

# What is SOAP API? SOAP is an API How does it work?

SOAP, which stands for Simple Object Access Protocol, is a type of API used by leading companies. But SOAP doesn't seem to be that popular anymore, as its use is dwindling in modern applications.

Curious to learn more about this classic API architecture, even being a fan of REST?

Let's find out with Tipsmake what SOAP is and see if it is still used today!

## What is SOAP API? How does it work?



SOAP is based on WSDL (Web Services Description Language), an extensible markup language (XML) for sending data between software.

And considering the rigid structure of XML, the data transferred by SOAP API is quite verbose and seems more complex than the more prevalent REST (REpresentational State Transfer) architecture.

Sending or receiving data from the SOAP API means that you are transmitting tightly encapsulated items contained in individual identification tags. The data arrangement in SOAP follows a rigid structure and access pattern in a dedicated file. This makes SOAP highly protocol oriented.

In addition to transferring data over HTTP (Hypertext Transfer Protocol), SOAP also supports more primitive protocols, including FTP (File Transfer Protocol), TCP (Transmission Control Protocol), and SMTP (Simple Mail Transfer Protocol). So it provides flexibility in transmission across many different networks and platforms.

That said, while other transfer protocols make it possible to exchange primitive data, it is more feasible to serve SOAP over [HTTPS networks](#).

SOAP uses the security of Web Service (WS), a dedicated message encryption extension. So this fills the gap while sending data using data transfer protocols other than HTTPS.

This is also combined with SSL (Secure Sockets Layer), a security token that serves websites over HTTPS. So, in terms of security, SOAP has an advantage over REST, which relies solely on HTTPS for security.

In addition, the format of the data returned by the SOAP API is pre-programmed. This makes it possible to easily integrate across a number of programming technologies.

As a result, the SOAP API is extensible, cross-platform compatible, and protocol-neutral.

## SOAP Architecture

SOAP, like any API framework, has a common structure. That said, the architecture of the SOAP API is similar to that of the [HTML DOM](#).

The SOAP API has the following structure:

1. Envelope: This tells you that an incoming or outgoing XML is SOAP data. You can think of this as the head in the HTML DOM.
2. Header: It contains more XML header information.
3. Body: This is the payload or body of the SOAP message.
4. Fault: Error handling and request status in the SOAP API.

## Is the SOAP API still in use today and why?



Originally designed and used by Microsoft in 1998, SOAP is considered old and complex. And it has been largely replaced by a more flexible REST architecture that serves more than 70% of today's public APIs.

However, some leading companies still use SOAP - especially as a middleman for transfers between internal services.

The SOAP API supports both stateless and stateful communication. This composability is another reason why SOAP remains the framework of choice in some cases.

When you use SOAP in state data exchange, it enables efficient information tracking across multiple requests. While this complex operation can clog the server, it still makes SOAP a preferred choice when building complex applications that require an extra layer of security and chaining.

Stateless transitions, on the other hand, do not overload the server's memory. So this feature is equally handy if the aim is to reduce runtime and get better server performance.

But instead of using SOAP to handle stateless communication, web services now prefer to use REST framework, which is more flexible and completely stateless.

For example, the [Microsoft Dynamics](#) program uses the SOAP API to provide business-to-business solutions for large companies.

Because SOAP is ACID compliant, stateful, provides WS secure encryption, and comes with SSL, it is a popular API architecture for banking and financial application transactions.

The stateful nature of the SOAP API maintains the integrity of the database during transactions. Even if a request fails, it tracks and reverses the compromised data.

This explains what it means to comply with the ACID (Atomicity, Consistency, Integrity and Durability) concept:

1. Atomicity: Specify the relevance for each process in a request. That way, failure in a single request unit would derail the entire process.
2. Consistency: Ensures that database queries and methods follow defined rules.
3. Integrity: Maintains the state of the database even when requests occur concurrently.
4. Durability: Keeps a successful request in its state even if the server fails.

## Should you use SOAP API in your programs?

SOAP dominates in the API domain as one of the most secure messaging channels between software. Although complex, slow, old, and heavy, SOAP is still indispensable in many companies today. While modern APIs are easy to use, after all, the SOAP API may be the best choice in some cases.

And besides creating a solution yourself, you may find yourself in a situation where it's the only applicable option that can provide a solution in software. So learning more about SOAP adds valuable knowledge about the API.

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