DNS

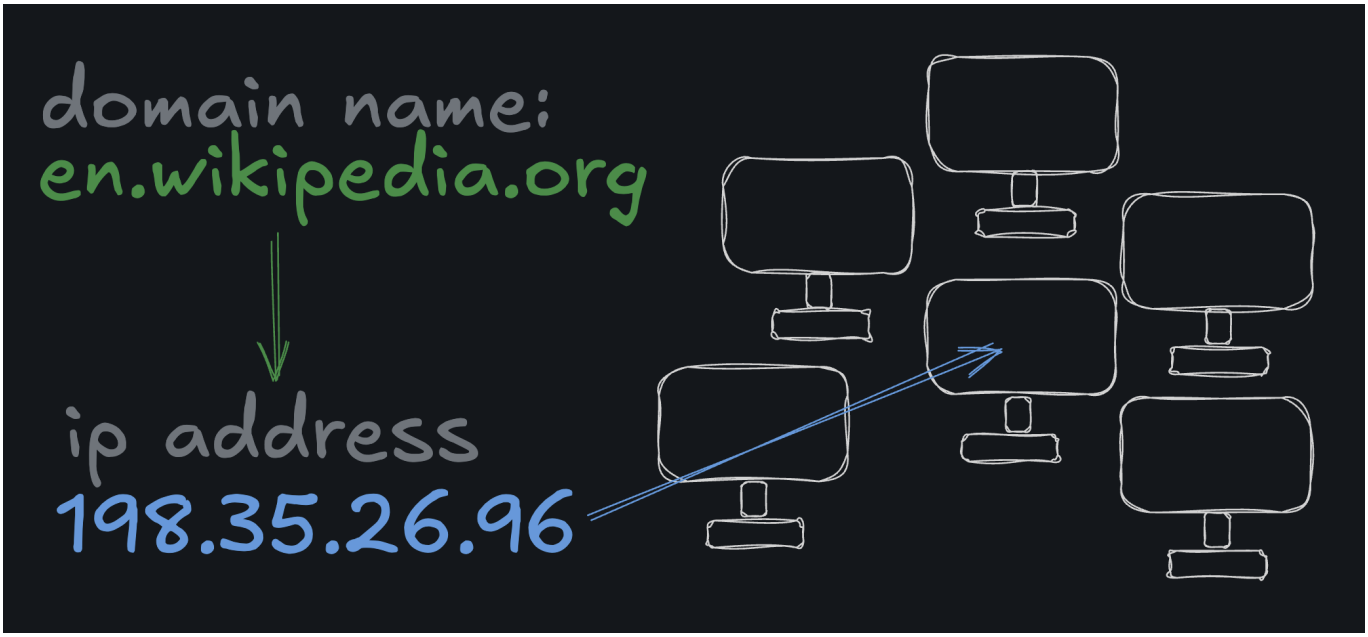
Web Adresses

In the real world, we use physical addresses to help us find where a friend lives, where a business is located, or where a party is being thrown (well, I don't because I'm not invited to parties, but I digress).

In computing, web clients find other computers over the internet using Internet Protocol (IP) addresses. Each device connected to the internet has a unique IP address.

Domain names and IP Addresses

When we browse the internet, we type in a human readable domain name. That domain is converted into an IP address. The IP address tells our computer where the server is located on the internet.



An IP address typically looks like a sequence of numbers separated by periods, ranging from 0 to 255.

To recap, a domain name is part of a URL. It's the part that tells the computer where the server is located on the internet by being converted into a numerical IP address. An IP address is what your computer is using at a lower level to communicate on a network.

Deploying a real website to the internet is actually quite simple. It involves only a couple of steps:

- Create a server that hosts your website files and connect it to the internet
- Acquire a domain name
- Connect the domain name to the IP address of your server
- Your server is accessible via the internet.

Domain Name

A "domain name" or "hostname" is just one portion of a URL. We'll get to the other parts of a URL later.

For example, the URL `https://homestarrunner.com/toons` has a hostname of homestarrunner.com. The `https://` and `/toons` portions aren't part of the `domain name -> IP address` mapping that we've been talking about.

