CSE-403
Internet Working and Web Design

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ASSISTANT PROFESSOR

DEPARTMENT OF CSE

Internet Working and Web Design

Course Code:	CSE-403	Credits:	02
		CIE Marks:	60
Exam Hours:	03	SEE Marks:	40

Course Learning Outcome (CLOs): After Completing this course successfully, the student will be able to…

CLO	Description
CLO1	Understand the history and progression of the web, including Web 1.0 and Web 2.0.
CLO2	Create and structure web pages using basic HTML tags, attributes, and elements.
CLO3	Develop styled web pages incorporating XHTML, advanced HTML, and CSS for layout and presentation.
CLO4	Explain the roles of client-side coding (HTML, CSS, JavaScript) and server-side coding (PHP, Python).
CLO5	Create forms for data collection and validate them using HTML attributes and JavaScript.
CLO6	Add images, videos, and interactive elements such as animations and maps to web pages.
CLO7	Create and manage links, anchors, and navigation systems for efficient website structure.
CLO8	Use HTML to create structured tables and various list types for organized data presentation.
CLO9	Explain and design URL paths, directory structures, and file organization for websites.
CLO10	Ensure web pages meet usability and accessibility standards through testing and best practices.

Summary of Course Content

Sl.	Course Content	HRs	CLOs
1	History and Evolution of the Internet	2	CLO1
2	Introduction to Web Development and Platforms	2	CLO1, CLO2
3	HTML Basics: Tags, Elements, and Attributes	6	CLO2
4	Advanced HTML and XHTML	4	CLO2, CLO3
5	CSS for Styling and Layout	6	CLO3
6	Client-Side vs. Server-Side Coding	3	CLO4
7	Forms and Form Validation	5	CLO5
8	Multimedia and Interactive Features	4	CLO6
9	Links, Navigation, and Anchors	3	CLO7
10	Tables and Lists for Data Presentation	4	CLO8
11	URL Structure and Directory Organization	2	CLO9
12	Accessibility, Usability, and Testing	3	CLO10
13	Introduction to Frames and Inline Frames	3	CLO2, CLO6
14	Advanced Topics: Image Maps, Nested Frames, and Grouping	4	CLO6, CLO7

Recommended Books

1. HTML & CSS: Design and Build Websites
   Author: Jon Duckett
   Description: A beginner-friendly guide to learning HTML and CSS with visual examples.
   Publisher: Wiley

2. Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics
   Author: Jennifer Robbins
   Description: A comprehensive introduction to web design principles and coding.
   Publisher: O'Reilly Media

Recommended Web Resources

1. Mozilla Developer Network (MDN) Web Docs
   Description: A go-to resource for web development documentation, including HTML, CSS, and JavaScript.

2. W3Schools
   Description: Interactive tutorials and references for web technologies, including coding exercises.

3. GeeksforGeeks – Web Development
   Description: A collection of tutorials and problem-solving guides for web programming concepts.

4. CSS-Tricks
   Description: A resource for CSS tips, tricks, and techniques.

5. Smashing Magazine
   Description: Articles and tutorials on web design and development.

Assessment Pattern

CIE- Continuous Internal Evaluation (60 Marks)

Bloom's Category Marks (out of 60)	Tests (30)	Assignments (10)	Quizzes (10)	Attendance (10)
Remember	5		3	
Understand	5	2	2	
Apply	5	3	5	
Analyze	5			
Evaluate	5			
Create	5	5		

SEE- Semester End Examination (40 Marks)

Bloom's Category	Test
Remember	5
Understand	5
Apply	10
Analyze	5
Evaluate	5
Create	10

Course Plan

Week No	Topics	Teaching Learning Strategy(s)	Assessment Strategy(s)	Alignment to CLO
1	History and Evolution of the Internet	Lecture, Discussion, Videos	Quiz on internet history	CLO1
2	Basics of Web Development and Platforms	Lecture, Hands-on Practice	Classroom Q&A, Assignment on identifying web technologies	CLO1, CLO2
3	HTML Basics: Tags, Elements, and Attributes	Lecture, Coding Practice	Lab Exercise: Create a simple HTML page	CLO2
4	Advanced HTML and XHTML	Lecture, Hands-on Coding	Lab Exercise: Develop a structured HTML page	CLO2, CLO3
5	Introduction to CSS for Styling	Lecture, Demonstration, Coding Practice	Assignment: Style a webpage using CSS	CLO3
6	Client-Side vs. Server-Side Programming	Lecture, Group Discussion	Quiz on the differences and examples of client/server-side	CLO4
7	Forms and Form Validation	Lecture, Hands-on Practice	Lab Exercise: Create and validate a form	CLO5
8	Adding Multimedia and Interactive Features	Lecture, Coding Practice	Project: Add images and videos to an HTML page	CLO6
9	Links, Navigation, and Anchors	Lecture, Hands-on Practice	Lab Exercise: Create a navigation menu using links	CLO7
10	Tables and Lists for Data Presentation	Lecture, Coding Practice	Assignment: Create a table with nested lists	CLO8
11	URL Structure and Directory Organization	Lecture, Demonstration	Quiz on URL components and directory setup	CLO9
12	Testing, Usability, and Accessibility	Lecture, Case Studies	Group Discussion: Evaluate a website for accessibility	CLO10
13	Frames and Inline Frames	Lecture, Hands-on Coding	Lab Exercise: Create a webpage with inline frames	CLO2, CLO6
14	Image Maps and Advanced Navigation Techniques	Lecture, Coding Practice	Lab Exercise: Create an image map	CLO6, CLO7
15	Advanced HTML/CSS Layout Techniques	Lecture, Coding Practice	Assignment: Build a webpage with complex layouts	CLO3
16	Web Project Development and Integration	Lecture, Group Project Work	Final Project: Complete and submit a functional website	CLO1-CLO10
17	Course Review and Final Assessment	Review Sessions, Project Demonstrations	Final Exam, Project Presentation	CLO1-CLO10

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Internet Working and Web Design

This presentation delves into the inner workings of the internet, the foundation of web design, and emerging trends in web development.

Understanding the Internet: A Global Network of Interconnected Computers

Interconnected Computers

The internet is a vast network of computers, interconnected by cables and wireless signals, allowing communication and data sharing.

Protocols and Standards

The internet operates on a set of rules and protocols that govern data transmission and ensure seamless communication between devices.

Web Architecture and Standards: The Backbone of the World Wide Web

HTML

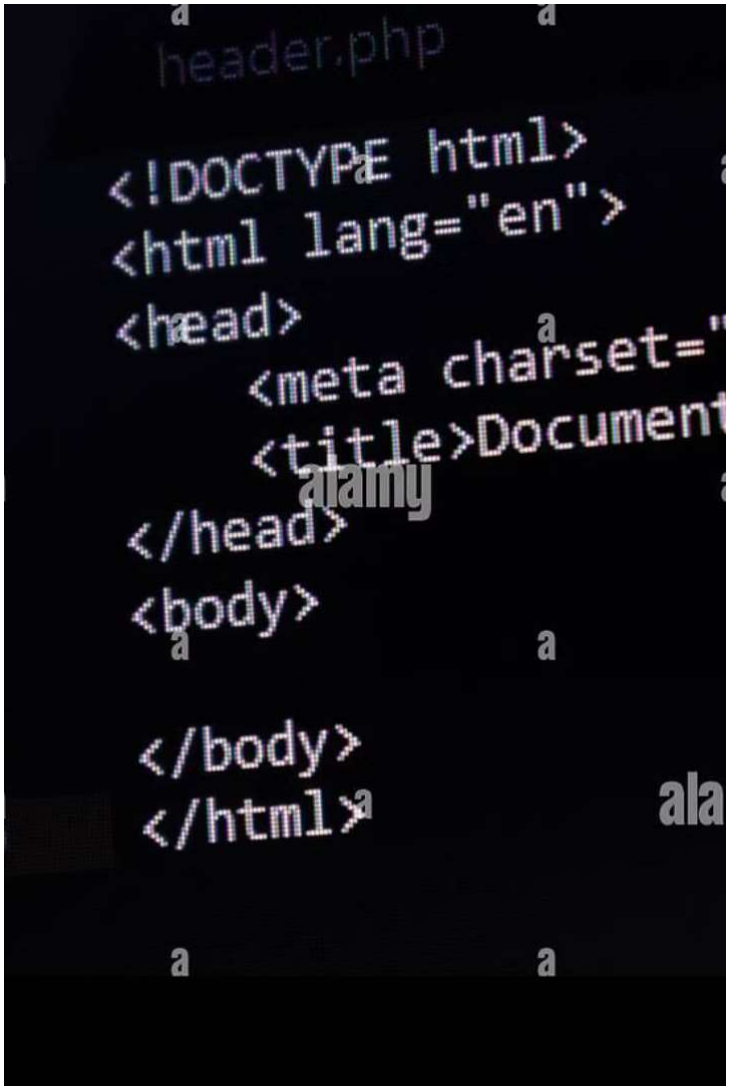
The foundation of web pages, defining content structure and layout.

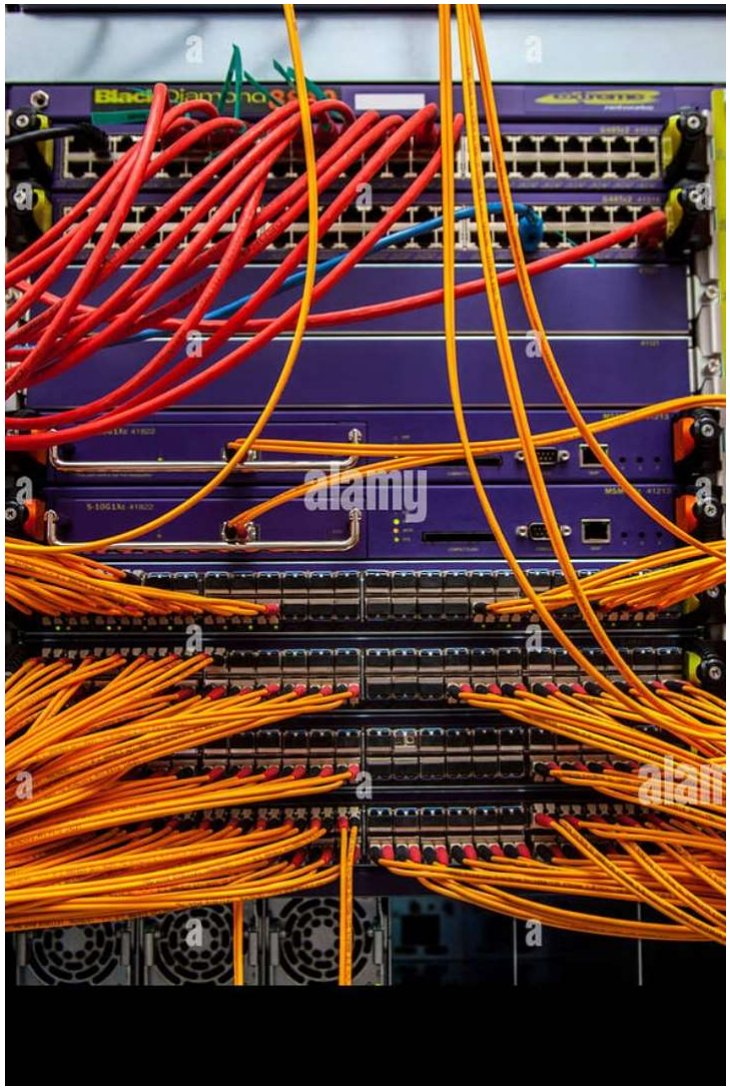
CSS

Used to style and visually enhance web pages, controlling colors, fonts, and page layout.

