

# Academy Web Service

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## Web Service

Tomcat entryptoint

## Web Services

Endpoint	Information
Service Name: {http://academy/}HelloImplService Port Name: {http://academy/}HelloImplPort	Address: <a href="http://localhost:8080/hello/hello">http://localhost:8080/hello/hello</a> WSDL: <a href="http://localhost:8080/hello/hello?wsdl">http://localhost:8080/hello/hello?wsdl</a> Implementation class: academy.HelloImpl

## WSDL Operations

<http://localhost:8080/hello/hello?wsdl>

```
</message>
<portType name="hello">
  <operation name="test">
    <input wsam:Action="http://academy/hello/testRequest" message="tns:test"/>
    <output wsam:Action="http://academy/hello/testResponse" message="tns:testResponse"/>
  </operation>
  <operation name="hello">
    <input wsam:Action="http://academy/hello/helloRequest" message="tns:hello"/>
    <output wsam:Action="http://academy/hello/helloResponse" message="tns:helloResponse"/>
  </operation>
  <operation name="getUsers">
    <input wsam:Action="http://academy/hello/getUsersRequest" message="tns:getUsers"/>
    <output wsam:Action="http://academy/hello/getUsersResponse" message="tns:getUsersResponse"/>
  </operation>
  <operation name="changeUserName" parameterOrder="id newName">
    <input wsam:Action="http://academy/hello/changeUserNameRequest" message="tns:changeUserName"/>
    <output wsam:Action="http://academy/hello/changeUserNameResponse" message="tns:changeUserNameResponse"/>
    <fault message="tns:UserNotFoundException" name="UserNotFoundException" wsam:Action="http://academy/hello/changeUserName/Fault/UserNotFoundException"/>
  </operation>
  <operation name="deleteUser">
    <input wsam:Action="http://academy/hello/deleteUserRequest" message="tns:deleteUser"/>
    <output wsam:Action="http://academy/hello/deleteUserResponse" message="tns:deleteUserResponse"/>
    <fault message="tns:UserNotFoundException" name="UserNotFoundException" wsam:Action="http://academy/hello/deleteUser/Fault/UserNotFoundException"/>
  </operation>
  <operation name="createUser" parameterOrder="id name">
    <input wsam:Action="http://academy/hello/createUserRequest" message="tns:createUser"/>
    <output wsam:Action="http://academy/hello/createUserResponse" message="tns:createUserResponse"/>
  </operation>
</portType>
```

