JBoss Web Services User Guide

Version: 3.2.0.GA

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JBossWS Runtime Overview

JBossWS is a web service framework developed as a part of the JBoss Application Server. It implements the JAX-WS and JAX-RS specifications. JAX-WS (Java API for XML Web Services) defines a programming model and run-time architecture for implementing web services in Java, targeted at the Java Platform, Enterprise Edition 5 (Java EE 5). JAX-RS (Java API for RESTful Web Services) is a Java API that supports the creation of Representational State Transfer (REST) web services, using annotations.

JBossWS integrates with most current JBoss Application Server releases as well as earlier ones, that did implement the J2EE 1.4 specifications. Even though JAX-RPC, the web service specification for J2EE 1.4, is still supported JBossWS does put a clear focus on JAX-WS.

1.1. Key Features of JBossWS

For a start, we propose you to look through the table of main features of JBossWS Runtime:

Feature	Benefit
JAX-RPC and JAX-WS support	JBossWS implements both the JAX-WS and JAX-RPC specifications.
JAX-RS support	JBossWS implements the JAX-RS specification.
EJB 2.1, EJB3 and JSE endpoints	JBossWS supports EJB 2.1, EJB3 and JSE as Web Service Endpoints.
WS-Security 1.0 for XML Encryption/Signature of the SOAP message	WS-Security standardizes authorization, encryption, and digital signature processing of web services.
JBoss AS	JBoss Application Server 5 (JavaEE 5 compliant) web service stack.
Support for MTOM/XOP and SwA-Ref	Message Transmission Optimization Mechanism (MTOM) and XML-binary Optimized Packaging (XOP) more efficiently serialize XML Infosets that have certain types of content.

Table 1.1. Key Functionality for JBossWS

1.2. Other relevant resources on the topic

You can find some extra information on:

• JBossWS Tools Wiki FAQ. [http://www.jboss.org/community/wiki/JBossWS-FAQ#Tools]

Creating a Simple Web Service

This chapter describes how to create a simple web service.

2.1. Generation

A simple web service can be created by using the **Simple Web Service** wizard as described in *Generate a simple web service*

Procedure 2.1. Generate a simple web service

- 1. Access the New Select a wizard dialog
 - a. Right click on the project name in the **Project Explorer** view.
 - b. Select New \rightarrow Other.
 - c. Expand the **Web Services** folder and click on the **Simple Web Service** option.

Result: The **New - Select a wizard** dialog displays with the selected wizard type highlighted.



Figure 2.1. The New - Other (Wizard selection) dialog

2. Access the Simple Web Service dialog

Click the **Next** button to proceed.

Result: The Simple Web Service - Project and Web Service Details dialog displays.

	Simple Web Service	×
Project and Wel	o Service Details	
Specify the Dynar name for the sam	nic Web Project, service, package and class ple web service and web service class.	
Technology ③ JAX-WS (WSD	DL-based) O JAX-RS (REST)	
Dynamic web pro	pject	
MyProject1		•
Service details Service name He V Update web.xi Service implemen	elloWorld ml itation	
Package	org.jboss.samples.webservices	
Class	HelloWorld	
Application class		
?	< Back	sh

Figure 2.2. Simple Web Service - Project and Web Service Details

3. Define the service attributes

Define the project, web service, package and class names according to the options displayed in *Table 2.1, "Project and Web Service Details"*

Table 2.1. Project and Web Service Details

Dialog group	Field	Manda	Instruction	Description
Technology		yes	Select the technology the Web Service will be based on.	A simple web service can be based on either the Web Service Definition Language (WSDL) or RESTful (REST) API. Click the radio button

Dialog group	Field	Manda	Instruction	Description
				beside the technology your web service should use.
Dynamic web project		yes	Select the project name.	The project name will default to the highlighted project in the Project Explorer . A different project can be selected from the drop-down list.
Service details	Service name	yes	Enter the name to for the web service.	The web service name will be the URL for the service as mapped in the deployment descriptor (web.xml).
	Update web.xm	no Il	Checkbox is checked by default, but is not mandatory.	Leaving this checked will add your new service to the web.xml in your project.
Service implementation	Packag	eyes	Enter the package for the web service servlet.	The default package is org.jboss.samples.websevices Select your own package using the button.
	Class	yes	Enter the name of the web service servlet.	The default class name will correspond to the default web service name resulting in an equivalent URL to servlet name mapping in the deployment descriptor (web.xml).
	Applica class	ti on ly when the JAX- RS technol option is selected	Enter the name of the JAX-RS application class to use.	The default application class is MyRESTApplication.Select your own application class using the button.

4. Generate the web service

Click the **Finish** button to complete the web service setup.

Result: The web service classes will be generated and the web.xml file updated with the deployment details if the **Update web.xml** option was selected.

Java EE - MyProject1	L/src/org/jboss/samples/webservices/HelloWorld.jav
<u>File Edit Source Refactor Navigate</u>	e Se <u>a</u> rch <u>P</u> roject <u>R</u> un <u>W</u> indow <u>H</u> elp
➡ = = = = @ % \$ @ & € + 巻 ● 巻	\$≠ Q • Q •] ゐ • ③ •] @ @ @ @ A •] \$ [] ☆ • 월 • 집 • \$ \$ \$ • \$ •
Project Explorer 🛿 🗖 🗖	🖸 HelloWorld.java 🛛
	<pre>package org.jboss.samples.webservices;</pre>
▽ 😂 MyProject1	<pre> • import javax.jws.WebMethod;</pre>
AX-WS Web Services	(awebService())
Deployment Descriptor: MyPr	public class HelloWorld {
 ✓ ♣ Java Resources: src ✓ ♣ org.jboss.samples.webserv ▶ ● ● HelloWorld.java ▶ ● ▲ Libraries ▶ ▲ JavaScript Resources ▶ ● ● Web Resources : WebContent 	<pre>@WebMethod() public String sayHello(String name) { System.out.println("Hello: " + name) return "Hello " + name + "!"; } }</pre>
👂 🗁 build	Markers Properties & Servers S? M Data Source
👂 🗁 WebContent	Thankers a rioperties we servers to get Data Source
	Boss SOA-P 5.1 Runtime Server [Stopped]
〕□◆	Writable Smart Insert 7 : 20

Figure 2.3. Created Simple Web Service

Creating a Web Service using JBossWS runtime

In this chapter we provide you with the necessary steps to create a Web Service using JBossWS runtime. First you need to create a Dynamic Web project:

3.1. Creating a Dynamic Web project

Before creating a web service, you should have a Dynamic Web Project created:

E New Project 🗙
Select a wizard 🛁 🐟
Create a Dynamic Web project
Wizards:
type filter text
 ▷ ➢ Java ▷ ➢ Java EE ▷ ➢ JavaScript ▷ ➢ JPA ▷ ➢ Plug-in Development ▽ ➢ Web
Static Web Project
Image: Second

Figure 3.1. Dynamic Web Project

Create a Web project by selecting *New > Project... > Dynamic Web project*. Enter the following information:

- Project Name: enter a project name
- Target runtime: any server depending on your installation. If it is not listed, click New button and browse to the location where it is installed to. You may set *Target Runtime* to *None*, in this case, you should read the section *Section 3.2, "Configure JBoss Web Service facet settings"*.

