

CS- 504 (A) Internet and Web Technology

Unit - I

Syllabus (Unit-I)

UNIT 01

Introduction: Concept of WWW, Internet and WWW, HTTP Protocol : Request and Response, Web browser and Web servers, Features of Web 2.0 Web Design: Concepts of effective web design, Web design issues including Browser, Bandwidth and Cache, Display resolution, Look and Feel of the Web site, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation.

Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal

New Scheme of Examination as per AICTE Flexible Curricula

V Semester

Bachelor of Technology (B.Tech) Computer Science and Engineering/ Computer Engineering/Computer Science & Technology]

(w.e.f. July, 2019)

S.No.	Subject Code	Category	Subject Name	Maximum Marks Allotted					Total Marks	Contact Hours per week			Total Credits			
				Theory			Practical			Term work	Lab Work & Sessional	L	T	P		
				End Sem.	Mid Sem. Exam.	Quiz/Assignment	End Sem									
1.	CS-501	DC	Theory of Computation	70	20	10	30	20	150	3	-	2	4			
2.	CS-502	DC	Database Management Systems	70	20	10	30	20	150	3	-	2	4			
3.	CS -503	DE	Departmental Elective	70	20	10	-	-	100	3	1	-	4			
4.	CS -504	OE	Open Elective	70	20	10	-	-	100	3	-	-	3			
5.	CS -505	D Lab	Lab (Linux)	-	-	-	30	20	50	-	-	4	2			
6.	CS -506	O/E Lab	Lab (Python)	-	-	-	30	20	50	-	-	4	2			
7.	BT -407	IN	Evaluation of Internship-II	-	-	-	-	100	100	-	-	6	3			
8.		IN	Internship - III	To be completed anytime during Fifth/Sixth semester. Its evaluation/credit to be added in Seventh Semester.												
9.	CS -508	P	Minor Project- I	-	-	-	-	50	50			4	2			
10.	Additional Credits [#]	<i>[#]Additional credits can be earned through successful completion of credit based MOOC's Courses available on SWAYAM platform (MHRD) at respective UG level.</i>														
			Total	280	80	40	120	230	750	12	1	22	24			

Departmental Electives	Open Electives
CS 503 (A) Data Analytics	CS 504 (A) Internet and Web Technology *
CS 503 (B) Pattern Recognition	CS 504 (B) Object Oriented Programming **
CS 503 (C) Cyber Security	CS 504 (C) Introduction to Database Management Systems**

* Can be offered to students of all branches including CSE

** Can be offered to students of all branches except CSE and IT

Reference Books

1. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
2. Web Technologies, Black Book, dreamtech Press
3. HTML 5, Black Book, dreamtech Press
4. Web Design, Joel Sklar, Cengage Learning
5. Developing Web Applications in PHP and AJAX, Harwani, McGrawHill
6. Internet and World Wide Web How to program, P.J. Deitel & H.M. Deitel , Pearson

Internet Basics

Data Communications : Data communications are the exchange of data between two devices via some form of transmission medium such as a wired cable or wireless medium.

Internet Basics

cont...

- **Components of Data Communication:**

The different components of Data communication are shown in the following figure.

1. **Message:** The message is the information (data) to be communicated. Popular forms of information include text, numbers, pictures, audio, and video.
2. **Sender:** The sender is the device that sends the data message. It can be a computer, workstation, telephone handset, video camera, and so on.
3. **Receiver:** The receiver is the device that receives the message. It can be a computer, workstation, telephone handset, television, and so on.
4. **Transmission medium:** The transmission medium is the physical path by which a message travels from sender to receiver. Some examples of transmission media include twisted-pair wire, coaxial cable, fiber-optic cable, and radio waves.
5. **Protocol:** A protocol is a set of rules that govern data communications. It represents an agreement between the communicating devices.

Internet Basics

cont...

Categories of networks

Network divided in to three primary categories: LAN, MAN, WAN. In to which category a network falls is determined by its Size, Ownership, Distance it covers, and Physical architecture

Internet Basics

cont...

1. Local-Area Network(LAN) :

- LAN is usually Privately owned and Links devices in single office, building or campus.
- LAN size is Limited to few meters.
- LANs are designed to allow resources (i.e. hardware or software) to be shared between

PCs and workstations

- LAN will use a single transmission media.
- The most common LAN Topologies are Ring, bus, star.

Internet Basics

cont...

2. Metropolitan-Area Network (MAN):

- A MAN is designed to extend over an entire city.
- It may be single network such as cable television network, or it may be a means of connecting number of LANs in to a larger networks.
- A MAN be wholly Owned and operated by a private company, or it may be a Service provider by Public company such as a local telephone company.

3.Wide-Area Network(WAN):

- WAN provides long-transmission of data, voice, image and video information over large geographic areas that may comprise a country, a continent or even the whole world.
- WAN that is wholly owned and used by a single company is often referred to as an enterprise network.

Internet Basics

cont...

Application of Computer Network:

- Sharing of resources such as printers
- Sharing of expensive software's and database
- Communication from one computer to another computer
- Exchange of data and information among users via network
- Sharing of information over geographically wide areas.

Internet Basics

cont...

INTERNET

Internet is a worldwide network of networks that uses the standard Internet protocol suite (TCP/IP) to link several billion devices worldwide.

Hardware and software Requirements

1. A computer
2. A modem and physical line (Internet cable)
3. An Internet browser (software) and software to connect you to the ISP
4. An account with an Internet Service Provider (ISP)

Internet Basics

cont...

Applications of Internet:

- Sending and receiving email
- Searching and browsing information archives
- Copying files between computers
- Conducting financial transactions
- Navigating (in your car, smart scooter, smart bike, or other)
- Playing interactive games.
- Video and music streaming
- Chat or voice communication (direct messaging, video conferencing) etc.

Internet Basics

cont...

Intranet

An intranet is a computer network for sharing information, collaboration tools, operational systems, and other computing services within an organization, usually to the exclusion of access by outsiders.

Internet Basics

cont...

Uses of the intranet:

- Streamlining everyday activities by making repeated tasks more feasible.
- Centralizing and managing important information and company data in a single database.
- Making collaboration easier since information can be shared across the entire network.
- Providing personalized content to employees based on their role within the company.
- Improving internal communication by making employee directories, company news and organization charts readily available.
- Providing fast and easy access to information about company policies, benefits and updates.

Internet Basics

cont...

Parameter	Internet	Intranet
Usage	Public	Private
User Types	Any user having dial up or Internet access line.	Organization employees and Internal company departments
Usage	Access all kind of information	Internal employee communication , telephone directories etc.
Security	Low security. Configured under 0 security level in firewall	High security. Configured under 100 security level in firewall
Regulated by	Internet Architecture Board (IAB): Oversees the technical and engineering development of the IETF and IRTF. Internet Corporation for Assigned Names and Numbers (ICANN).	It is regulated by an organization.
Coverage	Wide Area	Within an organization
Access	Large number of users	Limited number of users
System failure	Unpredictable	System availability is high since system is monitored by authority

Internet Basics

cont...

Domain Name System (DNS)

- DNS Stands for Domain Name System (or Service or Server).
- It is an Internet service that translates domain names into IP addresses.
- Because domain names are alphabetic, they're easier to remember. The Internet however, is really based on IP addresses. Every time you use a domain name, therefore, a DNS
- service must translate the name into the corresponding IP address. For example, the domain name `www.example.com` might translate to `198.105.232.4`.

Three main components of DNS

- 1.Name resolver
- 2.Name server
- 3.database of resource records(RRs)

Internet Basics

cont...

DNS resolver

The client-side of the DNS is called a DNS resolver. It is responsible for initiating and sequencing the queries that ultimately lead to a full resolution (translation) of the resource sought, e.g., translation of a domain name into an IP address.

Name Sever

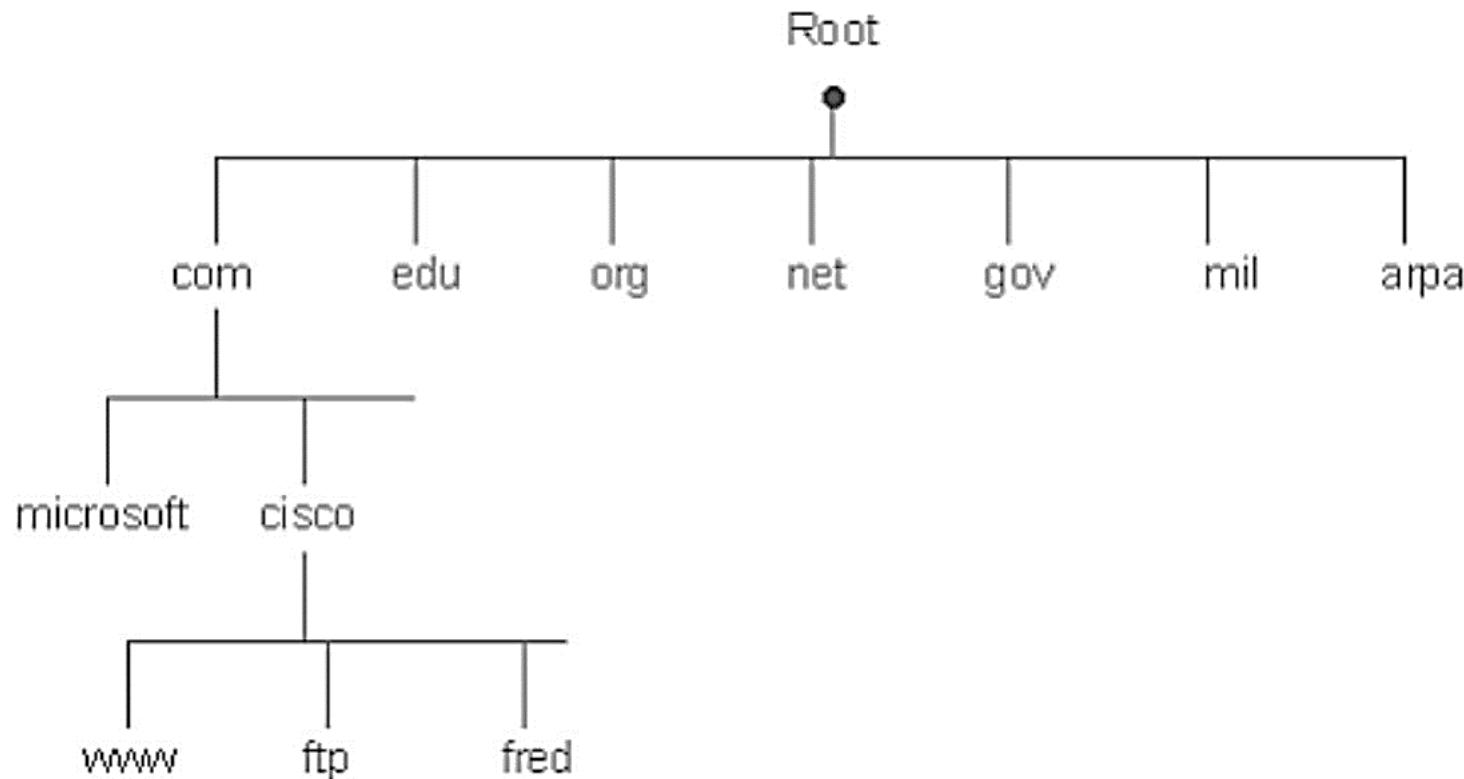
Server responsible for answering DNS queries

- Exists at all levels of hierarchy.
- Authoritative name servers hold part of the DNS database.
- One name server can serve more than one zone.
- Many name servers “should” serve the same zone.
- Some name servers are authoritative for certain zones

Internet Basics

cont...

DNS STRUCTURE



Internet Basics

cont...

DNS is hierarchical in structure. A domain is a subtree of the domain name space. From the root, the assigned top-level domains in the U.S. are:

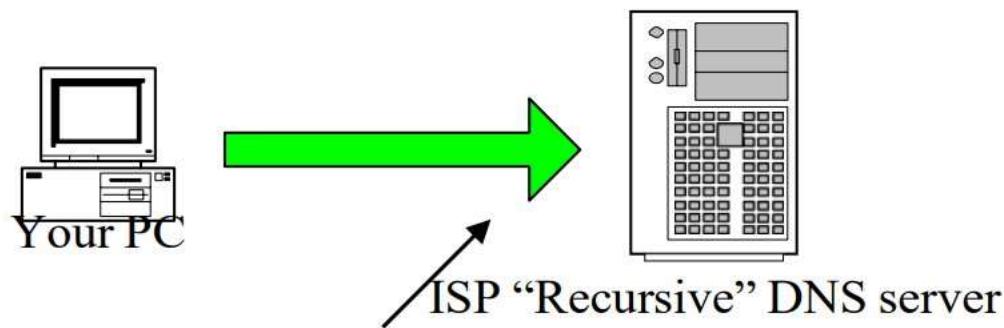
- **.GOV** - Government body.
- **.EDU** - Educational body.
- **.NET** - Networks
- **.COM** - Commercial entity.
- **.MIL** - U. S. Military.
- **.ORG** - Any other organization not previously listed.

Internet Basics

cont...

FOR EXAMPLE:-

Step 1: Your PC sends a resolution request to its configured DNS Server, typically at your ISP.

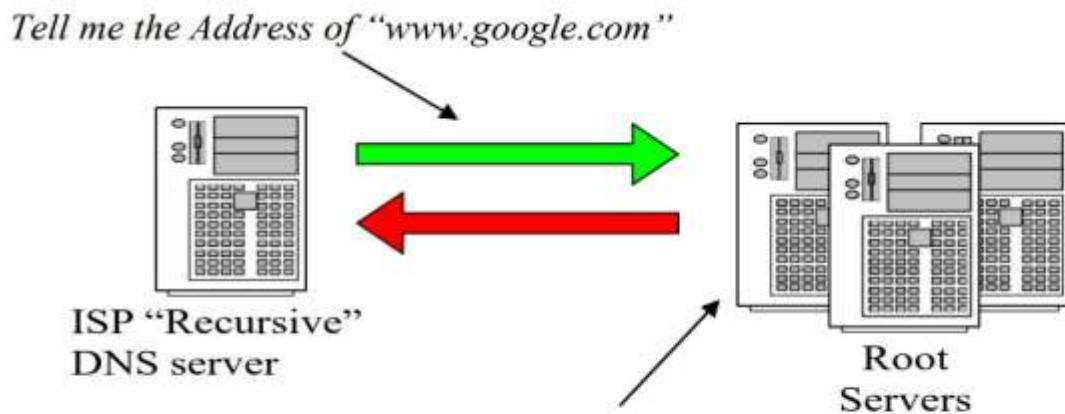


Tell me the Address of “www.google.com

Internet Basics

cont...

