

## # History of Web & Internet { WORLD WIDE WEB }

- Sir Tim Berners-Lee invented the World Wide Web in 1989.  
→ He is a British Computer Scientist while working at CERN.
- The Web was originally conceived and developed to meet the demand for automated information-sharing between scientists in universities & institutes around the world.
- The first workable prototype of the Internet came in the late 1960s with the creation of ARPANET (Advanced Research Projects Agency Network) originally funded by the US Dept. of Defense. ARPANET used packet switching to allow multiple computers to communicate on a single network.
- The technology continued to grow in the 1970s after scientist Robert Kahn & Vinton Cerf developed TCP/IP, a communication model.
- In 1983, ARPANET adopted TCP/IP.
- More recognizable in 1990s by Sir Tim Berners-Lee.

## # Protocols Governing Web

The Defence Advance Research Projects Agency (DARPA) originally developed Transmission control protocol / Internet Protocol (TCP/IP) to interconnect various defence department computer networks.

The internet, uses TCP/IP to connect government and educational institutions across the world.

The TCP/IP suite includes the following protocols :-

### > Data Link Layer

ARP/RARP : Address Resolution Protocol & Reverse

Address Resolution protocol is used by TCP/IP suite to

initialize the use of Internet addressing on an Ethernet or other network that uses its own media access control (MAC).

ARP allows a host to communicate with other hosts when only the Internet address of its neighbours is known.

## → Network layer

**DHCP** - The Dynamic Host Configuration protocol provides Internet hosts with configuration parameters.

It is consist of two components :-

- a protocol for delivering host-specific configuration parameters from a DHCP server to host and a mechanism for allocation of a network addresses to hosts.

**ICMP/ICMPv6**: The Internet Control Message Protocol was revised during definition of IPv6. In addition, the multicast control functions of the IPv4 Group Membership protocol (IGMP) are now incorporated with ICMPv6.

**IGMP** : The Internet Group Management Protocol (IGMP) is used by IP hosts to report their host group memberships to any immediately neighbouring multicast routers.

**IP** : The Internet Protocol - is the routing layer datagram service of the TCP/IP suite. All other protocols within the TCP/IP, except ARP & RARP, use IP to route frames from host to host.

## Transport layer

TCP : It provides a reliable data delivery & virtual connection service to applications ~~through~~ the use of sequence acknowledgement with retransmission of packets when necessary.

UDP : User Datagram Protocol provides a simple but unreliable message service for connection-oriented services.

- Each UDP header carries both a source port identifier, allowing high-level protocols to target specific applications and services among hosts.