📕 New Dynamic Web Project 🗙
Dynamic Web Project 🚬
Create a standalone Dynamic Web project or add it to a new or existing Enterprise Application.
Project name: test
Project contents:
☑ Use <u>d</u> efault
Directory: /home/grid/workspace/documents/test Browse
Target Runtime
<none> \v New</none>
Dynamic Web Module version
2.4 🗸
Configuration
Default Configuration
The default configuration provides a good starting point. Additional facets can later be installed to add new functionality to the project.
EAR Membership
Add project to an EAR
EAR Project Name: EAR New
⑦ < <u>Back</u> <u>Next</u> > <u>Finish</u> Cancel

Figure 3.2. Dynamic Web Project Wizard

- Configuration: You may *Section 3.2, "Configure JBoss Web Service facet settings"* by clicking the Modify... button. The opened page is like Figure 2.4.
- Configure Web Module values:

New Dynamic Web Project	×
Web Module	3
Configure web module settings.	
Context Root	
test	_
Content Directory	
WebContent	_
lava Source Directory:	
src	
	-
(7) < <u>Back</u> <u>Next</u> > <u>Finish</u> Cance	2

Figure 3.3. Web Module Settings Configuration

If you added the JBoss Web Service facet to the project, now the Finish button is unavailable. You must click Next button to set more information about the JBoss Web Service facet. The page is like Figure 2.5. Then click on the Finish button.

If you didn't add the JBoss Web Service facet to the project, click on the Finish button. Next you will need to add JBoss Web Service facet to the project.

3.2. Configure JBoss Web Service facet settings

If you have already created a new Dynamic Web project and not set the JBoss Web Service facet to the project, the next step is to add JBoss Web Service facet to the project. Right-click on the

project, select its *Properties* and then find *Project Facets* in the tree-view on the left-side of the project properties dialog. Tick on the check box for JBoss Web Services. You will see what like this:

E		Properties for zz
type filter text	Project Facets	
Resource	Configuration: <custom></custom>	
Builders	Project Excel	Datalis Duntiman
Drools	N D D Avie 2 Web Empire	Coccars Automics
FreeMarker Context	Dia Axisz Web Services	JBoss Web Services
Hibernate Settings	M Contractive D Module 2	Enables Web services generation through the JBoss Web services engine.
Java Build Path	Evel Java Bresisterer	j
Java Code Style		۸
Java Compiler	I avaScript Toolkit	,L
Java Editor	JavaServer Faces	
Java EE Module Dependenci	B Boss Web Services	
Javadoc Location	🗆 🖹 Seam 🛛 💈 2	
JavaScript	WebDoclet (XDoclet)	4
JEE Module Dependencies (
JSP Fragment		
Project Archives		
Project Facets		
Project References		
Run/Debug Settings		
Seam Settings		
Server		
Service Policies		
Targeted Runtimes		
Task Tags		*
Templates		
Validation		
Web Content Settings		
Web Page Editor		
Web Project Settings		
b XDociet		<u>i</u>
ADJUCE	Further configuration required	
	127	
	123	
0		

Figure 3.4. Choose JBoss Web Service Facet

At the bottom-left of the right-side of the project properties dialog, there is a error link: *Further configuration required...*. You must click the link to set more information about JBoss Web Service facet.

Click on the Further configuration required... link. In the opened window

C Modify F	Faceted Project	×
JBossWS Facet		
 Server Supplied JBossWS Runtime Image: Server Supplied JBossWS Runtime 		> New
Package all JBossWS runtime jars into the deploy	oyment archive	
0	< <u>B</u> ack <u>N</u> ext >	ОК

Figure 3.5. Configure JBoss Web Service Facet

Server Supplied JBossWS Runtime: If you have already set a JBoss runtime to the project's target runtime, you may choose *Server Supplied JBossWS Runtime* and then click *Ok* to finish the configuration of JBoss Web Service facet.

If the project has no *Target Runtime* settings, you should check the second radio button and specify a JBossWS runtime from the list. You also can create a new JBossWS runtime, click on the *New...* button will bring you to another dialog to configure new JBossWS runtime.

E	New JBossWS Runti	ime	×
JBossWS Run	ntime		
Create a JBos	sWS Runtime		
Name:			
Version			
Home Folder:			Browse
	- IDean With Coming southing form		Diowse
	e JBoss Web Service runtime jars		
0		Finish	ancel
U			ancer

Figure 3.6. Configure JBossWS Runtime

See how to configure a new JBossWS runtime in the *Chapter 5, JBoss WS and development environment* section.

After setting the information about JBoss Web Service facet, for saving the result, you should click the Apply or OK button at the bottom-right of the right-side of the project properties dialog.

3.3. Creating a Web Service from a WSDL document using JBossWS runtime

In this chapter we provide you with the necessary steps to create a Web Service from a WSDL document using JBossWS runtime.

At first, please make sure that you have already created a dynamic Web project with JBoss Web Service facet installed.

See how to make it in the Section 3.1, "Creating a Dynamic Web project" section and in the Section 3.2, "Configure JBoss Web Service facet settings" section.



Note

To use the **Simple Web Service** wizard to create this Web Service, replace the **Class** and **Application Class** fields with your specific classes, within the instructions in *Chapter 2, Creating a Simple Web Service*. To create a Web Service using JBossWS runtime select *File > New > Other > Web Services > Web Service* to run Web Service creation wizard.

Let's get through the wizard step-by-step:

6	Web Service	×
Web Services Select a service implement	ntation or definition and move the sliders to set the	Ð
level of service and client	generation.	
Web service type:	Top down Java bean Web Service	
Service definition:	/JBossWSProject/HelloWorld.wsdl	Browse
Start service	Configuration: Server: JBoss AS 4.2 Web service runtime: JBossWS Service project: JBossWSProject Service EAR project: aEAR	
<u>C</u> lient type: Java Proxy		 ~
No client	Configuration: No client generation	on.
<u>P</u> ublish the Web servi	ce	
Monitor the Web serv	ice	
0	< <u>B</u> ack <u>N</u> ext > <u>E</u> inish	Cancel

Figure 3.7. New Web Service Wizard

First, please select Top down Java bean Web Service from the Web Service type list, and select a WSDL document from workspace, click on the Server name link on the page will bring you to another dialog. Here you can specify the server to a JBoss Server and Web Service runtime to JBossWS runtime:

Service Deployment Configuration	×
Choose from the list of runtimes and deployment servers, or use the default settings.	
 Server-Side Deployment Selection: Choose server first Choose Web service runtime first 	
 Explore options 	
Web service runtime:	
Apache Axis	
Apache Axis2	
JBossWS	
Server:	
🤯 org.jboss.ide.eclipse.as.42	
Server Types	
OK Cance	

Figure 3.8. Select Server and Web Service runtime

Click on the *Finish* button to see the next wizard view opened:



Figure 3.9. New Web Service Wizard

Click on the *Next* button to proceed:

6	Web Service	×
JBoss Web Service Please input the appropr	e Code Generation Configuration riate option for the code generation	2
Custom package name	org.example.www.helloworld	
JAX-WS specification	2.0	×
Catalog file		Add
Binding files		Add
		Remove
🗹 Generate default We	b Service Implementation classes	
✓ Update the default Web.xml		
0	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish	Cancel

Figure 3.10. New Web Service Wizard

On this page, the default package name comes from the namespace of the WSDL document, you also can change it to any valid package name you want. JAX-WS specification should be set to 2.0 if your JBossWS runtime in JBoss Server is JBossWS native runtime. You can specify a catalog file and binding files if you have them. If you want the wizard to generate empty implementation

classes for the Web Service, check the *Generate default Web Service implementation classes* check box. If you want to update the default Web.xml file with the Web Service servlets configured, check the *Update the default Web.xml* check box. Click on the *Next* or on the *Finish* button to generate code.