JavaScript

Adds interactivity to websites, enabling dynamic content, user interaction, and animations.





Domain Names, IP Addresses, and DNS: Navigating the Online Landscape

Domain Names

Human-readable addresses for websites, such as "example.com."

IP Addresses

Numerical addresses assigned to devices on the internet, unique and essential for communication.

DNS

A system that translates domain names into IP addresses, enabling users to access websites by their familiar names.

HTTP and the Client-Server Model: How Websites Communicate with Browsers

1

Request

A user's browser sends a request for a specific web page to a web server.

2

Response

The server processes the request and sends back the requested content, including HTML, CSS, and JavaScript files.

3

Rendering

The browser receives the response and displays the content on the user's screen.

HTML, CSS, and JavaScript: The Building Blocks of Web Design

1

HTML

Defines the structure of web pages, organizing content into headings, paragraphs, and lists.

2

CSS

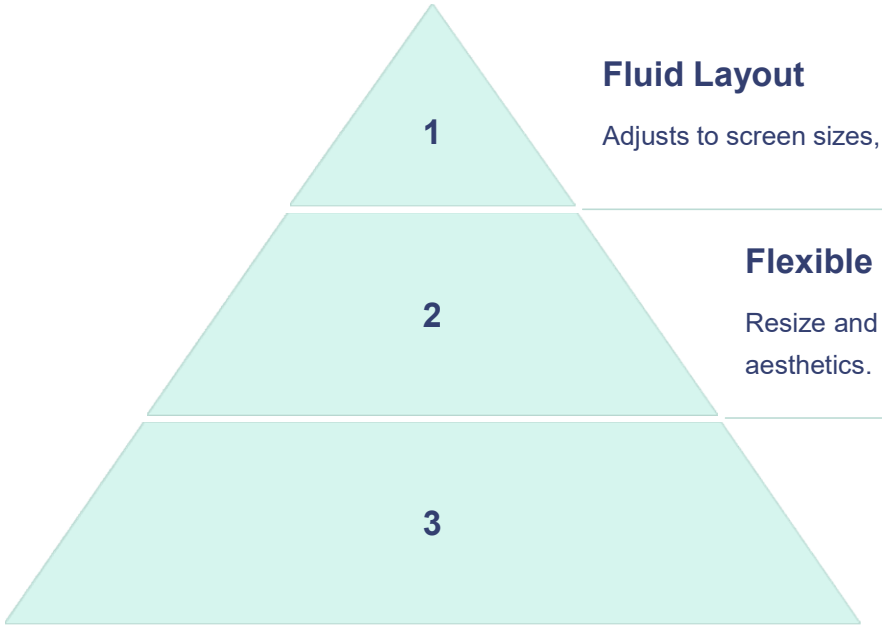
Controls the visual appearance of web pages, including fonts, colors, layout, and spacing.

3

JavaScript

Adds interactivity, dynamic content, and advanced features to websites, enhancing user experience.

Responsive Web Design: Optimizing for Multiple Devices



Fluid Layout

Adjusts to screen sizes, ensuring readability and optimal viewing on different devices.

Flexible Images

Resize and adapt to different screen sizes, maintaining image quality and aesthetics.

Mobile-First Approach

Prioritizing mobile devices, ensuring the core functionality and experience is accessible on all platforms.

Web Servers and Web Hosting: Delivering Websites to Users

1

Web Servers

Powerful computers that store and process website files, making them accessible to users.

2

Web Hosting

A service that provides the physical space and resources for a website to reside on the internet.

3

Domain Name System (DNS)

A system that translates domain names into IP addresses, enabling users to access websites by their familiar names.

Search Engine Optimization (SEO): Improving Website Visibility and Traffic

1

Keyword Research

Identifying relevant terms that users search for to optimize content for search engines.

2

On-Page Optimization

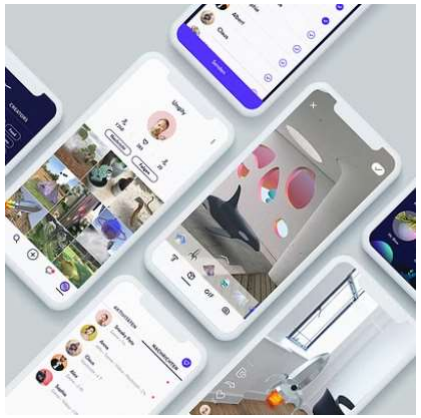
Optimizing website content, structure, and code to improve search engine ranking.

3

Off-Page Optimization

Building backlinks from other websites to increase website authority and visibility.

Emerging Trends in Web Development: From Mobile Apps to Progressive Web Apps



What is a Web Developer?

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3. Internet – Intranet - Extranet
4. Connection of Internet
5. Network Topology
6. Let us sum up
7. Check your Progress
8. Check your Progress: Possible Answers
9. Further Reading
10. Assignment

1. LEARNING OBJECTIVE

1.1 Objectives

After studying this unit student should be able to:

- Emerging applications of Internet from Its History
- Able to differentiate Internet – Intranet - Extranet
- Types of Internet Connection
- Layout of desktop called Topology of Computer Network

1.2 INTRODUCTION TO INTERNET

In the early days, most people just used the internet to search for information. Today's internet is a constantly evolving tool that not only contains an amazing variety of information, but also provides new ways of accessing, interacting and connecting with people and content. As a result, new terms are constantly appearing as new technologies are introduced.

Figure-1 Applications of Internet

The internet is the most cost-effective communications method in the world, in which the following services are instantly available:

- Email

- Web-enabled audio/video conferencing services
- Online movies and gaming
- Data transfer/file-sharing, often through File Transfer Protocol (FTP)
- Instant messaging
- Internet forums
- Social networking
- Online shopping
- Financial services

What is Internet: “Largest Computer Network in the world, connecting millions of computers? A network is a group of two or more computer systems linked together.”

Friends, we look at the Time-Line and brief history of Internet with its application we can get idea from below figure

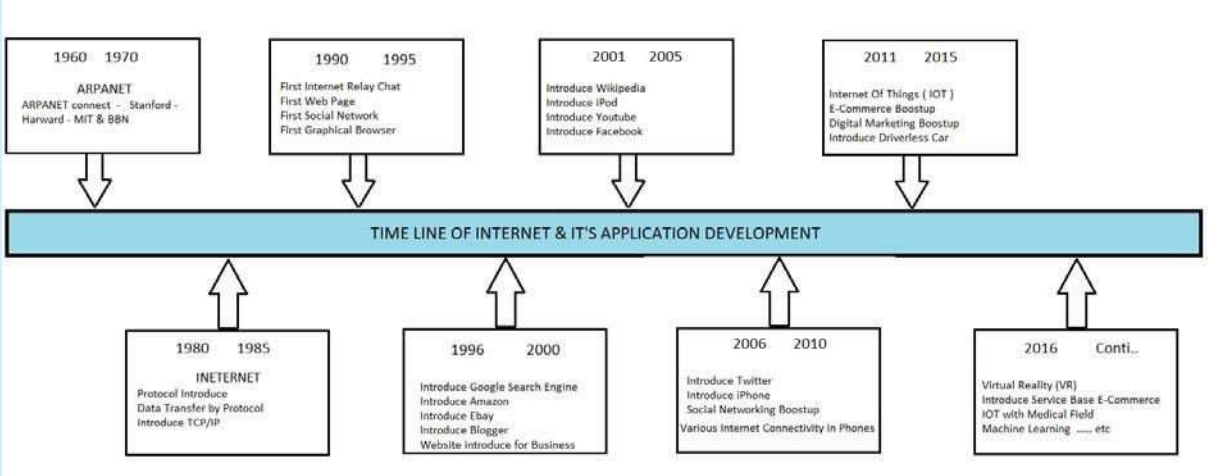

Figure 2: Time Line / History of Internet

Advantages of Internet:

- E-mail
- 24 hours a day - 7 days a week: availability
- Information

- Online Chat
- Net banking
- E-commerce
- Entertainment
- Software Downloads

Limitations of Internet

- Theft of Personal information
- Negative effects on family communication
- Internet addiction
- Children using the Internet
- Virus threat

1.3 INTERNET – INTRANET - EXTRANET

Hi Friends Internet – Intranet and Extranet is basically terminology that provide at various types of computer network for different purpose. We can clear our concept by below diagram

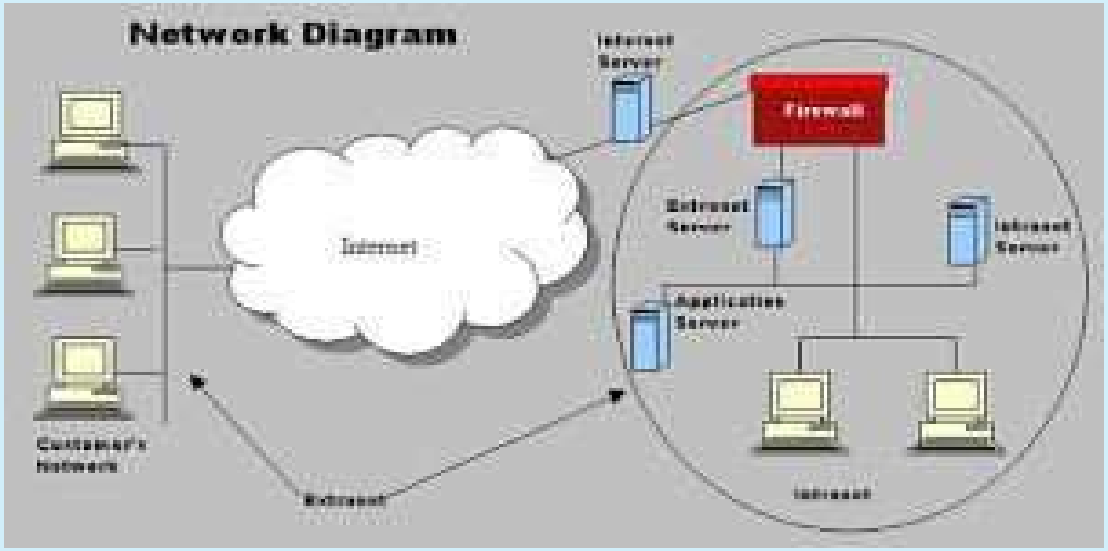

Figure 3: Internet – Intranet and Extranet

If we compare this three terms it is easily understood by the comparison factor like layout – process – Accessibility – Security – Maintenance … etc.

Internet	Intranet	Extranet
Global Interconnect Network	Private Network specific to an organization	Private Network that use public network but share information to one or more entity (Suppliers and

		Vendors)
Accessible to Everyone	Only Members can Access	Permitted External Members can Access (Suppliers and Vendors)
Not Control by any Authority	Control by specific Authority	Control by more than one Authority
Owned by no One	Owned by single Organization	Owned by Single / Multiple organization (Suppliers and Vendors)

Sharing Information throughout Worldwide	Sharing sensitive information throughout organization	Sharing information between members and external members (Suppliers and Vendors)
Security is depend on User of device connected to Network	Security provide by Firewall	Security provide by Firewall that separate Internet and Extranet
Internet is free and open for all	Intranet is regulated and operated by certain policies	Extranet regulated by contractual between companies
Access all facilities without username and password	Access facilities to specific users as per policies	Access facilities to Internal as well as external members as per restriction.

