INTRO TO WEB DEVELOPMENT v2.0
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1) The Internet and Networking

Internet Statistics

- *More than 4.64 billion users globally*
- *59.6% of all world population has access*
- *More than 1.7 billion websites*
- *11x increase from 2000 to 2020*

Internet History

- *1958 – Bell Labs – Modem*
- *1961 – MIT – Packet Switching*
- *1968 – ARPANET*
- *1972 – University Internet Nodes, UCLA Chat*
- *1974 – Vint Cerf – TCP…..Read more*

How People Use the Internet

Internet users say they spend about 6.5 hours a day online. What do they do there?

They have fun:

Netflix has **125m** subscribers,

NETFLIX

about 55% of whom are international.

About **1m** people

twitch

are always watching Twitch.

2018 data

They send information and updates to friends and colleagues:

269bn emails are sent and received each day.

They run errands:

According to one survey **42%** of global respondents say they paid a bill using their mobile device.

They pursue education:

Online education is worth **$165bn** and is projected to reach **$275bn** by 2022.

They keep in touch with old friends and make new ones:

2.2bn people are monthly active users on Facebook.
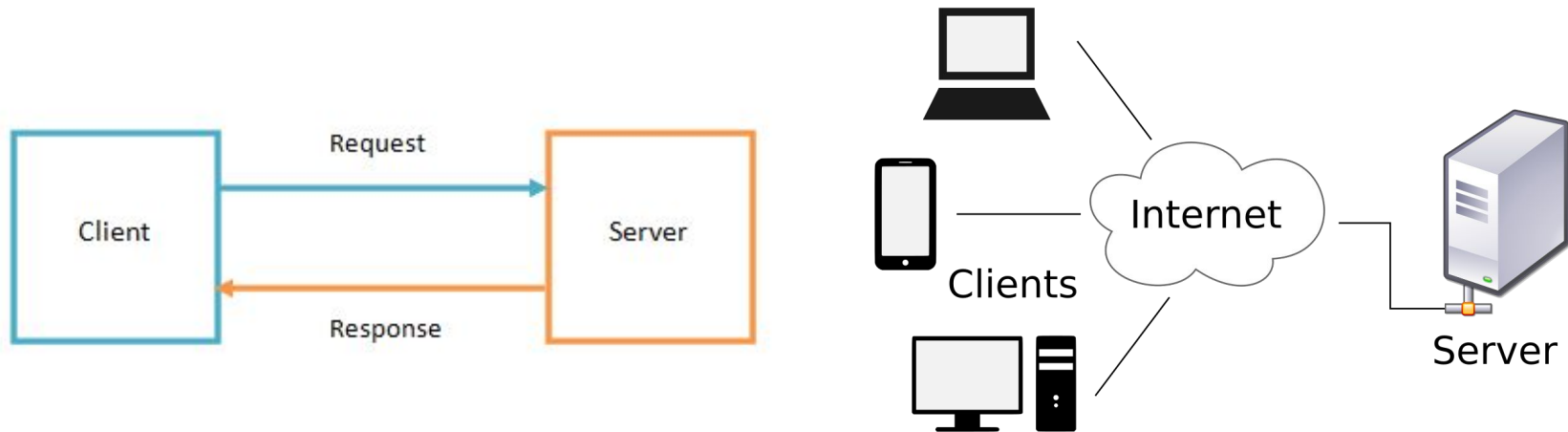
World101

2) How the Web Works?

Internet Components

- *Servers*
- *Clients*
- *ISPs*
- *DNS*
- *Data Centers*

# Client Server Model

Internet Service Provider (ISP)

- Company that provides access to user
- Internet can be over DSL, Phone Line, Cable, Fibre, Wireless and other medium

Domain Name Server (DNS)

- Contact list of the Internet
- Maps domains (www.google.com, www.facebook.com) to IP addresses (112.123.21.22, 176.13. 69.63)
- Humans remember domains while Browsers work with IP

Data Centers

A data center or data centre is a building, dedicated space within a building, or a group of buildings used to house computer systems and associated components, such as telecommunications and storage systems.
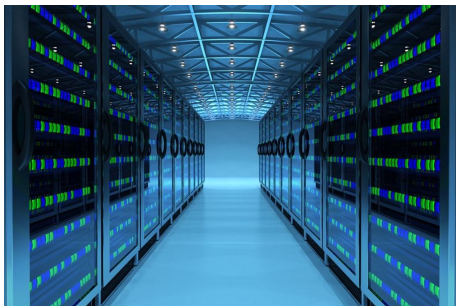
3) Web Technologies

Major Components

- *Protocols*
- *Addresses*
- *Packets*

The **Internet Protocol** (IP) is a **protocol**, or set of rules, for routing and **addressing packets** of data so that they can travel across networks and arrive at the correct destination. Data traversing the **Internet** is divided into smaller pieces, called **packets**.