Step 2: Your ISPs recursive name server starts by asking one of the root servers predefined in its “hints” file

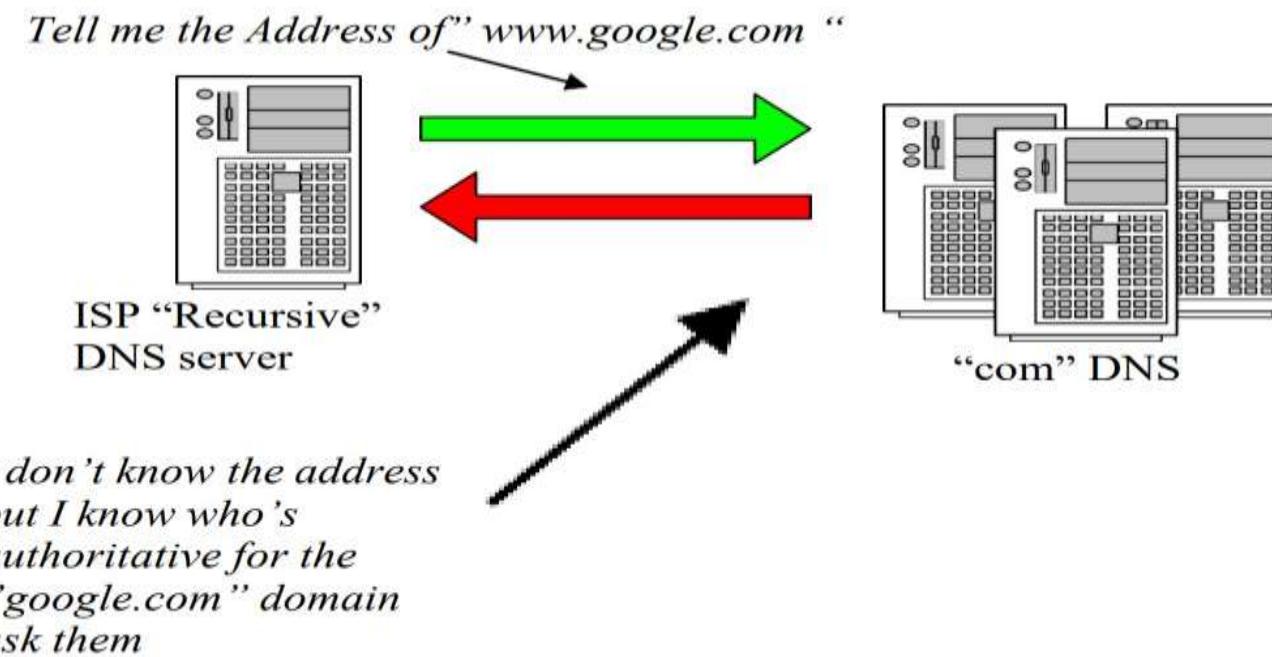


I don't know the address but I know who's authoritative for the "com" domain ask them

Internet Basics

cont...

Step 3: Your ISPs recursive name server then asks one of the “com” name servers as directed.

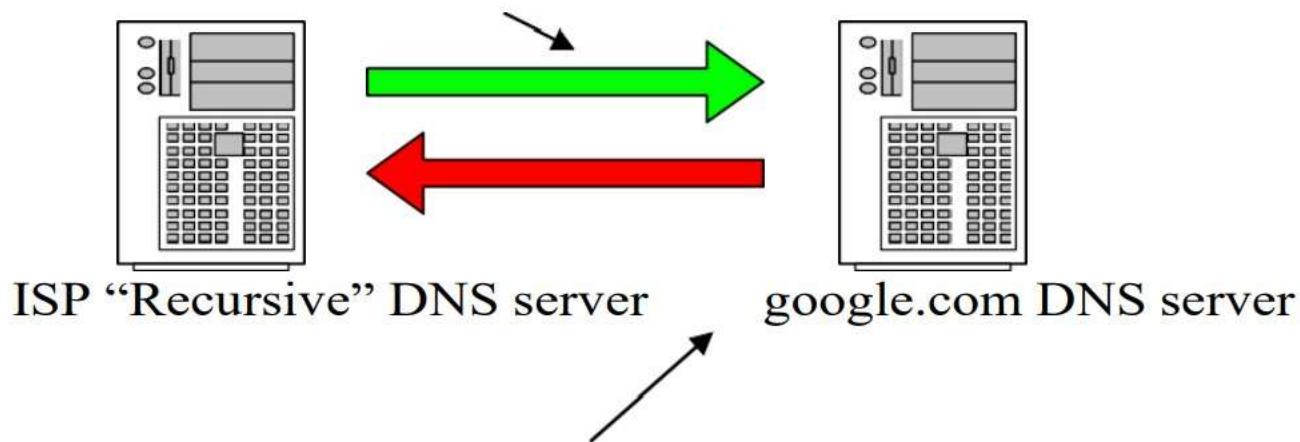


Internet Basics

cont...

Step 4: Your ISPs recursive name server then asks one of the “google.com” name servers as directed.

Tell me the Address of “www.google.com”

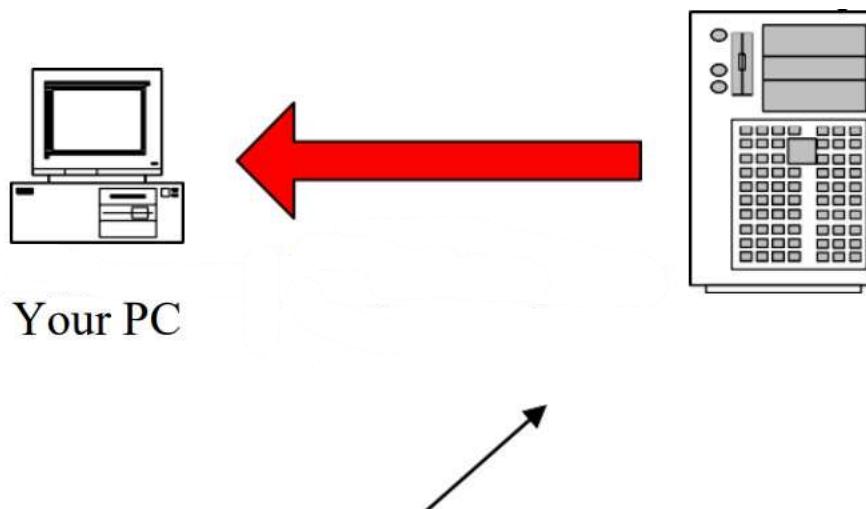


The Address of www.google.com is 216.239.53.99

Internet Basics

cont...

Step 5: ISP DNS server then send the answer back to your PC. The DNS server will “remember” the answer for a period of time.

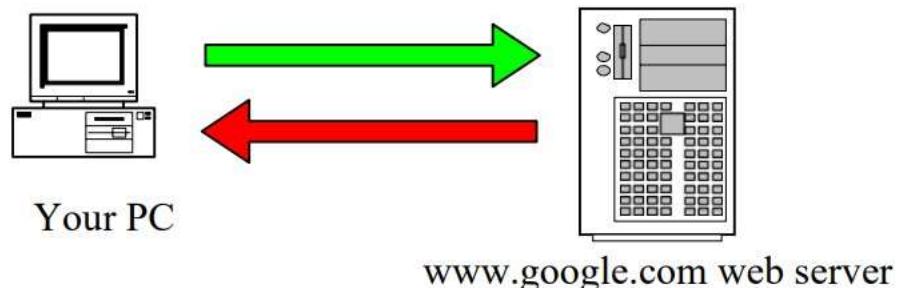


The Address of www.google.com is 216.239.53.99

Internet Basics

cont...

Step 6: Your PC can then make the actual HTTP request to the web server.



Here it is!

Internet Basics

cont...

INTERNET SERVICE PROVIDER

An Internet service provider (ISP) is an organization that provides services for accessing, using, or participating in the Internet

Factors to consider when choosing ISP

- Bandwidth
- Availability
- Cost
- Network security
- Customer Services
- Location & they need for speed

History of Internet and World Wide Web

- In the late 1960s, one of the authors (**HMD Harry Deitel**) was a graduate student at MIT.
- His research at MIT's Project (**now the Laboratory for Computer Science—the home of the World Wide Web Consortium**) was funded by ARPA.
- Operating at a then-stunning **56 Kbps** (i.e., **56,000 bits per second**) but telephone lines to computers at a rate of **110 bits per second**.
- Researchers at Harvard talked about communicating with the Univac 1108 “supercomputer” at the University of Utah to handle calculations related to their computer graphics research.
- Shortly after this conference, ARPA proceeded to implement the ARPANET, which eventually evolved into today's Internet.

History of Internet and World Wide Web

Cont....

- The protocols for communicating over the ARPAnet became known as **TCP**—the Transmission Control Protocol.
- TCP ensured that messages were properly routed from sender to receiver.

History of Internet and World Wide Web

Cont....

- As the Internet evolved, organizations worldwide were implementing their own net works for both **intraorganization** (i.e., within the organization) and **interorganization** (i.e., between organizations) communications.
- One challenge was to get these different networks to communicate.
- ARPA accomplished this with the development of **IP**—the Internetworking Protocol, truly creating a “**network of networks**,”
- The combined set of protocols is now commonly called **TCP/IP**.

History of Internet and World Wide Web

Cont....

- Initially, Internet use was limited to **universities and research institutions**;
- Then the **military** began using the Internet.
- The government decided to allow access to the Internet for commercial purposes.
- Initially, research and military communities were concerned that response times would become poor as “the Net” became saturated with users.

History of Internet and World Wide Web

Cont....

- In fact, the exact opposite has occurred.
- Businesses rapidly spending vast amounts of money to develop and enhance the Internet.
- This generated fierce competition among the communications carriers and hardware and software suppliers.

History of Internet and World Wide Web

Cont....

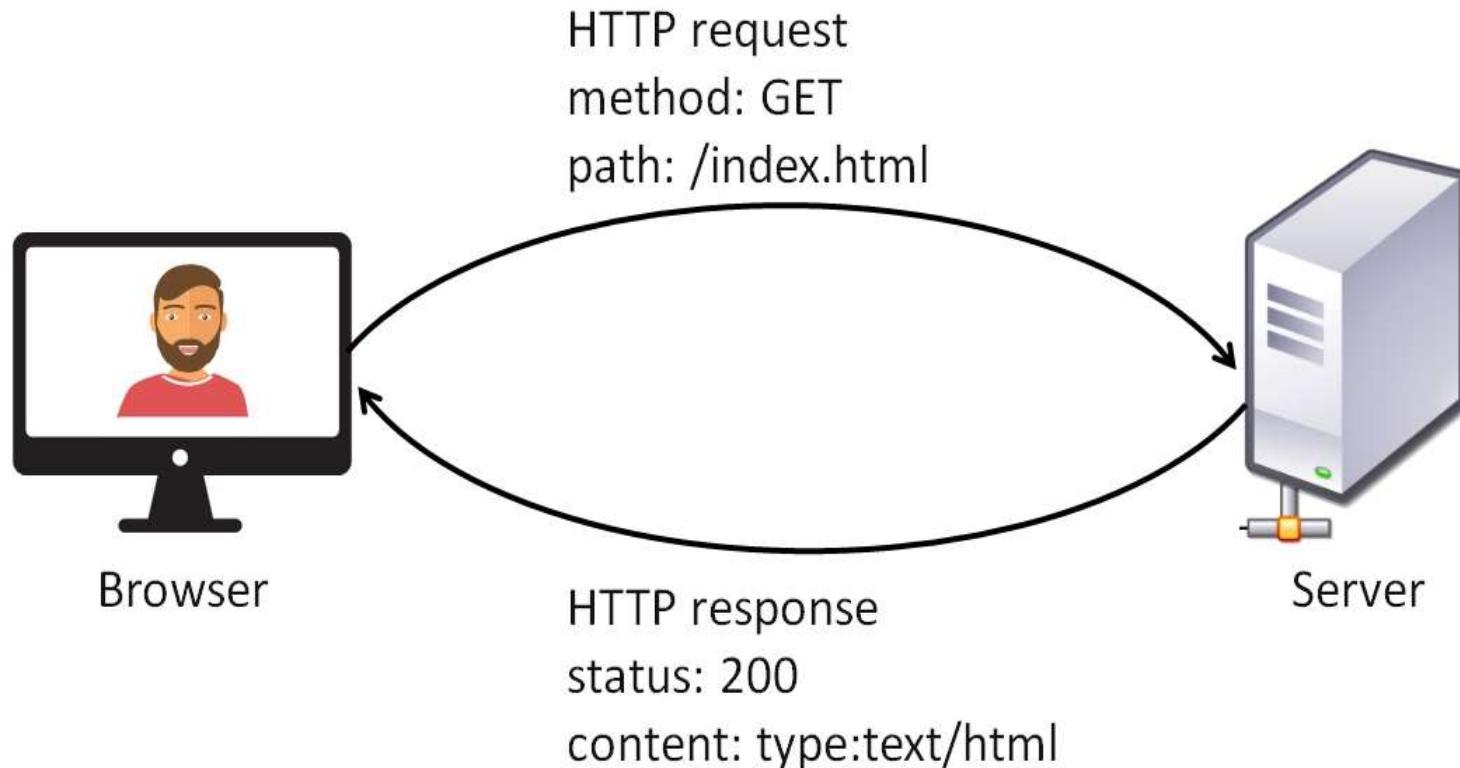
- The result is that **bandwidth** (i.e., the information carrying capacity) on the Internet has increased tremendously and costs have decreased significantly.
- It is widely believed that the Internet has played a significant role in the **economic prosperity of the United States**.

What is HTTP?



- The Hypertext Transfer Protocol (HTTP) is the foundation of the World Wide Web, and is used to load webpages using hypertext links.
- HTTP (Hypertext Transfer Protocol) is the set of rules for transferring files such as text, images, sound, video and other multimedia files over the web.
- The latest version of HTTP is HTTP/2, which was published in May 2015.

What is HTTP?



The WEB and HTTP



Researchers



University students



Acedemics

Internet

World Wide Web



World Wide Web

••• **amazon.com**

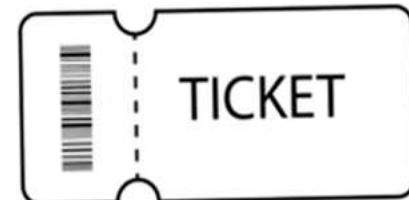


Shopping

••• **myplaintext.com**

HTTP or HyperText Transfer Protocol is the application layer protocol that is implemented in the client program and the server program. An example of a client program is a Web browser like Google Chrome. An example of a server program is a web server like Apache web server. When we open a web page on a web browser, we see that it contains some text, images, audio, or videos. These are called objects. Say, a web page contains some text and 5 images. It means that the web page has 6 objects. Web pages are written in HTML language. The HTML file contains text and links to the other 5 images.

••• **goindigo.in**



World Wide Web

••• amazon.com



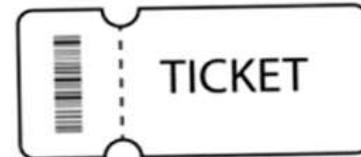
Shopping

••• myplaintext.com

HTTP or HyperText Transfer Protocol is the application layer protocol that is implemented in the client program and the server program. An example of a client program is a Web browser like Google Chrome. An example of a server program is a web server like Apache web server.

When we open a web page on a web browser, we see that it contains some text, images, audio, or videos. These are called objects. Say, a web page contains some text and 5 images. It means that the web page has 6 objects. Web pages are written in HTML language. The HTML file contains text and links to the other 5 images.

••• goindigo.in



Info on-demand

World Wide Web

••• amazon.com

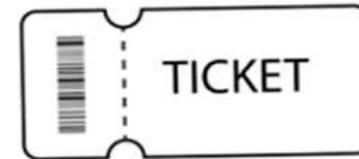


Shopping

••• myplaintext.com

HTTP or HyperText Transfer Protocol is the application layer protocol that is implemented in the client program and the server program. An example of a client program is a Web browser like Google Chrome. An example of a server program is a web server like Apache web server. When we open a web page on a web browser, we see that it contains some text, images, audio, or videos. These are called objects. Say, a web page contains some text and 5 images. It means that the web page has 6 objects. Web pages are written in HTML language. The HTML file contains text and links to the other 5 images.