Once the Web Service code is generated, you can view the implementation class and add business logic to each method.

```
🕖 Greeterimpl.java 🕺
  package org.apache.hello_world_soap_http;
  import javax.jws.WebService;
  @WebService(name = "GreeterImpl", serviceName = "Greeter", endpointInterface =
  public class GreeterImpl implements Greeter {
       public String sayHi() {
 8
           return "";
       }
       public String greetMe(String requestType) {
           return "";
       }
 8
       public void greetMeOneWay(String requestType) {
           return;
       }
       public void pingMe() {
           return;
       }
                                                                                    >
```

Figure 3.11. The generated implementation Java code

View the Web.xml file:



Figure 3.12. Web.xml

In the next chapter you will find out how to create a Web service from a Java bean.

3.4. Creating a Web service from a Java bean using JBossWS runtime

The Web Service wizard assists you in creating a new Web service, configuring it for deployment, and then deploying it to the server.

To create a Web service from a bean using JBoss WS:

Setup Chapter 5, JBoss WS and development environment.

Create Section 3.1, "Creating a Dynamic Web project".



Note

To use the **Simple Web Service** wizard to create this Web Service, replace the **Class** and **Application Class** fields with your specific classes, within the instructions in *Chapter 2, Creating a Simple Web Service*.

Section 3.2, "Configure JBoss Web Service facet settings"

Create a Web Service from a java bean:

- Switch to the Java EE perspective Window > Open Perspective > Java EE.
- In the Project Explorer view, select the bean that you created or imported into the source folder of your Web project.



Figure 3.13. Select the Bean Created

• Click *File > New > Other*. Select Web Services in order to display various Web service wizards. Select the Web Service wizard. Click on the Next button.

E N	ew 🗙
Select a wizard	
Create a new XML web service.	
Wizarde	
mizarda.	
V 🗁 SQL Development	
User Assistance	
Web	
▼ 🗁 Web Services	
Ant Files	
🗊 Unit Test UDDI	
🏄 Web Service	
🔊 Web Service Client	
2 WSDL	
ML	=
Examples	
O < Back	Next > Einish Cancel

Figure 3.14. New Web Service

• On the first Web Service wizard page: select Bottom up Java bean Web service as your Web service type, and select the Java bean from which the service will be created:



Figure 3.15. Set Web Service Common values

- Select the stages of Web service development that you want to complete using the slider:
 - Develop: this will develop the WSDL definition and implementation of the Web service. This includes such tasks as creating modules that will contain generated code, WSDL files, deployment descriptors, and Java files when appropriate.
 - Assemble: this ensures the project that will host the Web service or client gets associated to an EAR when required by the target application server.
 - Deploy: this will create the deployment code for the service.
 - Install: this will install and configure the Web module and EARs on the target server.
 - Start: this will start the server once the service has been installed on it. The serverconfig.wsdd file will be generated.

- Test: this will provide various options for testing the service, such as using the Web Service Explorer or sample JSPs.
- Select your server: the default server is displayed. If you want to deploy your service to a different server click the link to specify a different server.
- Select your runtime: ensure the JBoss WS runtime is selected.
- Select the service project: the project selected in your workspace is displayed. To select a
 different project click on the project link. If you are deploying to JBoss Application Server
 you will also be asked to select the EAR associated with the project. Ensure that the project
 selected as the Client Web Project is different from the Service Web Project, or the service
 will be overwritten by the client's generated artifacts.
- If you want to create a client, select the type of proxy to be generated and repeat the above steps for the client. The better way is to create a web service client project separately.

Click on the Next button.

• On the JBoss Web Service Code Generation Configuration page, set the following values:

Web Service	×
JBoss Web Service Code Generation Configuration Please input the appropriate option for the code generation	9
Ø Generate WSDL file Ø Update the default Web.xml	
⊘ < <u>B</u> ack <u>N</u> ext > <u>F</u> inish Cancel	

Figure 3.16. Set Web Service values for Code Generation

- Generate WSDL file: select it, you will get a generated WSDL file in your project. But this wsdl's service address location values are not a real address.
- After the Web service has been created, the following option can become available depending on the options you selected: Update the default web.xm file. If selected, you may test the web service by Explorer.

Click on the Next button.

• On this page, the project is deployed to the server. You can start the server and test the web service. If you want to publish the web service to a UDDI registry, you may click the Next button to publish it. If not, you may click the Finish button.

Web Service ×
Start the server from this page.
In order to proceed the server "JBoss AS 4.2 at localhost" must be st Once the server is started the "next" button will be enabled. The "back" button can be used while the server is starting to change any previous settings in this wizard.
Currently the server is stopped. Start server
Cancel

Figure 3.17. Start a Server

After the Web Service has been created, the following options may become available depending on the options selected:

- the generated web services code
- If you selected to generate a WSDL file, you will get the file in your project's wsdl folder.

🕒 Project Explorer 🛛 📽 Navigator 👘 🗖	🕑 HelloWorld.java 🔄 🖉 HelloWorldService.wsdl 🛛
e % ≥ * *≧test	<pre><input message="tns:HelloWorld_sayHello2"/> <output message="tns:HelloWorld_sayHello2Response"></output></pre>
Deployment Descriptor: test	
	<pre></pre>
# erg.example.www.helloworld	<pre><soap:binding sayhello'="" style="document" transport="http://schemas.xmlsoap.org/soap/</pre></th></tr><tr><th>HelloWorld.java</th><th><pre><operation name="></soap:binding></pre>
e org.example.www.helloworld.iaxws	<pre><soap:operation soapaction="`nttp://www.example.org/Helloworld/sayHello'/"> <ipput></ipput></soap:operation></pre>
b >Libraries	<pre><soap:body use="literal"></soap:body></pre>
b es build	
, e Web Centent	<output></output>
WebContent	<soap:body use="literal"></soap:body>
≂ ⇔ wsdl	
HelloWorldService.wsdl	<pre><pre>coperation name='savHello2'></pre></pre>
JavaScript Support	<pre><soap:operation <="" pre="" soapaction="http://www.example.org/HelloWorld/sayHello2"></soap:operation></pre>
▷ 🗁 testEAR	<input/>
▶ ₩ISB-109 Web Services	<soap:body use="literal"></soap:body>
, ajsteros web services	
	<output></output>
	<soap:body use="literal"></soap:body>
	/binding>
	<pre><service name="HelloWorldService"></service></pre>
	<pre><port binding="tns:HelloWorldBinding" name="HelloWorldPort"></port></pre>
	<pre><soap:address location="REPLACE_WITH_ACTUAL_URL"></soap:address></pre>
	Design Source

Figure 3.18. The Generated HelloWorldService.wsdl File in the wsdl Folder

• If you selected to update the default web.xml, you will test the web service in the browser. Open the Explorer, input the url for the web service according to web.xml plus ?wsdl, you will get the WSDL file from Explorer.



Figure 3.19. The Updated web.xml file

In the next chapter you will be able to create a Web Service Client from a WSDL document using JBoss WS.

Creating a Web Service Client from a WSDL Document using JBoss WS

To create a Web Service Client from a WSDL Document using JBoss WS you need to fulfil the following steps:

Setup Chapter 5, JBoss WS and development environment.

Section 3.1, "Creating a Dynamic Web project".

Section 3.2, "Configure JBoss Web Service facet settings".

Then you can create a Web Service Client from a WSDL document:

- Switch to the Java EE perspective Window > Open Perspective > Java EE.
- Click File > New > Other. Select Web Services in order to display the various Web service wizards. Select the Web Service Client wizard. Click on the Next button.

