SOAP

Application Integration

Simple Object Access Protocol

XML over HTTP

SOAP uses HTTP to transport XML formatted messages between applications. A consumer calls a SOAP endpoint and receives a response after a query or command has been completed by the server.

HTTP Post

SOAP calls are usually HTTP POST methods, although it's technically possible to use GETs.

"Web Services"

SOAP services were often simply referred to as "web services" during the peak of it's popularity. Also they were a common compoenent of Service Oriented Architecture.

SOAP Message Structure

```
<?xml version="1.0"?>

<soap:Envelope
xmlns:soap="http://www.w3.org/2003/05/soap-envelope/"
soap:encodingStyle="http://www.w3.org/2003/05/soap-encoding">

<soap:Header>
...
</soap:Header>

<soap:Body>
...
  <soap:Fault>
  ...
  </soap:Fault>
</soap:Body>

</soap:Envelope>
```

SOAP Header

```
<?xml version="1.0"?>

<soap:Envelope
xmlns:soap="http://www.w3.org/2003/05/soap-envelope/"
soap:encodingStyle="http://www.w3.org/2003/05/soap-
encoding">

<soap:Header>
 <m:Trans xmlns:m="https://www.example.com/transaction/"
 soap:actor="https://www.example.com/code/"
 soap:mustUnderstand="1">12345
 </m:Trans>
</soap:Header>
...
...
</soap:Envelope>
```

SOAP Body

```
<?xml version="1.0"?>

<soap:Envelope
xmlns:soap="http://www.w3.org/2003/05/soap-envelope/"
soap:encodingStyle="http://www.w3.org/2003/05/soap-encoding">

<soap:Body>
 <m:GetExchangeRate
xmlns:m="https://www.example.com/GetExchangeRate">
   <m:Currency>JPY</m:Currency>
 </m:GetExchangeRate>
</soap:Body>

</soap:Envelope>
```

SOAP Response

```
<?xml version="1.0"?>

<soap:Envelope
xmlns:soap="http://www.w3.org/2003/05/soap-envelope/"
soap:encodingStyle="http://www.w3.org/2003/05/soap-encoding">

<soap:Body>
 <m:GetExchangeRateResponse
xmlns:m="https://www.example.com/GetExchangeRate">
   <m:Rate>117.34</m:Rate>
 </m:GetExchangeRateResponse>
</soap:Body>

</soap:Envelope>
```

SOAP Fault

```
<?xml version="1.0"?>

<soap:Envelope
xmlns:soap="http://www.w3.org/2003/05/soap-envelope/"
soap:encodingStyle="http://www.w3.org/2003/05/soap-encoding">

<soap:Body>
 <soap:Fault>
       <faultcode xsi:type = "xsd:string">E002</faultcode>
       <faultstring xsi:type = "xsd:string"> Invalid currency code.</faultstring>
    </soap:Fault>
</soap:Body>

</soap:Envelope>
```

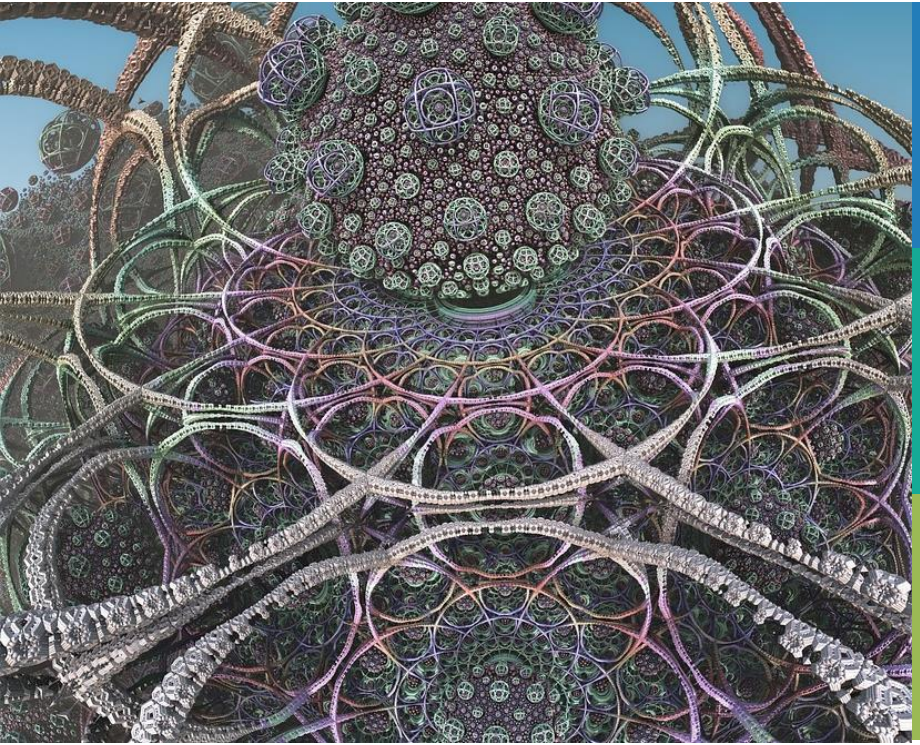
Web Services Description Language (WSDL)

```
<definitions>

<types>
  data type definitions.....
</types>

<message>
  definition of the data being communicated....
</message>

<portType>
  set of operations.....
</portType>

<binding>
  protocol and data format specification....
</binding>

</definitions>
```

SOAP Extensions

Standard	Purpose
WS-Policy	Advertises a web service's security or quality of service policies
WS-Discovery	Defines how to broadcast the existence of web services on a local network
WS-Security	Describes how to enforce confidentiality and integrity in SOAP web services. It focuses on encryption and use of digital signatures.
WS-ReliableMessaging	Provides a standard way of reliably delivering messages using the SOAP protocol. Defines certain types of delivery guarantees like deliver At Least Once, AtMostOnce, ExactlyOnce, and InOrder.

SOAP Challenges



Complexity

Sills and technology necessary to implement SOAP and WS-* standards can be extremely complex. This often can be a hurdle to developing application integrations involving SOAP.

SOAP Versions and Compatibility

Many versions of SOAP and WS-* standards. There is a version 1.1 and 2.0 of WSDL which use different terms for the same concepts.

XML Dependency

SOAP is intimately connected to the XML which is a bulky way of representing data. SOAP messages can be large and bulky. SOAP and XML have lost popularity in the software development community.