••• goindigo.in

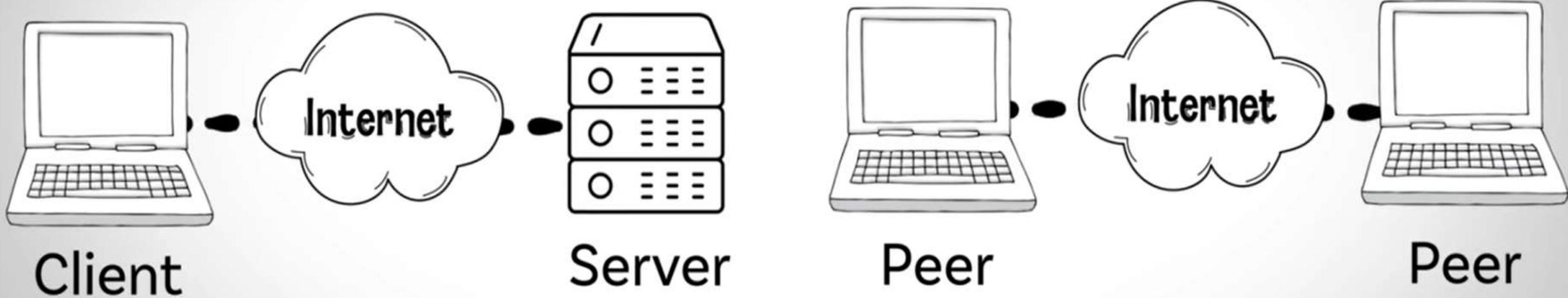


Info on-demand

No time Adjustment

Network Application

{ World Wide Web }

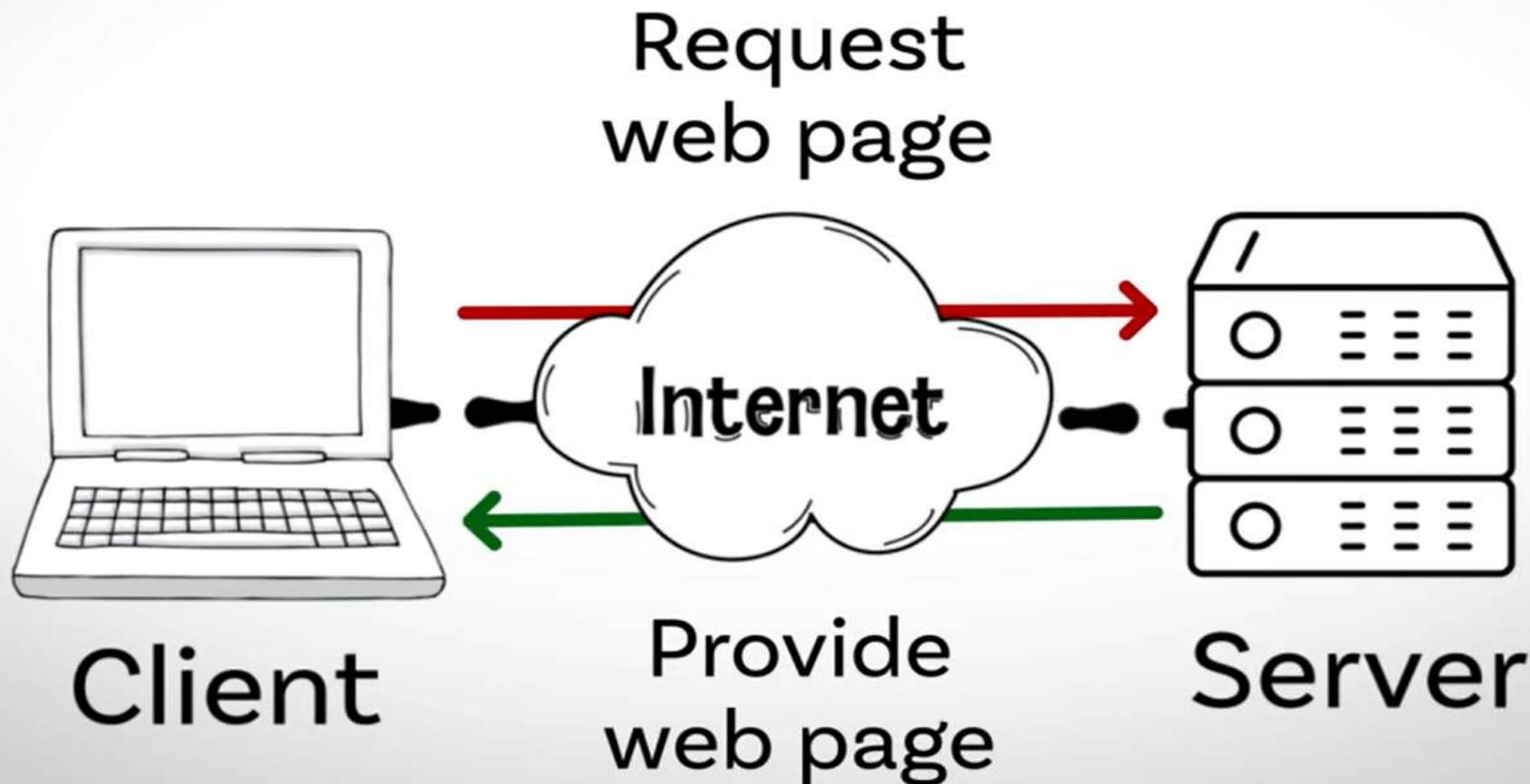


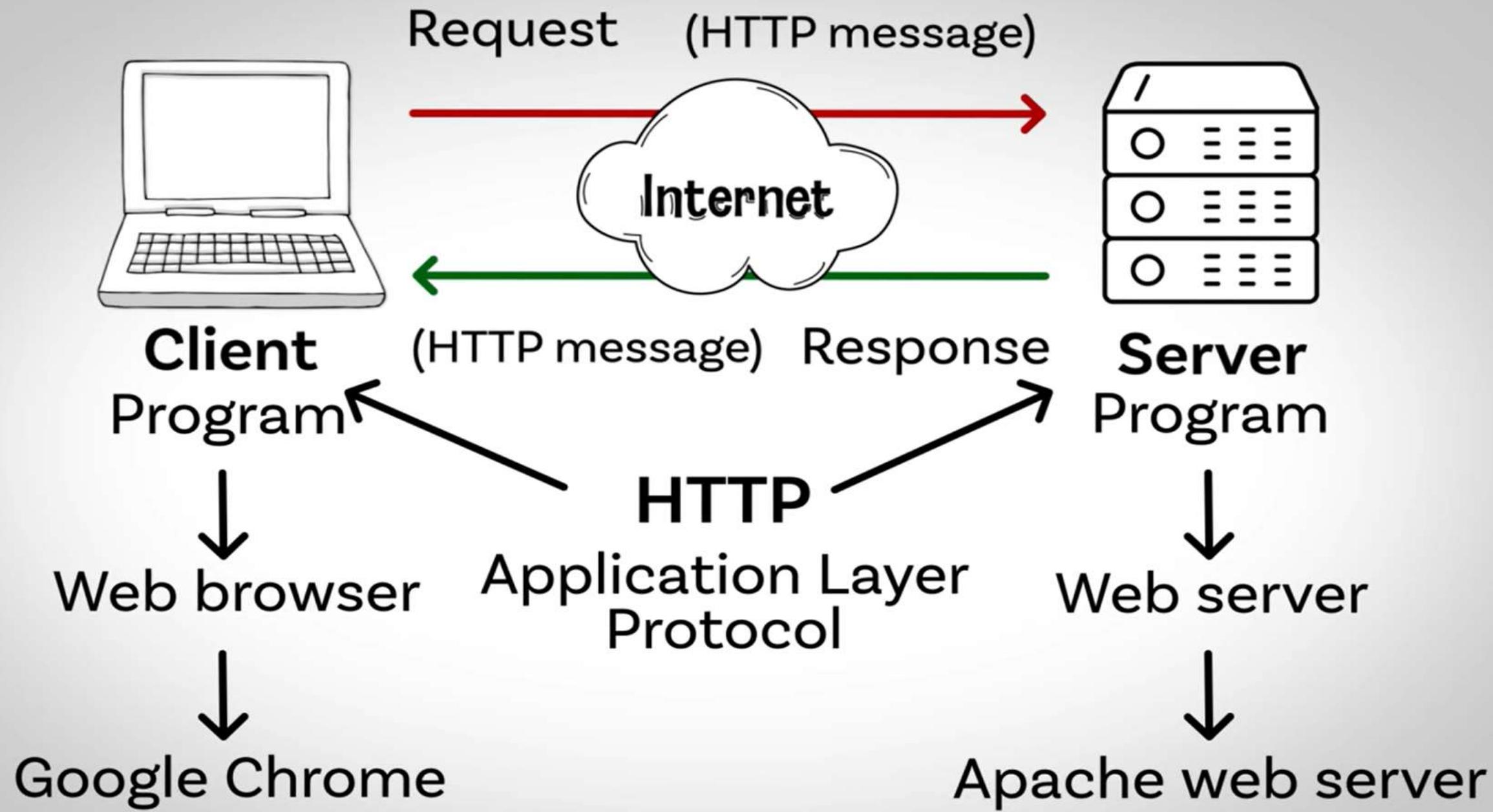
Client-Server Architecture

Peer-to-Peer Architecture

Network Application

{ World Wide Web }





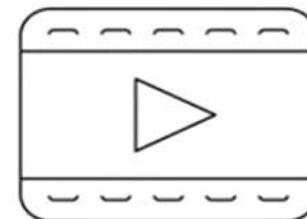
www.xyz.com/home

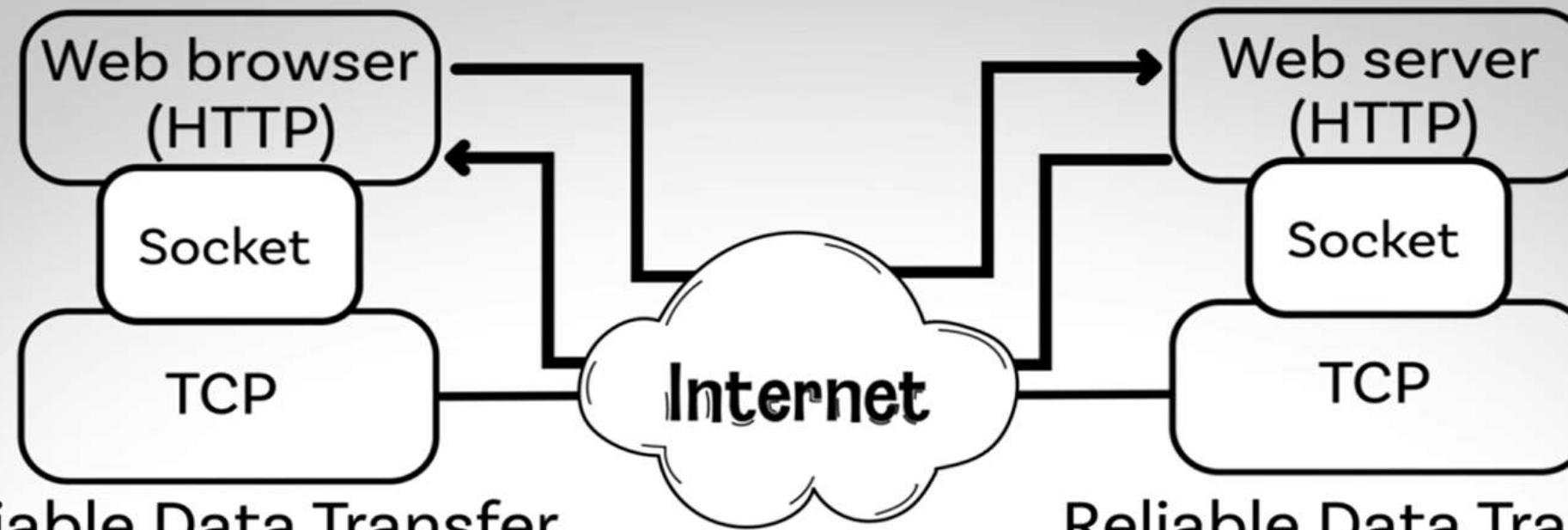
In the last video, we discussed - Network Applications - in detail. In this video, we will discuss one of the most popular Network Applications - the World Wide Web and its application layer protocol - Hypertext Transfer Protocol or HTTP. So let us start.

Initially, the Internet was primarily used by researchers, academics, and university students. It was not popular among the general public. The Internet gained popularity after the arrival of the most popular network application - the World Wide Web.

With the arrival of WWW, people were able to build their websites at extremely low cost. With websites, people were able to share information, online shopping, book travel tickets, news updates, and so on. People get information whenever they want. They need not adjust their time as per the schedule of radio and TV broadcasts. These features made WWW popular among the general public.

→ Objects ←





Reliable Data Transfer

Reliable Data Transfer

HTTP Request Message

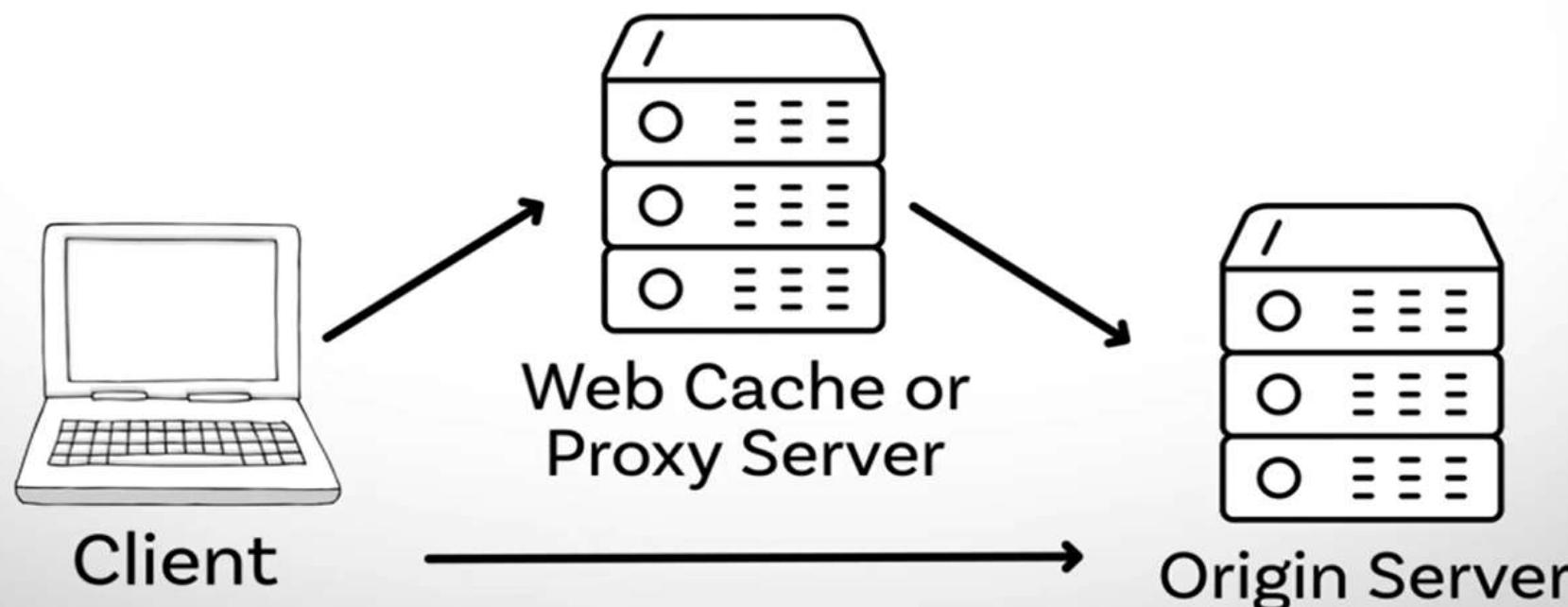
GET /dir/page.html HTTP/1.1
Host: www.xyz.com
Connection: close
User-agent: Mozilla/5.0
Accept-language: fr

HTTP Response Message

HTTP/1.1 200 OK
Connection: close
Date: Tue, 18 Aug 2023 15:44:04 GI
Server: Apache/2.2.3 (CentOS)
Last Modified: Tue, 18 Aug 2023 15:11:03
Content-Length: 6821
Content-Type: text/html
(data data data data data.....)