E New ×	
Select a wizard —	
Access an existing XML web service	
Wizards:	
type filter text	
P G WED	
🔊 Ant Files	
🗐 Unit Test UDDI	
A Web Service	
💋 Web Service Client	
2 WSDL	
Þ 🗁 XML	
Examples	
	_
Rack Next > Enich Cancel	ר
	J

Figure 4.1. New Web Service Client

• The first and the second Web Service Client wizard pages are the same as for Section 3.3, "Creating a Web Service from a WSDL document using JBossWS runtime".

C Web Service	Client ×
Web Services Select a service definition.	<u>_</u>
Service definition:	Browse
<u>C</u> lient type: Java Proxy	
Deploy client	Configuration: Server: JBoss v4.2 Web service runtime: JBossWS Client project: client Client EAR project: testEAR
(?) < <u>B</u> ack Next	> Einish Cancel

Figure 4.2. Set Web Service Common values
e	Web Service Client	×		
JBoss Web Service Code Generation Configuration				
	, ,	3		
Custom package name	org.example.www.helloworld			
JAX-WS specification	2.0	×		
Catalog file		Add		
Binding files		Add		
		Remove		
⑦ < B	ack Next > Finish	Cancel		

Figure 4.3. Set Web Service values related to WSDL file

The only difference is:

• Client Type: Support of Java Proxy only.

Click on the Finish button.

After the Web Service Client has been created, the following may occur depending on the options you selected:

- the generated web service and client codes
- a client sample class.



Figure 4.4. Client Sample Class

JBoss WS use a Java class to test Web Service. A client sample class will be generated, you may run this client as a java application to call a web service.



JBoss WS and development environment

In this chapter you will learn how to change JBossWS preferences and how to set default server and runtime.

5.1. JBossWS Preferences

In this section you will know how JBossWS preferences can be modified during the development process.

JBossWS preferences can be set on the JBossWS preference page. Click on *Window* > *Preferences* > *JBoss Tools* > *Web* > *JBossWS Preferences*.

On this page you can manage the JBossWS Runtime. Use the appropriate buttons to Add more runtimes or to Remove those that are not needed.



Figure 5.1. JBossWS Preferences Page

Clicking on *Add* or *Edit* button will open the form where you can configure a new JBossWS runtime and change the path to JBossWS runtime home folder, modify the name and version of the existing JBossWS runtime settings. Press Finish to apply the changes.

				Preferences	×
ty	pe filter	text]	JBossWS Preferences	
Þ	FreeMa Guvnor Help	rker Editor		Name Versio Path Jboss-4.2.2.GA 2.0 /home/user/Eclipse/jboss-4.2.2.GA	<u>A</u> dd
	HQL ec	itor C		Edit IBossWS Runtime	move
	Install/	Edit IBossWS	Runti		
L P	Java	Input new valu	les		
Þ	IBoss i	inpartient raie			
Þ	JBoss	Name:	jboss-4	1.2.2.GA	
Þ	JPA Plug-ir Project	Version Home Folder:	4.2.2 /home,	≎ /user/Eclipse/jboss-4.2.2.GA Browse	
Þ	Report	Customize	Boss	Web Service runtime jars	
Þ	Run/De				
Þ	Server				
Ι.	Servic				
	Team				
ь	Web				
~	Web S				
	Axis Axis JBos	SWS Preterence Dialog Select	s ion ¥	Enish Cancel	
¢	D			ок	ancel

Figure 5.2. Edit JBossWS Runtime

WS container allows Source and JavaDoc locations to be set via the Properties dialog on each contained .jar: right-click on any .jar file in the Project Explorer view, select *Properties*. Choose *Java Source Attachment* and select location (folder, JAR or zip) containing new source for the chosen .jar using one of the suggested options (workspace, external folder or file) or enter the path manually:

Properties for /home/user/jbdevstudio/jboss-eap/jboss-as/client/javassist.jar					
type filter text	Java Source Attachment				
Java Source Attachment Javadoc Location Native Library	Select the location (folder, JAR or zip) containing the source for 'javassist.jar': Logation path:	Extern			
0	ок	C			

Figure 5.3. Classpath Container: Java Source Attachment

Click on Apply and then on Ok.

To change JavaDoc Location choose *Javadoc Location* and specify URL to the documentation generated by Javadoc. The Javadoc location will contain a file called *package-list*:

Properties	s for /home/user/jbdevs	tudio/jboss-eap	o/jboss-as/client/jav	vassist.jar	
ype filter text	Javadoc Location				\$ ~
Java Source Attachment	Specify the location (URI) of the documer	ntation generated by J	avadoc. The Javadoc I	ocatio
Javadoc Location	 Iavadoc URL (e.g. 'htt 	to://www.sample-u	url.ora/doc/" or 'file:/c:/r	myworkspace/myproie	ect/doo
Native Library	Javadoc location path:	[<u></u>		B
					Va
	 Javadoc in ar<u>c</u>hive 				
		External file	O Wor <u>k</u> space file		
	Archive path:				B
	Path within archive:				Br
					Va
				Restore <u>D</u> efaults	
٢					

Figure 5.4. Classpath Container: Javadoc Location

Click on Apply and then on Ok.

5.2. Default Server and Runtime

Open *Window > Preferences > Web Services > Server and Runtime*. On this page, you can specify a default server and runtime.

For ease of use, the better way is to set runtime to JBoss WS.

After server and runtime are specified, click on the Apply button to save the values.

E		Prefer	ences
3	/pe filter text	Server and Runtime	1
⊳	General	Server-	IBoss v4.2
₽	Ant	Server.	10033 44.2
₽	Data Management	Web service runtime:	JBossWS
Þ	Help		
Þ	Install/Update		
₽	Java		
₽	JavaScript		
	JPA		
₽	Mylyn		
₽	Plug-in Development		
Þ	Remote Systems		
₽	Run/Debug		
₽	Server		
	Service Policies		
₽	Team		
₽	Usage Data Collector		
	Validation		
₽	Web		
~	Web Services		
	Axis Emitter		
	Axis2 Preferences		
	JBossWS Preferences		
	Popup Dialog Selection		
	Project Topology		
	Resource Management		
_۱	Scenario Defaults		
	Server and Runtime		
	Test Facility Defaults		
	Wizard Validation		
	WSDL Files		
Þ	XDoclet		
Þ	XML		
¢	D		

Figure 5.5. Specifing a default server and runtime

On the whole, this guide covers the fundamental concepts of work with tooling for JBossWS. It describes how to easily create a Web Service and a Web Service Client using JBossWS Runtime and adjust JBossWS and development environment as well.

If the information on JBossWS tools in this guide isn't enough for you, ask questions on our *forum* [http://www.jboss.com/index.html?module=bb&op=viewforum&f=201]. Your comments and suggestions are also welcome.

Sample Web Service wizards

JBoss Tools includes wizards for the creation of sample web services. These include:

- Create a sample Web Service for a JAX-WS web service; and
- Create a sample RESTful Web Service for a JAX-WS web service.

These wizards are used within a Dynamic Web project. A dynamic web project can be created by following the steps in *Creating a dynamic web project*.

Procedure 6.1. Creating a dynamic web project

1. Access the New Project Dialog

 $\mathsf{Select}\; \textbf{File} \to \textbf{New} \to \textbf{Project}$

Result: The New Project screen displays.

- 2. Define the Project Type
 - a. Click the Dynamic Web Project label by expanding the Web folder.
 - b. Click the Next button to proceed.

Result: The New Dynamic Web Project screen displays.

