**What is SOAP?**

**SOAP** is a protocol which was designed before REST and came into the picture. The main idea behind designing SOAP was to ensure that programs built on different platforms and programming languages could exchange data in an easy manner. SOAP stands for Simple Object Access Protocol.

**What is REST?**

**REST** was designed specifically for working with components such as media components, files, or even objects on a particular hardware device. Any web service that is defined on the principles of REST can be called a RestFul web service. A Restful service would use the normal HTTP verbs of GET, POST, PUT and DELETE for working with the required components. REST stands for Representational State Transfer.

**KEY DIFFERENCE**

* SOAP stands for Simple Object Access Protocol whereas REST stands for Representational State Transfer.
* SOAP is a protocol whereas REST is an architectural pattern.
* SOAP uses service interfaces to expose its functionality to client applications while REST uses Uniform Service locators to access to the components on the hardware device.
* SOAP needs more bandwidth for its usage whereas REST doesn’t need much bandwidth.
* Comparing SOAP vs REST API, SOAP only works with XML formats whereas REST work with plain text, XML, HTML and JSON.
* SOAP cannot make use of REST whereas REST can make use of SOAP.

**Difference Between SOAP and REST**

Each technique has its own advantages and disadvantages. Hence, it’s always good to understand in which situations each design should be used. This REST and SOAP API difference tutorial will go into some of the key difference between REST and SOAP API as well as what challenges you might encounter while using them.

Below is the main difference between SOAP and REST API

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| **SOAP** | **REST** |
| * SOAP stands for Simple Object Access Protocol | * REST stands for Representational * State Transfer |
| * SOAP is a protocol. SOAP was designed with a specification. It includes a WSDL file which has the required information on what the web service does in addition to the location of the web service. | * REST is an Architectural style in which a web service * can only be treated as a RESTful service if it follows the * constraints of being   1. Client Server   2. Stateless   3. Cacheable   4. Layered System   5. Uniform Interface |
| * SOAP cannot make use of REST since SOAP is a protocol and REST is an architectural pattern. | * REST can make use of SOAP as the * underlying protocol for web services, * because in the end it is just an architectural pattern. |
| * SOAP uses service interfaces to expose its functionality to client applications. In SOAP, the WSDL file provides the client with the necessary information which can be used to understand what services the web service can offer. | * REST use Uniform Service locators to access * to the components on the hardware device. For example, * if there is an object which represents the data of an * employee hosted on a URL as http://demo.guru99 , the below * are some of URI that can exist to access them.   http://demo.guru99.com/Employee  http://demo.guru99.com/Employee/1 |
| * SOAP requires more bandwidth for its usage. Since SOAP Messages contain a lot of information inside of it, the amount of data transfer using SOAP is generally a lot.   <?xml version="1.0"?>  <SOAP-ENV:Envelope  xmlns:SOAP-ENV  ="http://www.w3.org/2001/12/soap-envelope"  SOAP-ENV:encodingStyle  =" http://www.w3.org/2001/12/soap-encoding">  <soap:Body>  <Demo.guru99WebService  xmlns="http://tempuri.org/">  <EmployeeID>int</EmployeeID>  </Demo.guru99WebService>  </soap:Body>  </SOAP-ENV:Envelope> | * REST does not need much bandwidth when requests * are sent to the server. REST messages mostly * just consist of JSON messages. Below is an * example of a JSON message passed to a web server. * You can see that the size of the message is * comparatively * smaller to SOAP.   {"city":"Mumbai","state":"Maharastra"} |
| * SOAP can only work with XML format. As seen from SOAP messages, all data passed is in XML format. | * REST permits different data format such as * Plain text, HTML, XML, JSON, etc. But the most preferred format for transferring data is JSON. |