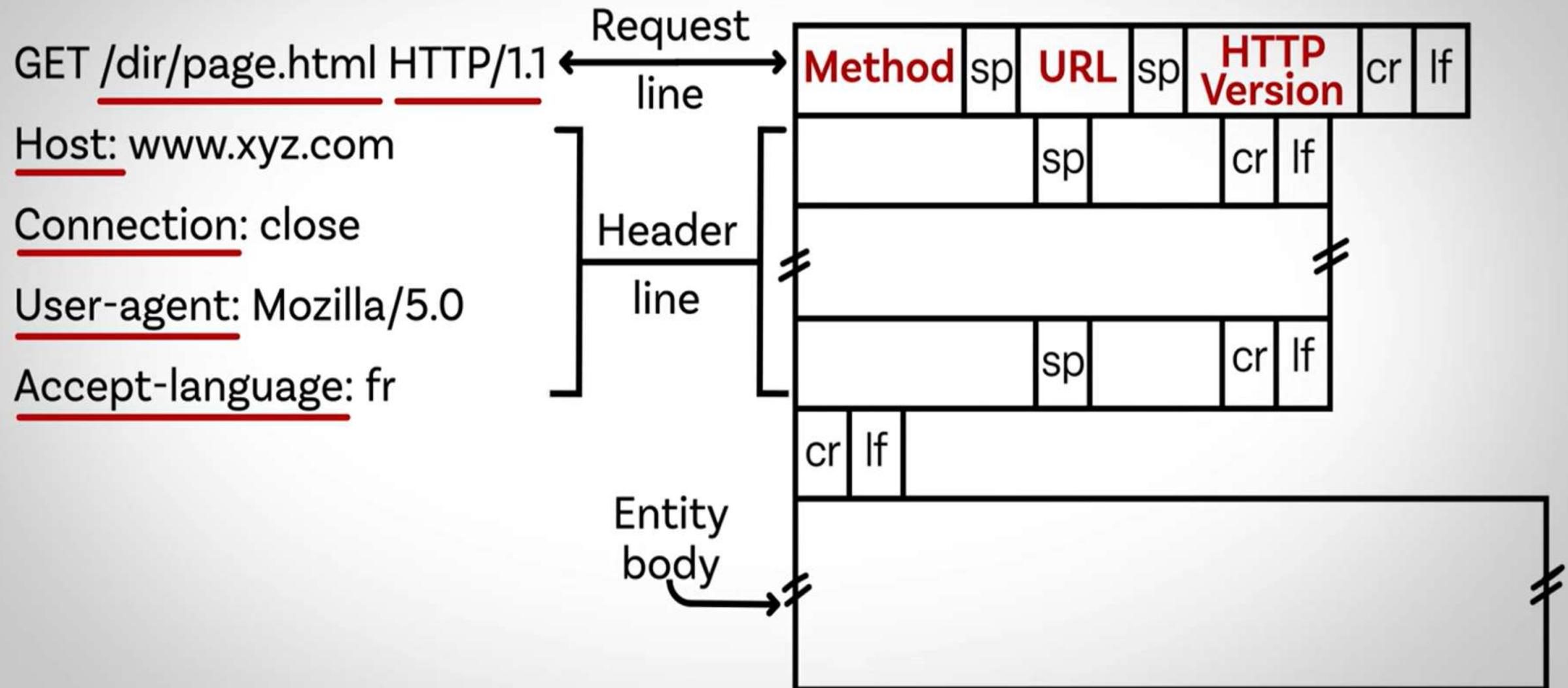
http://www.xyz.com/dir/test.png

URL
Absolute → Protocol + Domain + Path
Relative → Path



- GET → used when a web browser requests an object from a web server
- POST → used to submit data to the server for processing
- HEAD → used by the application developers for debugging
- PUT → used to upload an object to a specific directory on a server
- DELETE → used to delete objects from the server

HTTP Request Message



HTTP Response Message

HTTP/1.1 200 OK

Connection: close

Date: Tue, 18 Aug 2023 15:44:04 GMT

Server: Apache/2.2.3 (CentOS)

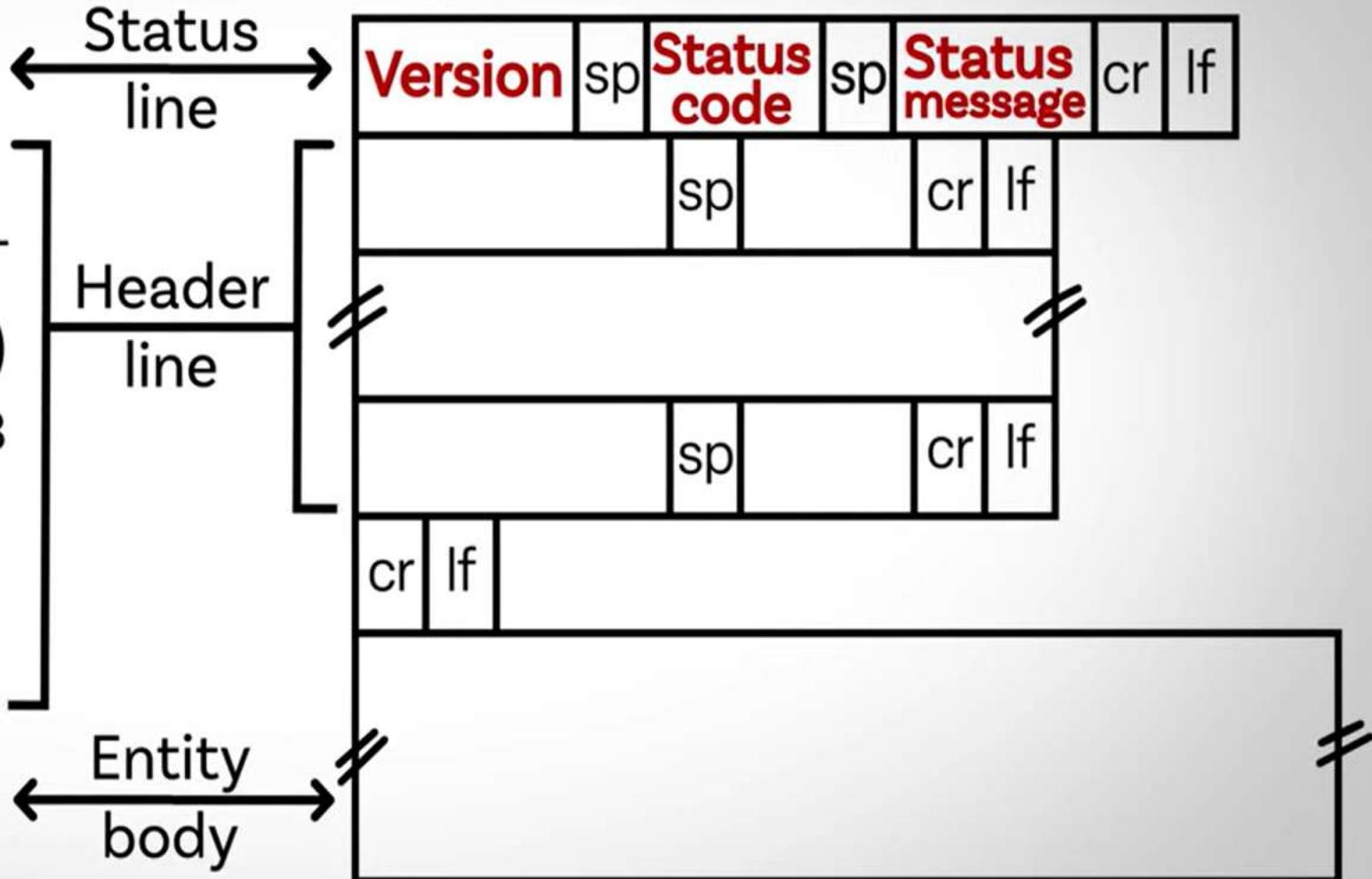
Last Modified: Tue, 18 Aug 2023

15:11:03 GMT

Content-Length: 6821

Content-Type: text/html

(data data data data)



HTTP Response Message

HTTP/1.1 200 OK



200

OK

301

Moved Permanently

400

Bad Request

404

Not Found

505

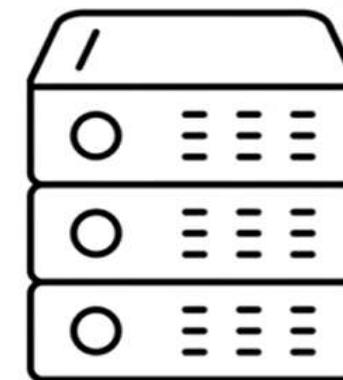
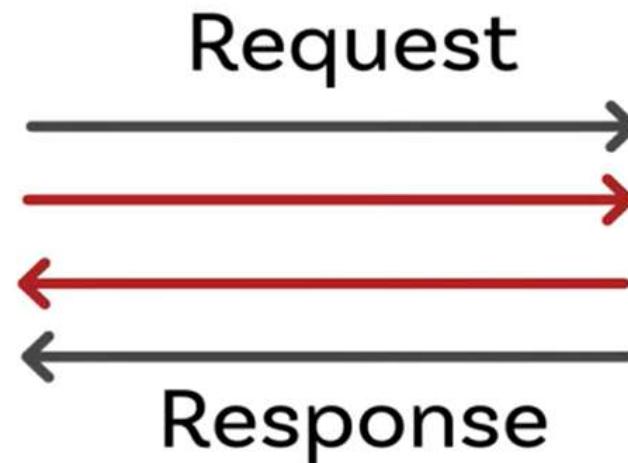
HTTP Version Not Supported