New Dynamic Web Project			
Dynamic Web Project 🚬			
Create a standalone Dynamic Web project or add it to a new or existing Enterprise Application.			
Project name:			
Project location			
✓ Use default location			
Location: //home/bclare/workLocal/Eclipse_Nightly_Test Browse			
Target runtime			
JBoss v5.0 🗘 New Runtime			
Dynamic web module version			
2.5			
Configuration			
Default Configuration for JBoss v5.0			
A good starting point for working with JBoss v5.0 runtime. Additional facets can later be installed to add new functionality to the project.			
EAR membership			
Add project to an EAR			
EAR project name: EAR			
Working sets			
 Add project to working sets 			
Working sets: Select			
(?) < Back Next > Cancel Finish			

Figure 6.1. Dynamic Web Project Attributes

3. Define the Project Attributes

Define the Dynamic Web Project attributes according to the options displayed in *Table 6.1, "New Dynamic Web Project"*

Field	Mandator	Instruction	Description
Project name	yes	Enter the project name.	The project name can be any name defined by the user.
Project location	yes	Click the Use default location checkbox to define the project location as the Eclipse workspace or define a custom path in the Location field.	The default location corresponds to the Eclipse workspace.
Target runtime	no	Select a pre-configured runtime from the available options or configure a new runtime environment.	The target runtime defines the server to which the application will be deployed.
Dynamic web module version	yes	Select the required web module version.	This option adds support for the Java Servlet API with module versions corresponding to J2EE levels as listed in <i>Table 6.2, "New Dynamic</i> <i>Project - Dynamic web module</i> <i>version</i> ".
Configurat	ioynes	Select the project configuration from the available options.	The project can be based on either a custom or a set of pre-defined configurations as described in <i>Table 6.3,</i> <i>"New Dymanic Project -</i> <i>Configuration"</i> .
EAR membersh	no lip	Add the project to an existing EAR project.	The project can be added to an existing EAR project by selecting the checkbox. Once checked, a new EAR project can be defined by clicking the New Project button.
Working sets	no	Add the project to an existing working set.	A working set provides the ability to group projects or project attributes in a customized way to improve access. A new working set can be defined once the Select button has been clicked.

 Table 6.1. New Dynamic Web Project

Option	Description
2.2	This web module version corresponds to the J2EE 1.2 implementation.
2.3	This web module version corresponds to the J2EE 1.3 implementation.
2.4	This web module version corresponds to the J2EE 1.4 implementation.
2.5	This web module version corresponds to the JEE 5 implementation.

Table 6.2. New Dynamic Project - Dynamic web module version

Table 6.3. New Dymanic Project - Configuration

Option	Description
<custom></custom>	Choosing from one of the pre-defined configurations will minimise the effort required to set up the project.
BIRT Charting Web Project	A project with the BIRT Charting Runtime Component.
BIRT Charting Web Project	A project with the BIRT Reporting Runtime Component.
CXF Web Services Project v2.5	Configures a project with CXF using Web Module v2.5 and Java v5.0.
Default Configuration for JBoss 5.0 Runtime	This option is a suitable starting point. Additional facets can be installed later to add new functionality.
Dynamic Web Project with Seam 1.2	Configures a project to use Seam v1.2.
Dynamic Web Project with Seam 2.0	Configures a project to use Seam v2.0.
Dynamic Web Project with Seam 2.1	Configures a project to use Seam v2.1.
Dynamic Web Project with Seam 2.2	Configures a project to use Seam v2.2.
JBoss WS Web Service Project v3.0	Configures a project with JBossWS using Web Module v2.5 and Java v5.0.
JavaServer Faces v1.2 Project	Configures a project to use JSF v1.2.
Minimal Configuration	The minimum required facets are installed. Additional facets can be chosen later to add functionality to the project.

4. Access the Java sub-dialog

Click Next to proceed.

Result: The New Dynamic Web Project - Java dialog displays.

5. Define the source and ouput folders

Define the Dynamic Web Project source and output folders by adding or editing folders as required.

6. Access the Web Module sub-dialog

Click Next to proceed.

Result: The New Dynamic Web Project - Web Module dialog displays.

New Dynamic Web Project	X
Web Module Configure web module settings.	
Context root: SampleDynamic Content directory: WebContent ☑ Generate web.xml deployment descriptor	
Cancel	Finish

Figure 6.2. New Dynamic Web Project - Web Module

7. Enter the web module settings

Define the settings as listed in *Table 6.4, "New Dynamic Web Project - Web Module*" including the root folder for path names in the web project context and the name of the web content directory.

Field	Mandator	Instruction	Description
Context root	yes	Enter the context root for the project.	The context root identifies a web application to the server and which URLs to delegate to the application.
Content directory	yes	Enter the directory name for the web content.	Web resources such as html, jsp files and graphic files will be written to the specified content directory.

Field	Mandator	Instruction	Description
Generate	no	Check this box to generate a	URL to servlet mappings and
web.xml		deployment descriptor for the	servlet authentication details
deploymer	nt	project.	are written to the deployment
descriptor			descriptor enabling the web
			server to serve requests.

- 8. Open the Java EE perspective.
 - a. Click the Finish button to complete the project setup.

Result: If not already set, a dialog will appear prompting the user to open the relevant perspective.

b. Click the Yes button to display the Java EE perspective.

Result: The project is configured and the Java EE perspective is displayed.

6.1. Sample Web Service

These sections describe how to generate and deploy a sample web service.

6.1.1. Generation

A sample web service can be created by using the **Create a Sample Web Service** wizard as described in *Generate a sample web service*

Procedure 6.2. Generate a sample web service

- 1. Access the New Select a wizard dialog
 - a. Right click on the project name in the Project Explorer view.
 - b. Select New \rightarrow Other.
 - c. Click the Create a Sample Web Service label by expanding the Web Services folder.

Result: The **New - Select a wizard** dialog displays with the selected wizard type highlighted.

2. Access the Generate a Sample Web Service dialog

Click the **Next** button to proceed.

Result: The **Generate a Sample Web Service - Project and Web Service Name** dialog displays.

0	Generate a Sample Web Service		
Project a	nd Web Service Name		
Specify th name for	e Dynamic Web Project, service, package and class the sample web service and web service class.		
Dynamic	Web Project		
WebSer	viceSample 🗸 🗸		
Web Service Name HelloWorld			
Sample V	Veb Service Class		
Package	org.jboss.samples.webservices		
Class	HelloWorld		
?	< Back Next > Cancel Finish		

Figure 6.3. Generate a Sample Web Service - Project and Web Service Name

3. Define the service attributes

Define the project, web service, package and class names according to the options displayed in *Table 6.5, "Project and Web Service Name"*

Table 6.5. Project and Web Service Name

Dialog group	Field	Manda	Instruction	Description
Dynamic Web Project		yes	Enter the project name.	The project name will default to the highlighted project in the Project Explorer . A different project can be selected from the list or entered directly in the editable drop-down list.
Web Service	Name	yes	Enter the name for the web service.	The web service name will be the url for the service as mapped in the deployment descriptor (web.xml).

Dialog group	Field	Manda	Instruction	Description
Sample Web Service Class	Packag	eyes	Enter the package for the web service servlet.	The default package for the sample web service will be displayed.
	Class	yes	Enter the name of the web service servlet.	The default class name will correspond to the default web service name resulting in an equivalent url to servlet name mapping in the deployment descriptor (web.xml).

4. Generate the web service

Click the **Finish** button to complete the web service setup.

Result: The web service classes will be generated and the web.xml file updated with the deployment details.

5. Browse the HelloWorld.java class

Double click the HelloWorld.java class and note the annotated class name and method. These annotations identify the web service entities to the server.



Figure 6.4. web.xml

6. Browse the web.xml deployment decriptor

Double click the web.xml file and note the servlet mapping as defined in *Figure 6.3, "Generate a Sample Web Service - Project and Web Service Name*". Note also that:

- the main servlet for the application is org.jboss.samples.webservices.HelloWorld which is given the custom name HelloWorld; and
- the main servlet is mapped to the particular url /HelloWorld [1].



