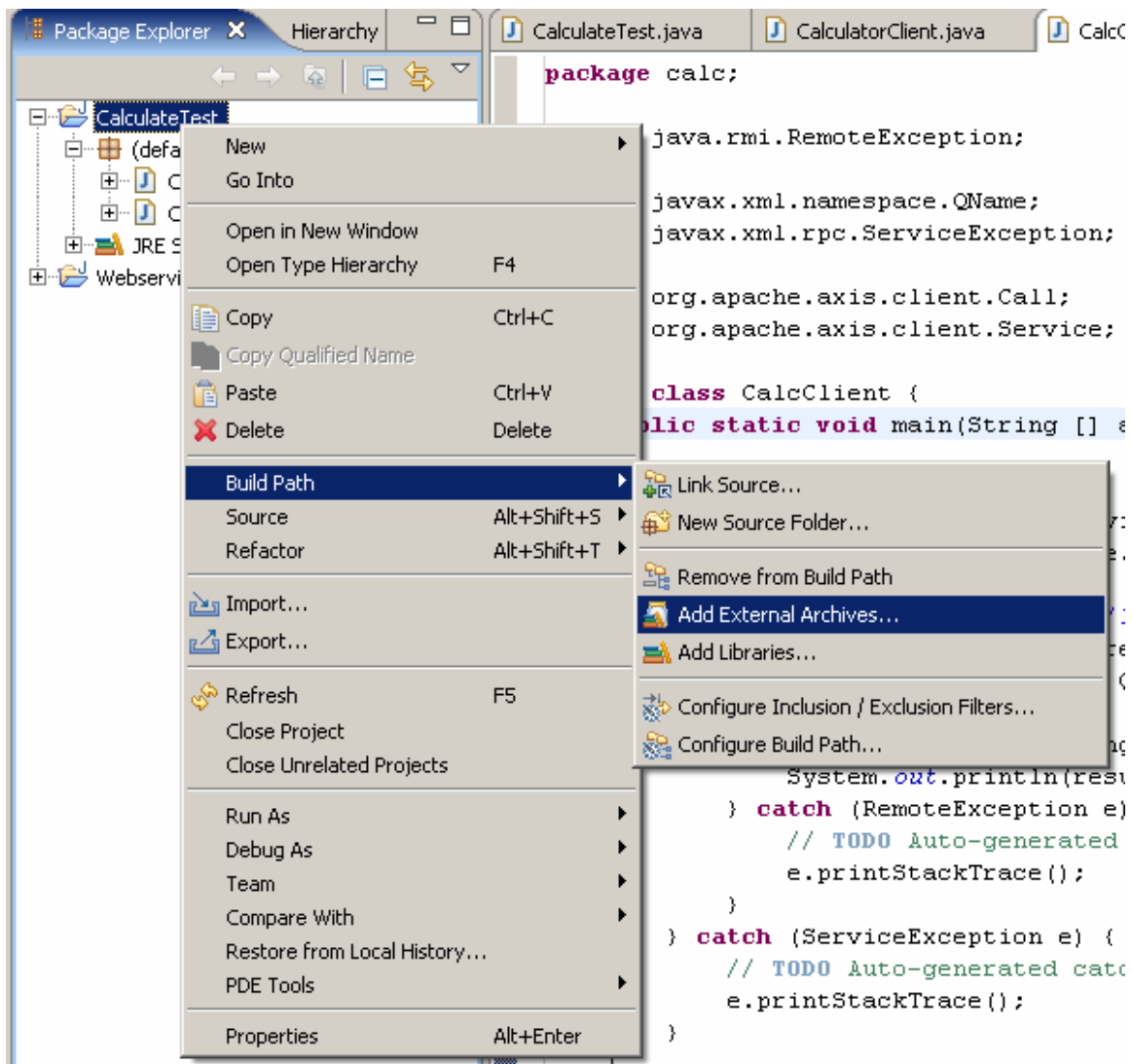
8. Restart tomcat server.

9. Now point your browser to <http://localhost:8080/axis/CalculateTest.jws?wsdl> this should display wsdl to you.

Writing a Web Service client.

1. Create a new class called CalcClient

2. Add required jar files to the project



Browse to axis jar files and add them all.

3. Use the following code to class.

```
import java.rmi.RemoteException;

import javax.xml.namespace.QName;
import javax.xml.rpc.ServiceException;

import org.apache.axis.client.Call;
import org.apache.axis.client.Service;

public class CalcClient {
    public static void main(String [] args)
    {
        try {
            Service service = new Service();
            Call call = (Call) service.createCall();

            String endPoint =
"http://localhost:8080/axis/CalculateTest.jws";
            call.setTargetEndpointAddress(endPoint);
            call.setOperationName(new QName("add"));
            try {
                Integer [] params = new Integer[2];
                params[0] = new Integer(440);
                params[1] = new Integer(998);

                Integer result = (Integer) call.invoke(params);
                System.out.println(result);
            } catch (RemoteException e) {
                // TODO Auto-generated catch block
                e.printStackTrace();
            }
        } catch (ServiceException e) {
            // TODO Auto-generated catch block
            e.printStackTrace();
        }
    }
}
```

4. Save the file and run it. You should get the result as 1438