HTTP

Stateless Protocol



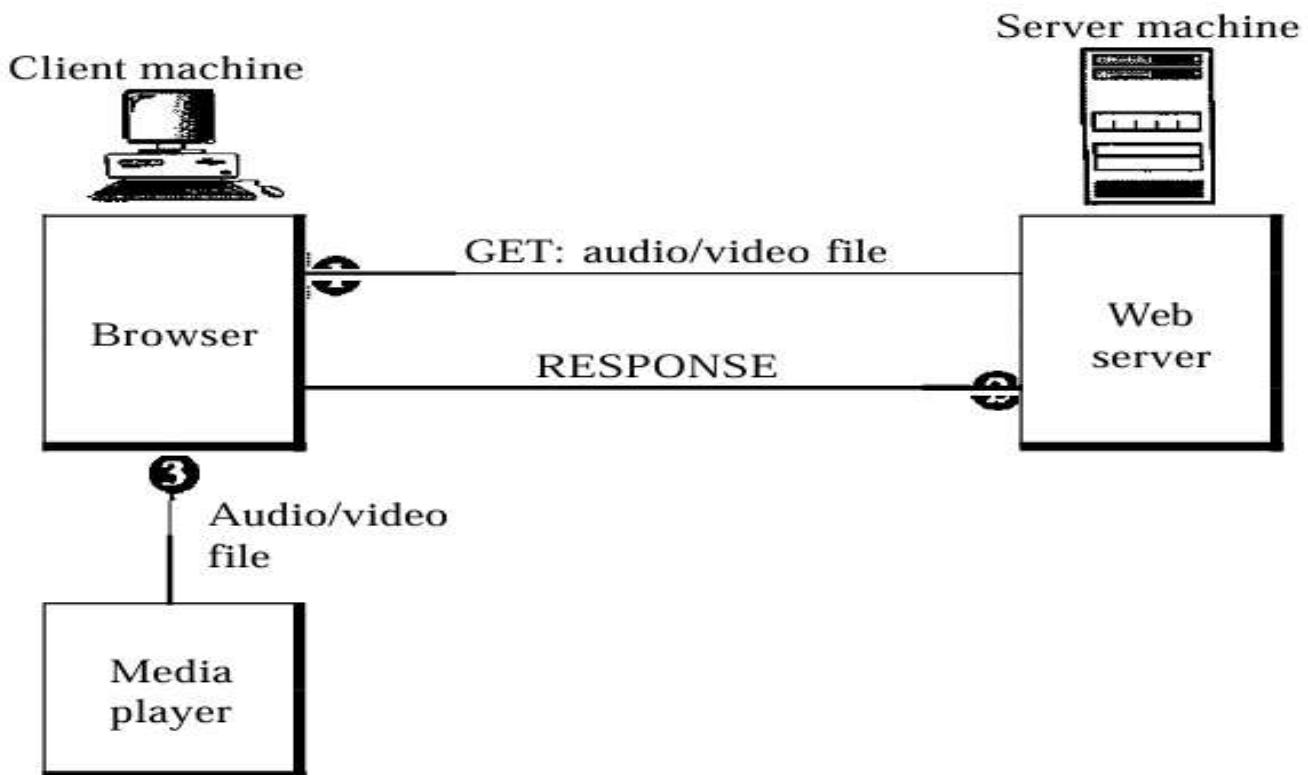
Client



Server

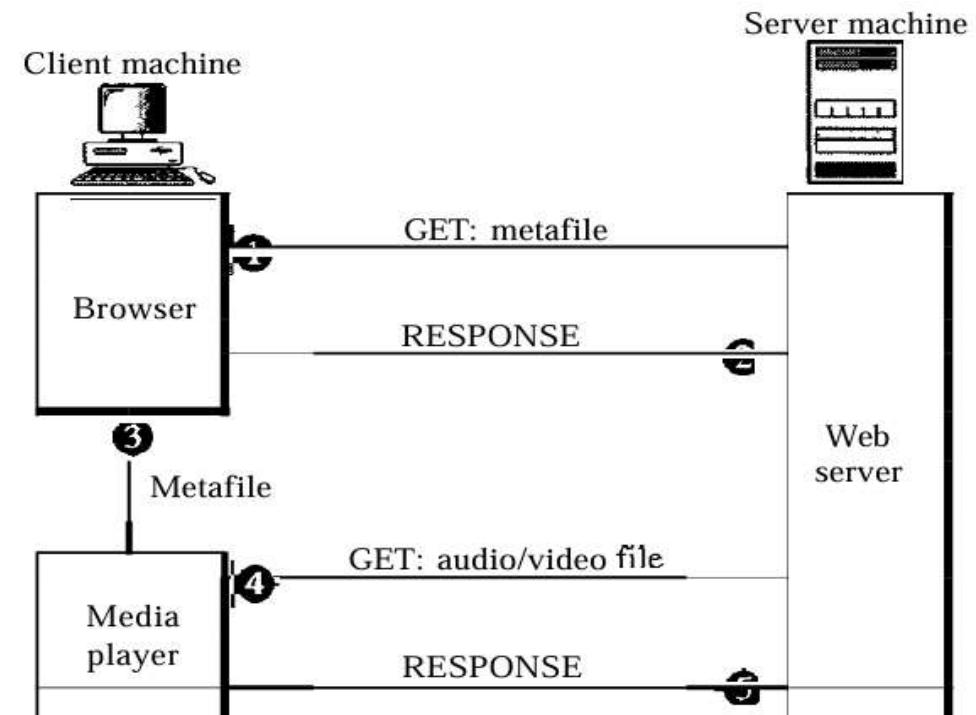
STREAMING STORED AUDIO AND VIDEO

- **First Approach:**
Using a Web Server



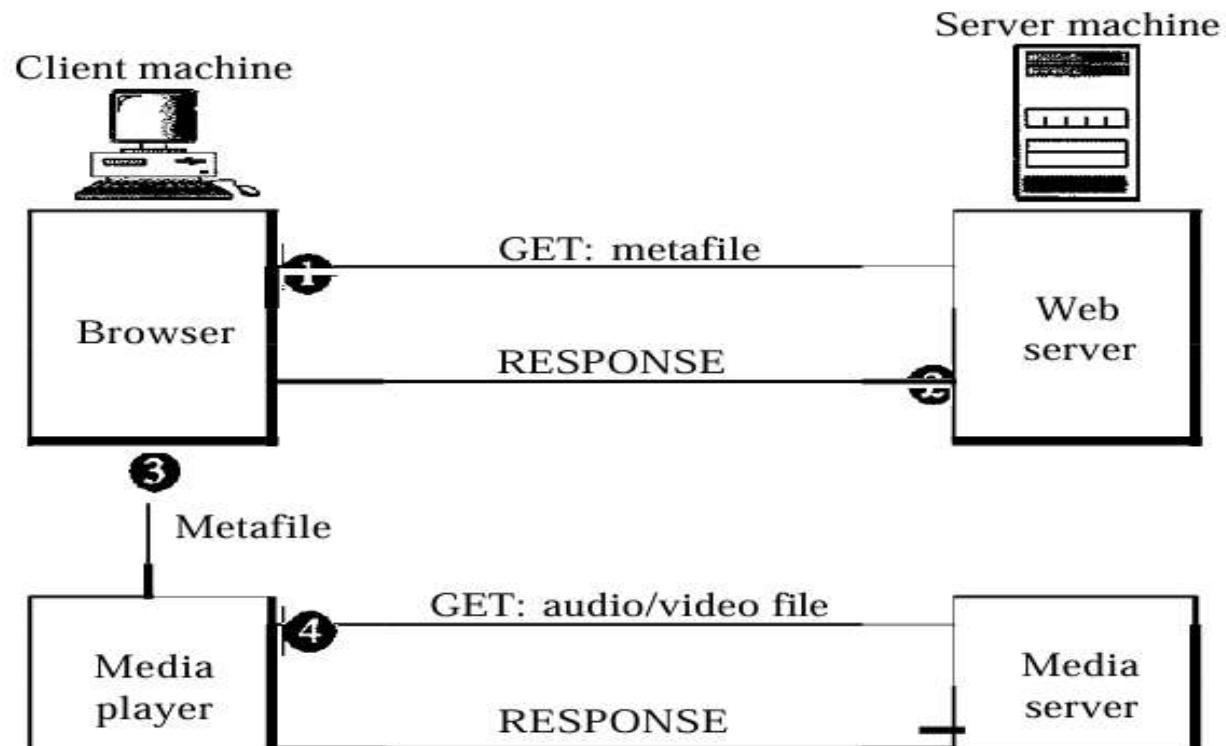
STREAMING STORED AUDIO AND VIDEO

- **Second Approach:**
Using a Web Server with Media Player



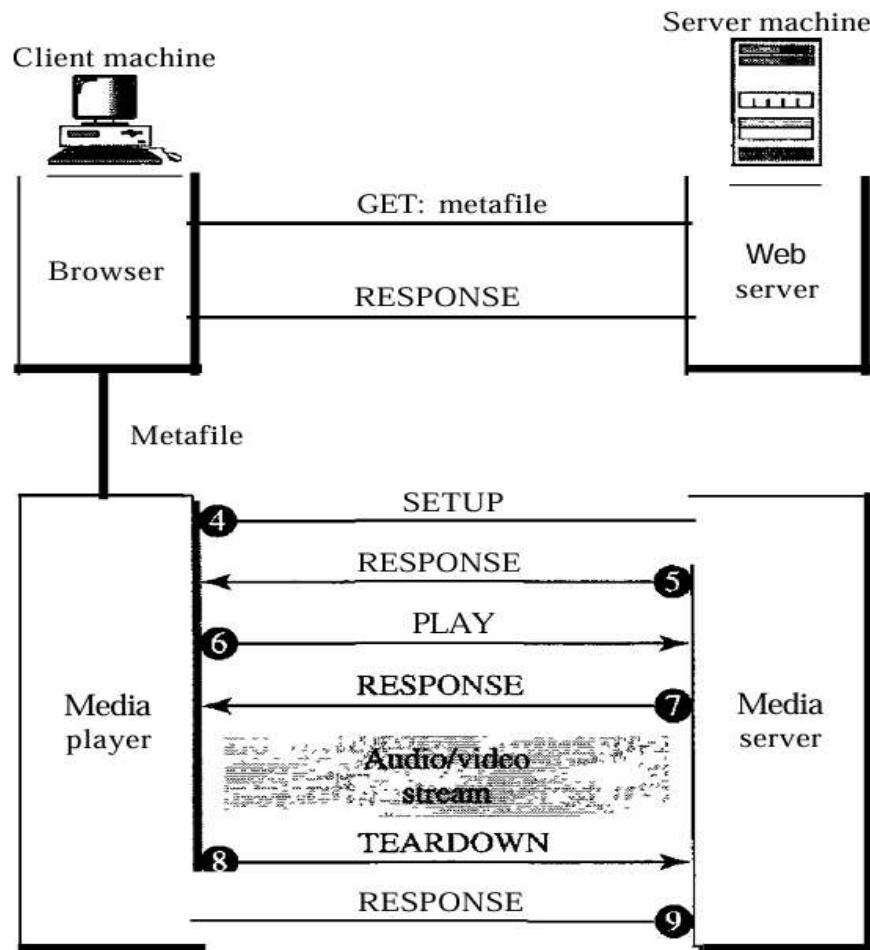
STREAMING STORED AUDIO AND VIDEO

- **Third Approach:**
Using a Media Server



STREAMING STORED AUDIO AND VIDEO

- **Fourth Approach:**
Using a Media Server and RTSP



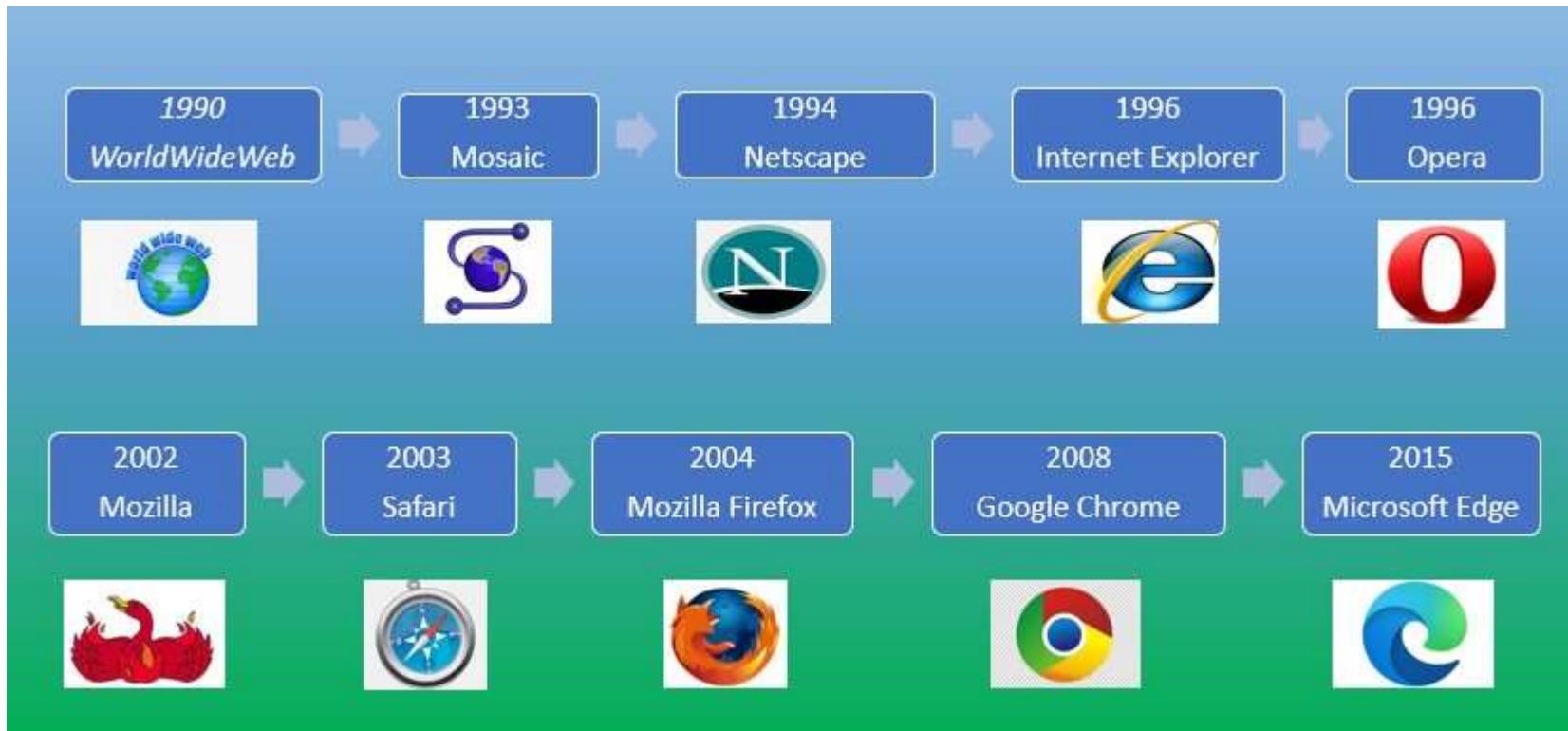
What is Web Browser

- Application software to explore www (World Wide Web).
- Interface between the server and the client
- Compiler to render HTML
- Examples of web browsers:
 - Google Chrome,
 - Microsoft Edge,
 - Mozilla Firefox, and
 - Safari

History of the Web Browsers

- The first web browser **Nexus** invented in the year of 1990 by Tim Berners-Lee.
- In the year of 1993, a new browser **Mosaic** was invented by Mark Andreessen
- He also invents another browser **Netscape** in 1994.
- In 1995 Microsoft launched a web browser **Internet Explorer** which was already installed in the Windows operating system.
- In 1996, Opera Software released its web browser "**Opera**".
- In 1998, Netscape made its code open source which led to the birth of "**Mozilla**"
- In 2003, Apple launched "**Safari**" a web browser for the Macintosh OS. Later it was available for Windows users too and even had a mobile version.
- In 2008, the "**Google Chrome**" web browser, founded by Google.
- In 2015, Internet Explorer was renamed as "**Microsoft Edge**".
- other browsers like **Brave and Vivaldi**

History of the Web Browsers

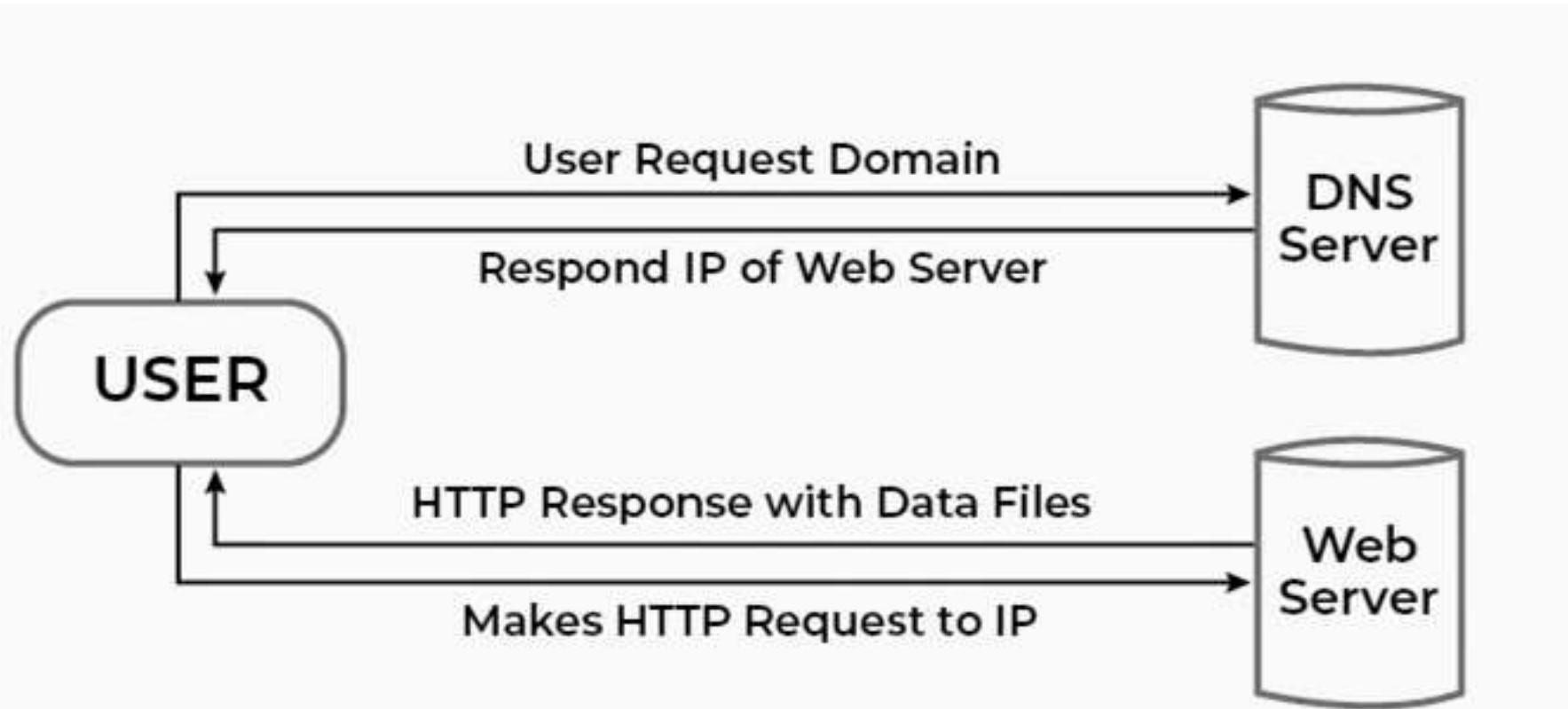


What is a web server?