Figure 6.5. web.xml

Upon start up, the server will write a WSDL file to the server-profile/data/wsdl/ directory and the WSDL can be accessed with *http://localhost:8080/ProjectName/[1]?WSDL* or, *http://localhost:8080/WebServiceSample/HelloWorld?WSDL*.

6.1.2. Deployment

Once created, the sample web service can be deployed to the target runtime as described in *Export the project as a Web Archive (WAR)*.

Procedure 6.3. Export the project as a Web Archive (WAR)

- 1. Access the Export dialog
 - a. Right click on the project name in the **Project Explorer** view.
 - b. Select **Export** \rightarrow **WAR file**.

Result: The **Export- WAR Export** dialog displays with the selected web project highlighted.

0	Export	×
WAR Export Export Web pr	roject to the local file system.	
Web project: Destination: Target runtim I Optimize JBoss v5.0	WebServiceSample ~	Browse
 Export sou Overwrite 	urce files existing file	
?	Cancel	Finish

Figure 6.6. Export - WAR Export dialog

2. Complete the export dialog

Define the WAR file attributes as described in Table 6.6, "Export - War Export"

Table 6.6. Export - War Export

Field	Mandate	Instruction	Description
Web project	yes	Enter the web project name.	The project name will default to the highlighted project in the Project Explorer . A different project can be selected from the list or entered directly in the editable drop-down list.
Destination	yes	Enter or browse to the destination.	Set the destination as the build folder to store the WAR file within the project. Alternatively, deploy the project directly to the deploy

Field	Mandat	Instruction	Description
			directory of the target server profile.
Optimize for a specific server runtime	no	Select this box to optimize the WAR file for deployment to the targeted runtime.	The list of available runtimes will be those configured during the project set-up or by selecting File \rightarrow New \rightarrow Server .

3. **Deploy the application**

Copy the file to the deploy directory of the required target server profile, such as the all profile. Note that the WAR file destination may have already been set as the deploy directory in *Step 2*.

6.2. Sample RESTful Web Service

A sample Restful web service can be generated by following the steps outlined in *Generate a* sample RESTful web service.

Procedure 6.4. Generate a sample RESTful web service

Target runtime must have RESTEasy installed

The sample RESTful web service will not work unless it is deployed to a server with RESTEasy installed.

1. Access the New - Select a wizard dialog

- a. Right click on the project name in the **Project Explorer** view.
- b. Select New \rightarrow Other.
- c. Click the **Create a Sample RESTful Web Service** label by expanding the **Web Services** folder.

Result: The **New - Select a wizard** dialog displays with the selected wizard type highlighted.

2. Access the Generate a Sample RESTful Web Service dialog

Click the Next button to proceed.

Result: The **Generate a Sample RESTful Web Service - Project and Web Service Name** dialog displays.

Generate a	Sample RESTful Web Service 🛛 🗮			
Project and Web Servio	ce Name			
Specify the Dynamic Web name for the sample web	Specify the Dynamic Web Project, service, package and class name for the sample web service and web service class.			
Dynamic Web Project				
RestfulSample	~			
Web Service				
Name MyRESTApplicatio	on			
Update web.xml				
Sample Web Service Clas	5			
Package	org.jboss.samples.rs.webservices			
Class	HelloWorldResource			
Application Class Name:	MyRESTApplication			
? < Back	Next > Cancel Finish			

Figure 6.7. Generate a Sample RESTful Web Service - Project and Web Service Name

3. Define the service attributes

Define the project, web service, package and class names according to the options displayed in *Table 6.7, "Project and Web Service Name"*

Table 6.7. Project and Web Service Name

Dialog group	Field	Manda	Instruction	Description
Dynamic Web Project		yes	Enter the project name.	The project name will default to the highlighted project in the Project Explorer . A different project can be selected from the list or entered directly in the editable drop-down list.
Web Service	Name	yes	Enter the name for the web service.	The web service name will be the url for the service as mapped in the deployment descriptor (web.xml).

Dialog group	Field	Manda	Instruction	Description
	Update web.xml	no I	Check this box to add the service to the deployment descriptor.	This option is checked by default and may be unchecked when deploying to JBoss AS 6.0 or RESTEasy 2.0 servers. Service information is not required in the deployment descriptor for these servers.
Sample Web Service Class	Package	ayes	Enter the package for the web service class.	The default package for the sample web service will be displayed.
	Class	yes	Enter the name of the web service class containing the JAX-RS annotated path.	This class defines the path to the web service and is referenced in the Application Class Name. The Application Class Name is declared in the deployment descriptor providing indirect access to the annotated path.
	Applicat Class Name	iyotens	Enter the name of the Application Class Name.	The Application Class Name constructor instantiates objects of the web service class containing the JAX- RS annotated path, GET and POST methods. It serves as a single point of access to the application for the web server.

4. Generate the web service

Click the **Finish** button to complete the web service setup.

Result: The web service classes will be generated and the web.xml file updated with the deployment details.

5. Browse the MyRESTApplication.java class

Double click the MyRESTApplication.java class and note the constructor instantiating objects of type HelloWorldResource. The relevance of this will be discussed shortly.



Figure 6.8. Application Class - MyRESTApplication.java

6. Browse the HelloWorldResource.java class

Double click the HelloWorldResource.java class and note the JAX-RS annotated path and the annotated GET method.



Figure 6.9. HelloWorldResource.java

7. Browse the web.xml deployment descriptor

Double click the web.xml file and note the *jax.ws.rs.Application* paramater mapped to the **Application** class. Note also that:

- the main servlet for the application is org.jboss.resteasy.plugins.server.servlet.HttpServletDispatcher which is given the custom name Resteasy; and
- the main servlet is not mapped to a particular url as indicated by /*.

The url for sending GET requests can be resolved as follows:

- a. Identify the Application Class as defined in the deployment descriptor.
- b. Note the object type instantiated in the **Application** class and added to the singleton set: HelloWorldResource.
- c. Note the JAX-RS annotated path declared in the corresponding HelloWorldResource class: @Path("/MyRESTApplication") [1].



Figure 6.10. web.xml

The url for sending GET requests is therefore *http://localhost:8080/ProjectName/[1]* or, *http://localhost:8080/RestfulSample/MyRESTApplication*.

RestEasy simple project example

JBoss Tools includes many example projects which are available by selecting $Help \rightarrow Project$ Examples. The following sections describe setting up the example RESTEasy project. This project serves as a good example for testing the numerous **Web Service Test View** functions.

7.1. The example project

Once the required plugins have been installed, the example project can be set up as described in *JBoss Tools New Example Project*

Procedure 7.1. JBoss Tools New Example Project

1. Access the New Example Project Dialog

Select $Help \rightarrow Project Examples$

Result: The New Example Project dialog displays.

- 2. Define the Example Project Type
 - a. Click the **RESTEasy Simple Example** label by expanding the **RESTEasy** node.
 - b. Click the Finish button to complete the project set up.

Result: The simple project is configured and ready to build.



Project requirements

In the event that a message is displayed indicating some requirements could not be configured, click the **Details** button followed by the **Fix** button to rectify the problem. The message will be displayed as a result of missing plugins or a requirement to select or configure a suitable runtime.

3. Build the project

Right click on the project name and select Run As \rightarrow Maven package

Result: The simple.war file is written to the project's 'target directory.

4. Deploy the project

Copy the simple.war file to the deploy directory of the required server profile such as the all profile.

Result: The simple.war file is written to the target directory.

