JavaOne℠

Coding SOAP and REST Together

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Goal

We will show you how to combine the good from REST and SOAP to build better web services

Agenda

- **JAX-WS (SOAP) Basics**
- JAX-RS (REST) Basics
- Code both together (demo)
- Bad Practices (demo)
- Good Practices
- Music Store demo

Simple Web Service - POJO

Write code:

```
import javax.jws.WebService;
@WebService
public class TechSessionWS {
    public TechSession getSession(String s) {
        return getTS(s);
    }
}
```

Compile & Deploy

Simple Web Service – The Result

WSDL Definition (The Contract)

```
- <definitions targetNamespace="http://greeter/" name="GreeterService">
  - <types>
    - <xsd:schema>
        <xsd:import namespace="http://greeter/" schemaLocation="http://localhost:8080/GreeterProject/GreeterService?xsd=1"/>
      </xsd:schema>
    </types>
  - <message name="sayHello">
      <part name="parameters" element="tns:sayHello"/>
    </message>
  - <message name="sayHelloResponse">
      <part name="parameters" element="tns:sayHelloResponse"/>
    </message>
  - <portType name="Greeter">
    - <operation name="sayHello">
        <input message="tns:sayHello"/>
        <output message="tns:sayHelloResponse"/>
      </operation>
    </portType>
  - <binding name="GreeterPortBinding" type="tns:Greeter">
      <soap:binding transport="http://schemas.xmlsoap.org/soap/http" style="document"/>
    - <operation name="sayHello">
        <soap:operation soapAction=""/>
      - <input>
          <soap:body use="literal"/>
        </input>
      - <output>
          <soap:body use="literal"/>
        </output>
      </operation>
    </binding>
  - <service name="GreeterService">
    - <port name="GreeterPort" binding="tns:GreeterPortBinding">
        <soap:address location="http://localhost:8080/GreeterProject/GreeterService"/>
      </port>
    </service>
</definitions>
```

Request

```
- <soapenv:Envelope>
  - <soapenv:Body>
    - <q0:sayHello>
        <s>JavaOne</s>
      </q0:sayHello>
    </soapenv:Body>
</soapenv:Envelope>
```

Response

```
- <S:Envelope>
  - <S:Body>
    - <sayHelloResponse>
        <return>Hello JavaOne</return>
      </sayHelloResponse>
    </S:Body>
</S:Envelope>
```

Java EE Client

```
@Stateless
public class MyBean {
    @WebServiceRef(TechSessionWS.class)
    TechSessionWS proxy;

    public TechSession useIt() {
      return proxy.getSession("4883");
    }
}
```

Advantages

- No deployment descriptors needed
  - Use annotations
  - Descriptors still available if required
- Part of Java EE 5 and 6
- Protocol and Transport independence
  - JMS, SMTP, Fast Infoset, ...

The Runtime

- METRO = JAXB + JAX-WS + WSIT
  - Web Service Stack
  - http://metro.dev.java.net
- Running on GlassFish v2 / v3 / Tomcat / ...

Why SOAP?

- You contract/part of it is already defined
- Well established infrastructure and know-how
- Advanced security scenarios
- Other non-functional requirements (QoS)