- It is a software application.
- Stores, processes, and serves web content to users over the internet.
- Operate on the Hypertext Transfer Protocol (HTTP)

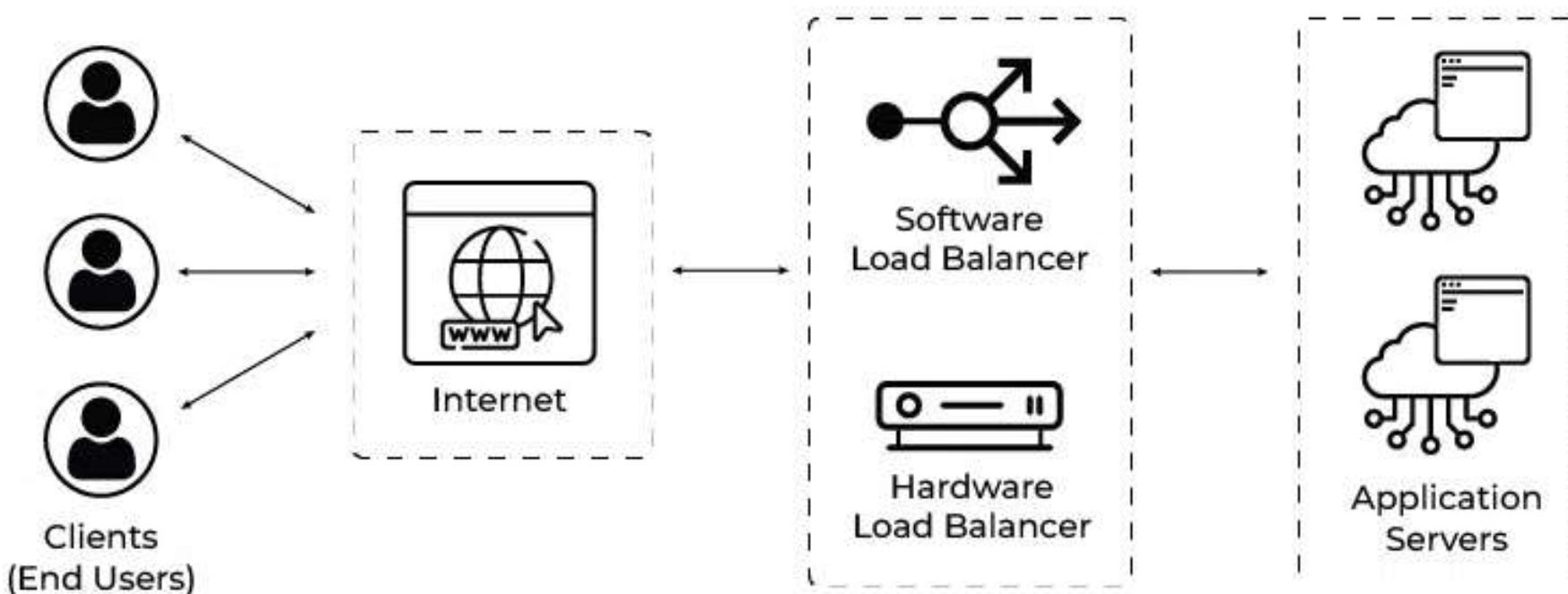
Web Server Architecture

- Single-Tier (Single Server) Architecture:



Web Server Architecture

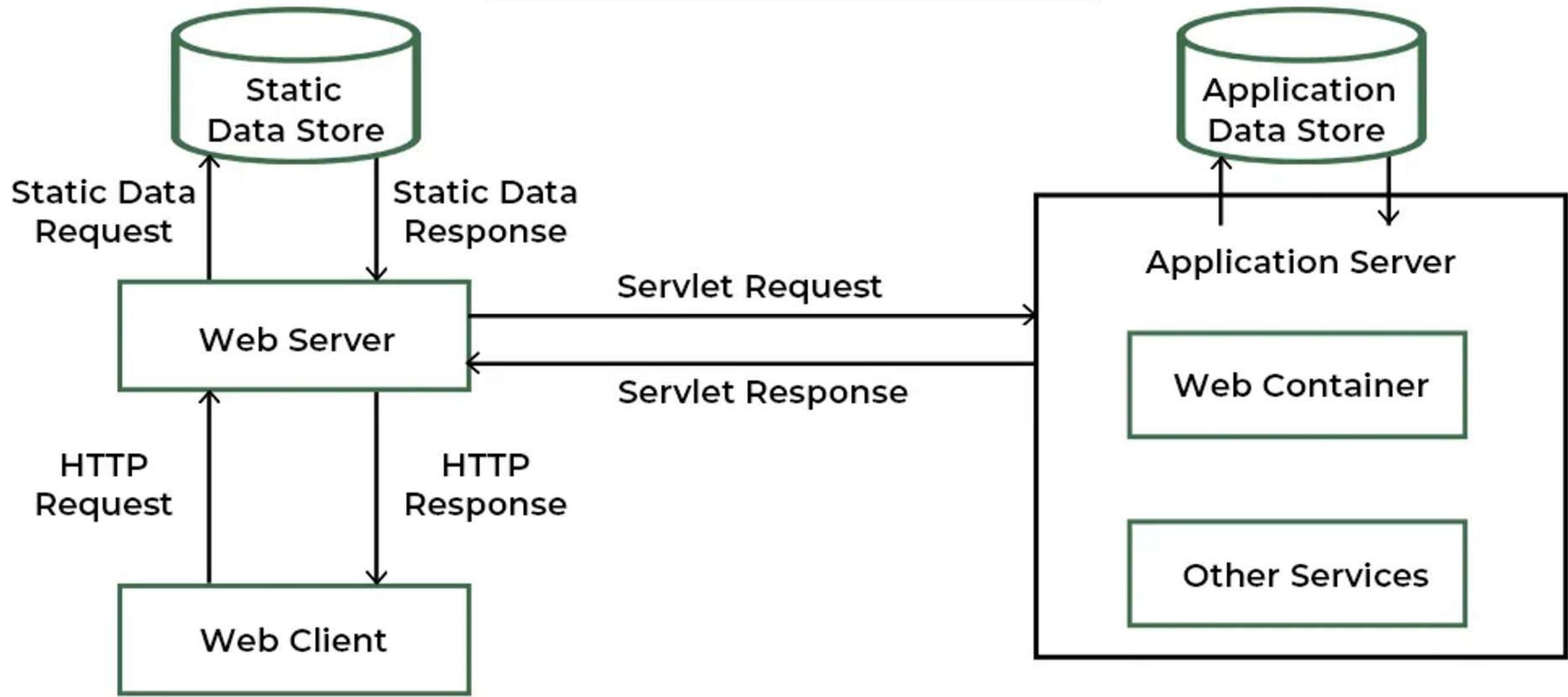
- **Multi-Tier (Load-Balanced) Architecture:**



Working of Web Servers

- Obtain the IP address from domain name
- Requests full URL from Browsers
- Web Server Responds to the request
- The Web Page is displayed on the browser

Working of Web Server



Types of Web Servers Softwares:

- Apache HTTP Server
- Nginx
- Microsoft Internet Information Services (IIS)
- LiteSpeed

Features of Web Servers

- Content Hosting
- Security
- Load Balancing
- Logging and Monitoring
- Caching

Web 1.0

Four Design Essentials of a Web 1.0 Site Include:

- ❖ Static pages.
- ❖ Content is served from the server's file system.
- ❖ Pages built using Server Side Includes or Common Gateway Interface (CGI).
- ❖ Frames and Tables are used to position and align the elements on a page.

Web 2.0

- ❖ Web 2.0 is an enhanced version of Web 1.0.
- ❖ Web 2.0 refers to worldwide websites which highlight user-generated content, usability, and interoperability for end users.
- ❖ It does not refer to a modification to any technical specification, but to modify the way Web pages are designed and used.
- ❖ The transition is beneficial but it does not seem that when the changes occur.

WEB 2.0



facebook



hi5

YouTube



Web
2.0



Linkedin

twitter

flickr

Google
Apps

del.icio.us

Features of Web 2.0 Web Design

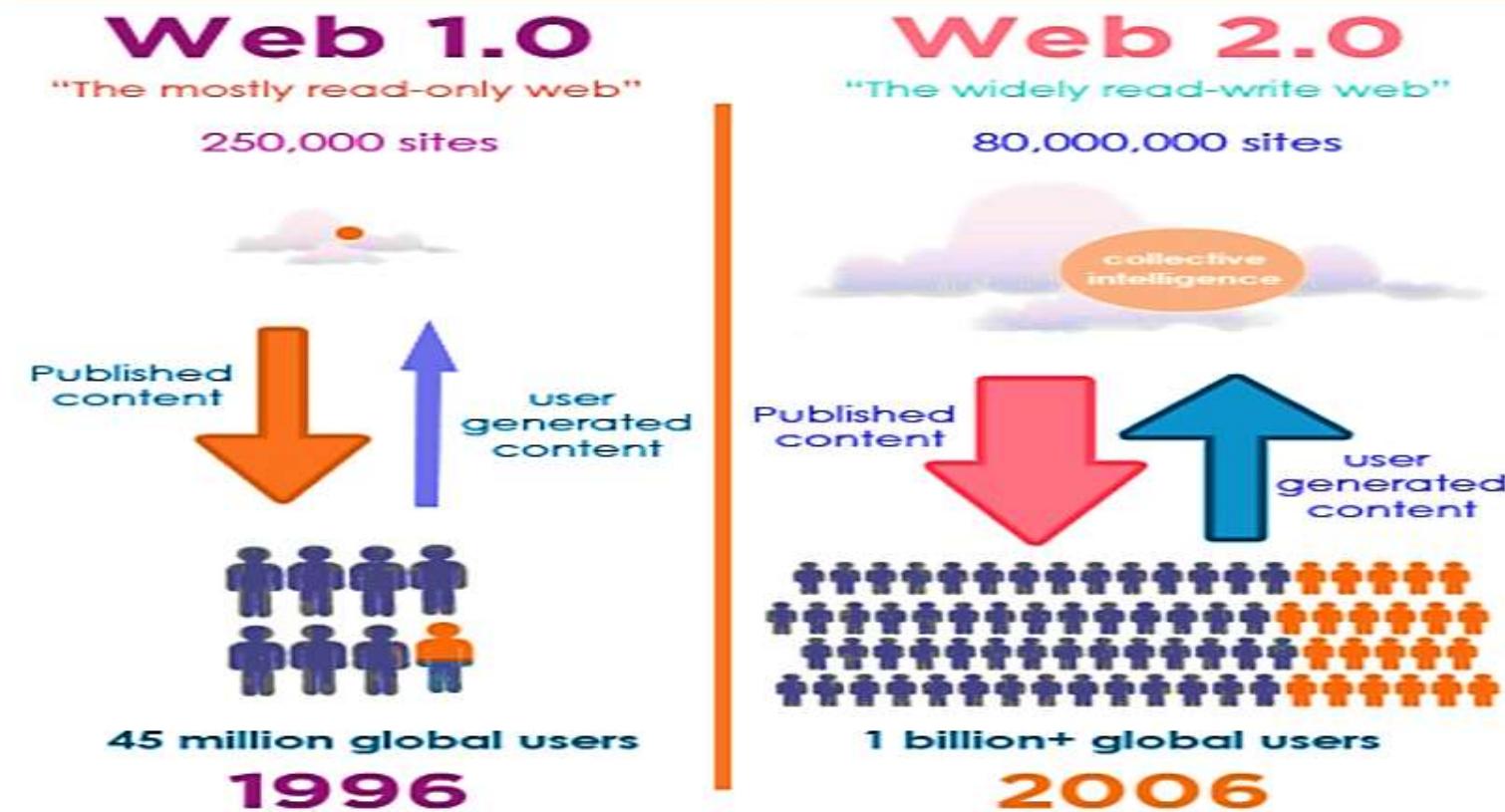
- ❖ It's a simply improved version of the first worldwide web, characterized specifically by the change from static to dynamic or user-generated content.
- ❖ The concept behind Web 2.0 refers to rich web applications, web-oriented architecture, and social web.
- ❖ It refer to changes in the ways web pages are designed and used by the users, without any change in any technical specifications.

Web 2.0 examples

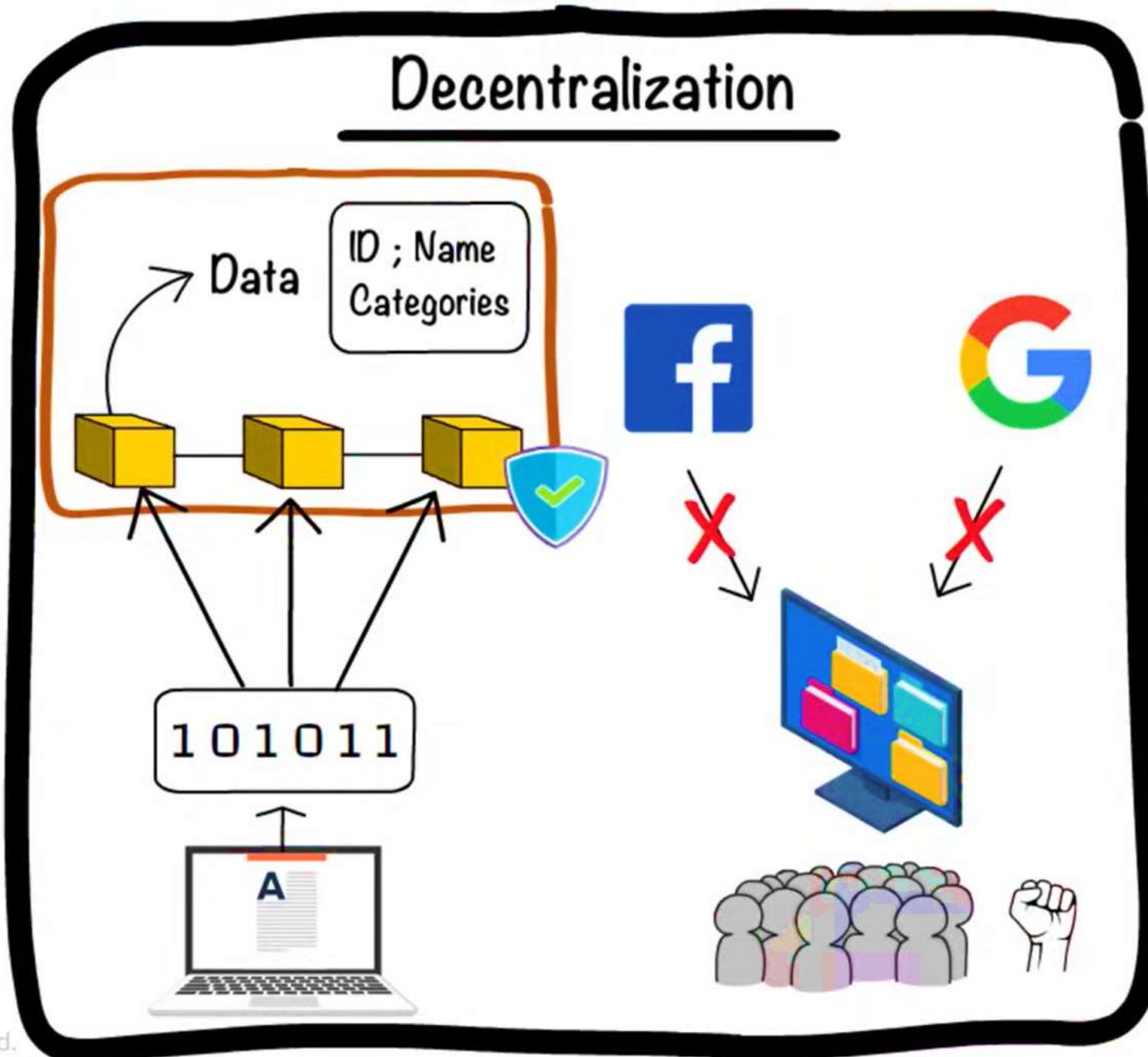
- ❖ Hosted services (Google Maps), Web applications (Google Docs, Flickr),
- ❖ Video sharing sites (YouTube), wikis (MediaWiki), blogs (WordPress),
- ❖ Social networking(Facebook), Microblogging (Twitter).

So the major difference between web 1.0 and web 2.0 is that web 2.0 websites enable users to create, share, collaborate and communicate their work with others, without any need of any web design or publishing skills. These capabilities were not present in Web 1.0 environment.