## Java WebService Declaration

```
@WebService(name="hello")
@SOAPBinding(style = Style.RPC)
public interface Hello {
    public String msg = "Hello";
    public ArrayList<User> userList = new ArrayList<User>();

    @WebMethod
    public String hello();

    @WebMethod
    public String test(String param);

    @WebMethod
    public User createUser(@WebParam(name = "id") int id, @WebParam(name = "name")
String name);

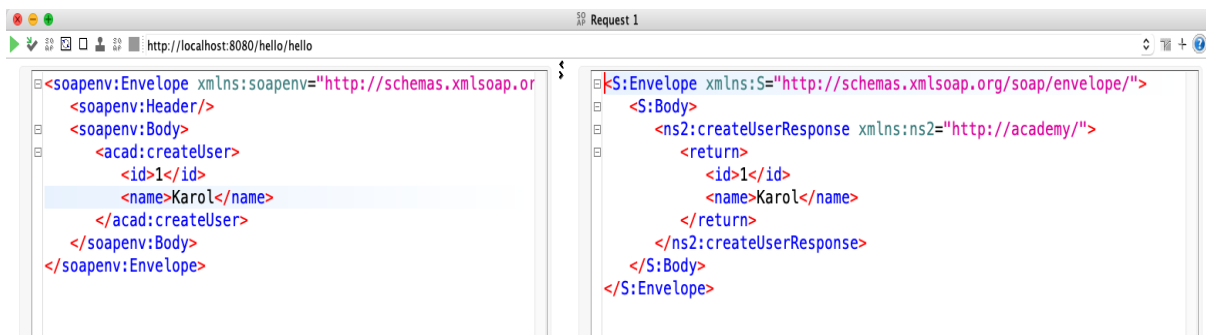
    @WebMethod
    public User[] getUsers();

    @WebMethod
    public boolean changeUserName(@WebParam(name = "id") int id, @WebParam(name =
"newName") String newName) throws UserNotFoundException;

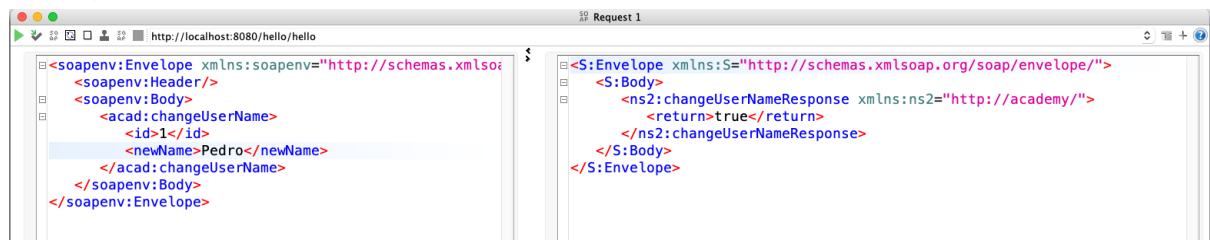
    @WebMethod
    public boolean deleteUser(@WebParam(name = "id") int id) throws
UserNotFoundException;
```

## Operations tested with SoapUI

### Create user



## Change user name



The screenshot shows a SOAP client window with two panes. The left pane displays the request XML, and the right pane displays the response XML. The request is a `changeUserName` operation with a new name of `Pedro`. The response is a `changeUserNameResponse` with a `return` value of `true`.

```
<?xml version='1.0'?'>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
  <soapenv:Header/>
  <soapenv:Body>
    <acad:changeUserName>
      <id>1</id>
      <newName>Pedro</newName>
    </acad:changeUserName>
  </soapenv:Body>
</soapenv:Envelope>
```

```
<?xml version='1.0'?'>
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:changeUserNameResponse xmlns:ns2="http://academy/">
      <return>true</return>
    </ns2:changeUserNameResponse>
  </S:Body>
</S:Envelope>
```