Internet Protocols

Web Protocols

- *TCP/IP*
- *HTTP*
- *DHCP*
- *FTP*
- *SMTP*
- *SSH*
- *Telnet*

The standard network protocol of the Internet, TCP/IP, stands for Transmission Control Protocol/Internet Protocol. The Internet Protocol part of the standard refers to the addressing of data message packets.

Web Addresses

Addresses

- *Domain Name*
- *IP Address*
- *Mac Address*

Domain Name

- Human-readable web address
- \<subdomain\>.\<domain\>.\<TLD\>
- TLD – Top level domain are **.com, .in, .org**

IP Address

- 32-bit, 4-word address (IPv4)
- Uniquely defines a server, a client, a node, or a router.
- IPv6 Address – Default in future - 128-bit (16 octet)
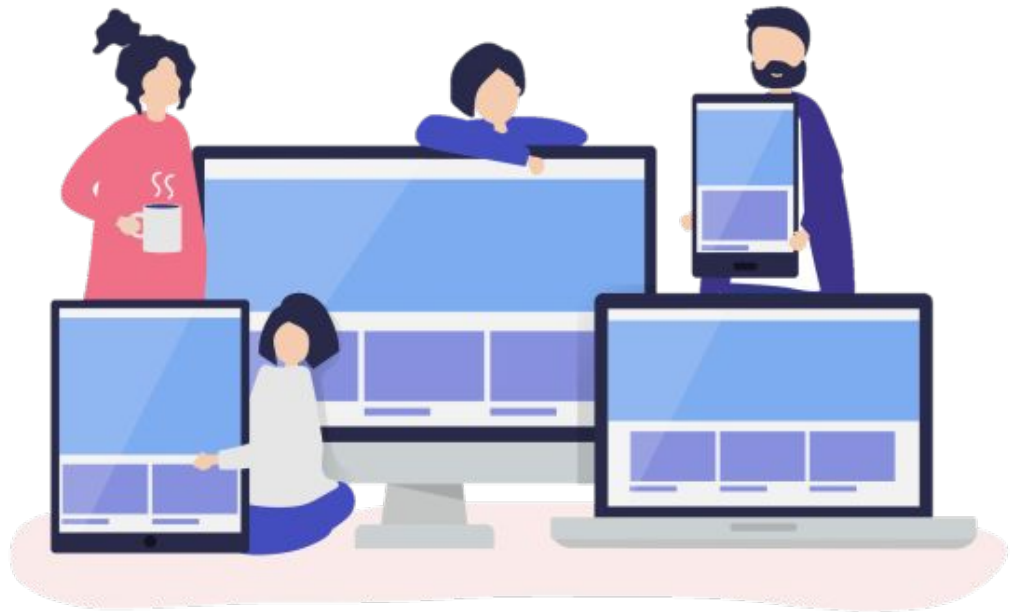- IP allows – Subnets, Gateways, Private Ips

Mac Address

- Media Access Control
- An ID unique to a hardware Network Interface
- Is not dynamic like IP. Is fixed for a hardware device.
- Used by all IEEE 802 Network Technologies
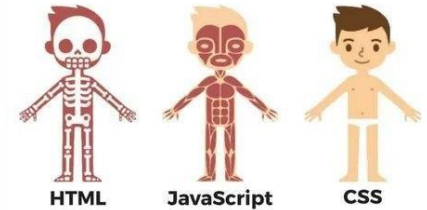
4) Components of the Web

Components

- *Web Pages*
- *Web Sites*
- *Search Engines*
- *Web Servers*

Web Pages

- A document that can be viewed over web
- Transported over Internet
- Viewed on a browser
- Uses markup (HTML) and styling. Can contain scripts

Web Sites

- Collection of webpages
- Also can include other media (audio, images, video)