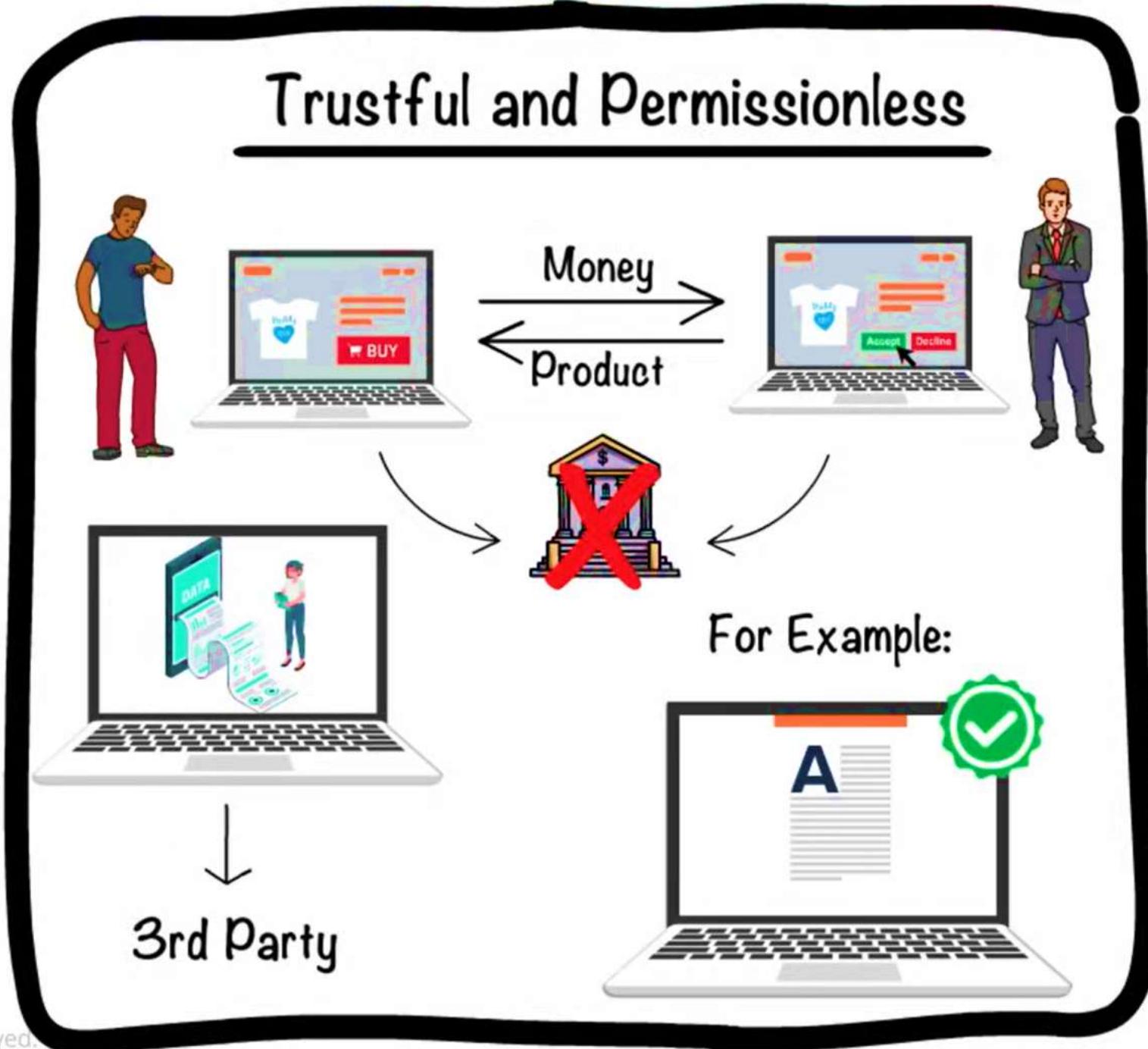
Web 1.0 Vs Web 2.0



Features of Web 2.0

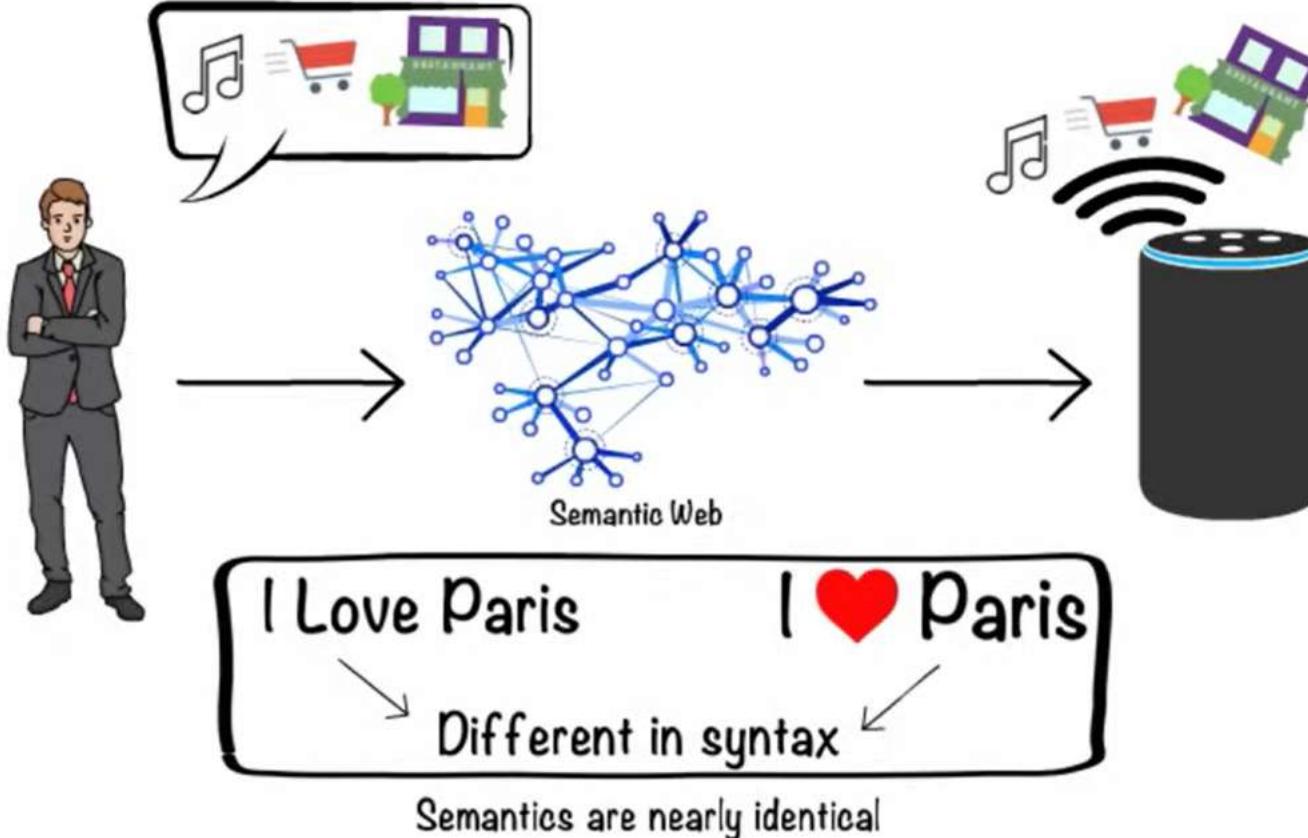


Features of Web 2.0



Features of Web 2.0

Artificial Intelligence and Machine Learning



This will help the user to achieve more relevant content of their choices and will provide them ease with Internet browsing

Connectivity and Ubiquity



Web 2.0

- ❖ With Web 2.0 website are not only very dynamic but also very interactive
- ❖ Web 2.0 is more interactive because of use of AJAX that is Asynchronous JavaScript & XML programming language.
- ❖ AJAX make it possible for the web browser to connect the Web server and download small amounts of information in the background.

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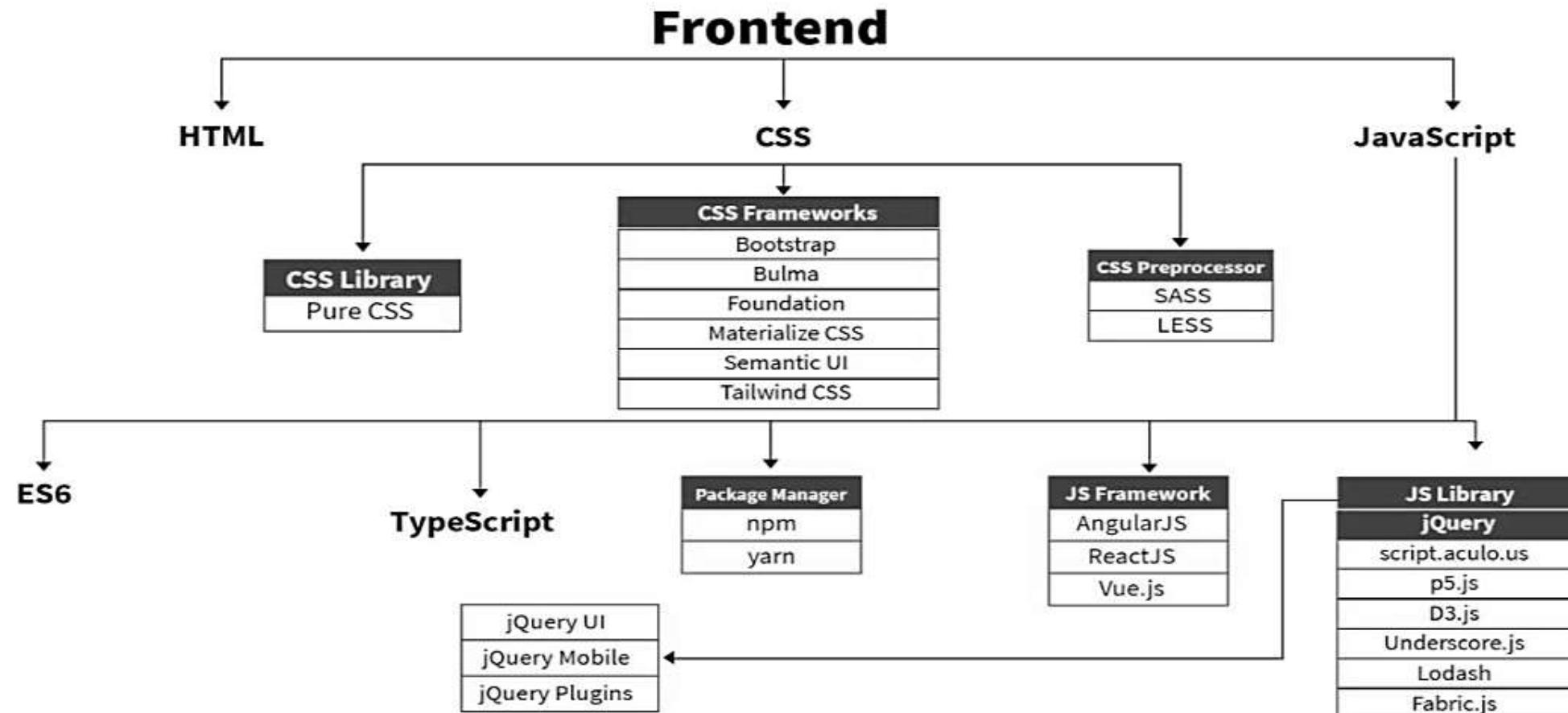
Comparing Web 1.0, Web 2.0 and Web 3.0:

- ◆ **Web 1.0:** Web 1.0 was the stage of World Wide Web with only flat data (“read only”). It simply acts as an information portal where user could only passively receive the information without being able to reply or comment or edit on it.
- ◆ **Web 2.0:** This stage of World Wide Web allow the users to actively “read as well as write”, it thus improves collaboration and information sharing on a wide scale over internet. Ajax, JavaScript Framework, Microsoft.NET Framework and Adobe Flex are the respective technologies used for Web 2.0.

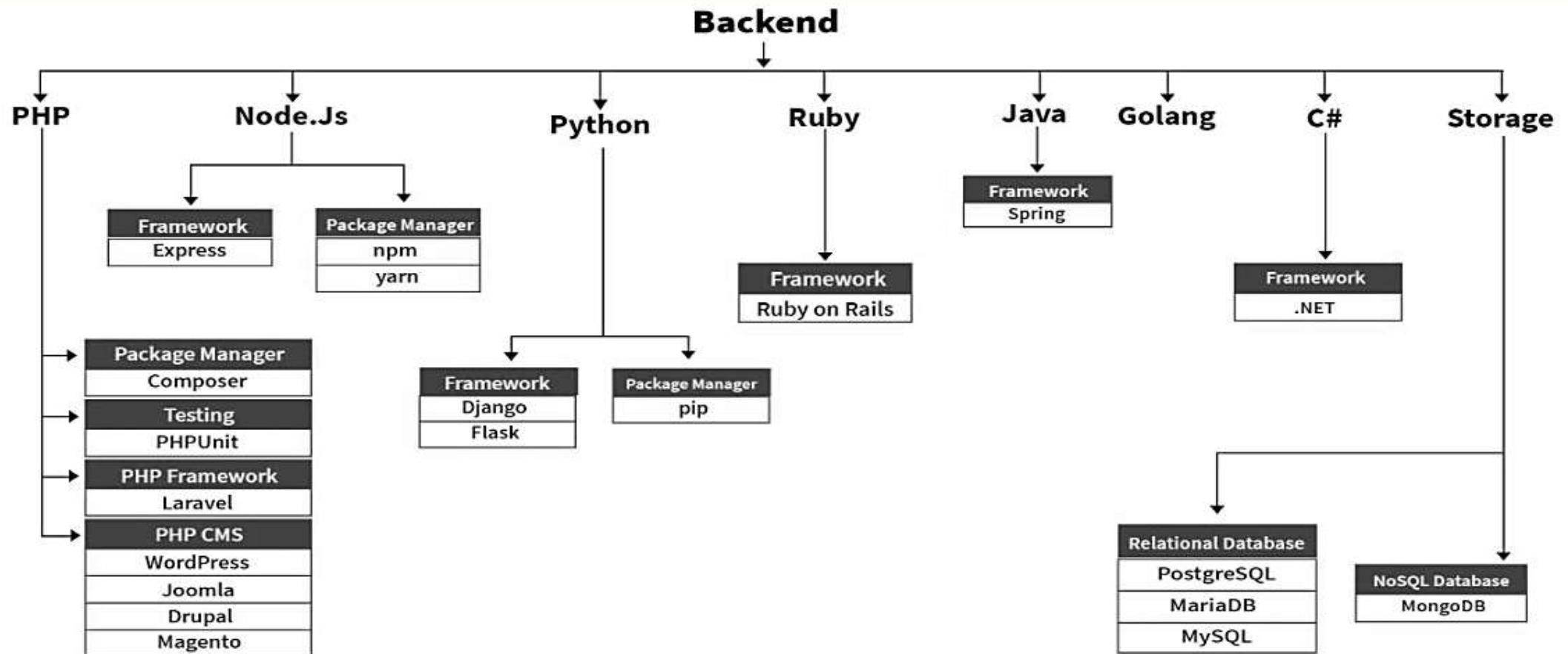
Cont...

- ❖ **Web 3.0:** Unlike to Web 1.0 and Web 2.0, Web 3.0 would be the “read-write-executable” stage of World Wide Web. It is going to be the Third Generation of Web, which will make the web more connected, open and intelligent. Technologies in association with Web 3.0 are Semantic Search, Knowledge base and with Intelligent digital assistance.