5. Determine the URL for the web service

Double click the web.xml file and note the *jax.ws.rs.Application* paramater mapped to the **Application** class. Note also that:

- the main servlet for the application is org.jboss.resteasy.plugins.server.servlet.HttpServletDispatcher Which is given the custom name Resteasy; and
- the main servlet is mapped to the url /rest-services/* [1].

The url for sending GET requests can be resolved as follows:

- a. Identify the Application class as defined in the deployment descriptor.
- b. Note the object type (CustomerResource) instantiated in the Application class (ShoppingApplication) and added to the singleton set (singletons.add(new CustomerResource())).
- c. Note the JAX-RS annotated path declared in the corresponding CustomerResource class: @Path("/customers") [2].



Figure 7.1. web.xml

The url for sending GET requests can be formed from *http://localhost:8080/ProjectName/[1]/* [2] or, *http://localhost:8080/simple/rest-services/customers.*.

Web Service Test View

JBoss Tools provides a view to test web services. The **Web Services Test View** can be displayed by following the steps in *Web Services Test View*.

Procedure 8.1. Web Services Test View

- Access the Show View dialog
 - a. Select Window \rightarrow Show View \rightarrow Other

Result: The Show View dialog displays.

b. Click on the **Web Services Tester** label by expanding the **JBoss Tools Web Services** node and click **OK**.

Result: The Web Services test view displays.



Figure 8.1. Web Service Test View

The main components of the Web Service Tester View are:

- WSDL path/button bar (Table 8.1, "WSDL path/button bar")
- Request details panel (Table 8.2, "Request details panel")
- Response details panel (Table 8.3, "Response details panel")

Component	Description
Editable dropdown list	Enter the location of the WSDL file or HTTP address of the service to be tested. The combo box requires the path to the WSDL in a URI format.
Combo box	Select the type of service to test. The options are JAX-WS or any other option to test a JAX-RS service using HTTP request methods (PUT, GET, POST, DELETE or OPTIONS).
Toolbar button - Get From WSDL	Click this button to display the Select WSDL dialog. Enter the URL , File system location or Eclipse Workspace location of the WSDL file. Given a vaild file, the dialog will allow selection of the Port and Operation to test. Once selected, the request details will be displayed in the Request Details panel.
Toolbar button - Invoke	Once the WSDL file has been selected, the service can be invoked by clicking this button. Reponse details will be displayed in the Response Details panel.

Table 8.1. WSDL path/button bar

Table 8.2. Request details panel

Component	Description
Prompt for Basic Authentication	Select this check box to send a username and password with the request. Entering the user details for each subsequent request is not necessary as the details are stored in memory.
Headers	Enter (Add) one or more name=value pairs. These headers will be passed with the invocation request at the HTTP level where possible.
Parameters	As for header information, enter one or more name=value pairs by clicking the Add button.
Body	Enter the JAX-WS SOAP request messages or input for JAX-RS service invocations in this text box.

Table 8.3. Response details panel

Component	Description
Response headers	The headers returned by the service invocation will be displayed in this panel.
Response body	The JAX-WS and JAX-RS response bodies will be displayed in this box. The raw text returned form the web service invocation can be displayed by clicking the Show Raw button. The output will be embedded in a html browser by clicking the Show in Browser

Component	Description
	button. The output can alternatively be displayed in the Eclipse editor as xml or raw text (depending on the response content type) by clicking the Show in Editor button.
Parameters	As for header information, enter one or more name=value pairs by clicking the Add button.
Body	Enter JAX-WS SOAP request messages and input for JAX-RS service invocations in this text box.

The following sections describe testing JAX-WS and JAX-RS web services including the necessary preliminary steps.

8.1. Preliminaries

The following procedure describes the steps to perform before testing a web service.

Procedure 8.2. Testing a JAX-RS web service

Preliminary steps

Prior to testing a web service:

a. The Web Service Test View should be opened as described in Web Services Test View;

Result: The Web Service Test View displays.



Figure 8.2. Web Service Test View

b. A web service has been deployed to the deploy directory of the chosen server profile as described in:

- Export the project as a Web Archive (WAR) for the RestfulSample project; or
- JBoss Tools New Example Project for the RESTEasy sample project.
- c. The server has been started with run.sh -c <profile>

8.2. Testing a Web Service

A JAX-WS web service can be tested by using the **Web Service Tester View** displayed in *Figure 8.1, "Web Service Test View*". The JAX-WS test is specified by:

- 1. Selecting the **JAX-WS** combo box option.
- 2. Entering the location of the WDSL file.

Step 2 can be performed in a number of ways including:

- · entering the location directly in the editable dropdown list; or
- clicking the Get from WSDL file button and entering the URL, Eclipse workspace or File system details.

Testing a JAX-WS web service demonstrates testing the **WebServiceSample** project developed in *Generate a sample web service*.

Procedure 8.3. Testing a JAX-WS web service

 Following the preliminary steps described in *Testing a JAX-RS web service*, select **JAX-WS** from the available combo box options.

Result: The SOAP message details are displayed in the **Body Text** textbox of the **Request Details** panel.

Body Text

```
<?xml version="1.0" encoding="utf-8" standalone="yes" ?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/
envelope/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" >
<soap:Body>
</soap:Body>
</soap:Envelope>
```

Figure 8.3. JAX-WS Body Text

- Enter the location of the WSDL file in the editable dropdown list. The location for the WebServiceSample web service is <u>http://localhost:8080/WebServiceSample/HelloWorld?</u> WSDL [http://localhost:8080/WebServiceSample/HelloWorld?WSDL]
- 3. Click the **Invoke** button.

Result: The Select WDSL dialog appears.

0	Select WSDL	x		
Specify the Source WSDL for the Web Service				
Select the source WSDL in the workspace or file system, or provide a URL from which to download the WSDL.				
WSDL URI: http://localhost:8080/WebServiceSample/HelloWorld?WSDL				
	Workspace File system UF	۱L)		
Select the s	ervice operation:	_		
Service:	HelloWorldService	٥		
Port:	HelloWorldPort	٥		
Operation:	sayHello			
?	OK Cancel			

Figure 8.4. Select WSDL

4. Select the required service attributes

Select the Service, Port and Operation from the combo boxes and click OK.

Results: The <soap:Body/> section of the SOAP message is filled with the SayHello message details.

<soap:body></soap:body>
<sayhello xmlns="http://webservices.samples.jboss.org/"></sayhello>
<arg0>?</arg0>

Figure 8.5. JBoss Tools Project Creation

The response header details are returned.

Response Headers

Transfer-encoding=[chunked] [HTTP/1.1 200 OK] Content-type=[text/xml;charset=UTF-8] X-powered-by=[Servlet 2.5; JBoss-5.0/JBossWeb-2.1] Server=[Apache-Coyote/1.1] Date=[Thu, 16 Sep 2010 03:50:15 GMT]

Figure 8.6. JBoss Tools Project Creation

The response message body is displayed in the **Response Body** textbox.

- Response Body

<env:Envelope xmIns:env="http://schemas.xmIsoap.org/
soap/envelope/">
<env:Header/>
<env:Body>
<ns2:sayHelloResponse xmIns:ns2="http://
webservices.samples.jboss.org/">
<return>Hello null!</return>
</ns2:sayHelloResponse>
</env:Body>
</env:Body>
</env:Envelope>

Figure 8.7. JBoss Tools Project Creation

These results indicate a successful test.

8.3. Testing a RESTful Web Service

Testing a RESTful (JAX-RS) web service is achieved by following a similar procedure to testing a JAX-WS web service. Instead of selecting the JAX-WS option in the combo box, the JAX-RS service is invoked by sending HTTP method requests of the form OPTIONS, GET, POST, PUT and DELETE. As there is no WSDL file associated with a JAX-RS service, the available options can be determined by selecting **OPTIONS** in the combo box.

