

Web service style

Document vs RPC

BACKGROUND - WHAT IS SOAP?

- “Simple Object Access Protocol”, but..
 - Not really Simple
 - Doesn’t really Access Objects
 - Not really a Protocol
- What is it really?
 - “A simple messaging framework for transferring information specified in the form of an XML infoset between an initial SOAP sender and an ultimate SOAP receiver” (SOAP 1.2 Primer)
 - “SOAP 1.2 will not spell out the acronym.”

VERY BRIEF HISTORY OF SOAP

- 1998: XML had no type system (no XML Schema), SOAP focused on providing one
 - Dave Winer invents XML-RPC using original SOAP type system
- 1999-2000: SOAP adds support for arrays and references; XML Schema still in flux
- 2001-?: SOAP also adopts XSD, providing two “type systems”
- Present: SOAP Encoding is going away..

WHAT IS RPC/ENCODED?

- Remote Procedure Call style invocation
 - Changes the Fault elements slightly
 - (WSDL 1.2) Each element in the “input” document is a parameter
 - Top-level structure MUST be a sequence (no “choice”)
- SOAP Encoding
 - Serialization of XML adds ID and HREF to allow a directed graph (not just a tree)
 - **Resulting XML document may no longer validate against the XML Schema**

RPC/ENCODED WSDL (1.1)

- Input:

```
<wsdl:message name="DistanceInput">  
    <wsdl:part name="p1" type="tns:Point" />  
    <wsdl:part name="p2" type="tns:Point" />  
</wsdl:message>
```

- Output:

```
<wsdl:message name="DistanceOutput">  
    <wsdl:part name="result" type="xsd:float"/>  
</wsdl:message>
```

RPC/ENCODED SOAP

- Input:

```
<soap:Envelope ..>
  <soap:Body soap:encodingStyle=
    "http://schemas.xmlsoap.org/soap/encoding/">
    <ns:Distance ..>
      <p1 HREF="#id1"/>
      <p2 HREF="#id1"/>
    </ns:Distance>
    <ns:Point id="id1">
      <x>10</x>
      <y>20</y>
    </ns:Point>
  </soap:Body>
</soap:Envelope>
```

WHAT IS DOCUMENT/LITERAL?

- Document-style invocation
 - Input is any XML document
 - Output, if present, is another one
 - Both are described with XML Schema (in theory, other schema languages are supported)
- Literal
 - **The schema can validate the XML in the SOAP request**

DOCUMENT/LITERAL WSDL (1.1)

- Input:

```
<rnc:Distance>
  distance { p1 { Point }, p2 { Point } }
  Point = x {xsd:float}, y {xsd:float}
</rnc:Distance>
<wsdl:message name="DistanceInput">
  <wsdl:part name="body" type="rnc:Distance" />
</wsdl:message>
```

..in *theory*, non-XSD
schema languages can
be used

- Output:

```
<wsdl:message name="DistanceOutput">
  <wsdl:part name="result" type="xsd:float" />
</wsdl:message>
```

DOCUMENT/LITERAL SOAP

- Input:

```
<soap:Envelope>  
  <soap:Body>  
    <ns:distance>  
      <p1>  
        <x>10</x> <y>20</y>  
      </p1>  
      <p2>  
        <x>100</x> <y>200</y>  
      </p2>  
    </ns:distance>  
  </soap:Body>  
</soap:Envelope>
```

Contents of soap:Body
will validate against the
schema

EXAMPLE: RPC/LITERAL (SOAP)

```
<soapenv:Body>
  <vin:bookHotel>
    <person>
      <city>Bangalore</city>
      <name>Vinod</name>
      <region>Karnataka</region>
    </person>
    <hotel>
      <address>Whitefield, Bangalore</address>
      <name>Ginger</name>
    </hotel>
    <from-date>2010-10-2</from-date>
    <to-date>2010-10-15</to-date>
  </vin:bookHotel>
</soapenv:Body>
```

Operation name to be invoked

Parameters to the operation