



Developer Tools (Browser)

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What are Developer Tools?

- Built-in browser tools for debugging and optimizing websites.
- Available in Chrome, Firefox, Edge (*F12 or Ctrl + Shift + I*).

Key DevTools Tabs

Tab	Purpose
Elements	Modify HTML & CSS live
Console	Run JavaScript commands, debug errors
Network	Monitor API calls and webpage requests
Application	Manage storage, cookies, cache
Performance	Analyze page load time



Web Servers

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What is a Web Server?

A web server stores, processes, and delivers web pages to users via the internet.

How Web Servers Work

- A user enters a website URL in the browser.
- The request goes to a DNS server to find the website's IP address.
- The web server processes the request and returns the web page.
- The browser renders the HTML, CSS, and JavaScript.

Examples of Web Servers

- **Apache** – Open-source, widely used.
- **NGINX** – High-performance, scalable.
- **IIS** (*Internet Information Services*) – Microsoft's web server.



What is an IP Address?

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What is an IP Address?

An IP Address (Internet Protocol Address) is a unique numerical label assigned to each device connected to the Internet.

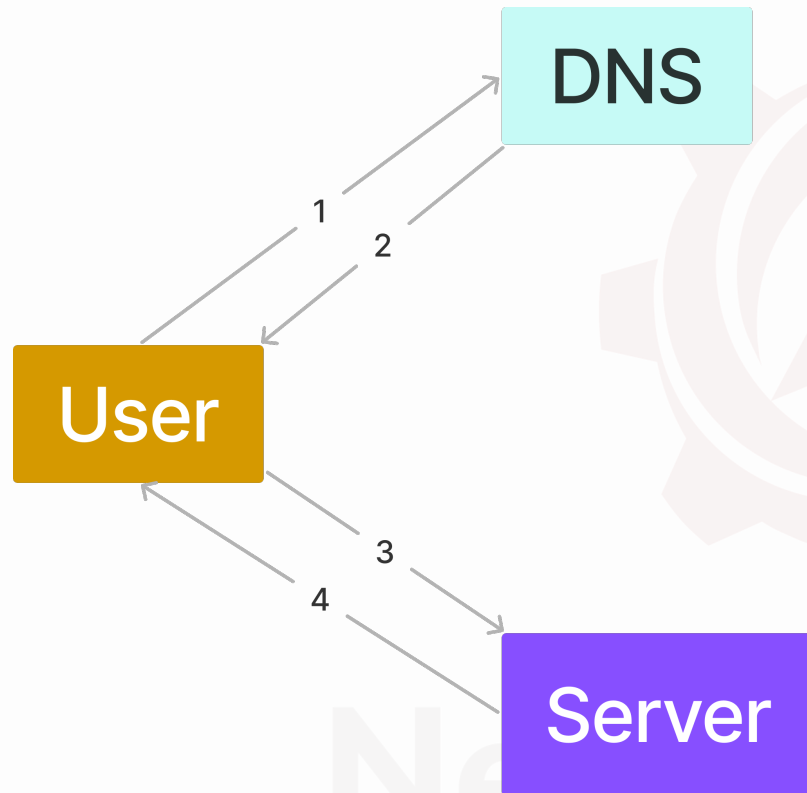
Types of IP Addresses

- **IPv4** – 32-bit address, limited availability.
e.g., 192.168.1.1
- **IPv6** – 128-bit, more addresses.
e.g., 2001:0db8:85a3::8a2e:0370:7334

Public vs Private IP

Type	Example	Usage
Public IP	203.0.113.45	Used to identify a device on the internet
Private IP	192.168.1.1	Used for internal networks (home, office)

How IP Works in Web Requests



1. User Send a request to the **DNS Server**. With www.google.com.
2. The **DNS Server** sent a response to the user, with "**142.250.190.78**".
3. User sends request **Actual Server** that IP Address is "**142.250.190.78**".
4. User receives requested data from the server.

Imagine you want to visit Google. But computers don't understand names like "google.com"—they only understand numbers called IP addresses (like 142.250.190.78).



HTTP & Domain

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What is HTTP?

HTTP (Hypertext Transfer Protocol) is a communication protocol for web browsers and servers.

HTTP vs. HTTPS

Protocol	Security	Uses Encryption?
HTTP	Less secure	No
HTTPS	More secure	Yes (SSL/TLS)

What is a Full Domain URL?

A URL (Uniform Resource Locator) consists of multiple parts. Example:

https://subdomain.example.com:8080/path/page.html?search=query#section

Protocol Sub Domain Second-level Domain High-level Domain Port Path Query Fragment

Domain Name

Part	Example	Meaning
Protocol	https://	Communication type (HTTP/HTTPS)
Subdomain	www.	A section of the main domain
Domain Name	example.com	The website's registered name
Port	:8080	Specifies a communication port (default: 80 for HTTP, 443 for HTTPS)
Top-Level Domain (TLD)	.com, .org, .lk	Main domain category
Second-Level Domain (SLD)	google in <i>google.com</i>	Unique website name
Subdomain	mail.google.com	A section of the main domain
Path	/path/page.html	The specific file/resource requested
Query String	?search=query	Data sent to the server (e.g., search terms)
Fragment	#section	A specific section of the webpage



Version Control with Git

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What is Version Control?

Version control tracks code changes over time, allowing developers to revert to previous versions if needed.

What is Git?

Git is a distributed version control system that helps manage project history.

Why Use Git?

- Tracks every code change.
- Allows collaboration with multiple developers.
- Helps revert back to previous code versions if needed.

Basic Git Commands

Command	Description
<code>git init</code>	Initialize a new Git repository
<code>git clone <repo_url></code>	Copy an existing repository
<code>git add <file></code>	Stage a file for commit
<code>git commit -m "message"</code>	Save changes to history
<code>git status</code>	Check repository status
<code>git log</code>	View commit history
<code>git push origin main</code>	Upload changes to GitHub