Using the URL API in JavaScript

The `URL` API is built into JavaScript. You can create a new URL object:

```
const urlObj = new URL('https://homestarrunner.com/toons')
```

And then you can extract just the hostname:

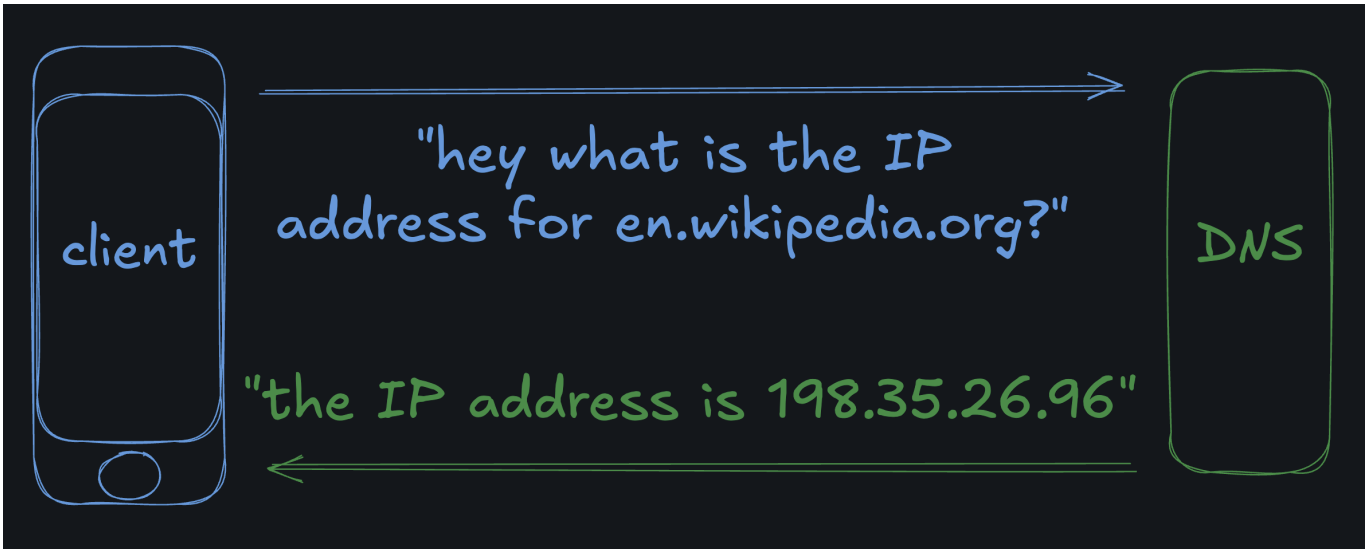
```
const hostname = urlObj.hostname
console.log(hostname) // homestarrunner.com
```

What is the Domain Name System?

So we've talked about domain names, but we haven't talked about the system that makes them work.

DNS, or the "Domain Name System", is the phonebook of the internet. Humans type easy-to-read domain names like htl-leonding.at. DNS "resolves" those domain names to their associated IP addresses so that web clients can find the server they're looking for.

Domain names are for humans, IP addresses are for computers.



How does DNS Work?

We'll go into more detail on DNS in a future course, but to give you a simplified idea, let's just introduce ICANN. ICANN is a not-for-profit organization that manages DNS for the entire internet.

Whenever your computer attempts to resolve a domain name, it contacts one of ICANN's "root nameservers" whose address is included in your computer's networking configuration. From there, that nameserver can gather the domain records for a specific domain name from their distributed DNS database.

If you think of DNS as a phonebook, ICANN is the publisher that keeps the phonebook in print and available.

Subdomains

We learned about how a domain name resolves to an IP address, which is just a computer on a network - often the internet.

A subdomain prefixes a domain name, allowing a domain to route network traffic to many different servers and resources.

For example, the main website wikipedia.org is hosted on a different machine than the media repository. The media repository, found at commons.wikipedia.org, is hosted on the "commons" subdomain (and the IP address/computer it points to).