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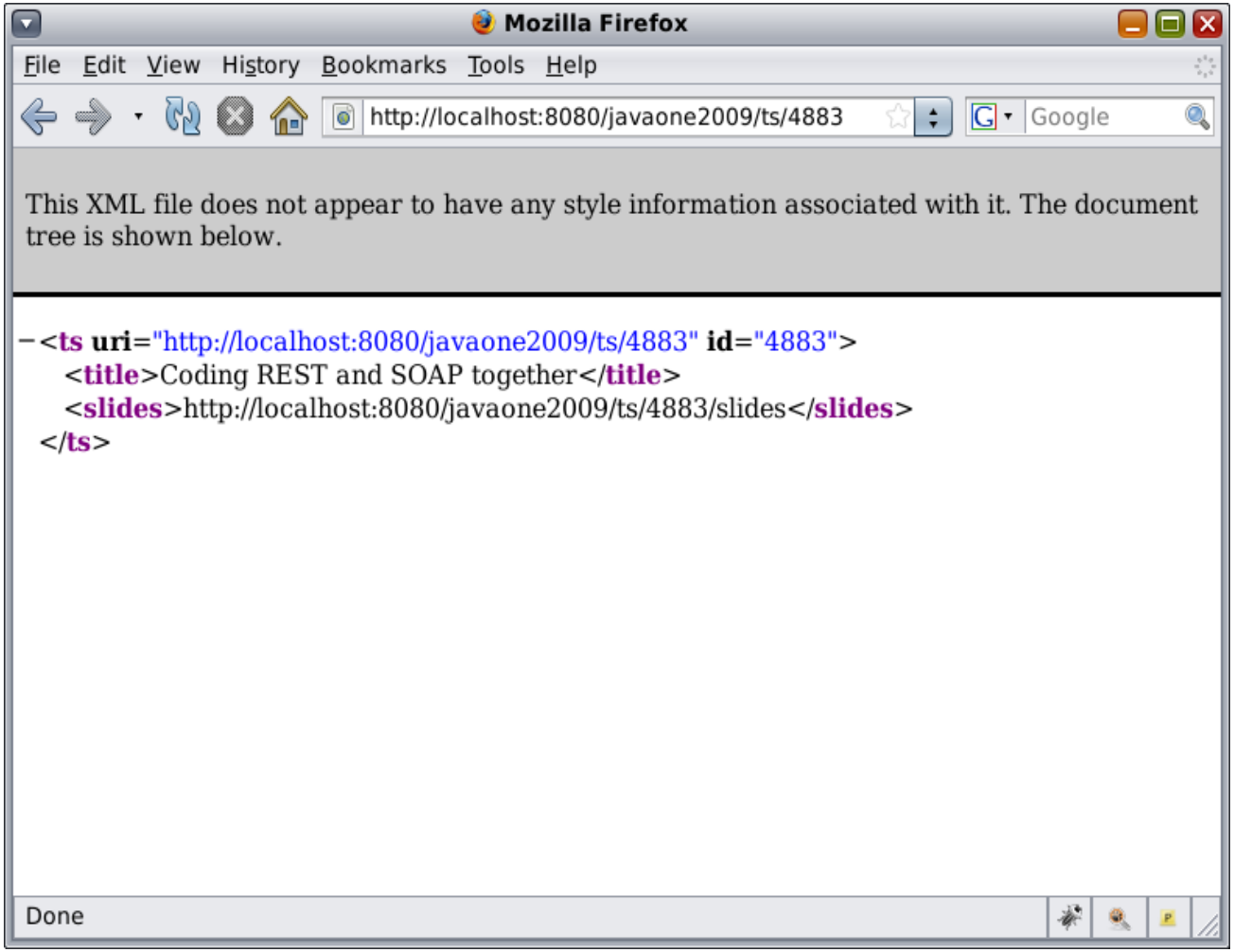
JAX-RS Web Resource

```
@Path("ts/{id}")
public class TechSessionResource {
  @GET
  @Produces("application/xml","application/json")
  public TechSession getSession(
      @PathParam("id") String id) {
    return getTS(id);
  }
}
```

Client side


Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:8080/javaone2009/ts/4883
Google
This XML file does not appear to have any style information associated with it. The document tree is shown below.
−<ts uri="http://localhost:8080/javaone2009/ts/4883" id="4883">
<title>Coding REST and SOAP together</title>
<slides>http://localhost:8080/javaone2009/ts/4883/slides</slides>
</ts>
Done

Another Web Resource

```
public class SlidesResource {
  @PUT @Consumes(
     "application/vnd.oasis.opendocument.presentation")
  public void updateSlides(Slides s) { slides = s;}
  @GET @Produces({"application/pdf",
      "application/vnd.oasis.opendocument.presentation"})
  public Slides getSlides() { return slides;}
  @DELETE
  public void deleteSlides() { slides = null;}
}
```

Why REST ?

- Simplicity (remember the browser as a client?)
- Takes advantage of the existing caches/proxies
- Serendipity
- Scalability (HTTP load balancers)

Common JAX-WS/RS concepts

- POJO based
- Annotations driven
- Web container at runtime

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Let's combine them together!

```
@Path("ts/{id}")
  @WebService
public class TechSessionResource {
  @GET
  @Produces("application/xml","application/json")
  @WebMethod
  public TechSession getSession(
          @PathParam("id") String id) {
     return getTS(id);
  }
}
```

Let's combine them together!

- Demo – TechSession SOAP & REST live

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What might get wrong?

- Do not fall into RPC over HTTP
  - REST-RPC Hybrid
- Use compatible security
  - Securing SOAP doesn't automatically secure the REST
- Annotation hell

What might get wrong

- Demo – how to break REST

What went wrong

- Misuse of HTTP GET method
  - coding method names into URIs
  - GET used for data manipulation
  - danger of unintended data corruption
- Another widely misused method is POST
- Introduced a security hole
  - Only SOAP is secured
  - REST interface remained unsecured !

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Good practices

- Think about the consumers of your service
- Do you really need both SOAP and REST?
  - Consider using REST only in part of your application
- Use `@WebMethod` annotations
  - Enables control over exposed SOAP methods
- To get the widest possible exposure, simply consider providing client code with your service

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Summary

1. You can easily develop SOAP & REST in Java
2. You can easily combine them together
3. You know how to get the best of both worlds

References

- http://jsr311.dev.java.net
- http://jersey.dev.java.net
- http://jax-ws.dev.java.net
- http://metro.dev.java.net

See also

- Thursday, June 04
  - BOF-4878 - Developing RESTful Web Services with Jersey and Java™ API for RESTful Web Services (JAX-RS)
    - 7:30 PM - 8:20 PM
  - TS-4402 - Metro Web Services Security Usage Scenarios
    - 9:30 AM - 10:30 AM
  - BOF-5305 - Java™ API for XML Web Services (JAX-WS) 2.2
    - 7:45 PM - 8:35 PM

Thank You

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