No Maintenance required	Maintenance required for user level policy as well as data security	Maximum Maintenance required for Internal Users as well as permitted External users for data transfer
Ex. We use Internet	Ex. A Company Use	Ex. An MNC Company Use
normally	Internet for only their Employee.	Internet for its multiple branches and Employee.
Ex. abjadeja@gmail.com	Ex. abjadeja@TCS.db.com	Ex. abjadeja.ind@TCS.db.com

1.4 CONNECTION OF INTERNET

There are five types of Internet connections

1. Dial Up connections
2. Leased Connections
3. DSL Connections
4. Cable Modem Connections
5. VSAT

Dial Up Connection

Such type of Internet Connection that **use Phone Line** for Internet Access is called

Dial up Connection

For Dial Up connection Friends **one Device mainly used name MODEM (Modulation Demodulation)** that **convert Analog signals (telephone) to Digital Signal (Desktop) and same as vice verse.**

Dial Up connection generally use **Telephone line as main source** and when connect Internet Telephone number dial it generates buzzing sound when **ISP (Internet Service Provider)** connect with Main Line.

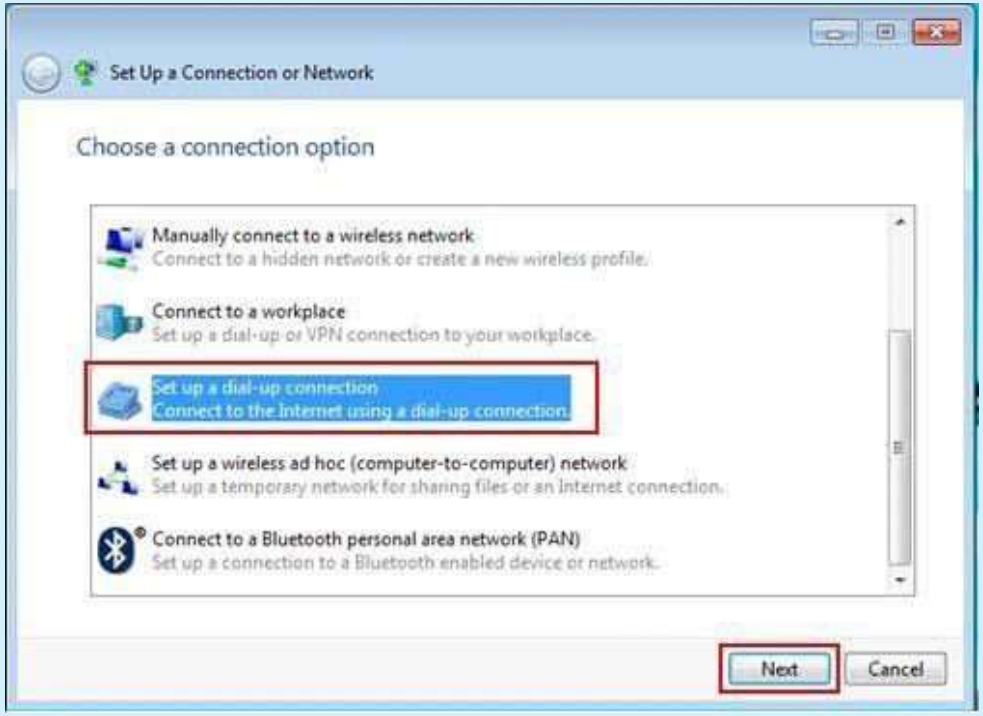

Figure 4: Dial up Connection Setup

Advantages • Low

Price

- Low Maintenance

- Secured Connection – IP Address continually changes
- Offer in Rural areas also where Telephone line available

Disadvantages

- Slow Speed
- Phone Line is must
- Busy signals for friends and family members when dial up
- Telephone Cable dependency **Leased Connection**

Friends it is extended version of Dial up Connection only

Such type of Internet Connection that **use Permanent Tele Phone Line** for two or more points as leased as Internet Access is called Leased Connection

This is leased line so the **Telephone line and Internet line is distributed by ISP**

(Internet Service Provider) so it is better than Dial up Connection.

Advantages

- Connection is speed is better because connection does not carry any other communications
- Connection can divide in two line it is called multiplexing
  - Speed is better than Dial Up Connection
  - Reliable because down time is very less
- Bandwidth of signal can easily transmit because it's separate telephone line
  - Secure and Private **Disadvantages**
  - Maximum transmission speed is 1.544 Mbps
  - Phone Line is must
  - It is expensive as installation and for rent level

- Distance dependent to nearest Telephone exchange

DSL Connections

DSL means Digital Subscriber Line (DSL) is special type of Internet Access technology where **Data transfer by Digital** way Data transfer rate is compare to high level i.e. **256 Kbit/second to 40 Mbit/second** directions to the customer.

Data transmission and signal can be both the way **Asymmetric Digital Subscriber Line (ADSL)** as well as **SymmetricDigital**

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Subscriber Line (SDSL) so Upload and Download Data rates are same.

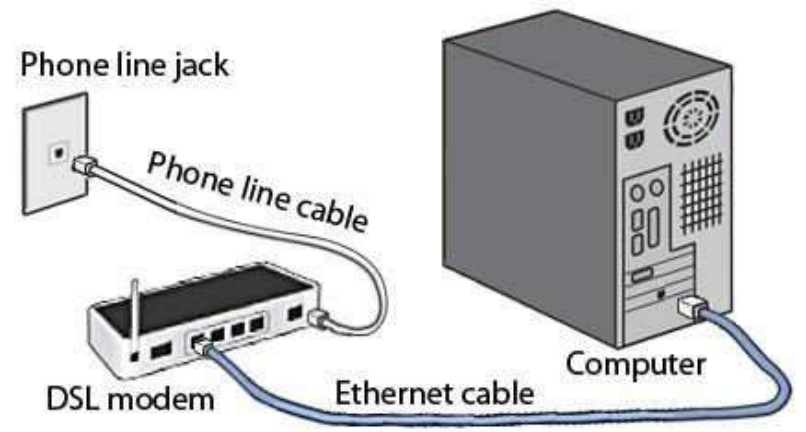

Figure 5: DSL Connection Setup

Advantages

-
- High Bandwidth
  Cheap line charges from the phone company
- Best for data traffic management
- DSL can integration with other external entity like ATM and WAN technology also
- More secure than Dialup as well as Leased line internet connection

Disadvantages

- No standard formation for various types of WAN
- Comparative expensive Setup Cost (DSL Modem required)

-
- Connection is slower when multiple external entity like ATM or WAN are parallel working

Cable Modem Connections

Friend's most general use of Internet Access Technology of today

"Internet Access Technology that use **Bridge and Modem** that supply bit-direction data **transmission by Radio Frequency** is called Cable Model Connection " Guys now days we can see at our home also Coaxial cable runs our TV set with Setup box as

- well it provides Internet to our home members for multiple smart

phones can use data band width receive.

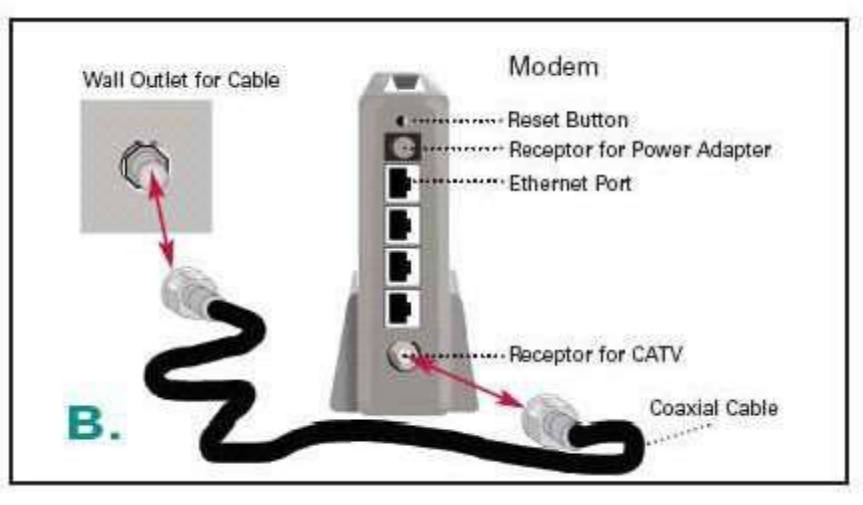

Figure 6: Cable Modem Connection

Advantages

- Most general as maximum use of technology now a day's use by customer.
- No telephone line required
  Data transfer rate is high
- It can be attach more than one electronic device at a time .(ex. router can connect laptop , desktop , smart phones at a time)
- Routing can increase the strength of signals as well as continues data transfer rate
- File transfer capability is also high

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- It is always connected (i.e. it can automatically connect multiple device like some wifi provides such facilities)

Disadvantages

- Coaxial cable is comparatively costly
- Modem cost is additional
- Bandwidth is equal to the budget of customer i.e. as per expense of money customer can received maximum bandwidth up 40 Mbps **VSAT**

It means Very Small Aperture Terminals (VSAT)

- “Internet Access technology that use at earthbound station (satellite) communication special establishment for transferring Data, Voice and Video signals broadcasting Television is known as VSAT”

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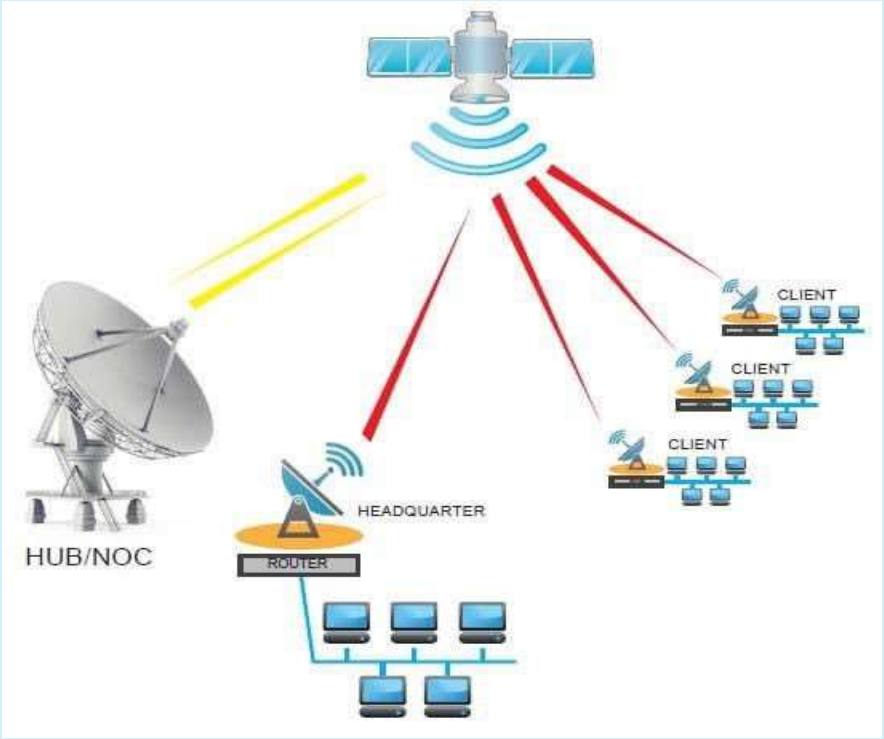

Figure 7: VSAT Connection

The **satellite sends and receives** signals from a **ground station** that acts as a hub for the system. **Every user is interconnected with the hub station** via the satellite, forming a topology. The hub controls the whole operation of the network. For one user to communicate with another, every transmission needs to initial go to the hub station that then retransmits it via the satellite to the opposite finish user's VSAT.

