

SOAP Messages and WSDL

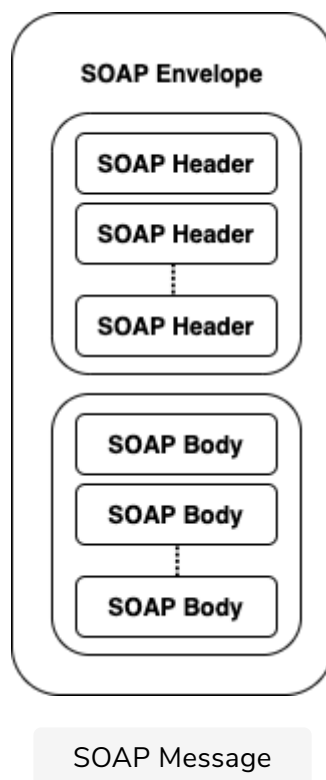
In this lesson, we will learn about the building blocks of SOAP messages and Web Service Definition Language (WSDL).

We'll cover the following

- The SOAP message
- Web Services Description Language (WSDL)
 - Sample WSDL document

The SOAP message

The SOAP message is an XML document which has the following components:



- An **Envelope** element that encapsulates the SOAP header and SOAP body, which form the SOAP message. This is the root of the SOAP message. It needs to have at least one SOAP body.
- A **SOAP Header** element that contains metadata about the message such as credentials that can be used for authentication. It consists of two attributes:

- **Actor** – defines the list of services or nodes that should receive the SOAP message in the chain the message propagation defined by SOAP
- **MustUnderstand** – labels that tell whether the header is mandatory or optional. When this attribute is set, the service node that receives the SOAP message will process and validate its semantics

A **SOAP Header** can also have complex types that can be used in the SOAP body as mentioned like so:

```
<?xml version="1.0"?>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:soap="http://educative.io/soap-automation">
  <soapenv:Header>
    <soap:requestId soapenv:mustUnderstand="true">dc7e2763-6495</soap:requestId>
  </soapenv:Header>
  <soapenv:Body>
    .....
  </soapenv:Body>
</soapenv:Envelope>
```

- A **SOAP Body** contains the information about the request and response. The **complexType** described in the **SOAP Header** will be used here.

```
<?xml version="1.0"?>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:soap="http://educative.io/soap-automation">
  <soapenv:Header>
    <soap:requestId soapenv:mustUnderstand="true">dc7e2763-6495</soap:requestId>
  </soapenv:Header>
  <soapenv:Body>
    <soap:getStudentsRequest>
      <soap:firstName>John</soap:firstName>
      <soap:lastName>Doe</soap:lastName>
      <soap:gender>Male</soap:gender>
    </soap:getStudentsRequest>
  </soapenv:Body>
</soapenv:Envelope>
```

- **Fault** (optional) – holds data about any errors that could be thrown by the web service. This is part of **SOAP** body.

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelop
e/">

  <soapenv:Header/>
  <soapenv:Body>
    <soapenv:Fault>
      <faultcode>soapenv:Server</faultcode>
      <faultstring xml:lang="en">student with id '103' not found</fault
string>
    </soapenv:Fault>
  </soapenv:Body>
</soapenv:Envelope>

```

Web Services Description Language (WSDL)

WSDL is an XML document that describes a web service and its components. It consists of the location of the web service, the methods contained in the web service, and its data types. All these information are described using the following elements:

- **<types>** – defines data types used by the web service
- **<message>** – defines data elements for each operation
- **<portType>** – operations that can be performed and the messages involved
- **<binding>** – defines the protocol and data format for each port type
- **<service>** – defines where the web service is hosted

Sample WSDL document

A sample WSDL XML document is given below:

```

<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<wsdl:definitions xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/" xmlns:sch="htt
p://educative.io/soap-automation" xmlns:soap="http://schemas.xmlsoap.org/wsdl/
soap/" xmlns:tns="http://educative.io/soap-automation" targetNamespace="htt
p://educative.io/soap-automation">
  <wsdl:types>
    <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefa
ult="qualified" targetNamespace="http://educative.io/soap-automation">
      <xs:element name="getStudentsRequest">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="id" nillable="true" type="xs:int" />
            <xs:element name="firstName" nillable="true" type="xs:
string" />
            <xs:element name="lastName" nillable="true" type="xs:s

```

```

tring" />
        <xs:element name="gender" nillable="true" type="xs:string" />
    </xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="getStudentsResponse">
    <xs:complexType>
        <xs:sequence maxOccurs="unbounded">
            <xs:element name="students" type="tns:student" />
        </xs:sequence>
    </xs:complexType>
</xs:element>
<xs:complexType name="student">
    <xs:sequence>
        <xs:element name="id" type="xs:int" />
        <xs:element name="firstName" type="xs:string" />
        <xs:element name="lastName" type="xs:string" />
        <xs:element name="gender" type="xs:string" />
    </xs:sequence>
</xs:complexType>
</xs:schema>
</wsdl:types>
<wsdl:message name="getStudentsResponse">
    <wsdl:part element="tns:getStudentsResponse" name="getStudentsResponse">
    </wsdl:part>
</wsdl:message>
<wsdl:message name="getStudentsRequest">
    <wsdl:part element="tns:getStudentsRequest" name="getStudentsRequest">
    </wsdl:part>
</wsdl:message>
<wsdl:portType name="StudentsPort">
    <wsdl:operation name="getStudents">
        <wsdl:input message="tns:getStudentsRequest" name="getStudentsRequest">
        </wsdl:input>
        <wsdl:output message="tns:getStudentsResponse" name="getStudentsResponse">
        </wsdl:output>
    </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="StudentsPortSoap11" type="tns:StudentsPort">
    <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http" />
    <wsdl:operation name="getStudents">

```

```
<soap:operation soapAction="" />
<wsdl:input name="getStudentsRequest">
    <soap:body use="literal" />
</wsdl:input>
<wsdl:output name="getStudentsResponse">
    <soap:body use="literal" />
</wsdl:output>
</wsdl:operation>
</wsdl:binding>
<wsdl:service name="StudentsPortService">
    <wsdl:port binding="tns:StudentsPortSoap11" name="StudentsPortSoap11">
        <soap:address location="http://ezifyautomationlabs.com:6566/educat
ive-soap/ws" />
    </wsdl:port>
</wsdl:service>
</wsdl:definitions>
```

In this lesson, we learned about SOAP Messages and WSDL. Let's take a quiz to see how much you have learned.