

## **Exercise #2 — Explaining Concepts**

Write a short overview that helps an engineer choose when to use REST or SOAP web services. This exercise should be two pages or less.

# SOAP vs REST

## SOAP Web Services

**SOAP** – Simple Object Access Protocol – is a network platform used in a web service to exchange or communicate data between two different machines on a network. SOAP uses the XML format of data to transfer messages over the HTTP protocol. In Web services, SOAP allows the user request to interact with other programming languages. This way it provides a way to communicate between applications running on different platforms.

### SOAP Characteristics

- It is an open standard protocol used in web services to communicate via the internet.
- Used to broadcast messages over the network.
- Used to call remote procedures and exchange documents.
- Can be used on any platform and can support multi-languages.
- Uses XML format to send messages over HTTP protocol.
- Structure of a SOAP message consists of an envelope, header, and body element.

## REST Web Services

**REST** - REpresentational State Transfer – is an architectural style of client-server application centered around the transfer of representations of resources through requests and responses. It is a set of constraints used to create a lightweight, scalable, and maintainable web service that facilitates easy communication. In the REST architectural style, data and functionality are considered resources and are accessed using Uniform Resource Identifiers (URIs), typically links on the Web. The resources are represented by documents and are acted upon by using a set of simple, well-defined operations. The REST architectural style constrains an architecture to a client/server architecture and is designed to use a stateless communication protocol, typically HTTP. In the REST architecture style, clients and servers exchange representations of resources by using a standardized interface and protocol. All web services that are based on the REST are called a RESTful web service.

### REST Characteristics

- It is a stateless server.
- It supports JSON and XML.
- Has well-maintained documentation that reflect each change in the architecture of REST.
- Has a simple approach to build client and server service.
- Follows standard protocol such as HTTP, HTTPS and FTP.
- Provides a way to connect with server-side applications.
- Based on architectural style for designing simple, lightweight, and distributed web services.

## SOAP vs. REST: Primary Differences

REST is most commonly used when you're exposing a public API over the internet. Conversely, SOAP exposes components of application logic as services rather than data. REST accesses data, while SOAP performs operation through a more standardized set of messaging patterns. REST or SOAP can be used to achieve the same results, with some differences in configuration.

| Benefits of REST Over SOAP   | Benefits of SOAP Over REST   |
|--|--|
| <ul style="list-style-type: none"> <li>• REST allows for a greater variety of data formats, whereas SOAP only allows XML.</li> <li>• REST is considered easier to work with.</li> <li>• Because of JSON, REST offers better support for browser clients.</li> <li>• REST provides superior performance, particularly through caching for information that isn't altered or dynamic.</li> <li>• It is the protocol is used the most by major services such as Yahoo, eBay, Amazon, and even Google</li> <li>• REST is generally faster and uses less bandwidth. It's also easier to integrate with existing websites. This enables developers to work faster rather than spend time rewriting a site from scratch.</li> </ul> | <ul style="list-style-type: none"> <li>• SOAP's standard HTTP protocol makes it easier for it to operate across firewalls and proxies without modifications so the SOAP protocol itself. Because it uses a complex XML format, it tends to be slower.</li> <li>• In some cases, designing SOAP services can actually be less complex compared to REST. For web services that support complex operations, requiring content and context to be maintained, designing a SOAP service requires less coding in the application layer for transactions, security, trust, and other elements.</li> <li>• SOAP is highly extensible through other protocols and technologies. In addition to WS-Security, SOAP supports WS-Addressing, WS-Coordination, WS-ReliableMessaging, and a host of other web services standards.</li> </ul> |

The current web development world allows for the use of both SOAP or REST. While each one offers specific advantages, the current development world can benefit from both. The best protocol is the one that makes the most sense for the organization, the types of clients that you need to support, and your desired flexibility for the application.