## Get users

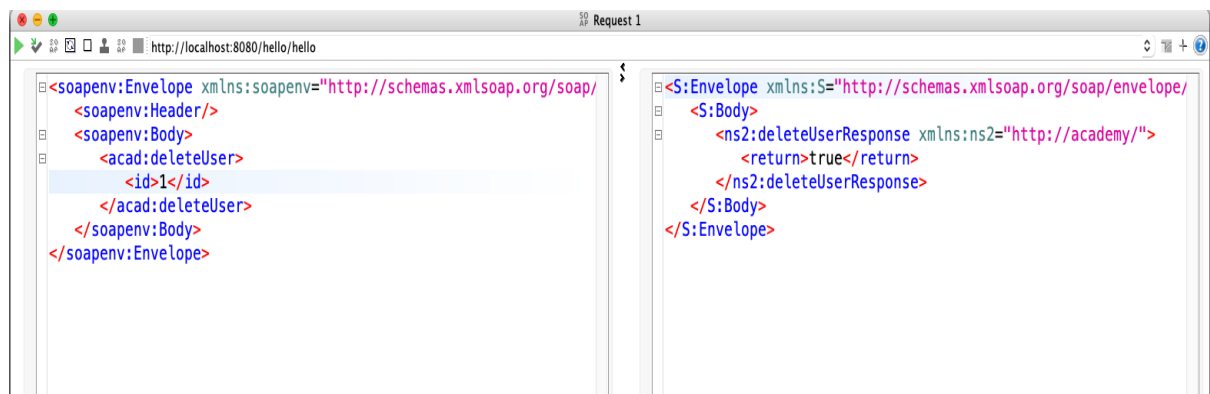


The screenshot shows a SOAP client window with two panes. The left pane displays the request XML, and the right pane displays the response XML. The request is a `getUsers` operation. The response is a `getUsersResponse` with a list of users, including one with `id` 1 and `name` `Pedro`.

```
<?xml version='1.0'?'>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
  <soapenv:Header/>
  <soapenv:Body>
    <acad:getUsers/>
  </soapenv:Body>
</soapenv:Envelope>
```

```
<?xml version='1.0'?'>
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:getUsersResponse xmlns:ns2="http://academy/">
      <return>
        <item>
          <id>1</id>
          <name>Pedro</name>
        </item>
      </return>
    </ns2:getUsersResponse>
  </S:Body>
</S:Envelope>
```

## Delete user

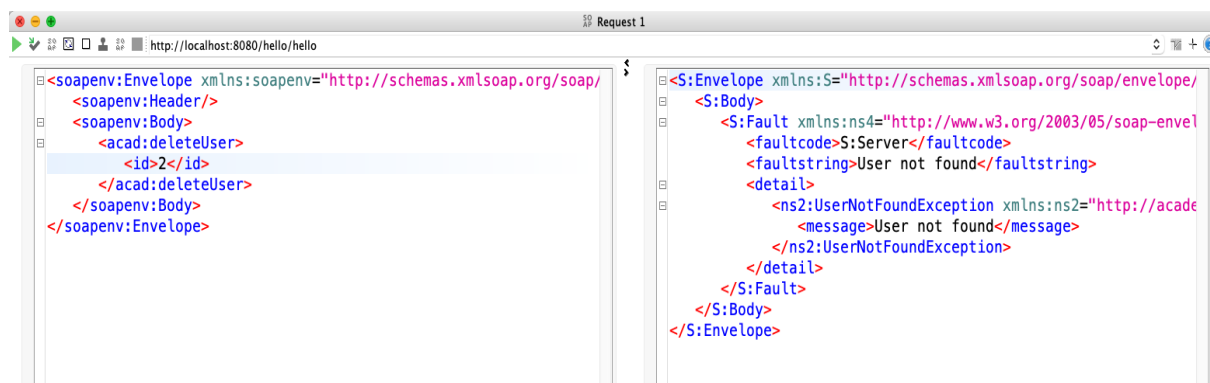


The screenshot shows a SOAP client window with two panes. The left pane displays the request XML, and the right pane displays the response XML. The request is a `deleteUser` operation with `id` 1. The response is a `deleteUserResponse` with a `return` value of `true`.

```
<?xml version='1.0'?'>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
  <soapenv:Header/>
  <soapenv:Body>
    <acad:deleteUser>
      <id>1</id>
    </acad:deleteUser>
  </soapenv:Body>
</soapenv:Envelope>
```

```
<?xml version='1.0'?'>
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:deleteUserResponse xmlns:ns2="http://academy/">
      <return>true</return>
    </ns2:deleteUserResponse>
  </S:Body>
</S:Envelope>
```

## Exception handling



The screenshot shows a SOAP client window with two panes. The left pane displays the request XML, and the right pane displays the response XML. The request is a `deleteUser` operation with `id` 2. The response is a fault message indicating that the user was not found.

```
<?xml version='1.0'?'>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
  <soapenv:Header/>
  <soapenv:Body>
    <acad:deleteUser>
      <id>2</id>
    </acad:deleteUser>
  </soapenv:Body>
</soapenv:Envelope>
```

```
<?xml version='1.0'?'>
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <S:Fault xmlns:ns4="http://www.w3.org/2003/05/soap-envelope" faultcode="S:Server" faultstring="User not found">
      <detail>
        <ns2:UserNotFoundException xmlns:ns2="http://academy/">
          <message>User not found</message>
        </ns2:UserNotFoundException>
      </detail>
    </S:Fault>
  </S:Body>
</S:Envelope>
```

