

Chapter-1

1

Web Services:-

- Web Services are client and server applications that communicate over the world wide web's (www) Hyper Text Transfer protocol (HTTP).
- As described by the world wide web Consortium (W3C), Web Services provide a standard means of interoperating between software applications running on a variety of platforms and frameworks.
- Web Services can be combined in a loosely coupled way to achieve complex operations.
- Web Service is a standardized medium to propagate communication between the client and server applications on the www (world wide web).
- A web Service is a software module that is designed to perform a certain set of tasks.

Why do we need a web service?

- Modern day business application use variety of programming platform to develop web applications, like, Java, .net, Angular JS etc.
- these heterogeneous applications need some sort of communication to happen between them. Since they are built using different development language, it becomes really difficult to ensure accurate communication between applications.

- So, this is to provide better communication between heterogeneous application when services come in.
- Web services provide a common platform that allows multiple applications built on various programming languages to have the ability to communicate with each other.

Response from server to client

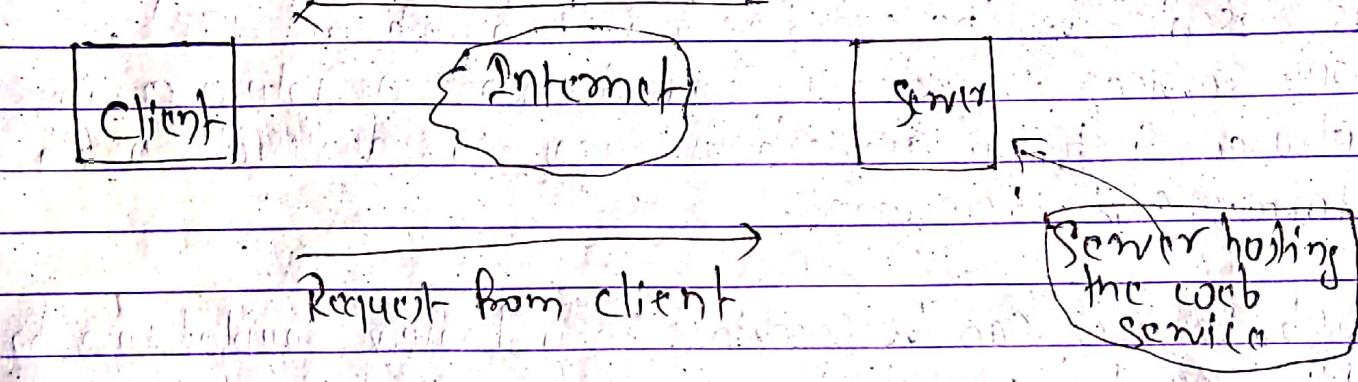


Fig:- How Web Services work?

- The above diagram shows a very simplistic view of how a web service would actually work.
- The client would invoke a service of web service (call via requests) to a server which would host the actual web service.
- These requests are made through Remote procedure call.

Web Service

- (i) used to transfer data between web application
- (ii) can be accessed from many language platform
- (iii) meant for communication between computers
- (iv) No GUI

Web Application

- (i) software application that user access over internet
- (ii) can be accessed through web browsers
- (iii) Human Interaction
- (iv) GUI

