

Overview

This document describes the SOAP and REST web service communication protocols and underlines the differences between them. Use cases for each protocol are demonstrated at the end of this document.

What are communication protocols?

To exchange information, electronic devices must be able to communicate with each other. A communication protocol defines a common language used by these devices to enable them to “speak” with each other and provides a system of rules that establish proper conduct and behavior.

SOAP and REST are two common communication protocols used for web services, such as APIs.

What is SOAP?

Simple Access Object Protocol, or SOAP, is the older and heftier of the two protocols, requiring a more comprehensive system of rules and stricter compliance to these rules. Designed to be extensible, neutral, and independent, it can operate over multiple protocols and programming models.

What is REST?

REpresentational State Transfer, or REST, is an architectural style more closely aligned with modern web design philosophy. It was designed for use with HTTP, and its primary features are simplicity, scalability, and usability. It shares a similar paradigm with object-oriented programming, referring to web resources as “nouns” and methods implemented on these resources as “verbs”.

Key differences between SOAP and REST

The envelope and the postcard. A common analogy used to compare SOAP and REST is the envelope and the postcard. SOAP is an envelope. It requires more

bandwidth and overhead, and also defines its own security measures. REST is a postcard. It's quick, efficient, and nimble, and relies on the HTTPS protocol for security.

Function-driven or data-driven. SOAP is function-driven, offering pieces of application logic as services, while REST is data-driven, using a small set of standard methods to access and manipulate web resources.

Standardization. SOAP is standardized protocol. REST does not have an "official" standard, though specifications exist (such as Swagger). As such, REST is not technically a protocol, but an architectural style and design philosophy.

Data formats. SOAP exclusively uses XML; REST permits multiple machine-readable data formats (most commonly JSON, HTML, or XML).

Choosing the right protocol

In general, there exists a tradeoff between control and usability.

SOAP is very closely coupled with the server. All messages operate under strict contracts between the client and the server. This coupling means that clients must thoroughly understand your web service to make requests and also that updating or making changes to your web service will be difficult.

REST is more flexible, scalable, and easy to learn and use. For the most part, developers tend toward a RESTful architecture unless there is an explicit need for the SOAP protocol. Such a need may appear for distributed systems or enterprise apps needing more stringent security.