# Maven Project Structure

- academy-parent (maven parent module)
- academy-webservice (maven submodule)
- academy-client (maven submodule)

Submodule declarations in parent pom:

```
<modules>
  <module>academy-webservice</module>
  <module>academy-client</module>
</modules>
```

The web service builds a .war file that deploys to Tomcat (or any servlet server). It also generates a .jar file so academy-client can access its classes (academy-client needs the service interface and user model in order to execute operations).

```
<plugin>
  <groupId>org.apache.maven.plugins</groupId>
  <artifactId>maven-war-plugin</artifactId>
  <version>3.3.1</version>
  <configuration>
    <failOnMissingWebXml>true</failOnMissingWebXml>
    <attachClasses>true</attachClasses>
  </configuration>
</plugin>
```

## Parent POM

```
<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
https://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>academy-parent</groupId>
  <artifactId>academy-parent</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <packaging>pom</packaging>
  <name>academy-parent</name>
  <modules>
    <module>academy-webservice</module>
    <module>academy-client</module>
  </modules>
  <dependencies>
    <dependency>
      <groupId>com.sun.xml.ws</groupId>
      <artifactId>jaxws-ri</artifactId>
      <version>2.3.3</version>
      <type>pom</type>
    </dependency>
    <dependency>
      <groupId>javax.servlet</groupId>
      <artifactId>servlet-api</artifactId>
      <version>2.5</version>
      <scope>provided</scope>
    </dependency>
    <!--
https://mvnrepository.com/artifact/javax.xml.ws/jaxws-api -->
    <!--
https://mvnrepository.com/artifact/org.springframework/spring-core -->
    <dependency>
      <groupId>org.springframework</groupId>
      <artifactId>spring-core</artifactId>
      <version>3.2.18.RELEASE</version>
    </dependency>
    <!--
https://mvnrepository.com/artifact/org.springframework/spring-context
-->
    <dependency>
      <groupId>org.springframework</groupId>
      <artifactId>spring-context</artifactId>
      <version>3.2.18.RELEASE</version>
    </dependency>
```

```
<!--  
https://mvnrepository.com/artifact/org.springframework/spring-web -->  
    <dependency>  
        <groupId>org.springframework</groupId>  
        <artifactId>spring-web</artifactId>  
        <version>3.2.18.RELEASE</version>  
    </dependency>  
    <dependency>  
        <groupId>org.springframework</groupId>  
        <artifactId>spring-webmvc</artifactId>  
        <version>3.2.18.RELEASE</version>  
    </dependency>  
    <dependency>  
        <groupId>junit</groupId>  
        <artifactId>junit</artifactId>  
        <version>4.12</version>  
        <scope>test</scope>  
    </dependency>  
    <dependency>  
        <groupId>org.apache.maven.plugins</groupId>  
        <artifactId>maven-war-plugin</artifactId>  
        <version>3.3.2</version>  
    </dependency>  
</dependencies>  
    <properties>  
        <maven.compiler.source>1.8</maven.compiler.source>  
        <maven.compiler.target>1.8</maven.compiler.target>  
        <main.basedir>${project.basedir}</main.basedir>  
    </properties>  
</project>
```

## Academy-webservice POM

```
<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
https://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <parent>
    <groupId>academy-parent</groupId>
    <artifactId>academy-parent</artifactId>
    <version>0.0.1-SNAPSHOT</version>
  </parent>
  <artifactId>academy-webservice</artifactId>

  <build>
    <plugins>
      <plugin>
        <groupId>org.apache.maven.plugins</groupId>
        <artifactId>maven-war-plugin</artifactId>
        <version>3.3.1</version>
        <configuration>

<failOnMissingWebXml>true</failOnMissingWebXml>
          <attachClasses>true</attachClasses>
        </configuration>
      </plugin>
      <plugin>
        <groupId>org.apache.maven.plugins</groupId>
        <artifactId>maven-compiler-plugin</artifactId>
        <version>3.8.1</version>
      </plugin>
    </plugins>
  </build>
  <properties>
    <maven.compiler.source>1.8</maven.compiler.source>
    <maven.compiler.target>1.8</maven.compiler.target>
  </properties>
  <packaging>war</packaging>
</project>
```

