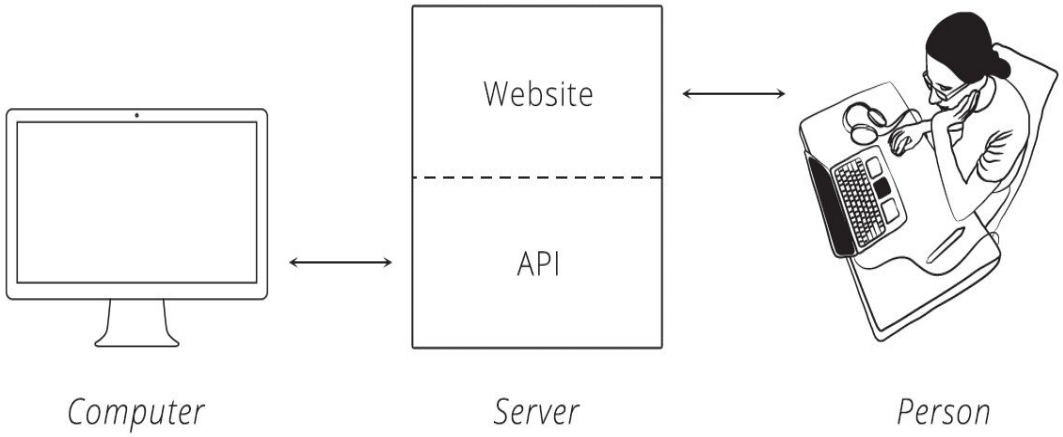
Application Programming Interface

An API is the tool that makes a website's data digestible for a computer. Through it, a computer can view and edit data, just like a person can by loading pages and submitting forms.



Making data easier to work with is good because it means people can write software to automate tedious and labor-intensive tasks. What might take a human hours to accomplish can take a computer seconds through an API.

Status Codes

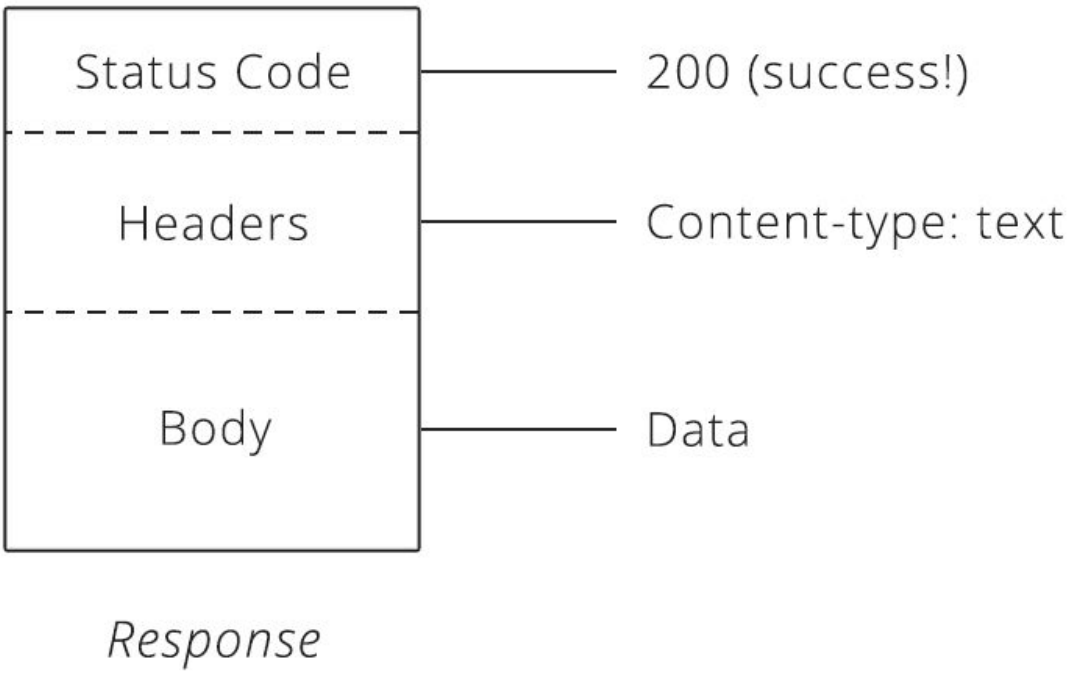
Status codes are three-digit numbers that each have a unique meaning. When used correctly in an API, this little number can communicate a lot of info to the client. For example, you may have seen this page during your internet wanderings:

Not Found

The requested URL / was not found on this server.

Apache/2.2.9 (Ubuntu) PHP/5.2.6-2ubuntu4 with Suhosin-Patch Server

Figure 3. A default 404 web page.



Building an API's HTTP

By now, you can see that HTTP supports a wide range of permutations to help the client and server talk. So, how does this help us with APIs? The flexibility of HTTP means that APIs built on it can provide clients with a lot of business potential. We saw that potential in the pizza ordering example above. A simple tweak to the request

method was the difference between telling the server to create a new order or cancel an existing one. It was easy to turn the desired business outcome into an instruction the server could understand. Very powerful!

This versatility in the HTTP protocol extends to other parts of a request, too. Some APIs require a particular header, while others require specific information inside the request body. Being able to use APIs hinges on knowing how to make the correct HTTP request to get the result you want.

Data Format of Representation

- **JSON**

  Many new APIs have adopted JSON as a format because it's built on the popular Javascript programming language, which is ubiquitous on the web and usable on both the front- and back-end of a web app or service. JSON is a very simple format that has two pieces: *keys* and *values*. Keys represent an attribute about the object being described.

- **XML**

  XML has been around since 1996. With age, it has become a very mature and powerful data format. Like JSON, XML provides a few simple building blocks that API makers use to structure their data. The main block is called a *node*.

Polling

When the client is the only one who can make requests, the simplest solution to keep it up-to-date with the server is for the client to simply ask the server for updates. This can be accomplished by repeatedly requesting the same resource, a technique known as polling.

Long Polling

If requests were free, then nobody would care about efficiency and everyone could just use polling. Unfortunately, handling requests comes at a cost. For an API to handle more requests, it needs to utilize more servers, which costs more money. Scale this cumbersome situation up to Google- or Facebook-sized proportions, and you're paying a lot for inefficiency. Hence, lots of effort has been put into optimizing the way the client can receive updates from the server.One optimization, which builds off of polling, is called long polling. Long polling uses the same idea of the client repeatedly asking the server for updates, but with a twist: the server does not respond immediately. Instead, the server waits until something changes, then responds with the update.

Webhooks

With polling ruled out, some innovative software developers thought, "if all our trouble is because the client is the only one making requests, why not remove that rule?" So they did. The result was webhooks, a technique where the client both makes requests and listens for them, allowing the server to easily push updates to it.