A JAX-RS web service can be tested by using the **Web Service Tester View** displayed in *Figure 8.1, "Web Service Test View*". The JAX-RS test is specified by:

1. Selecting the **OPTIONS** combo box option.

2. Entering the url of the JAX-RS web service.

The test procedure is discussed in the following sections for both the **RestfulSample** and the **RESTEasy** sample projects developed earlier.

8.3.1. RestfulSample project

Procedure 8.4. RestfulSample test

1. a. Query the available options

Select **OPTIONS** from the available combo box options.

- b. Enter the url of the web service in the editable drop-down list: *http://localhost:8080/ RestfulSample/MyRESTApplication.*
- c. Click the Invoke button

Result: The **Response Headers** text area indicates that the allowed options are [GET, OPTIONS, HEAD] as shown in *Figure 8.8, "JAX-RS Response Header Text*".

- Response Details

Response Headers

[HTTP/1.1 200 OK] Date=[Mon, 25 Oct 2010 11:12:24 GMT] Content-Length=[0] Allow=[GET, OPTIONS, HEAD]

Figure 8.8. JAX-RS Response Header Text

2. Test the GET request

- a. Having established that the **GET** request is valid, select **GET** from the available combo box options.
- b. Click the **Invoke** button.

Result: The **Response Body** text area displays the expected "Hello World" text as shown in *Figure 8.9, "JAX-RS Response Body Text*".

🕶 Response Body

Hello	World!	<u></u>	

🖳 🗖 🔝 🎱

Figure 8.9. JAX-RS Response Body Text

8.3.2. RESTEasy sample project

Procedure 8.5. Testing a JAX-RS web service- POST and GET requests

1. a. Query the available options

Following the preliminary steps described in *Testing a JAX-RS web service*, select the **OPTIONS** method from the operations text area.

- b. Enter the url of the web service in the editable drop-down list *http://localhost:8080/simple/ rest-services/customers*.
- c. Click the Invoke button

Result: The **Response Headers** text area indicates that the allowed options are [POST, OPTIONS] as shown in *Figure 8.10, "JAX-RS RESTEasy project Body Text"*.

```
- Response Details
```

Response Headers

[HTTP/1.1 200 OK] Date=[Mon, 25 Oct 2010 12:08:17 GMT] Content-Length=[0] Allow=[POST, OPTIONS] Server=[Apache-Coyote/1.1] X-Powered-By=[Servlet 2.5; JBoss-5.0/JBossWeb-2.1]

Figure 8.10. JAX-RS RESTEasy project Body Text

2. Test the POST option

a. Select **POST** method in the the operations drop-down list.
b. We will post xml data to this particular web service. Complete the header details by entering content-type=application/xml in the text area and click Add to add it to the Headers list.

Result: The **content-type** is added to the **Headers** list as shown in *Figure 8.11, "content-type header"*.

Headers



Figure 8.11. content-type header

c. Enter customer details

Enter the customer details in the **Body Text** area as displayed in *Figure 8.12, "Customer data"*.

- Body Text

<customer></customer>	
<first-name>Bill</first-name>	
<last-name>Customer</last-name>	
<street>28 Red Hat Way</street>	
<city>Boston</city>	
<state>MA</state> <zip>02115</zip>	
<country>USA</country>	

Figure 8.12. Customer data

d. Click the Invoke button.

Result: The **Response Headers** area indicated that a record was created and lists the location as *http://localhost:8080/simple/rest-services/cuntomers/1* as shown in *Figure 8.13, "Customer added"*.

Response Headers

```
[HTTP/1.1 201 Created]
Date=[Wed, 27 Oct 2010 12:29:00 GMT]
Content-Length=[0]
Location=[http://localhost:8080/simple/rest-services/customers/1]
Server=[Apache-Coyote/1.1]
X-Powered-By=[Servlet 2.5; JBoss-5.0/JBossWeb-2.1]
```

Figure 8.13. Customer added

The console also indicates the successful creation of the customer: 10:44:33,846 INFO [STDOUT] Created customer 1

3. Test the GET option

- a. Select the GET method in the the operations drop-down list.
- b. We will retrieve the record created in the previous step. Enter the url for the record returned in the previous step *http://localhost:8080/simple/rest-services/customers/1*
- c. Click the **Invoke** button.

Result: The **Response Headers** area indicates a [HTTP/1.1 200 OK] response and the customer data is retrieved and displayed in the **Response Body** area as shown in *Figure 8.14, "GET response"*.

🕶 Response Body



<customer id="1"></customer>
<first-name>Bill</first-name>
<last-name>Customer</last-name>
<street>28 Red Hat Way</street>
<city>Boston</city>
<state>MA</state>
<zip>02115</zip>
<country>USA</country>

Figure 8.14. GET response

4. Test the PUT option

- a. Editing a record is achieved by using the **PUT** method. Select the **PUT** method in the operations drop-down list.
- b. Enter the url of the record to be edited http://localhost:8080/simple/rest-services/ customers/1
- c. Enter the data in the **Body Text** area. Replace the first-name with a different entry as in *Figure 8.15, "Updated customer data"*

- Body Text

<customer></customer>	-
<first-name>Terry</first-name>	
<last-name>Customer</last-name>	
<street>28 Red Hat Way</street>	
<city>Bostin</city>	
<state>MA</state> <zip>02115</zip>	
<country>USA</country>	
	~

Figure 8.15. Updated customer data

- d. Ensure that the content-type=application/xml header is in the Headers list.
- e. Click the Invoke button.

Result: The **Response Headers** area indicates a No Response ([HTTP/1.1 204 No Content]) *Figure 8.16, "Response header following PUT"*.

Response Headers

```
[HTTP/1.1 204 No Content]
Date=[Mon, 01 Nov 2010 10:51:28 GMT]
Server=[Apache-Coyote/1.1]
X-Powered-By=[Servlet 2.5; JBoss-5.0/JBossWeb-2.1]
```

Figure 8.16. Response header following PUT

In this instance, the console does not indicate an update was performed, however, the console may provide useful information following an operation.

5. Check the updated data with a GET

Perform a GET operation by following the steps in Step 3.

Result: The Response Body area displays the updated data.

- Response Body

```
<customer id="1">
<first-name>Terry</first-name>
<last-name>Customer</last-name>
<street>28 Red Hat Way</street>
<city>Bostin</city>
<state>MA</state>
<zip>02115</zip>
<country>USA</country>
</customer>
```

Figure 8.17. Custmer data updated

- 6. Test the DELETE option
 - a. Deleting a record is a similar process to posting. Select the **DELETE** method in the operations drop-down list.
 - b. Enter the url of the record to be deleted http://localhost:8080/simple/rest-services/ customers/1
 - c. Click the Invoke button.

Result: The **Response Headers** area indicates a No Response ([HTTP/1.1 204 No Content]) as was the case for the PUT operation in *Figure 8.16, "Response header following PUT"*.

Once again, the console does not indicate an update was performed, however, the console may provide useful information following an operation.

7. Check the DELETE operation with a GET

Perform a GET operation by following the steps in Step 3.

Result: The **Response Body** area returns an error report indicating that The requested resource () is not available and the **Response Headers** area returns a [HTTP/1.1 404 Not Found].

Response Headers

[HTTP/1.1 404 Not Found]
Date=[Mon, 01 Nov 2010 11:23:55 GMT]
Content-Length=[942]
Content-Type=[text/html;charset=utf-8]
Server=[Apache-Coyote/1.1]

Figure 8.18. Custmer data deleted

The response header and body messages indicate that the data was successfully deleted.