## Academy-client POM

```
<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
https://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <parent>
    <groupId>academy-parent</groupId>
    <artifactId>academy-parent</artifactId>
    <version>0.0.1-SNAPSHOT</version>
  </parent>
  <artifactId>academy-client</artifactId>
  <dependencies>
    <dependency>
      <groupId>academy-parent</groupId>
      <artifactId>academy-webservice</artifactId>
      <version>0.0.1-SNAPSHOT</version>
      <classifier>classes</classifier>
    </dependency>
  </dependencies>
</project>
```



# Web Service Client

## Java Client Implementation

```
@WebServiceClient(targetNamespace = "http://localhost:8080/", wsdlLocation =
"http://localhost:8080/hello/hello?wsdl", name = "HelloImplService")
public class ClientService extends Service {

    protected ClientService(URL wsdlDocumentLocation, QName serviceName) {
        super(wsdlDocumentLocation, serviceName);
    }

    @WebEndpoint(name = "hello")
    public Hello getHelloPort() {
        return super.getPort(new QName("http://academy/", "HelloImplPort"),
Hello.class);
    }
}
```

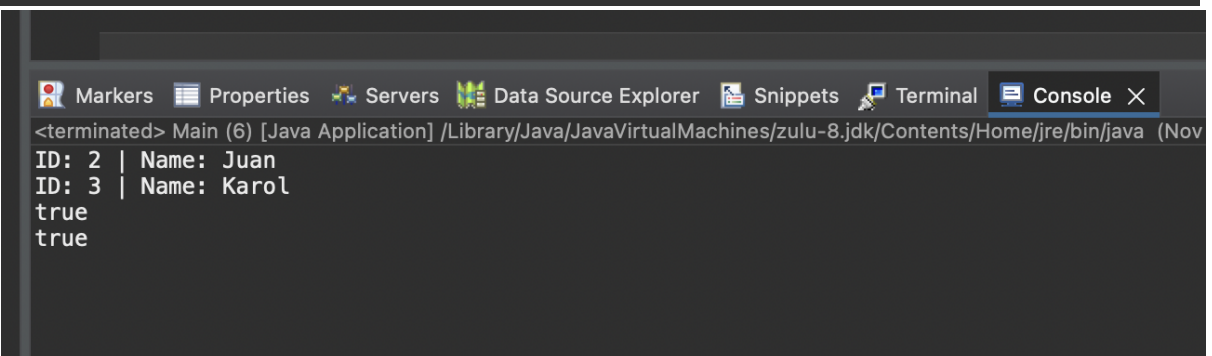
## Client test

```
ClientService es = new ClientService(new
URL("http://localhost:8080/hello/hello?wsdl"),
new QName("http://academy/", "HelloImplService"));

Hello clientPort = es.getHelloPort();
clientPort.createUser(2, "Juan");
clientPort.createUser(3, "Karol");

User[] userList = clientPort.getUsers();

for(User u : userList) {
    System.out.println("ID: " + u.getId() + " | Name: " + u.getName());
}
clientPort.changeUserName(2, "Pedro");
clientPort.deleteUser(2);
```



The screenshot shows the IDE's console window with the following output:

```
<terminated> Main (6) [Java Application] /Library/Java/JavaVirtualMachines/zulu-8.jdk/Contents/Home/jre/bin/java (Nov
ID: 2 | Name: Juan
ID: 3 | Name: Karol
true
true
```