Advantages

- Global Data transmission in real sense.
- One Stop solution for any type of data.
- Most Flexible and Portable.
- Easy to upgrade.

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- Multiple Device accessibility.
- **It is most secure so Data privacy can easily manage.**
- Data transfer rate is very high.

Disadvantages

- Setup cost is extremely high.
- Sometimes service quality limitation like ‘latency’ (high level of data transfer rate is very low for small period of times due to satellite communications)
- High level of maintenance required.
- High level of skill required for Setup design as well as satellite transmission
- Adopt by very confidential department.

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1.5 NETWORK TOPOLOGY

Hey Friends, In Computer System, the network topology refers to the **pattern of arrangement for the connected Devices** that involves **network as well its nodes** and connecting lines. A business setup or a home automation network can be designed better by including the concepts of understanding of standard topologies its routes, broadcast and other wireless connecting devices.

To build and efficient and effective Network three main measures can be considered are message receiving Speed between nodes, Network Structuring Cost and reliability of Network in times of connection or nodes malfunctioning. In simple terms a Network Topology is the description of a network layout, linking the sender and receiver nodes using the connecting lines.

Network Topology Types

In a personal computer network like home the Network Topology can be arrangement in a defined structure or any virtual shape.

- The structure of the network can be defined in two forms, Physical

Topology that depicts the factual Workstation layout and Logical Topology the signal pathway among nodes. In some networks both the forms of network Topologies can be essentially Identical while in other they might not be similar like Physical Topology of some can be of one configuration while it can be operating on another configuration arrangement of networks. The various common physical topologies can be categories as following basic types:

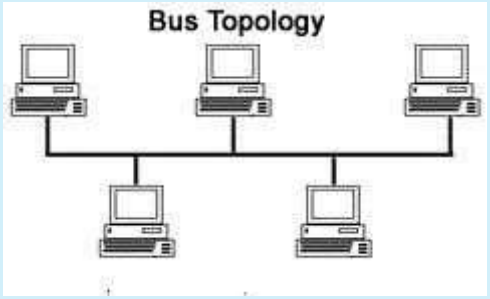
Bus Topology Ring Topology Star Topology
Mesh Topology Tree Topology Hybrid Topology

Bus Topology

The Bus Topology is a network type in which all the devices/nodes/workstation are connected in sequence to the main single cable having one transmission line called as Bus. It is even called as Linear Bus topology where each workstation is directly connected to every other workstation in the network using a common backbone. This type of topology is used in Ethernet LAN.

The characteristics of Bus Topology can be stated as:

- One direction Data transmission.
  Single Cable device/Node connectivity.
- The communication medium is shared through an interface connector.
- The sender sends a broadcast message through a cable visual to all nodes, while only the intended receiver recognizes and progresses the message.



Advantages:

- Effortless understanding
- Simplified topology.
- Comfortably Expandable.
- Less Expensive.
- Less requirement of Connecting Cable in respect to other Topologies.
- Small networks are availed.

Disadvantages:

- Length Limitation of Connecting Cable.
- Transmission failure of one Cable stops the entire network signaling.

-
- Able to manage the medium network traffic.
- Network Performance reduces during heavy network traffic.
- Slow speed of transmission than the other topology.
- Less Reliability as it is prone to network failure.
- Entire network Failure becomes unusable once the backbone cable interrupts.

Ring Topology

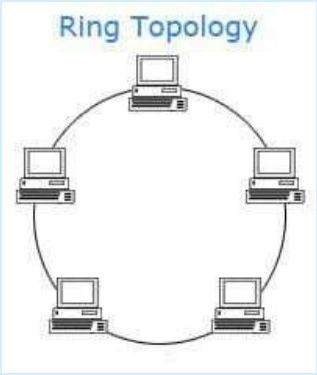
The Ring Topology is a network type in which all the devices/nodes/workstation are connected to each other in a closed loop configuration in such a way that first node connects to the succeeding nodes and the last node ends in connectivity

with the first node, hence making circular structure known as Ring. This type of topology is used in school campus and Offices.

The characteristics of Ring Topology can be stated as:

- Ring Structure formation.
- Each Workstation is connected to two devices
- During transmission repeaters are used to prevent the data loss as the message has to travel from sender crossing all nodes when it reaches to targeted receiver.
- Bit-by-Bit Data transmission passes through each node till it reaches the receivers node.

-
- Single directional data transmission either clockwise or anti-clockwise.
- The unidirectional data transmission according to requirement can be modified into bidirectional through the use of to and fro connection between each nodes, becomes Dual Ring Topology.
- The two-way directional data flow in Dual Ring Topology maintains the data so that data failure of one is backup by second ring, hence is Network is always up.
- Data Transmission is smooth as the node containing tokens can only transmit data.

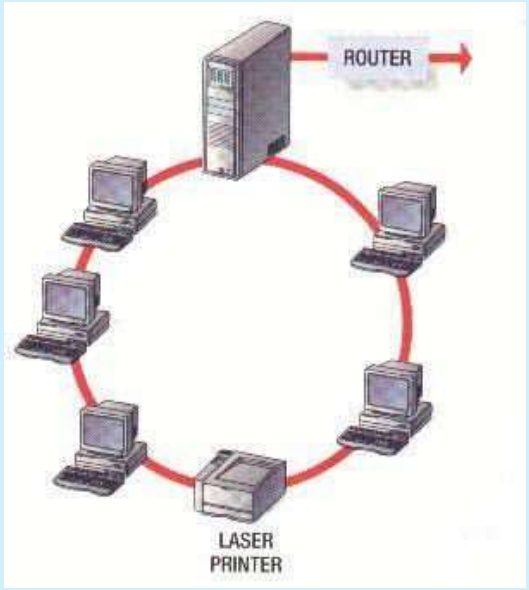


Advantages:

- Manages High Traffic network
- Reasonable cost of installation.
  Conformable expansion of workstation.
- Fairly low cost.

Disadvantages:

-
- Laborious Troubleshooting.
- Network connectivity and activity gets suspended at the time of addition and removal of workstation.
- Entire Network gets interrupted by malfunctioning of single workstation.
- Loop breaks and stops data transmission at failure of single cable.
- the entire network is down on
- Time Consuming as the data passes single or multiple Intermediate nodes.
- Average speed data transmission.



Star Topology

The Star Topology is a network type in which all the devices/nodes/workstation are directly connected to each other

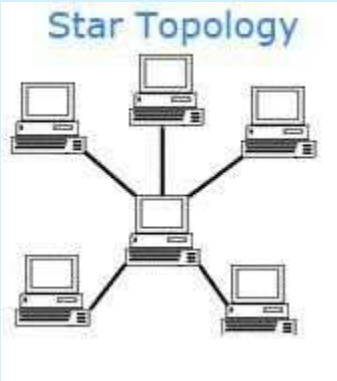
- by a connecting devices like Hub, Switch or Router through Cable

to the central Computer System or Server making a structure known as Star. This type of topology is used in many home networks and other Common local networks.

The characteristics of Star Topology can be stated as:

- A central computer indirectly connects each workstation.
- Connecting device act as the central Workstation that connects all the others nodes.
- Dedicated Connection of all workstation to Hub/Switch.
- Data Flow uses Hub that operates as a repeater.

- Twisted pair, Optical Fiber or coaxial cable can be used.



Advantages:

- Low network traffic among few nodes enhances the network performance. • No Network downtime due to malfunctioning of individual nodes or cables
- Smooth up gradation of connecting Devices like Hub and Switch.
- Quick and effective troubleshooting.

-
- Effortless setup and transform.
- Single workstation is affected by Dropout while remaining nodes works efficiently.

Disadvantages:

- Expensive installation.
- Expensive usage inclusive of devices.
- Excellent Speed during distance transmission Head Quarter Traffic jam is unavoidable.
- Entire Network downtime during central connecting device failure.

- Failure of connecting device Hub/Switch leads dropout of entire transmission.
  Efficiency and Performance is measured on the capacity of connecting device Hub/Switch.
- Star Topology utilizes more cable in comparison to bus topology.
- The reliability is hazardous as failure on Head Quarter stops all transmissions.

Mesh Topology

The Mesh Topology is a network type in which each device/node/workstation is directly connected to any of the available and required Node present in the Network in such a way

-

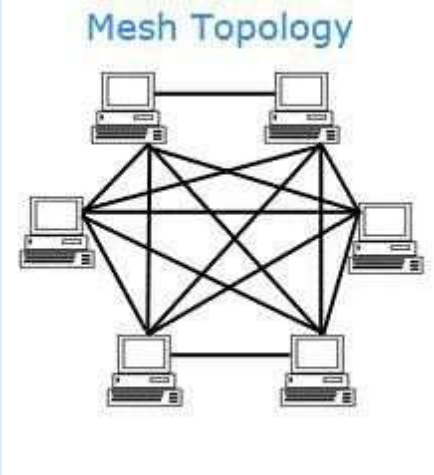
where there is no defined shape hence forming a Mesh structure. This type of topology is used in mainly used in some WANs, internet and Wireless Networks.

The characteristics of Star Topology can be stated as:

- On the basis of connections there are two types of Mesh Topology:
- Partial Mesh Topology: There is an exclusive connection between required nodes only and very few nodes are connected each other.

- Full Mesh Topology: All nodes have common mutual connection among each other.
- Mesh topology initiates the concept of routes as the broadcasted message onto this topology has multiple paths from sender to receiver. The two mechanisms of Data transmission in this Topology are:
- **Routing:** it has Routing Logic based on network requirements that directs the data in to its receiver through shortest path. The information about

- malfunctioning nodes resides in routing logic; hence it avoids those nodes during data transmission.
- **Flooding:** It does not require Routing Logic as same data is transmitting broadcasted to all network nodes. The advantage is that there is no data loss in flooding while on the other hand the unwanted load over the network is increased.
- Node to Node connection is present.
- Completely connected.
- Vigorous and Robust.
- Non-flexible.



Advantages:

- High Fault Tolerance due to Node-to-Node connectivity redundancy
- Own Data load is carried by all the connection itself.
- Speedy diagnosis of Troubleshooting and Faults.
- Security and Privacy efficiency is offered.

-

Disadvantages:

- Complex Installation and configuration.
- Expensive in terms of Connecting Cable.
- Needs voluminous Cable.
- Used in highly critical networks due to High cost.

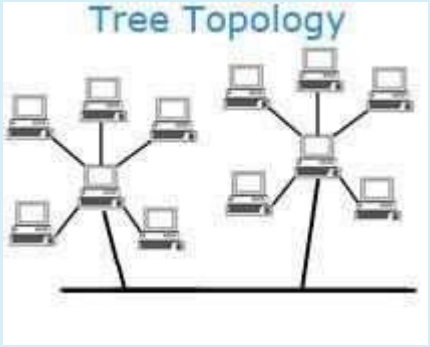
Tree Topology

The Tree Topology is a network type in which each device/node/workstation is hierarchically connected having a root node followed by two or multiple sub-levels nodes that further has second level of sub nodes forming a shape called s Tree

Structure. This type of topology is used in mainly used in Wide Area Network.

The characteristics of Tree Topology can be stated as:

- Has structure similarity with Bus (Network Backbone) and Star (low level nodes connectivity) topologies. Tree topology connects manifold star structured topologies together onto a bus.
- Three levels of hierarchy should be structured.
- Efficient where cluster or groups of workstations are positioned in groups.