Search Engines

- A website that indexes other websites/webpages
- Helps you find websites
- Uses techniques like 'crawling' to cache content for searching Google.com, Bing.com, Yahoo.com
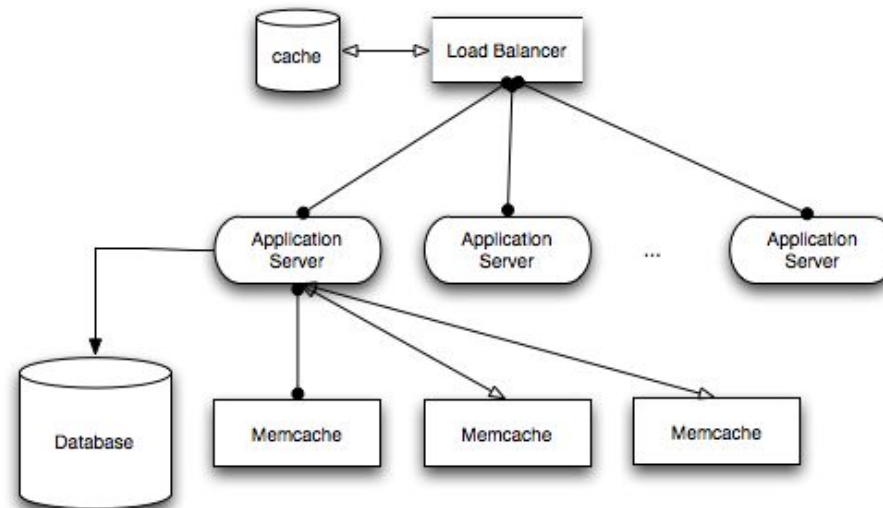
Web Servers

Server

- *A hardware (or software) that hosts the website.*
- *One website can be spread over multiple servers*
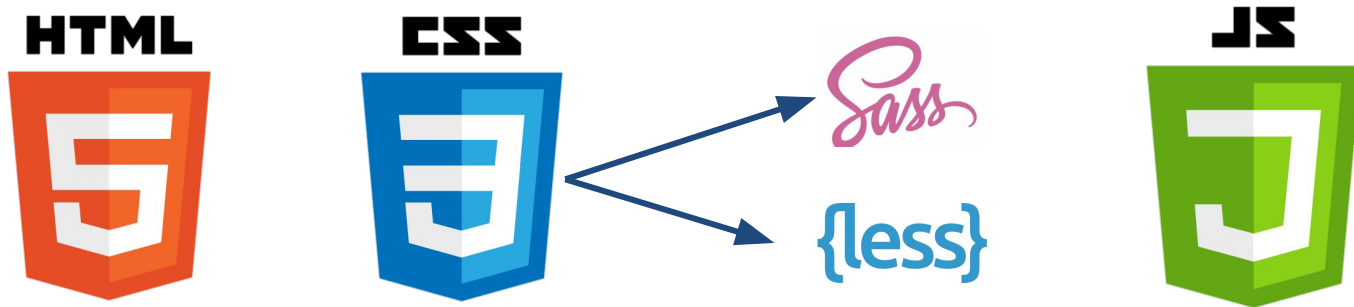- *One server can host multiple websites*

Web Server Architecture

5) How Web Technologies Work?

Client Side Technologies

Client Side Frameworks

Server Side

Server

- *Hardware*
- *Operating System*
- *Server Framework*
- *Containers/Servlets*
- *Server Applications*

Server Side Frameworks

JavaScript Framework

Python Framework

Codeigniter & Laravel

Ruby Framework

Java Framework

Server-side Databases

- RDBMS
  - MySQL
  - Postgres
  - Oracle

- NoSQL
  - MongoDB
  - Redis

Client-side Storage

- localStorage
- sessionStorage
- Cookies
- indexedDB
- cache

6) Website Design Principles

Type of Websites:

- **Static Websites:** All HTML content is created and saved on server
- **Dynamic Website:** Content is generated on demand for each user
- **Responsive:** Reacts to user, and his screen size

Website Design Principles:

- Reactive websites
- Single-Page Applications
- MVC, MVP, MVVM and MV* architectures
- Web Application Frameworks
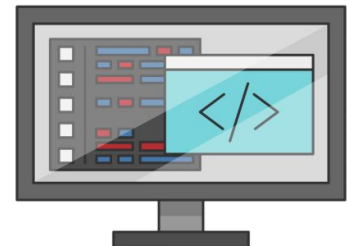
Restful APIs

A contract between servers and clients
GET, POST, PUT, DELETE and PATCH

Data exchange format
- JSON
- XML

Latest Development
- Virtual DOM, Shadow DOM
- Sockets
- Pub/Sub, Push Notifications
- Browser Native APIs (Locations, User data)

THANK YOU

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