Soap Web Services development

Contents

[1. What is SOAP Web Services? 3](#_Toc18591512)

[2. Building blocks of SOAP protocol, the SOAP Message 3](#_Toc18591513)

[3. SOAP Fault Code 3](#_Toc18591514)

[4. MTOM for attachments 4](#_Toc18591515)

[5. SOAP Specification (Version 1.2) and other standards and implementations 4](#_Toc18591516)

[6. SOAP Web Service development Approaches 4](#_Toc18591517)

[7. Practicals 5](#_Toc18591518)

# What is SOAP Web Services?

1. Simple Object Access Protocol (SOAP) is an XML based protocol to exchange information over http protocol.
2. The server application which provides the Web Service is known as web service provider.
3. The application which consumes the web service is known as consumer of web service or simply web service client.
4. The SOAP web services provider can be developed using any programming language like Java, .Net etc…
5. Similarly, the SOAP web services consumer can be developed in any programming language.

# Building blocks of SOAP protocol, the SOAP Message

The SOAP protocol defines a building block called SOAP Message, which consists of the following

1. Envelop
2. Soap Header with Header Blocks
3. Soap Body with Message Blocks

<Envelope>

<Header>

<HeaderBlock> </HeaderBlock>

</Header>

<Body>

<MessageBlock> </MessageBlock>

</Body>

</Envelope>

# SOAP Fault Code

The following are the SOAP fault codes, the fault code indicates what is the error.

1. SOAP-ENV:VersionMismatch – This is when an invalid namespace for the SOAP Envelope element is encountered.
2. SOAP-ENV:MustUnderstand - An immediate child element of the Header element, with the mustUnderstand attribute set to "1", was not understood.
3. SOAP-ENV:Client - The message was incorrectly formed or contained incorrect information.
4. SOAP-ENV:Server - There was a problem with the server, so the message could not proceed.

# MTOM for attachments

Message Transmission Optimization Mechanism (MTOM) is a method of efficiently sending binary data to and from Web services.

MTOM is usually used with the XOP (XML-binary Optimized Packaging)

# SOAP Specification (Version 1.2) and other standards and implementations

The XML Schema namespace is defined in <http://www.w3.org/2001/XMLSchema>

The SOAP protocol specification is available at <https://www.w3.org/TR/soap/>

The XSD for MTOM elements is defined in <http://www.w3.org/2005/05/xmlmime>

The WSDL Schema is defined in <http://schemas.xmlsoap.org/wsdl/>

The Web Services Description Language (WSDL) <https://www.w3.org/TR/2007/REC-wsdl20-20070626/>

The SOAP protocol 1.2 bindings is defined in <http://schemas.xmlsoap.org/wsdl/soap12/>

Apache CXF Implementation is available at <https://cxf.apache.org/download.html>

SOAP UI for testing web services <https://www.soapui.org/downloads/soapui.html>

# SOAP Web Service development Approaches

1. Top-Down approach  
   In this approach the WSDL is defined  
   Generate Server skeleton for web service provider and implement the web services  
   Generate Client Stubs and implement the client to consume the web services
2. Bottom Up approach  
   Develop the web service using the any programming language  
   Generate WSDL from the server  
   Generate client stubs and implement the client to consume the web services

# Practicals

1. Explain the sample employee WSDL’s, generate server skeleton and client stubs.
2. Assignment to enhance the WSDL definitions to add a new operation getEmployee into the existing WSDL’s
3. Explain updating Employee WSDL’s to provide Profile Picture of an employee and to retrieve the same
4. Introduction to sample top down implementation of employee web service, WSDL’s are taken from part a.
5. Assignment to enhance the implementation of employee web service to incorporate new operation getEmployee, WSDL’s are taken from part b.
6. Assignment to enhance the implementation of employee web service to provide Profile Picture of an employee and to retrieve the same, WSDL’s are taken from part c.