Advantages:

- Tree shaped simply distinguishable connection.
- Bus and Star Topology extension.
- Effortless and flexible nodes extension.
- Maintenance and Management is straightforward.
- Speedy Fault finding and troubleshooting.

Disadvantages:

- Heavily wired.

- Expensive.
- Expansion on Nodes challenges maintenance.
- Failure of Connecting Devices leads network failure.

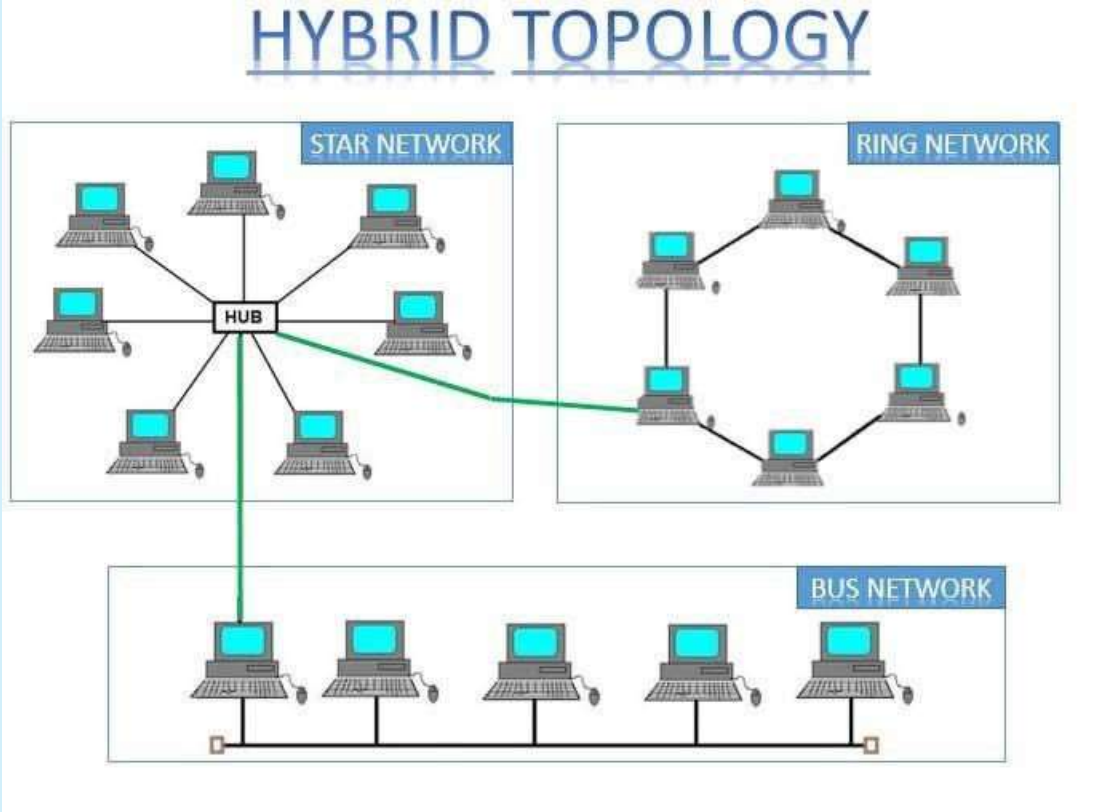
Hybrid Topology

The Hybrid Topology is a network type in which all the devices/nodes/workstation are connected in such a way that it is combinations of two or more different topologies, hence forming a combined structure called as Hybrid. This type of topology is used in multiple LAN networks in High-level organizations.

The characteristics of Hybrid Topology can be stated as:

- Has an arrangement of two or more than two topologies.

- The characteristics, merits and demerits are indirectly inherited form the combined topologies.



Advantages:

- Speedy Troubleshooting • Reliable Fault Finding.
- Effective transmission.
- Smooth expansion of Size.
- Scalable.
- Flexible.

Disadvantages:

- Complex Design
- Multifaceted Combination.
- Hierarchical mode of Network
- Expensive.

1.6 LET US SUM UP

Hey Friends now you complete this unit of Introduction to Internet let's focus on some of the key point that are as key elements are: Internet – Internet uses – Internet history – a comparison between Internet – Intranet – Extranet; Many ways to get Internet connection and each types advantages and disadvantages – for number of desktop arranging pattern: topology; Types of various topology with its advantages and disadvantages of each topology.

1.7 CHECK YOUR PROGRESS

- The most basic topology is Bus Topology? [True / False]

- Full form for below ○ LAN ○ WAN ○ FTP ○ DSL

- For satellite communication we use _____ Internet Connection

---

1.8 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- The most basic topology is Bus Topology? [True]
- Full form for below ○ LAN –Local Area Network ○ WAN – Wide Area Network ○ FTP – File Transfer Protocol ○ DSL – Digital Subscriber Line

- For satellite communication we use **VSAT** Internet Connection

1.9 FURTHER READING

Following are some Online Reference Reading as PDF:

http://ignou.ac.in/userfiles/Block2(1).pdf [Pg 5 – 22 For Network Topology]

http://ignou.ac.in/userfiles/Block2(1).pdf [Pg 18 – 20 For Internet Connection]

http://www.csl.mtu.edu/cs4451/www/notes/Network%20Topologies.pdf [About Network Topology]

http://www.just.edu.jo/~mqais/cis99/PDF/Internet.pdf [About Internet]

CSE-403
Internet Working and Web Design
<Week 4>
<Slides 81-150>

YouTube Reference:

https://www.youtube.com/watch?v=YOXwcbwSEUo [About Introduction to Internet]

https://www.youtube.com/watch?v=NSHj9BLnhj0 [About Network Topology]

https://www.youtube.com/watch?v=teWamog0iuk [About Network Devices]

10. ASSIGNMENTS

1. Define Internet , Its uses with its advantages and disadvantages

2. What is Internet Connection Type? Explain any 2 in Detail

3. Differentiate the below terms :
   a. Dial Up Connection v/s VSAT
   b. DSL Connection v/s Cable Modem Connection
   c. Bus Topology v/s Star Topology
   d. Tree Topology v/s Hybrid Topology

4. What is Computer Network Topology? Explain any 2 Topology with its characteristics block diagram and advantages and disadvantages.

1.11 ACTIVITIES

Note: For Activities Learners can use reference of search engine

Creative Zone:

- Draw Internet Development Time Line / History of Internet
- Find where you find Internet , Intranet and Extranet in your Daily Life

- Different Network Topology and Hardware Requirement list

Device

Analytical Zone:

- Internet Users statistics in World and India
- Which Internet Connection is popular according to Users statistics
- Maximum popular topology according to Users statistics

Unit 2: Internet Terminology 2

Unit Structure

2.1. Learning Objectives

2.Introduction to WWW

3. Web Browser, Web Server and Distributed Web Server

4.Basic Internet Terminologies: IP Addressing and Domain Name System

Web Hosting, Virtual Host, Multi Homing, Document Root, Cookies

5. Internet Service Provider and their Services

6. Static Web Sites & Dynamic Web Sites

7. Let us sum up

9. Check your Progress: Possible Answers

10. Further Reading

11. Assignment

12. Activities

2.1 LEARNING OBJECTIVE

After studying this unit student should be able to understand the concept of:

- Internet and World Wide Web.
- Web Browser, Web Server and Distributed Web Server.
- Basic Internet Terminologies: IP Addressing and Domain Name System Web Hosting, Virtual Host, Multi Homing, Document Root, Cookies.
- Internet Service Provider and their Services.
- Static Web Sites & Dynamic Web Sites.

2.2 INTRODUCTION TO WWW

Learners, the World Wide Web (WWW), also commonly known as Web, can be defined as an information space where various categories of web documents and resources are recognized by Uniform Resource Locators (URLs), interlinked by hypertext links in form of Web pages that integrates as Websites, and accessible via the Internet connectivity.

Figure 1: World Wide Web (WWW) Connectivity

Facts to ponder:

- World Wide Web Consortium (W3C) is a web organization that was framed with the support of Tim Berners Lee who is

designated as Web Inventor and defined that the World Wide Web is a global collection of documents and other resources, linked by hyperlinks and URIs.

- The Uniform Resource Locators (URL) is a web address used to identify documents on the Web.
- The WWW connect all types of devices having the connectivity network configuration as displayed in the Figure 1 either through cables or wireless connectivity.
- Using Web browser, one can access all information available on the internet.
- Web is software that makes browsing of hypertext document easy over the internet.

- Most commonly the web uses Hyper Text Transfer Protocol (HTTP) to share the information on Web.
- Web pages are primarily text documents formatted and annotated with Hypertext Markup Language (HTML).
- Web is very good example of distributed networks in which everything looks like a document.
- The World Wide Web follows client/server software design model where Client Software (ex. Web Browser) can be used to request information & Server Software is used to process on request and provide information to resolve the request.

- Web supports the nonlinear structure, multimedia information, hypertext information and Graphical User Interface (GUI) to arrange and retrieve information over the internet.

2.3 WEB BROWSER, WEB SERVER AND DISTRIBUTED WEB SERVER

Friends, a Web Browser also known simply as Browser which is application software used for exploring the required information and resources on the Web using a Web Server. The Web Browsers and Web Servers function together as a Client/Server

(C/S) System, that is a standard method in Computer Networking used for designing applications where data is kept in central locations (server computers) and efficiently shared with any number of other computers (the clients) on request.

Web Browser

Learners, an application Software that we used to view web pages of a website as well as upload or download files on FTP Web Servers can be called as Web Browser. The most popular Web Browsers are Google Chrome, Microsoft Internet Explorer, Mozilla Firefox, Apple Safari and others

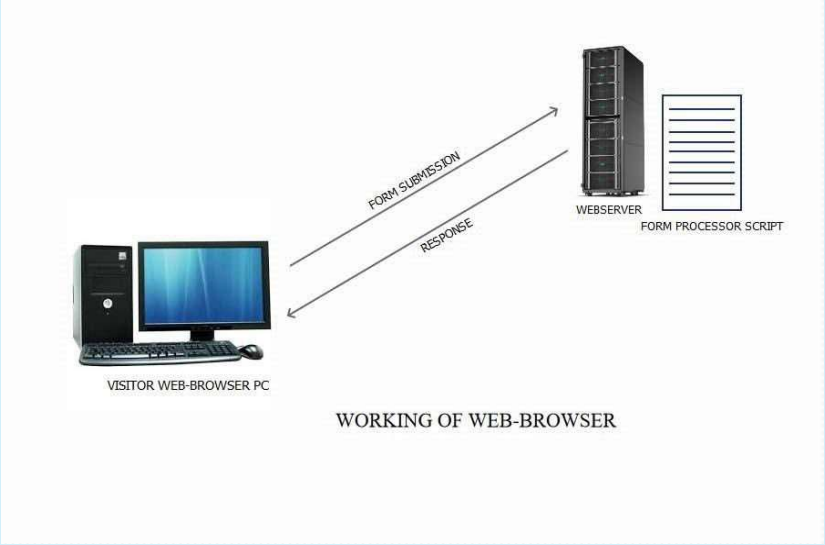


Figure 2: Web Browser Working

Facts to ponder:

- All web browsers function as clients that request information from websites (servers).

- Numerous web browser clients can request data from the same website. Requests can happen at all different times or simultaneously as shown in Figure 2.
- Client-server systems conceptually call for all requests to the same site to be handled by one server.
- Web browsers also rely on DNS to work with URLs. These protocol standards enable different brands of web browsers to communicate with different brands of web servers without requiring special logic for each combination.
- Web Browsers Caches the web pages by storing in cookies to increase the efficiency of Internet.