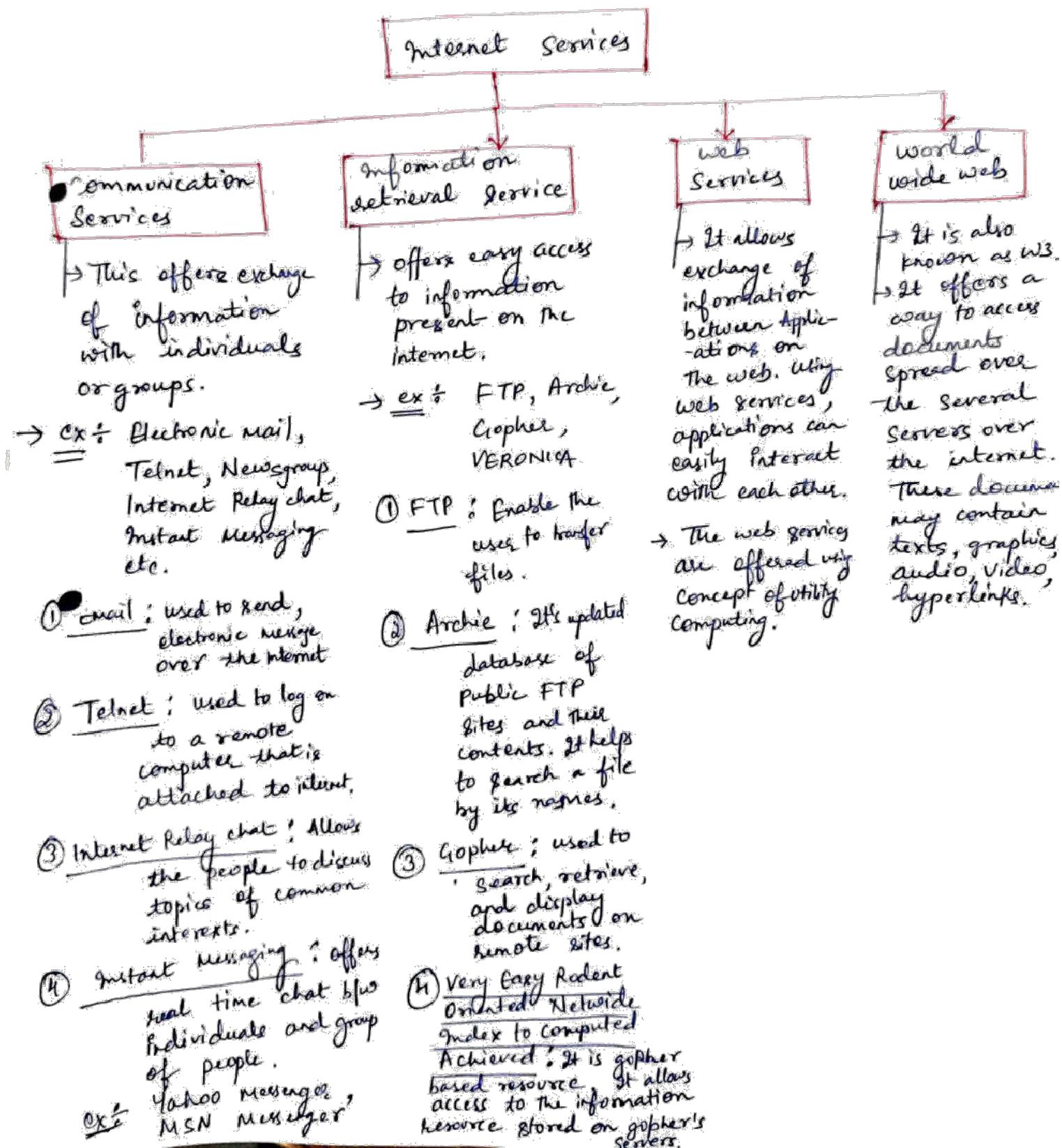
## Application layer

FTP : The File Transfer Protocol provides the basic elements of file sharing between hosts.

- It uses TCP to create a virtual connection for control information and then creates a separate TCP connection for data transfers.
- The control connection uses an image of the Telnet (TELNET) protocol to exchange commands and messages between hosts.

# Introduction to Internet Services & Tools

Internet Services allows us to access huge amount of information such as text, graphics, sound and software over the internet.



## UNIT:1

### Introduction

#### Web (World Wide Web)

- The World Wide Web (commonly shortened to the Web) is a system of interlinked hypertext documents accessed via the Internet.
- With a web browser, a user views web pages that may contain text, images, videos and other multimedia & navigates between them using hyperlinks.
- Viewing a web page on the web normally begins either by typing the URL of the page into a web browser, or by following a hyperlink to that page or resource.

Web Technology : Web technology refers to the various tools & techniques that are utilized in the process of communication between different types of devices over the internet.

- A web browser is used to access web pages.

## Web Development Strategies

### Responsive web design strategy

Nowadays, people have multiple interfaces such as notebooks, mobiles, laptops to get connect over the internet. So, the web designs should be very presentable on those interfaces used by the people.

Software prototyping strategy : Developers have to make a prototype of a software or website before they put the software or website in function.

Competitor analysis strategy : Competitor analysis can help to determine the position in the competitive market. So, <sup>with</sup> developers should make a strategy to identify all the weak points and approaching the possible solutions.

Make a team : Web development is team work. So, a proper team of experienced web developers ~~are~~ is needed to gives a positive outcome and also makes the project easier.

Identify the audience : It is necessary to identify the target audience, their perceptions, attitude, buying sentiment, requirements & expectations are highly essential to create a website.

Writing Web Projects : Web projects are software projects which are specialized to make different types of websites which are implemented on the Internet.

### Steps for writing web projects

- (i) Write a project mission statement : focus must be on following three tasks
- a). identify project objectives
  - b). identify your users
  - c). determine the scope of the project

(ii). Identify Objectives : Objectives are basically <sup>final</sup> results

specific

Measurable

Attainable

Realistic

Time-limited

(iii). Identify target user : this will totally depend upon market research, focus groups & understanding internet audiences.

(iv). Determine the scope : Many things can determine the scope of the project. The scope of a project can change quickly and project ~~as~~ can get over budget or can be late.

(v). Budget : the better you become at defining your project's scope, the more accurate your budget will be.

(vi). Preliminary Planning Issues : of major factors to be considered here are-

Project team and Developing Infrastructure.

## Writing web Projects

Developing web project is a crucial activity and web project development differs from traditional web projects

Phases of writing the web projects are

**A. Write a project mission statement:**

Write the specific mission statement that you want to do.

**B. Identify Objectives:**

- i. Specific
- ii. Measurable
- iii. Attainable
- iv. Realistic
- v. Time limited

**C. Identify your target users:**

The matter of a website will be determined by the users whom you want to visit the site. This is totally depend upon

- i. Market research
- ii. Focus group
- iii. Understanding the audiences

**D. Determine the scope:** By supporting documents and client's approval.

**E. Budget:**

- i. Assumption for budgets.
- ii. Budget categories.
- iii. Determine hidden costs and tools.

**F. Planning issues:**

- i. Discuss client's existing information system.
- ii. Project team and developing infrastructure.
- iii. Where the website will place.

## **Identification of objects :**

**A. Object identification:** All the components which are visible in website are objects or in other words, we can say that all visible components in the web browser are defined as objects. Ex. Text box, command button etc.

