SOAP vs. REST

SOAP to wash and REST to relax

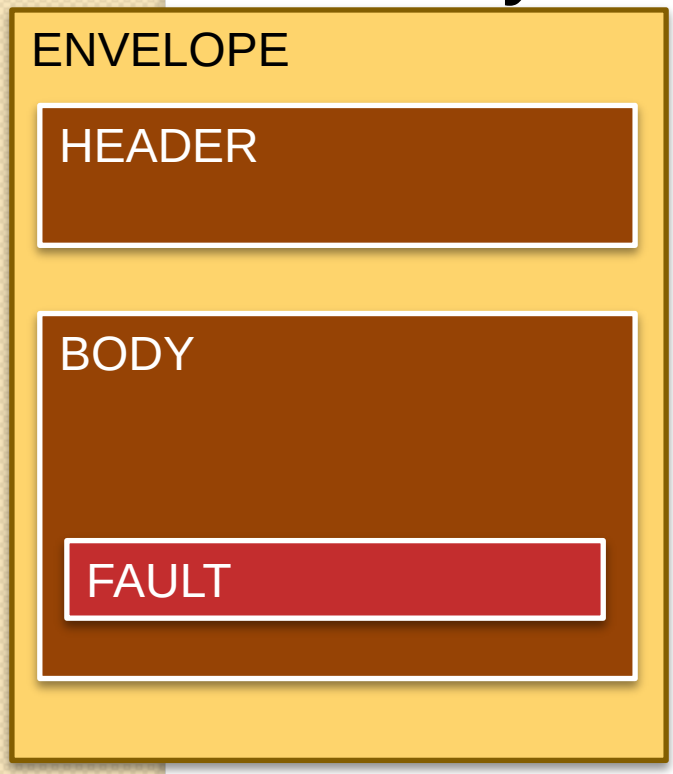
Antonio Loureiro Severien
FIB-UPC

What is SOAP?

- SOAP: Simple Object Access Protocol is a protocol for exchange of structured information on a decentralized and distributed platform using XML (eXtensible Markup Language)
- Works mainly with RPC (Remote Procedure Call) and HTTP (HyperText Transfer Protocol)
- HTTP makes SOAP go around firewalls

SOAP structure

- 3 parts message: Envelope, Header, Body




```
POST /InStock HTTP/1.1
Host: www.example.org
Content-Type: application/soap+xml; charset=utf-8
Content-Length: 299
SOAPAction: "http://www.w3.org/2003/05/soap-envelope"

<?xml version="1.0"?>
<soap:Envelope
      xmlns:soap="http://www.w3.org/2003/05/soap-envelope">
 <soap:Header>
 </soap:Header>
 <soap:Body>
  <m:GetStockPrice xmlns:m="http://www.example.org/stock">
   <m:StockName>IBM</m:StockName>
  </m:GetStockPrice>
 </soap:Body>
</soap:Envelope>
```

HTTP

Simple Example

REQUEST

```
POST /InStock HTTP/1.1
Host: www.example.org
Content-Type: application/soap+xml; charset=utf-8
Content-Length: nnn

<?xml version="1.0"?>
<soap:Envelope
xmlns:soap="http://www.w3.org/2001/12/soap-envelope"
soap:encodingStyle="http://www.w3.org/2001/12/soap-encoding">

<soap:Body xmlns:m="http://www.example.org/stock">
  <m:GetStockPrice>
    <m:StockName>IBM</m:StockName>
  </m:GetStockPrice>
</soap:Body>

</soap:Envelope>
```

Simple Example

RESPONSE

```
HTTP/1.1 200 OK
Content-Type: application/soap+xml; charset=utf-8
Content-Length: nnn

<?xml version="1.0"?>
<soap:Envelope
xmlns:soap="http://www.w3.org/2001/12/soap-envelope"
soap:encodingStyle="http://www.w3.org/2001/12/soap-encoding">

<soap:Body xmlns:m="http://www.example.org/stock">
  <m:GetStockPriceResponse>
    <m:Price>34.5</m:Price>
  </m:GetStockPriceResponse>
</soap:Body>

</soap:Envelope>
```

SOAP Characteristics, Pros and Cons

- Implements its own protocol
- Exposes pieces of application logic, operations
- Advantages
  - Versatile in use of different application protocols
  - Tunnels easily through firewalls due to the use of HTTP model
- Disadvantages
  - Slower when using large XML messages

What is REST?

- REST: Representational State Transfer focuses on accessing named resources through a consistent interface
- Every resource has its representation (could be a document) and the resource state changes when some method is applied through a request using any vocabulary

Constraints and Principles

- Client-server
- Cacheable
- Stateless
- Uniform interface

- Identification of resources
- Manipulation of resources
- Self-descriptive messages

SOAP vs. REST

- SOAP RPC: Application designers have to build up their protocol vocabulary whereas in REST it uses the well known vocabulary of the protocol in use
- REST: Different data formats where SOAP only allows XML
- REST has support for JSON, uses standard HTTP
- REST better performance and scalability
- SOAP reads cannot be cached

When to wash? When to relax?

- SOAP
  - WS-Security: enterprise security features
  - WS-AtomicTransactions: ACID compliant
  - WS-ReliableMessaging: end-to-end reliability
  - Ex.: smartphone app that communicates with a bank app on the web, need the previous implementations
- REST
  - Lightweight
  - Less complex for maintenance
  - Bring the “web” back to web services

Reference

- http://www.w3schools.com/soap/default.asp
- http://en.wikipedia.org/wiki/Representational_State_Transfer
- http://en.wikipedia.org/wiki/SOAP
- http://www.crummy.com/writing/RESTful-Web-Services/
- http://tomayko.com/writings/rest-to-my-wife