- While working on a Web Browser the below listed awareness is must:
  - Efficient Web Browser offering security and additional features must be used.
  - Latest updated version of Web Browser should be used.
  - Other than the standard, the other variety of Web Browsers must be explored. ○ The reading of reviews of Web Browser should be read.

Web Server

Friends, a Web Server is a rich configuration Computer system performing storing, processing and deliver of Web Pages of a Website with the help of application software. The most commonly used Web Server Is Apache Server which is a Free and Open Source Software (FOSS) Tool that holds maximum number of websites. Other available Web Server is Internet Information Service (IIS) owned by Microsoft.Another web server that is generally available is Internet Information Service (IIS). IIS is owned by Microsoft.

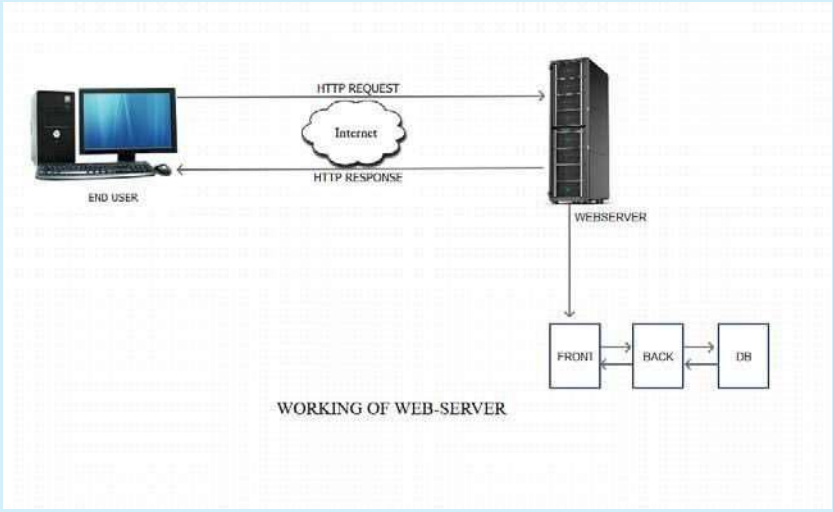


Figure 3: Web Servers Working

Facts to ponder:

- A Web Server comprises of many websites from same or different organizations. A unique IP Address is assigned to every Website on the same Web Server or even sometimes

multiple websites are configured using Host Header and/or different ports without using different IP Address.

- The Web server does the website request-response communication between connected devices by using Hypertext Transfer Protocol (HTTP), the email communications is done using Simple Mail transfer Protocol (SMTP) and the Fie transfer as well as storage is done using File Transfer Protocol (FTP) as displayed in the Figure 3.
- The Web Server displays the Website content onto the Web Browser.
- A web Server working locally is called as Intranet Web server.

- In practice, however, because the volume of requests to web servers can sometimes grow very large, web servers are often built as a distributed pool of multiple server computers.
- Web browsers and servers communicate via TCP/IP. Hypertext Transfer Protocol (HTTP) is the standard application protocol on top of TCP/IP supporting web browser requests and server responses.
- A basic web browsing session works like this:Working of Web Browser and a Web Server can be Explained as per the Below Figure 4 and given steps:

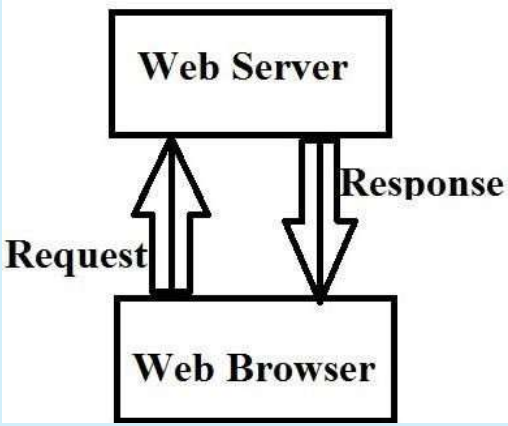


Figure 4: Web Server and Web Browser working

Step 1: The required URL is written by the user on the address bar of a Web Browser, knowing which the browser initiate the TCP connection to the Web Server which seeks information from DNS Server about which IP address the Domain Name is referring.

Step 2: The Web Browser after knowing the IP address of the domain name, sends a HTTP request of the required information

of complete URL to the respective Web Server. The content can include embedded URLs advertising banners or other thirdparty content that in turn triggers the browser to issue new TCP connection requests to those locations. If requested page does not exist an appropriate error message is displayed.

Step 3: After receiving the content page from web server the browser retrieves it from Http packets and displays accordingly. It even temporarily stores information about the surfed history into local files on Computer System called as Cookies. Step 4: The Web Server responds by sending the requested page to the Web Browser.

Every time a request is send in form of URL, or clicking of the hyperlink Step 2 and Step 3 are repeated to view a particular Web Page on the Internet.

Distributed Web Server

A Distributed Web Server (DWS) is a web server distributed across different geographical locations across the world to enhance the speed of Request-Response communication. It comprises of multiple Web Server holding various information by the use of Enhances Domain Name Service Platform.

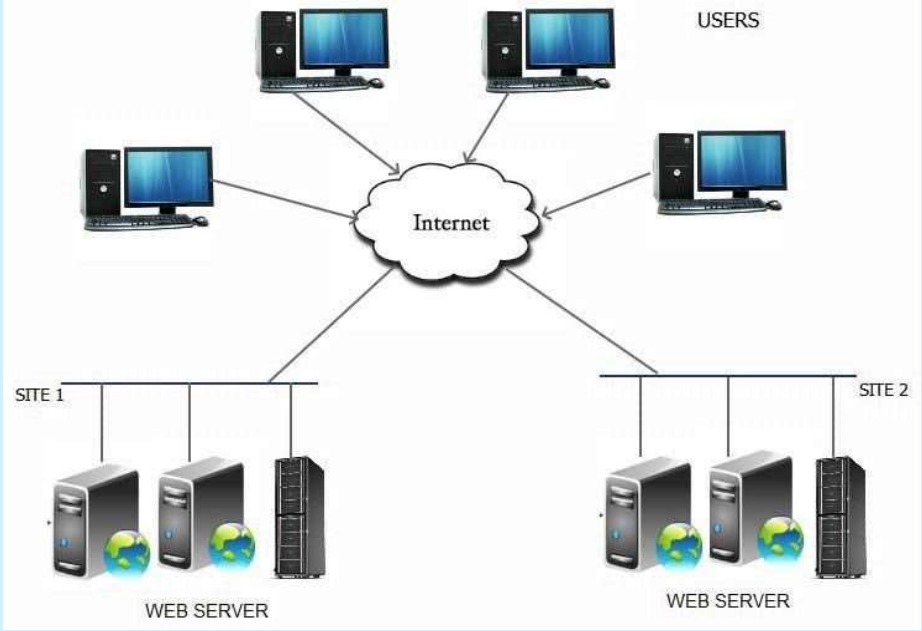


Figure 5: Distributer Web Server (DWS)

Additional facts to ponder:

- A DWS like a Web Server is a Computer system with high configuration that securely stores the hosted Website onto different Web Servers as displayed in the Figure 5.

- Some DWS are even Web servers that are dedicated for gaming, storage, FTP, email etc.
- DWS is software that responds to the request of the client for web resources and information.

  - A DWS respond to the client request in either of the following two ways:
    - Sending the file to the client associated with the requested URL.
    - Generating response by invoking a script and

      communicating with database

- The balancing of a load of replicated documents that are stored in different geographical location among different servers is always point of concern and handled with care.
- The promptness of handling Request-Response traffic displays the efficiency of a DWS.
- A good performance of DWS can be achieved by the technique of Object replication.
- DWS environment is most reasonable and dynamic against any failure of Hardware or Software.

2.4 BASIC INTERNET TERMINOLOGIES

Hey friends, the basic Internet Terminologies can be understood as detailed below.

IP Addressing and Domain Name System

An Internet is the largest network spread across the world connecting thousand millions of individual networks having large number of computer system and other connecting devices.In order to successfully communicate over this large network, each and every computer system as well other connecting devices having information are required to be identified uniquely.The

uniquely identification to differentiate each of them from one another is done by:

- IP Addressing
- Domain Name System

- **IP Addressing**

The information sharing among all the devices like Computer System, printer, hub, switch, router, gateway or any other device on a network requires a unique address in the form of logical number address is known as Internet Protocol (IP) addressing.

Figure 6: IP addressing

Facts to ponder:

- IP Address is measured as most vital component in networking that integrates the entire WWW in a single platform.

- Shares similarity to an address of an individual/organization required to post a professional or a personal letter.
- Considered as core component for designing a network based architecture without which no network can be framed.
- Every Node/Device on network is uniquely identified and assigned an IP Address using Transmission Control Protocol/Internet Protocol (TCP/IP) communication protocols as displayed in Figure 6.
- Being logical number IP address is subjected to change.

- The numbering system in an IP address is divided into 2 sections: The Network Section specifies type of Network and the Host section specifies the exact location.
- The IP addresses are categorized into two types: Firstly Classfull IP addressing in which IP address are grouped into 5 distinct classes—A, B, C, D and E and Secondly Classless IP addressing which has an random length of the prefix.
- The two Standards for IP Addressing are: Internet Protocol Version 4 (IPv4) and Internet Protocol Version 6 (IPv6) the core details are specified in the below Table 1.

Table 1: Specification of IP Addressing Standards

Specification	IPv4	IPv6
Addressing Length	32 bits (4 bytes)	128 bits (16 bytes)
Address Representation	Decimal	Hexadecimal
Numbering Format	x. x. x. x x = Octet having decimal value between 0	y: y : y : y : y : y : y : y y = segment having hexadecimal value between 0 and FFFF, separated by colons - not periods.

	and 255, separated by periods.	
Encryption and Authentication	Not offered	Offered
Broadcast Address	Provided	Not Provided
Fragmentation	Sender and Forwarding Routers	Only Sender

supported by:		
Header includes:	Checksum	Does not include Checksum
Example	101:102:103:104	3333:4444:cccc:dddd:5555:6666:eeee:ffff

- **Domain Name System (DNS)**

The Domain Name System (DNS) is can be called as the phonebook, that is a hierarchical and decentralized naming system for computers information, services, or other required resources of the Internet using which the user retrieves the entire

information from Internet or a private network.An individual can access information online through domain names, like google.com,wikipedia.org and others.

The Domain Name System has following characteristics:

- Domain Name is the unique name given to each computer which is connected to the Internet.
- Domain Names are given on the basis of geographical location or on the type of an organization.
- Domain names are not case sensitive.

- Domain Name can be based on geographical location as mentioned in and type of an organization as mentioned in Table 2.