## **B. Web development process:**



### **Strategy:**

- Goals and objectives
- Team building
- Research and review
- Project proposal

### **Design and Specification:**

- Developing concept
- Content planning
- Rough design
- Final design

### **Produced desired Result:**

- Build prototype
- Prototype testing
- Original design
- Satisfy the clients need

### **Testing and maintenance:**

- Test the code
- Maintain the web server.
- Register with ISP:
- Register domain name
- Get web space

### **Launch:**

- Connect domain name with web server
- Finally host the web accordingly.

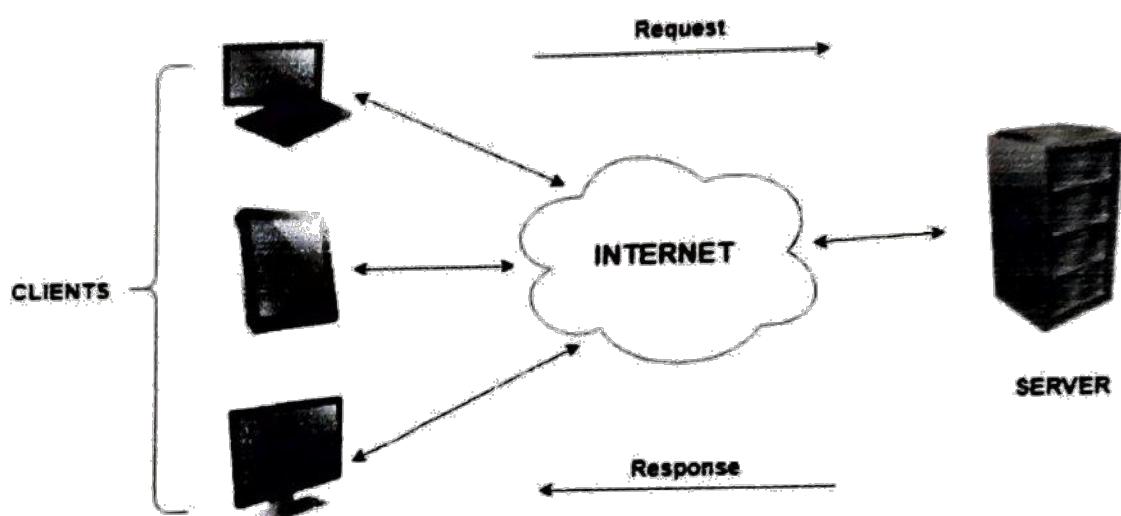
### **Principles involved in developing a website :**

- 1. Simple Is the Best.
- 2. Consistency.
- 3. Typography & Readability.
- 4. Mobile Compatibility.
- 5. Color Palette and Imagery.
- 6. Easy Loading.
- 7. Easy Navigation.
- 8. Communication

## Client Server Computing

In client server computing, the clients requests a resource and the server provides that resource. A server may serve multiple clients at the same time while a client is in contact with only one server. Both the client and server usually communicate via a computer network but sometimes they may reside in the same system.

An illustration of the client server system is given as follows:



## Characteristics of Client Server Computing

The salient points for client server computing are as follows:

- The client server computing works with a system of request and response. The client sends a request to the server and the server responds with the desired information.
- The client and server should follow a common communication protocol so they can easily interact with each other. All the communication protocols are available at the application layer.
- A server can only accommodate a limited number of client requests at a time. So it uses a system based to priority to respond to the requests.
- Denial of Service attacks hinder a servers ability to respond to authentic client requests by inundating it with false requests.
- An example of a client server computing system is a web server. It returns the web pages to the clients that requested them.

## Difference between Client Server Computing and Peer to Peer Computing

The major differences between client server computing and peer to peer computing are as follows:

- In client server computing, a server is a central node that services many client nodes. On the other hand, in a peer to peer system, the nodes collectively use their resources and communicate with each other.
- In client server computing the server is the one that communicates with the other nodes. In peer to peer computing, all the nodes are equal and share data with each other directly.
- Client Server computing is believed to be a subcategory of the peer to peer computing.

## Advantages of Client Server Computing

The different advantages of client server computing are:

- All the required data is concentrated in a single place i.e. the server. So it is easy to protect the data and provide authorisation and authentication.
- The server need not be located physically close to the clients. Yet the data can be accessed efficiently.
- It is easy to replace, upgrade or relocate the nodes in the client server model because all the nodes are independent and request data only from the server.
- All the nodes i.e clients and server may not be build on similar platforms yet they can easily facilitate the transfer of data.

## Disadvantages of Client Server Computing

The different disadvantages of client server computing are:

- If all the clients simultaneously request data from the server, it may get overloaded. This may lead to congestion in the network.
- If the server fails for any reason, then none of the requests of the clients can be fulfilled. This leads of failure of the client server network.
- The cost of setting and maintaining a client server model are quite high.

(P)

## Advantages Characteristics of Client - Server Computing

1. Very secure
2. Better performance
3. Centralized backup
4. Very reliable

## Disadvantages of Client-Server Computing

1. Requires professional administration
2. More hardware-intensive
3. ~~Expensive &~~ expensive & dedicated software
4. More software intensive