What is a Domain Name?

Domain names are a key part of the internet infrastructure. They provide a human-readable address for any web server available on the internet

Any Internet-connected computer can be reached through a public IP address, either an IPv4 address (e.g, 192.0.2.172) or an IPv6 address (e.g., 2001:db8:8b73:0000:0000:8a2e:0370:1337).

Computers can handle such addresses easily, but people have a hard time finding out is running the server or what service the website offers. IP addresses are hard to remember and might change over time.

To solve all those problems we use human-readable addresses called domain names.

Deeper dive

Structure of domain names

A domain name has a simple structure made of several parts (it might be one part only, two, three...), separated by dots and **read from right to left**:

A domain name is made up of different parts that help identify and locate a website on the internet. The **Top-Level Domain (TLD)** is the last part, like .com, .org, or .edu, and it gives a general idea of the site's purpose or origin. Some TLDs are open to anyone, while others are restricted to specific uses, like government or educational institutions. Country-specific TLDs, such as .fr or .us, may require the site to be hosted locally or presented in a certain language.

Before the TLD comes the **label**, which can be a word or sequence of characters that helps define the specific site. The label right before the TLD is called the **Secondary Level Domain (SLD)**, and it's often the main name of the website. Labels can include letters, numbers, and hyphens, and they follow certain formatting rules.

A domain name can have multiple labels, forming **subdomains** that organize different sections of a site. For example, developer.mozilla.org is a subdomain of mozilla.org. Each part of the domain name contributes to directing your browser to the correct server on the internet.

Buying a domain name

Who owns a domain name?

You cannot "buy a domain name". This is so that unused domain names eventually become available to be used again by someone else. If every domain name was bought, the web would quickly fill up with unused domain names that were locked and couldn't be used by anyone.

Instead, you pay for the right to use a domain name for one or more years. You can renew your right, and your renewal has priority over other people's applications. But you never own the domain name.

Companies called registrars use domain name registries to keep track of technical and administrative information connecting you to your domain name.

Note: *For some domain name, it might not be a registrar which is in charge of keeping track. For instance, every domain name under .fire is managed by Amazon.*

Finding an available domain name

To find out whether a given domain name is available,

- Go to a domain name registrar's website. Most of them provide a "whois" service that tells you whether a domain name is available.
- Alternatively, if you use a system with a built-in shell, type a whois command into it, as shown here for mozilla.org:

BASH Copy

```
whois mozilla.org
```

This will output the following:

```
Domain Name:MOZILLA.ORG
Domain ID: D1409563-LROR
Creation Date: 1998-01-24T05:00:00Z
Updated Date: 2013-12-08T01:16:57Z
Registry Expiry Date: 2015-01-23T05:00:00Z
Sponsoring Registrar:MarkMonitor Inc. (R37-LROR)
Sponsoring Registrar IANA ID: 292
WHOIS Server:
Referral URL:
Domain Status: clientDeleteProhibited
Domain Status: clientTransferProhibited
Domain Status: clientUpdateProhibited
Registrant ID:mmr-33684
Registrant Name:DNS Admin
Registrant Organization:Mozilla Foundation
Registrant Street: 650 Castro St Ste 300
Registrant City:Mountain View
Registrant State/Province:CA
Registrant Postal Code:94041
Registrant Country:US
Registrant Phone:+1.6509030800
```

As you can see, I can't register mozilla.org because the Mozilla Foundation has already registered it.

On the other hand, let's see if I could register afunkydomainname.org:

BASH Copy

```
whois afunkydomainname.org
```

This will output the following (at the time of writing):

```
NOT FOUND
```

As you can see, the domain does not exist in the whois database, so we could ask to register it. Good to know!

Getting a domain name

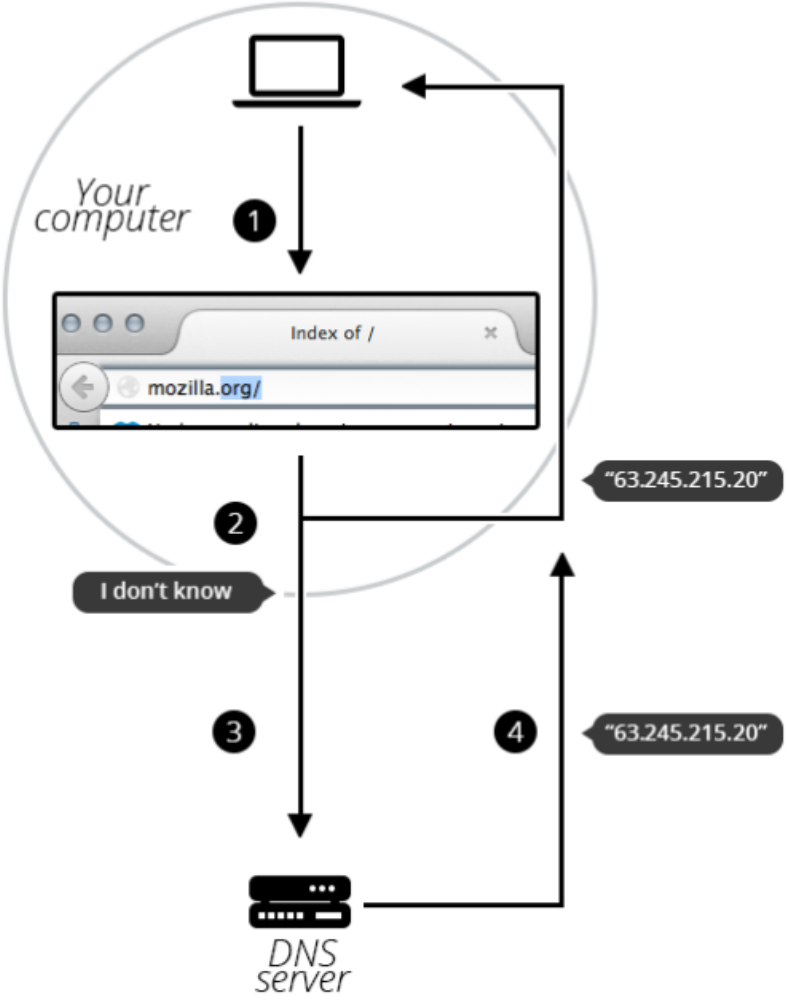
The process is quite straightforward:

1. Go to a registrar's website.
2. Usually there is a prominent "Get a domain name" call to action. Click on it.
3. Fill out the form with all required details. Make sure, especially, that you have not misspelled your desired domain name. Once it's paid for, it's too late!
4. The registrar will let you know when the domain name is properly registered. Within a few hours, all DNS servers will have received your DNS information.

> **Note:** In this process the registrar asks you for your real-world address. Make sure you fill it properly, since in some countries registrars may be forced to close the domain if they cannot provide a valid address.

DNS refreshing is the process by which updated domain information spreads across DNS servers worldwide. These servers rely on a few key authoritative name servers to manage and verify domain data. When a registrar updates a domain's details, it takes time for all DNS servers to refresh their records. Each server stores the data temporarily and, once it expires, it fetches the latest version from an authoritative source.

When you type a domain like mozilla.org into your browser, your computer first checks its local DNS cache to see if it already knows the IP address. If it does, it uses that to connect to the server. If not, it asks a DNS server to resolve the domain name into an IP address. Once the IP is known, your browser can communicate with the correct web server and load the page.


Your computer
1
Index of /
mozilla.org/
"63.245.215.20"
2
I don't know
3
4
"63.245.215.20"
DNS server