Table 2: Some Domain Name

Geographical Location based Domain Names		Type of an organization based Domain Names	
Domain Specification	**Location**	**Domain Specification**	**Organization Type**
in	India	.com	Commercial
uk	United Kingdom	.edu	Educational

us	United State of America	.org	Non – profit
au	Australia	.gov	Government
ch	China	.mil	Military group
bz	Brazil	.net	Network

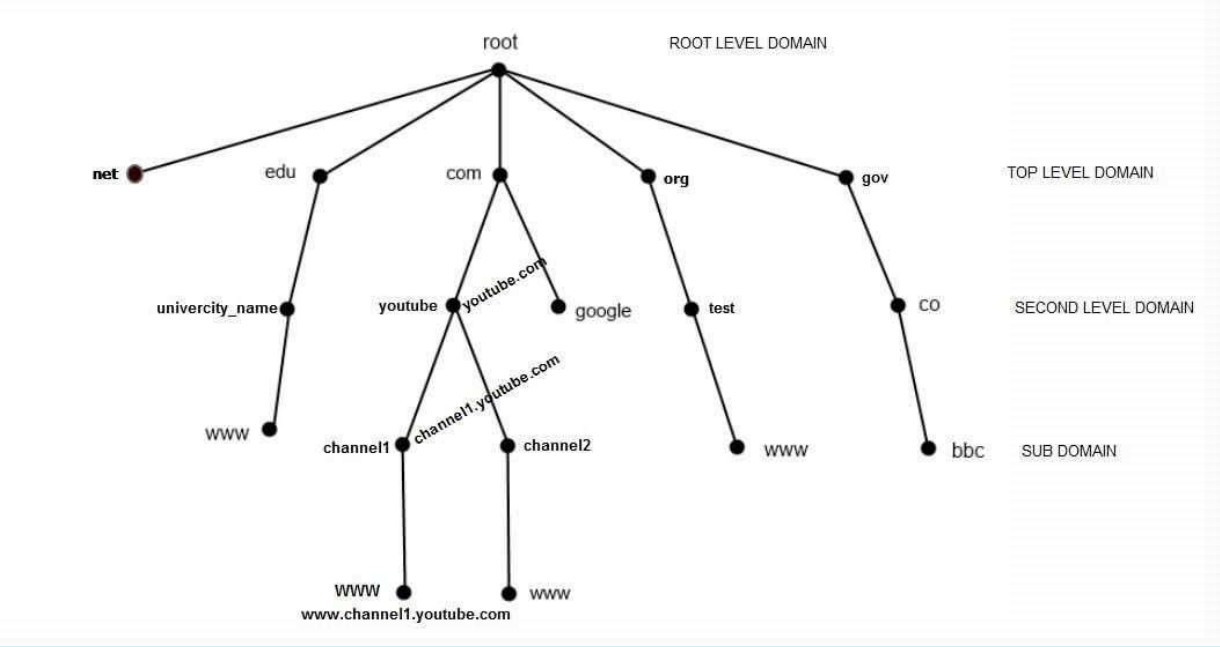


Figure 7: Domain Name System

Facts to ponder:

- The domain name is written on the address bar of a Web Browser to access the required information.

- Web browsers interact through Internet Protocol (IP)addresses when DNS translates domain names to IP addresses so that the Web Browser canload Internet resources.
- The Internet maintains two principal namespaces, the domain name hierarchy and the Internet Protocol (IP) address spaces as displayed in Figure 7.
  - The Domain Name System maintains the domain name hierarchy and provides translation services between it and the address spaces.
  - Internet name servers and a communication protocol implement the Domain Name System.

- DNS is helpful in locating any computer on the Internet because DNS server contains database of domain names and corresponding IP addresses.
- Domain name is essential in Internet due to two main reasons :
  - Firstly, domain name is easier to remember than IP address.
  - Secondly, shifting of remote computer from one place to another is possible without affecting the user, as DNS handles it by changing relevant information in database.

Web Hosting

Friends, Web Hosting are a service of providing online web space for storage of web pages of a Website that are made accessible by World Wide Web. The Organizations/companies which offer website hosting services are known as Web hosts, who can either be an Internet Service Provider (ISP), or companies that specifically provide a Web hosting service, such as A2 Hosting, Blue Host, HostGator, GoDaddy, Network Solutions and others.

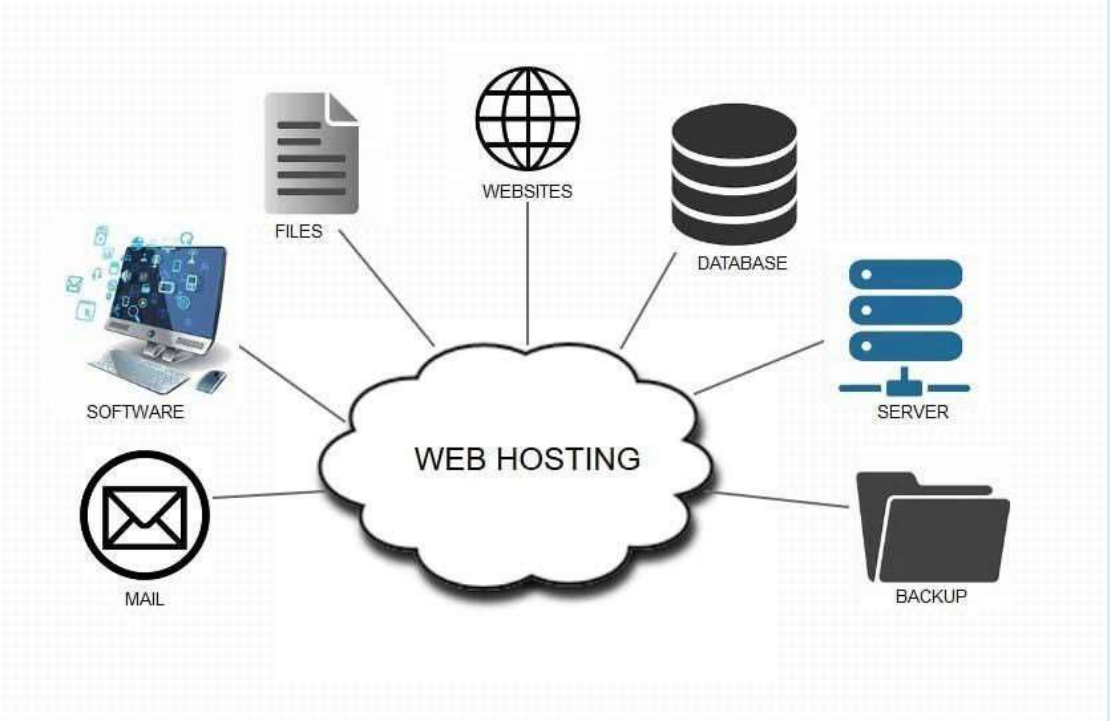


Figure 8: Web Hosting

Facts to ponder:

- Web hosting service allows organizations and individuals to post a website or web page onto the Internet.
- A web host, or web hosting service provider, is a business that provides the technologies and services needed for the website or webpage to be viewed in the Internet like Email, Softwares, Files, Websites, Databases, Server, and Backup as displayed in the Figure 8.
- Websites are hosted, or stored, on special computers called servers. When Internet users want to view your website, all they need to do is type your website address or domain into their browser. Their computer will then connect to your server

and your Webpages will be delivered to them through the browser.

- There are many types of Web hosts and Web hosting services, these includes:
  - Shared Web Hosting, possessing multiple Websites hosted onto single Web Server. ○ Virtual Private Server (VPS)/Virtual Dedicated Server (VDS), represents a server subdivided into multiple smaller servers.
  - Reseller Hosting, where the Customers themselves act as Web Hosts.

- Dedicated Hosting, in which the User/Client gets control over entire Server except the Hardware.
- Managed Hosting, in which the User/Client does not have control over entire Server, hence permitting Web Host to guarantee the excellence of the service. The User/Client may manage entire data and information by using FTP or other Remote management tools.
- Grid Hosting, targets stability and flexibility by sharing resources onto various number of Servers that can be added or removed without affecting other transactions.

Virtual Host

Learners, the Virtual Host is a method of for hosting multiple domain names and executing more than one Website with separate handling of each domain name on a single Server/pool of servers. The Figure 9 displays three Virtual Host: www.virtualhost1.com, www.virtualhost2.com and www.virtualhost3.com onto a single DNS Server further connected to a Web Server that is lined to the virtualhost1 target folder, virtualhost2 target folder andvirtualhost3 target folder respectively.

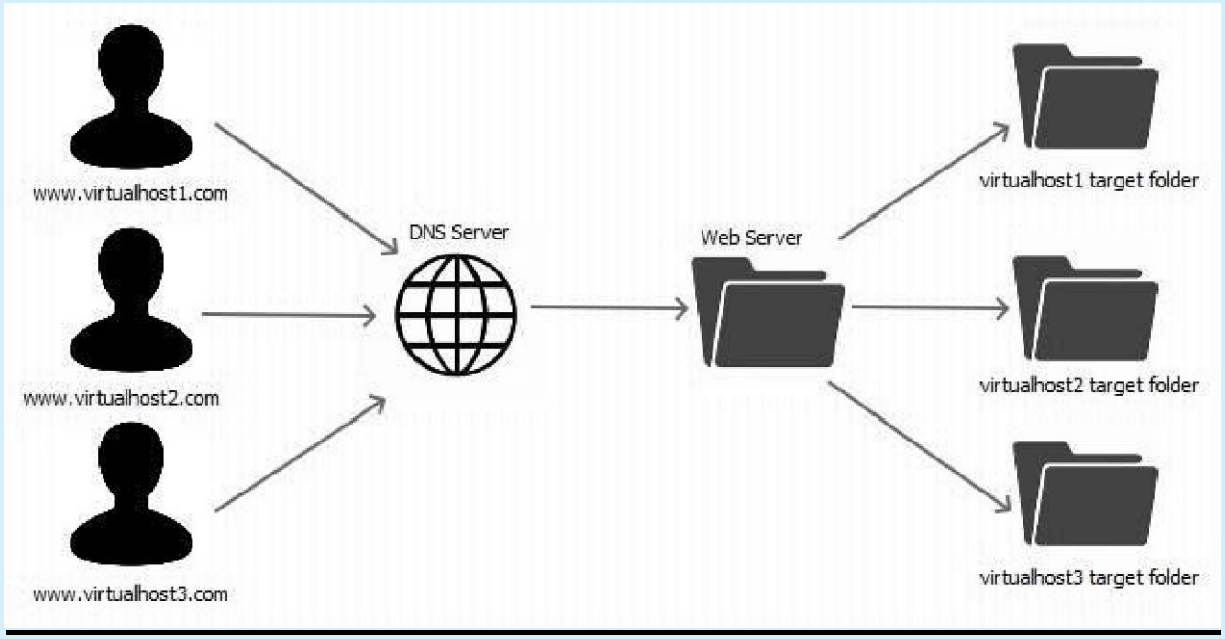


Figure 9: Virtual Host

Facts to ponder:

- Virtual Host permits one server to share its resources in form of Storage (memory) and Processing (Processor) by providing some of the services to use similar Host name.
- This type of hosting is used in reference to the Web Servers as well as other Web/Internet/Online Services.
- Shared Web Hosting is cost effective as then dedicated Web Server as it provides multiple hosting by multiple clients on a single Web Server.
- The other applicability is that it provides facility to a single client who has requirement of multiple names denoting different services on a single Hosting Server.
- Two main types of virtual hosting can be considered:

- Name based: Host name oriented accessibility by the Client which saves IP Address and other related managing tasks, on one condition that the functioning protocol must respond with the host name at suitable time.
- IP based: Individual IP Address oriented accessibility for respective Host Name.
- Port based: Port oriented accessibility that is rarely used due to low user friendliness.

Multi Homing

Friends, in Multi Homing Network a host or an interconnected Network is connected to multiples Networks with an objective to improve performance by effective routing towards the destination through a Network and increase reliability by routing through alternative network when there is failure of a particular link. The Figure 10 displays a Multi Homing Network having 3 Network interfaces consisting of different Internet Service Provider ISP 1 and ISP 2 responding to the requested destination in to Internet.

