**What is SOAP?**

SOAP is an XML-based protocol for accessing web services over HTTP and is short for Simple Object Access Protocol. It was designed before REST and was designed to ensure that programs built on different platforms and programming languages could exchange data in an easy manner. SOAP includes a Web Service Description Language (WSDL) file which has the required information on what the web service does in addition to the location of the web service. SOAP uses service interfaces to expose its functionality to client applications. In it, the WSDL provides the client with the necessary information to understand the services that the web service can offer. SOAP needs a good bit of bandwidth for its usage since SOAP messages contain a lot of information inside of it. SOAP messages typically consist of an envelope which contains a single header and at least one body. The envelope is mandatory and identifies the message as a SOAP message with it being the root element containing the other parts. The header is optional and can contain authentication credentials or complex data type definitions. It must be the first child of the element. The body contains the data that is being sent and every envelope must have at least one. Since SOAP envelopes change when versions change, a fault is generated when envelope versions don’t match up. SOAP can only work with XML format and all data is passed in this format. SOAP should be used for asynchronous processing and subsequent invocation, as a formal means of communication, and for stateful operations.

**What is REST?**

REST stands for Representational State Transfer and is an architectural style in which a web service can only be treated as a RESTful service if it follows certain constraints. These constraints are that the service is client-server, stateless, cacheable, uniform interface, layered system, and code on demand. If all these principles are met, then the interface is considered RESTful. REST can make use of SOAP as the underlying protocol for web services because in the end it is just an architectural pattern. HTTP methods are often used within RESTful implementations. While the methods can be defined differently for each implementation, they must remain consistent throughout the application. Common methods include the POST, GET, PUT, and DELETE methods. POST is often used to create a new object, GET is often used to retrieve objects, PUT is often used to update object data, and DELETE is often used to remove objects. REST uses Uniform Service locators to access the components on the hardware device. It does not need as much bandwidth when requests are sent to the server as SOAP does. REST messages mostly just consist of JSON messages. REST permits the use of different data formats such as Plain text, HTML, XML, JSON, etc. But the most preferred format for transferring data is JSON. In comparison to SOAP, REST should be used for limited resources and bandwidth, statelessness, caching, and the ease of coding.