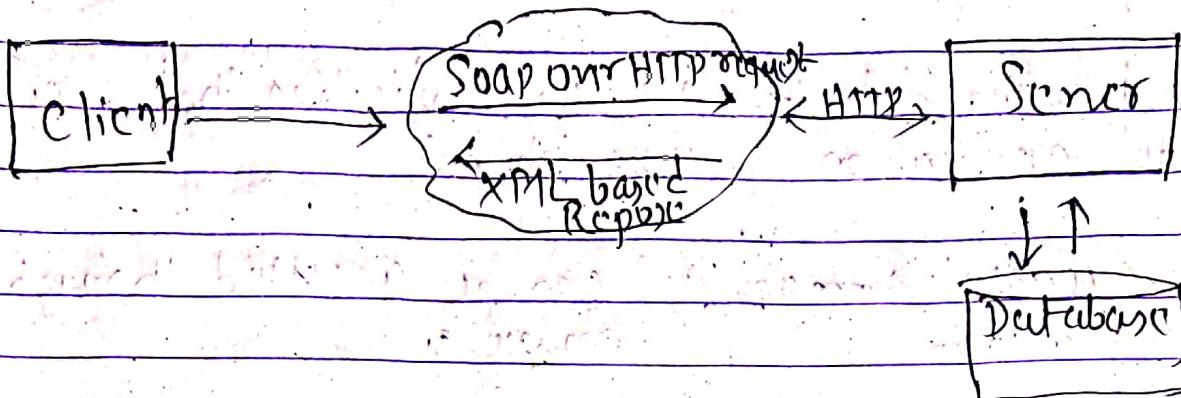
Data Standards & Interoperability:-

Components of web Service:-

- (i) SOAP (Simple object Access protocol)
- (ii) UDDI (Universal description, Discovery and Integration)
- (iii) WSDL (Web Service Description language)

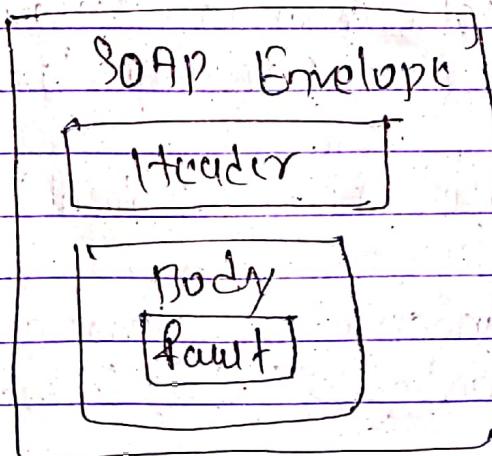
(i) SOAP (Simple object Access protocol):-

- It is a transport-independent messaging protocol.
- SOAP is built on sending XML data in the form of SOAP messages.
- A document known as an XML document is attached to each message.
- The best thing about web service and SOAP is that everything is sent through HTTP, the standard web protocol.



Why SOAP?

- It is important for web applications to be able to communicate over the internet.
- ~~The best way~~ SOAP provides a way to communicate between applications running on different operating systems, with different technologies and programming languages.



SOAP message structure

②

- SOAP Message containing the following elements:-

- (i) An Envelope:- indicates the start and end of the message
- (ii) Header :- It contains application-specific information like authentication, payment, etc. about the SOAP message
- (iii) SOAP Body :- contain the application-defined XML data being exchanged in the SOAP message.
- (iv) SOAP Fault:- SOAP Fault element is used to indicate error message.

Ex:-

Client

~~<m: GetDetails>~~
~~</m: GetDetails>~~
~~<m: GetDetails>~~
~~</m: GetDetails>~~

Server

<m: Details>
<name> webservice
</name>
</m: Details>

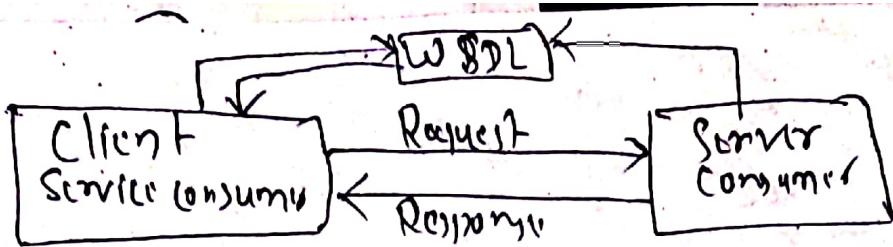
(ii) WSDL (Web Services description language):

- A web service cannot be used if it cannot be found.
- The client invoking the web service should know ~~to~~ what the web service actually does.
- the client application needs to know what the web service actually does, so that it can invoke the right web service.
- This is done with the help of the WSDL.
- The WSDL file is again an XML based file which basically tells the client application what the web service does.

