

## Lab 5: Web Applications

In this lab, you will write an HTML file and a servlet and package them into a .WAR file. You will then deploy them under JRun or your own application server.

### Objectives:

- To learn how to structure a web application
- To package a web application into a .WAR file
- To deploy a web application

### Steps:

1. Determine the following information:

#### **Lab Installation Directory:** \_\_\_\_\_

2. Open a console command prompt window. (Under Windows, use the Windows Start Menu to open a Command Prompt window.) Change to the **Lab Installation Directory**. Then change to the lab05 directory.
3. Your first job is to create the required subdirectories. Review the chapter on web applications and then use Windows Explorer or command-line commands (e.g. *mkdir*) to create the required subdirectories underneath the lab05 directory. The lab05 directory will act as the root of your web application's hierarchy. Be sure to create the directories with the proper case (upper and lower).
4. Next, create a file named **InputCount.html**, and in it, define an HTML form with an input field that lets the user enter an integer count and a Submit button. The form's action tag should reference a servlet with the following URL:

`http://localhost:8100/lab05/servlet/HelloCount`

Omit the “:8100” if you are not using JRun's internal web server.

Be sure to place this file in the proper directory in your web application's directory hierarchy! Note that the URI prefix for your web application will be *lab05*.

5. Create the **HelloCount.java** file for the servlet. Be sure that when you compile it, the HelloCount.class file resides in the proper directory within the web application's hierarchy. The servlet should generate the HTML for Hello, World *n* times, where *n* is the integer the user entered into the form. Run the batch file to set the CLASSPATH, then compile the servlet (see the first lab if you cannot remember how to do these steps).
6. Write the deployment descriptor, **web.xml** and place it in the proper directory. Your *welcome-file* should be the HTML file you wrote earlier.

7. Package your web application into the .war file. In a console window, from the lab05 directory, type:

```
jar cvf lab05.war *.*
```

Then look in the directory for the resulting **lab05.war** file.

8. Next you need to deploy your .war file. The way you deploy differs among application servers, so consult your documentation, or if you are using JRun, use the following instructions:

- a. If you are using JRun, you can deploy web applications using the JRun Management Console (JMC). To run the JMC in Windows, first start the Admin server by choosing from the Windows Start menu: Start – Programs - JRun - JRun Admin Server (you shouldn't need to explicitly start the Admin server in Unix). Then start the JMC by entering the following URL into your browser:

```
http://localhost:8000
```

- b. Log into the JMC using *admin* for both the user name and password (or whatever user name and password you used when installed JRun). Then, in the JMC main window, find *JRun Default Server* in the tree display and expand it.
- c. Click on the “Web Applications” link in the left window pane – JMC will display a list of the currently installed web applications (probably just the Default). Find the link “Deploy an Application” in the rightmost JMC pane and click on it. In the resulting form, enter the following:

Servlet War File or Directory:	Browse for your lab05.war file
JRun Server Name	JRun Default Server
Application Name:	Lab05
Application Host:	All Hosts
Application URL:	/lab05            -- this is the URI prefix
Application Deploy Directory:	accept the default

Press the Deploy button when you are finished. You should see a message that the web application was successfully deployed.

- d. Start or restart the JRun Default Server. Click on JRun Default Server in the JMC left window pane – you should see a summary of the server including its run state. Press the *start server* or *restart server* button to complete the deployment.
9. Test your application by starting your browser and entering the URL:

```
http://localhost:8100/lab05
```

Omit the “:8100” if you are not using JRun’s internal web server.

You should see your InputCount.html file even though you did not enter its complete URL. Why? Then enter a count (e.g. 5) and press Submit. Does your servlet run correctly? If so, you have successfully deployed a web application!

If you get an error indicating that JRun exited abnormally, you most likely have a syntax error in your web.xml file. Look at the JRun logs for details.

10. Edit the servlet and change the generated HTML so that Hello, world is in boldface. Re-compile the servlet, rebuild the .war file and re-deploy it. Then test it again. **Note:** to re-deploy a web application in JRun using the JMC, you must first delete the web application and then deploy it again.

How difficult was it to simply change the application's appearance? Could a non-programmer do this?

### ***Optional***

1. Create a lab05.jar file that contains only the servlet's class file, then delete the .class file. Ensure that the .jar file is in the proper directory, then delete and re-create the .war file for the application. Then re-deploy and test your application.

