**Web services:**

It is open standard based web application which interacts with other application in order to exchange data. Web services can convert an application into web application. Web service is any piece of code available itself in the internet and uses XML messaging system. If a client invokes a web service by sending an XML message, then he waits for a corresponding XML response. Since all the communication is XML based web services are bounded to any operating system or any language. Any two different languages can be communicated.

**Components of web services:**

The components that are used by web services are:

SOAP (Simple Object Access Protocol)

UDDI (Universal Description, Discovery and Integration)

WSDL (Web Services Description Language)

**Working of web services:**

Web services enables communication between application by using open standards such as XML, HTML, WSDL, SOAP. XML is used to tag the data, SOAP is to transfer the message, WSDL is used to describe the availability of service.

**WSDL:**

testing webservices:

how would you know what are the operations present in web service?

how would you decide what are the parameters you need to send and what are the datatypes that would be given to invoke an operation in an web service?

how many operations are present in web service, how many ways you can test it?

we need to have some document to explain this web service and this document is nothing but WSDL file. WSDL stands for web service description language.it is a standard format for describing a web service.

WSDL is often used in combination with SOAP and XML to provide web services over the internet.

**SOAP PROTOCOL:**

SOAP is an xml based protocol for exchanging information between webservices and its full form is simple object access protocol. it is a communication protocol. it provides data transfer for web services. soap enables client applications to easily connect to remote services and invoke remote methods.

SOAP message is an ordinary XML document consisting **of following elements:**

consider example of calculator performing add operation

soap message consists of soap request and soap response. In soap request we will be giving what operation to be done and what the parameters to be passed.when it reaches the calculator web service it interprets the soap request message which we have sent and it invokes the add operation successfully. That output is again wrapped up into a soap response message and sent it to the client side.

now, we will see what kind of structure or protocol to be followed while developing soap message?

**Envelope:(mandatory)**

SOPA Envelope indicates the start and end of the message so that receiver understands when the entire message has been received. the soap envelope solves the problem of when we are done with receiving the message and start the processing of it.

1. every soap message has a root envelope element

2. envelope element is mandatory part of soap message

<Envelope>

</Envelope>

**Header(optional):**

contains any optional attributes of the message used in processing the message,either at an intermediatery point or at the ultimate end point.

headers are intended to add new features and functionalites.

**Body(Mandatory):**

contains the XML data comprising the message being sent.

the SOAP body is a mandatory element which contails the application defined XML data being exchanged in the SOAP message. The body must be contained within the envelope and must follow any headers that might be defined for the message.

**Fault(optional):**

an optional fault element that provides information about errors that occurred while processing the message.

when an error occurs during processing, the response to a SOAP message is a SOAP fault element in the body of the message and the fault is returned to the sender of the soap message.

**instructions to configure web service in local machine:**

1. download the files from resources tab of this udemy lecture and unzip axis server file

2. set the axis server path in environment variables

3. download mysql installer file and set username and paswword to root and root, port to 3306

4. open workbench and execute the query(get the query from query.txt document)

**query**:create database Employeeportal;

use Employeeportal;

CREATE TABLE IF NOT EXISTS Employeeinfo(

name VARCHAR(100) NOT NULL,

id VARCHAR(200), dept varchar(20),

age INT NOT NULL,

PRIMARY KEY(name));

5. open axisserver.bat file

6. hit localhost:(portnum)

**BASIC ASSERTIONS:**

ADD EMPLOYEE TESTCASE:

verify response returning True- CONTAINS ASSERTION

verify response not having null or false value- NOT CONTAINS ASSERTION

verify response is valid soap response- SOAP RESPONSE ASSERTION

verify response have valid HTTP code- valid HTTP status code

verify that response time is with in boundaries

verify security threat

GET EMPLOYEE DETAILS TESTCASE:

verify ID of the employee is 545

verify department is computer science

check SoapUI response pattern

verify age attribute display

verify only unique name returns

Q:how can we communicate with web services

A:by using soap messages