Definition:

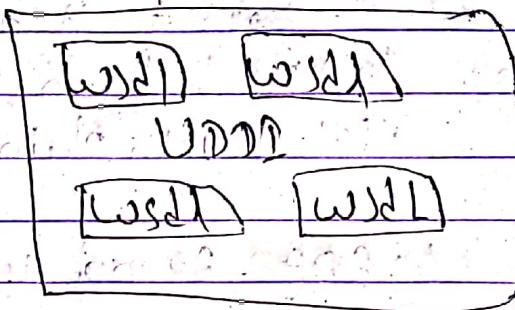
— Web Services Description language is an XML based interface description language that is used for describing the functionality offered by a web service.

```
<message name="getTermsRequest">
  <part name="term" type="xs:string"/>
</message>
<message name="getTermResponse">
  <part name="value" type="xs:string"/>
</message>
<prototype name="glossaryTerms">
  <operation name="getTerms">
    <input message="getTermRequest"/>
    <output message="getTermResponse"/>
  </operation>
</prototype>
```



(iii) UDDI (Universal Description, Discovery and Integration):

- UDDI is a directory Service where business can register and search for web services.
- UDDI ~~is~~ provides a repository on which WSDL files can be hosted. So the client application will have complete access the UDDI, which acts as a database containing all the WSDL files.



- Just as a telephone directory has the name, address and telephone number of a particular person, the same way the UDDI registry will have the relevant information for the web service so that a client application knows where it can be found.

SOAP

1. SOAP Stands for Simple Object Access protocol

2. It follows a strict standard to allow communication between the client.

3. It uses only XML for exchanging information in its message format.

4. REST can use SOAP protocol.

5. On the behalf of Service interface, SOAP uses @ WebService.

6. It requires more bandwidth, so it difficult to implement.

7. SOAP has SSL (Secure Socket Layer) and WS-Security.

REST

1. REST Stands for Representational State Transfer

2. REST is an architectural style that doesn't follow any strict standard.

3. ~~It uses~~ It is not restricted to XML, it can use like XML, JSON, plain-HTML.

4. SOAP cannot use REST

5. On the behalf of Service interface, REST uses URL like @ path.

6. It requires less bandwidth, so it easy to implement.

7. REST has SSL and HTTPS.

(3)

Data Formats:-

- (i) XML (Extensible markup language)
- (ii) JSON (JavaScript object notation)
- (iii) RDF (Resource Description framework)

RDF :-

- RDF is a standard for data interchange that is used for representing highly interconnected data.
- RDF is standard for describing web resource and data interchange, developed and standardized with the World Wide Web Consortium (W3C).
- RDF is a general method of durability data by defining relationships between data objects.

Data Standards & Interoperability :-

- (i) SOAP (Simple Object access protocol)
- (ii) WSDL (Web Service description language)
- (iii) UDDI (Universal description, discovery and integration)
- (iv) ebXML (Electronic Business Extensible Markup language)

(i) ebXML:-

- It is a global standard for electronic business that enables anyone, anywhere to do business transactions with anyone over the internet.

Business to Business

Features:-

- ebXML is an end-to-end B2B XML Framework
- It is a set of specifications that enable a modular framework.
- It can be implemented and deployed on virtually any computing platform.

Enterprise Architecture Frameworks:-

- i) Template Frameworks: Zachman framework (Matrix that defines enterprise)
- ii) Content frameworks

RDF (Resource Description Framework)-

- RDF is a standard for describing web resources.
- RDF can be used to describe title, author, content, and copyright information of web pages.
- RDF is designed to read and understood by computers.
- It is not designed for being displayed to people.
- It is written in XML.
- RDF Rules:-
 - RDF uses web ~~identifies~~ identification (URI) to identify resources.
 - It describes resources with properties and property values.