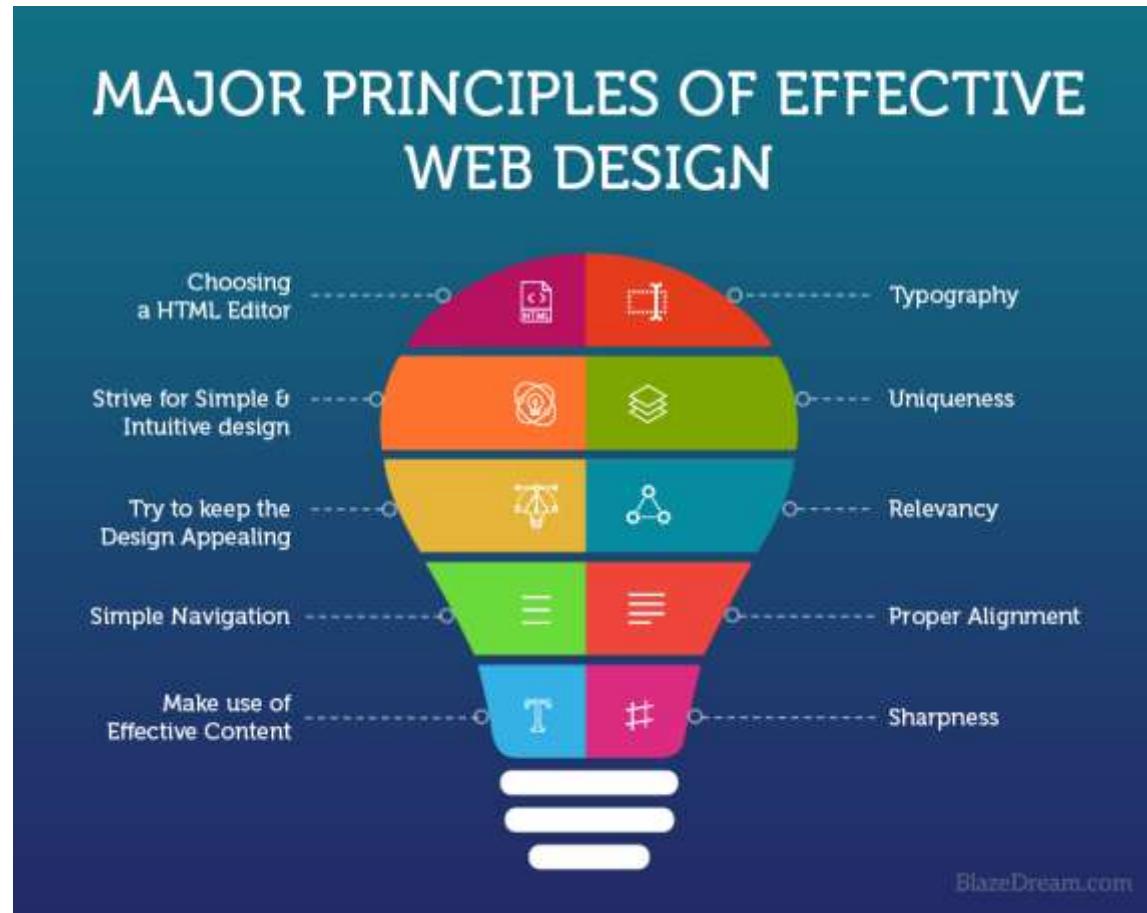
Frontend Development



Backend Development

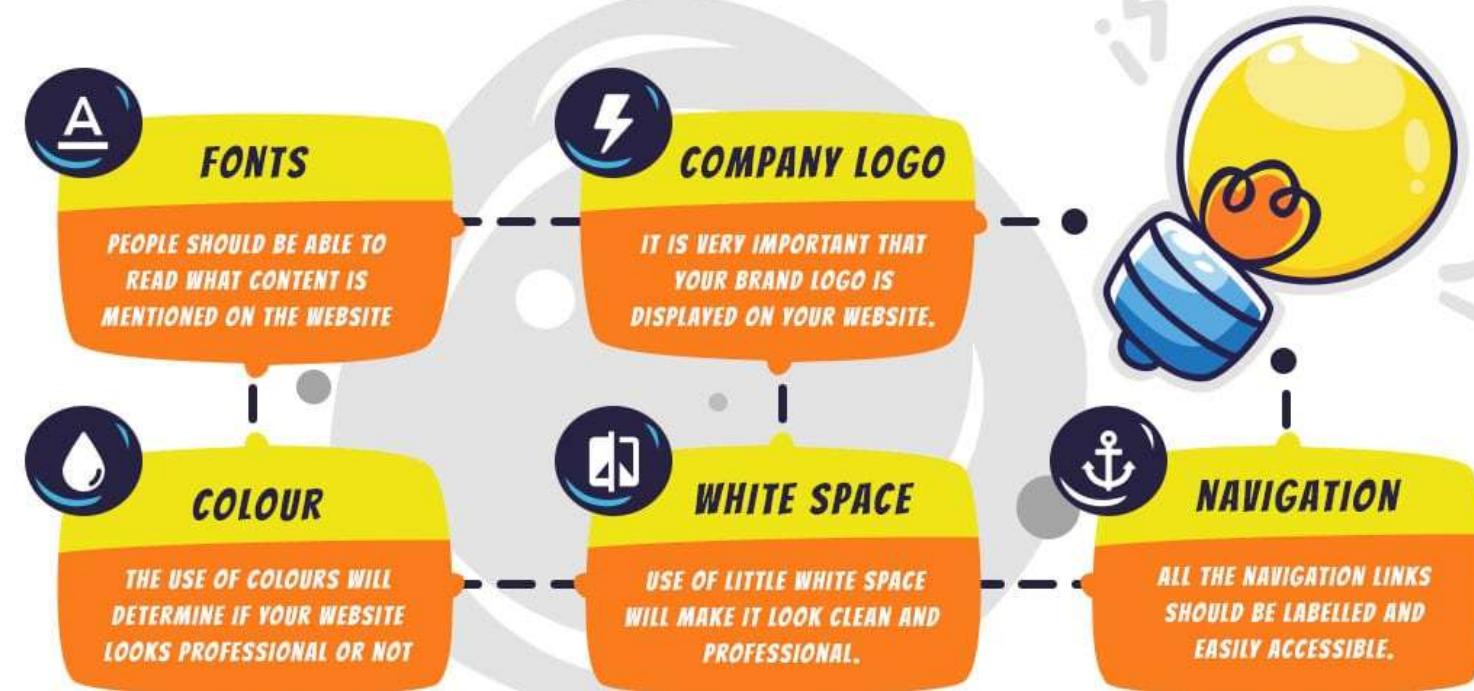


Effective Web Design



Effective Web Design

TIPS AND TOOLS FOR EFFECTIVE WEB DESIGN



Effective Web Design

1. Simple is the Best

2. Consistency

- ❖ Give your attention to match design elements throughout each of the pages.
- ❖ It can be understood that your fonts, sizes, headings, sub-headings, and button styles must be the same throughout the website.
- ❖ Finalize the fonts and the right colors for your texts, buttons, etc, and stick to them throughout the development.

Effective Web Design

3.Purpose

- ❖ Good web design always caters to the needs of the user. Are your web visitors looking for information, entertainment, some type of interaction, or to transact with your business? Each page of your website needs to have a clear purpose, and to fulfill a specific need for your website users in the most effective way possible.

Effective Web Design

4. Navigation

- ❖ Navigation is about how easy it is for people to take action and move around your website.
- ❖ Some tactics for effective navigation include a logical page hierarchy, using bread crumbs, designing clickable buttons, and following the ‘three click rule’ which means users will be able to find the information they are looking for within three clicks.

5. Load time

- ❖ Everybody hates a website that takes ages to load.
- ❖ Tips to make page load times more effective include optimising image sizes (size and scale), combining code into a central CSS or JavaScript file (this reduces HTTP requests) and minify HTML, CSS, JavaScript (compressed to speed up their load time).

Effective Web Design

6. Mobile Compatibility

- ❖ If your website design doesn't support all screen sizes, the chance is that you'll lose the battle to your competitors.
- ❖ There are a number of web design studios or service points from where you can turn your desktop design into a responsive and adaptive one for all screen sizes.

Effective Web Design

7.Communication-

- ❖ The ultimate purpose of the visitors is to get information, and if your website is able to communicate your visitors efficiently, most probably they would spend more time on your website.
- ❖ Tricks that may work to establish effortless communication with the visitors are – organizing information by making good use of headlines and sub-headlines, using bullet points, rather than long gusty sentences.

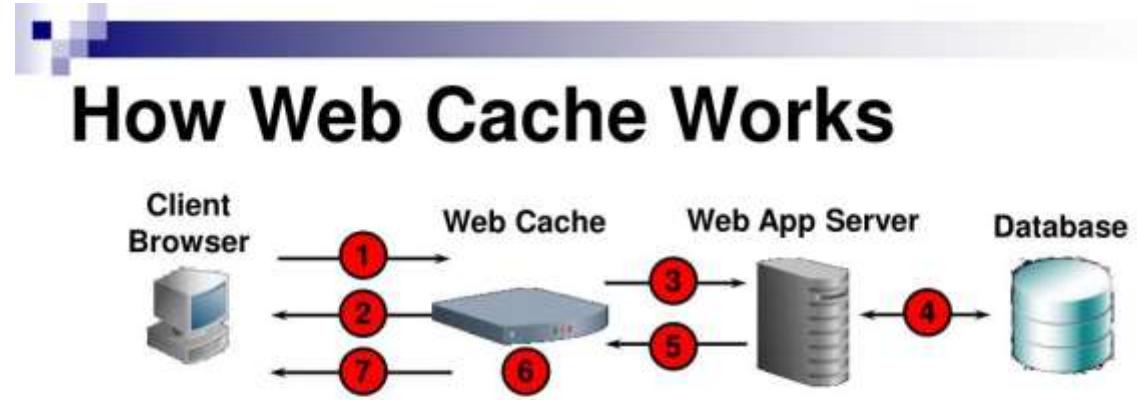
Web Design Issues

- ❖ Responsive website design is not only about good images, attractive layouts and templates, but we have to consider its accessibility and the user experience
- ❖ Web pages are written using different HTML tags & viewed in browser window.
- ❖ The different browser intercept different html tags in different ways. Support for different tags varies across different browser.
- ❖ Web pages should be tested on various platforms and browsers

Bandwidth and Cache

- ❖ Connection speed plays an important role in designing of web pages, if user has low bandwidth connection and a web page contains too many images, it takes more time to load.
- ❖ Browser provides temporary memory called as cache to store graphics.
- ❖ When a user gives URL for the first time, HTML file together with all the graphics file referred in a page is downloaded.

Web Cache



1. Client sends HTTP request
2. Web Cache responds immediately if cached object is available
3. If object is not in cache, Web Cache requests object from Application Server
4. Application Server generates response (may include Database queries)
5. Application Server responds to Web Cache
6. If response is cacheable, Web Cache retains a copy for subsequent requests
7. Web Cache compresses page and responds to Client

Display Resolution

- ❖ Most monitors use resolution of 1024*786 pixels and some old monitors use 800*600 resolution
- ❖ There are different choices of users for resolution of screen.

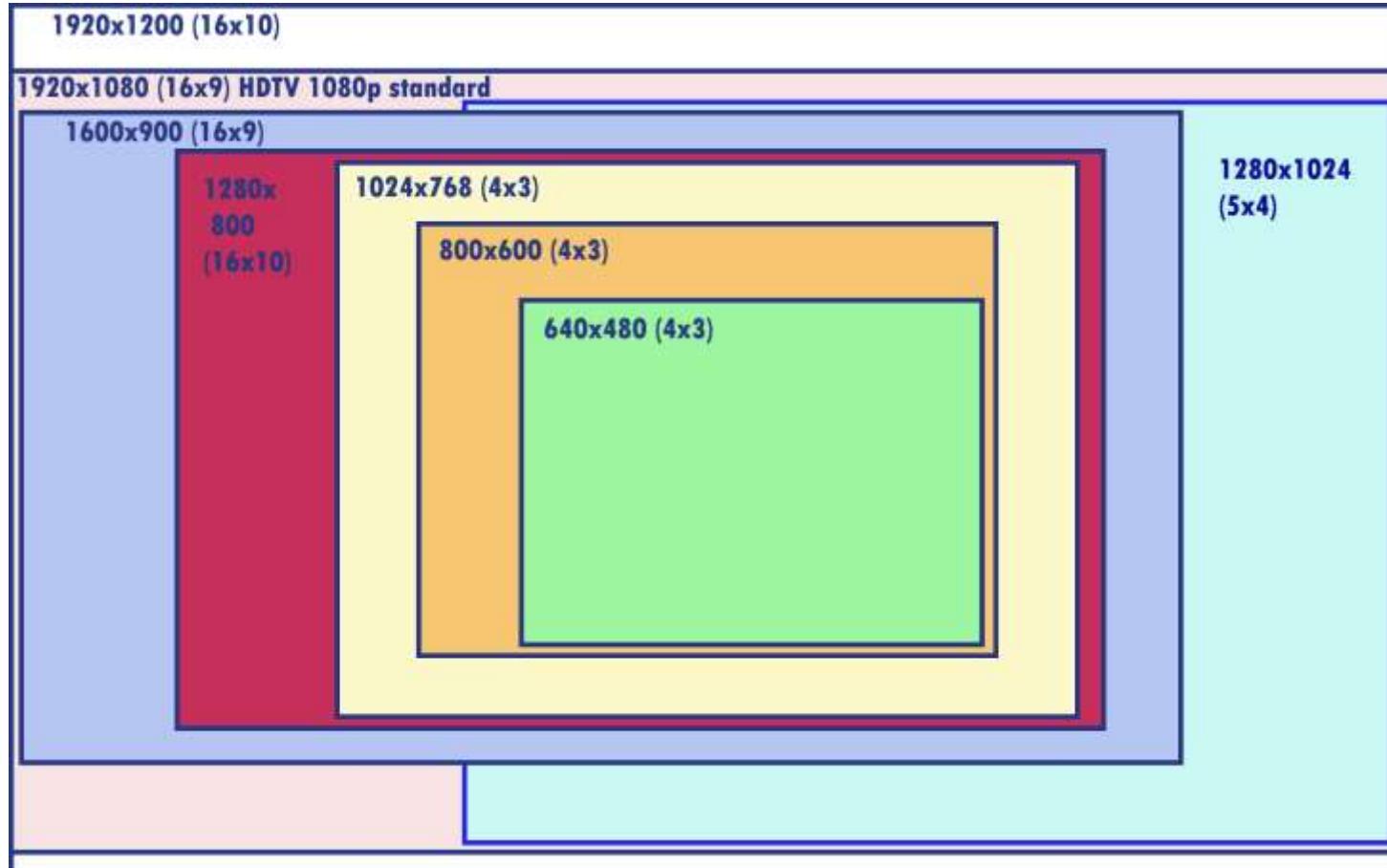
We have two choices:

1. Design web page with fixed resolution
2. Make a flexible design using HTML table to fit in different resolution.

Display Resolution

- ❖ Web page is divided into 3 columns with the middle column having available width.
- ❖ Depending on the resolution of the monitor on which the web page is viewed, the resolution will change
- ❖ If we design website for high resolution, some low resolution screen like mobile phones and tablets may not be able to display all the contents

Display Resolution



Look and Feel

- ❖ It includes all the design aspects such as
 - Website themes
 - Web typography
 - Graphics
 - Visual structure
 - Navigation
- ❖ Theme emphasizes on the unification of design that should be reflected in each element of the design, such that all pages of website held together & give impression of a single unit

Look and Feel

- ❖ Different fonts have different readability, some fonts are good for continuous reading while others for advertisement.
- ❖ During designing consistency should be maintained in using font type and size
- ❖ Use of CSS helps in this
- ❖ We should also consider availability of fonts on visitors's machine

Page Layout and Linking

- ❖ Page layout defines the visual structure of page.
- ❖ Page layout distributes the content in such a way that it can be easily searched & read.
- ❖ It divides the page area in to different parts to present the information of varying importance.

User Centric

- ❖ It is very difficult for web designers exact to predict behavior of website users.
- ❖ However idea of general behavior of common user helps in making website user centric.
- ❖ Users either scan the information on the web page to find the section of their interest or read the information to get details.

Sitemap

- ❖ List of Web pages(graphically or through hyperlinks).
- ❖ It becomes difficult for a visitor to quickly move part to another if website contains large no of sections & each section contains many pages.
- ❖ When sitemap will be available it will be known to user that at what point he is, and now to where he can move.

End of Unit - I
Thank You