Web Sevices

Different books and different organizations provide different definitions of Web Services. Some of them are listed here.

The term Web services describe a standardized way of integrating Web-based applications using the XML, SOAP, WSDL and UDDI open standards over an Internet protocol backbone.
XML is used to tag the data, SOAP is used to transfer the data, WSDL is used for describing the services available and UDDI is used for listing what services are available.
Used primarily as a means for businesses to communicate with each other and with clients, Web services allow organizations to communicate data without intimate knowledge of each other's IT systems behind the firewall.
        OR
The term Web service (WS) is either:
A service offered by an electronic device to another electronic device, communicating with each other via the World Wide Web, or
A server running on a computer device, listening for requests at a particular port over a network, serving web documents (HTML, JSON, XML, images), and creating web applications services, which serve in solving specific domain problems over the Web (WWW, Internet, HTTP)
        OR
Web services are a standardized way or medium to propagate communication between the client and server applications on the World Wide Web. This course will give a detailed insight into various components of web services like SOAP, WSDL, REST, and how they operate.
        OR
Web Services are self-contained, modular applications that can be described, published, located, and invoked over a network, generally, the World Wide Web.
The Web Services architecture describes three roles: service provider, service requester and service broker; and three basic operations: publish, find and bind. A network component can play any or all of these roles.
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Notes (SOAP Based Web Services):
6 Major Components
    1. WSDL (Web Service Description Language)
    2. UDDI (Universal Description, Discovery, and Integration) - Optional
    3. Skeleton
    4. Stub
    5. SOAP Protocol (Simple Object Access Protocol)
    6. HTTP Protocol
Web Service Work Flow:
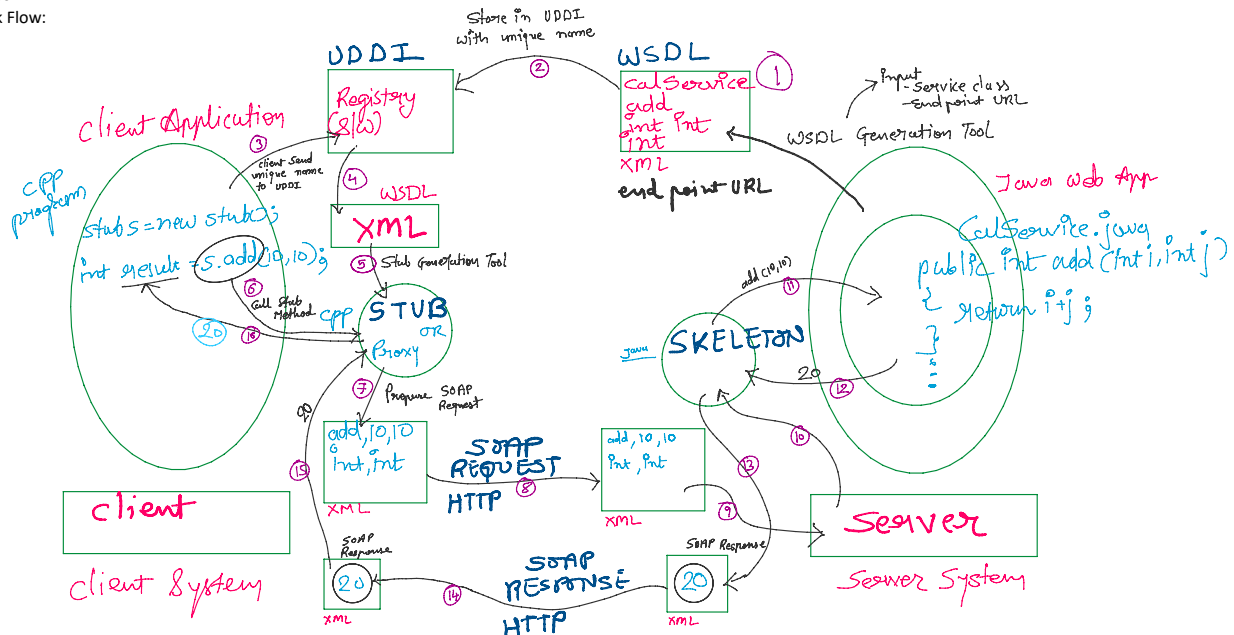
1. Service app will share information of services using WSDL in the form of XML.
    a. XML will contain information such as:
        i. Name of the service: CalService
        ii. Method name: add
        iii. Arguments type: int, int
        iv. Return type: int
    b. WSDL generation tool provided by Sun Micro. Provider for Java(for our example) is responsible to generate WSDL file.
        E.G. For services provided by .Net, Microsoft will provide WSDL Generator Tool.
2. WSDL file will be stored in UDDI Registry to be accessible by clients with unique name.
3. Client will access WSDL file with the help of UDDI Registry.
4. Client will download WSDL file(XML).
5. Client creates Stub with the help of Stub Generation Tool. If the client program is written in CPP then Stub is also created in CPP language.
6. Once stub is created, client will create an object of stub and call add method with the help of stub object.
7. Stub will prepare a SOAP Request with the method name, and parameters in the form of XML.
8. SOAP Request then sent to Server with the help of the HTTP Protocol.
9. Server will receive SOAP Request
10. Server sends SOAP Request to Skeleton. Skeleton in our case is written in Java as our server application is written in java. If our service class is written in C# then the skeleton is also in C#. To generate Skeleton predefined classes are available for different programming languages.
11. Skeleton will call add method with parameters 10,10
12. Skeleton receives 20 as the return value from the add method.
13. Skeleton prepare SOAP Response in the form of XML and send it to Client System.
14. Client system receive SOAP Response
15. The client system forwards the SOAP response to Stub.
16. Stub will return value 20 to client call