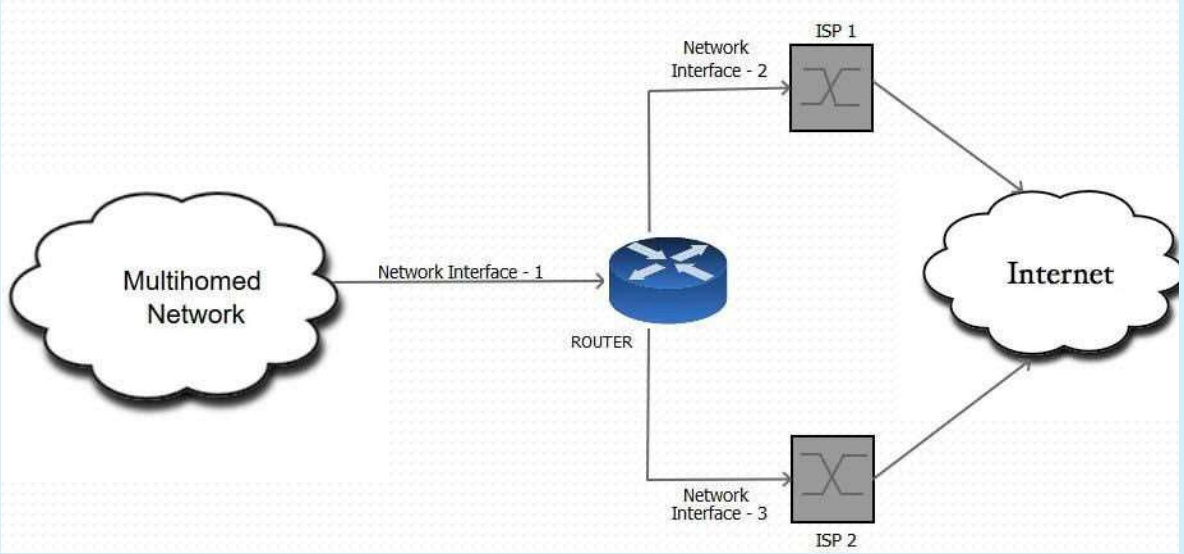


Figure 10: Multi Homing Network

Facts to ponder:

- In Multi Homing a distinctive host or destination network is related to a single network.

- A Multi Homed host commonly is allocated multiple addresses with a count of one per connected network.
- Device connectivity in it is such that the single host may be connected to multiple networks to route the message to the destination like, a desktop computer system is concurrently connected to a home network and VPN while a Mobile Phone/Tablet is connected to WiFi Network or a 4G.
- Multiple different ISPs are part of Multi homed networks where every ISP allocates a single IP address or a range of IP addresses to the client of an organization.
- Routers use BGP (), a part of the TCP/IP protocol suite, to route between networks using different protocols.

- The Internal Border Gateway Protocol (IBGP) is used at Domain side and External Border Gateway Protocol (EBGP) is used to communicate with different routers that are individually using Border Gateway Protocol (BGP) of TCP/IP to route among networks using different Protocols.

Document Root

Learners, the Host Web Server possessing all the Websites stores all the files of hosted domains, addon domain and subdomains separately onto a folder/directory that is known as Document Root. Since, CPanel permits multiple domain and its interrelated

domains, hence Document Root solves the purpose of uniquely identifying the interrelated files. **Facts to ponder:**

- The storage pattern of a domain on a Web Server is that the primary domain roots in a public_html folder/directory, its subdomain and addon domain are rooted to its respective folder within public_html folder/directory as displayed in the figure 11

Figure 11: Document Root

- The entire document root can be found within CPanel by a single click over the subdoamins as well as addon domains.
- The document folder is unique for each and every domain.
- All the Webpages and other related files of a websites possessing a domain name are found in Document Root.
- Document Root can even be stated as a folder/directory that possesses almost all the HTML files that serve the Request-Response most of the HTML files which are served in response to requests.

Cookies

Friends, a Cookie for Web means a file stored in the User's computer containing information about the access of Web Browser in a form of a small text file produced by a website. The cookie can be stored temporary for that Internet session or permanent onto the hard Disk, supporting the user to keep roadmap for his/her internet access. The Web Cookies can be disabled /enabled/ installed additionally to record the Internet Information Retrieval as displayed in the Figure 12.

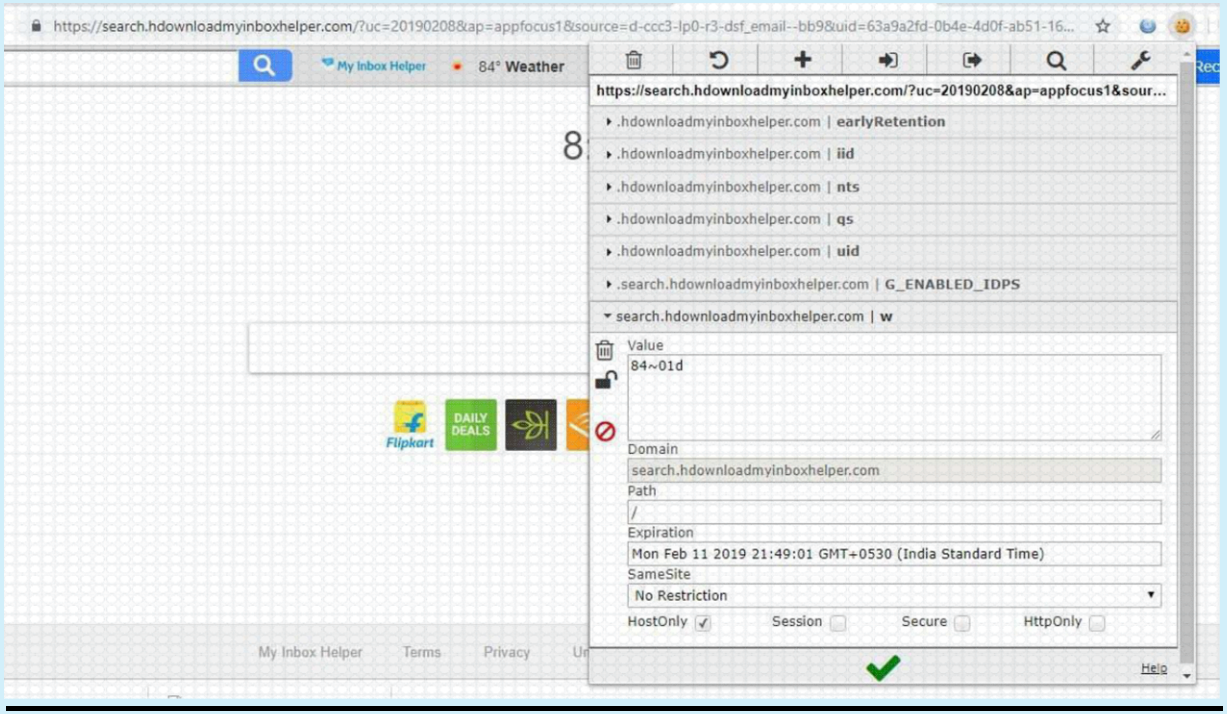


Figure 12: Installed Web Cookies management Interface

Facts to ponder:

- Web Cookies are files, generally from the visited Web Pages, which are stored on a user's computer.
- Stores a small amount of data, specific to a particular client and website.
- Maintains the State/Status of Web Browser.
- The Cookie stored Information liked usernames, password, session token, etc. can be accessed either by the Server/Client Computer System.
- It permits the Web Server to share the user its personalized page • There are different types of Web Cookies :

- Session Cookies – Online cart items information is stored for only a specific period of time and once the Web Browser is closed it gets expired.
- Permanent Cookies – These remember the Login ID and Password to save the typing time of user if user has opted and information is stored permanently even when the Web Browser is closed. It is recommended to delete these types of cookies after a specific duration.
- Third-Party Cookies − Installed by third parties for collecting certain information may be for beneficial Investigation or Hacking.

- Some Parameters that can be shared for Information Retrieval are Web Cookie's Name, Value, Expiration Date, Validity Path, and Validity Domain.

2.5 INTERNET SERVICE PROVIDER AND ITS SERVICES

Learners, an organization/company Internet Service Provider (ISP) that provides all the Users on Web with the medium of communication among devices availing Internet services on Personal Computers, Laptops, Tablet, Notebook and other

Mobile Devices is Internet Service Providers as displayed in Figure 13. The full form of ISP is even abbreviated as Independent Service Provider. Many a times it is even called as Internet Access Provider (IAP).

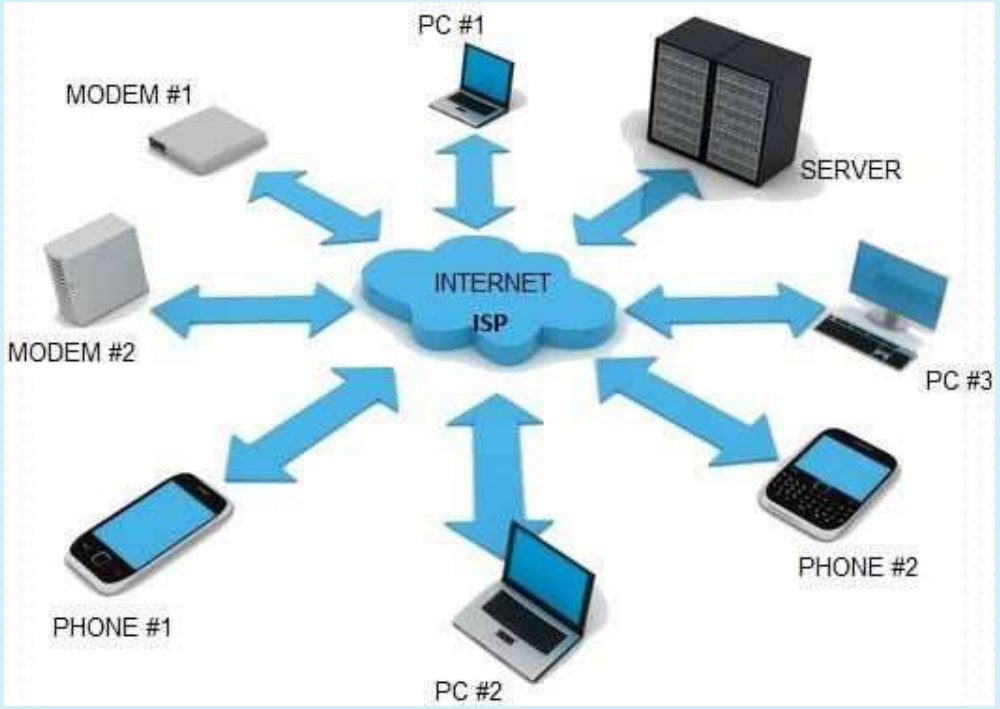


Figure 13: Internet Service Provider (ISP)

The Technology medium of the Internet Access that interlinks the Internet accessing devices and Web in form of Information

Packets over particular routing protocols are called as Digital Transmission Technology. Some of these are:

- Dial-up: Oldest traditional least expensive telephone line modem to modem technology.
- Digital Subscriber Loop/Line (DSL): Succeeding technology of Dial-Up having higher transmission speed either through the common Asymmetric Digital Subscriber Line (ADSL) or additional Symmetric Digital Subscriber Line (SDSL).
- Cable: High Bandwidth commonly used a broadband Internet Access and requiring additional installation of

Equipment. It may use telephone line/fiber optic cables for data transmission.

- Wireless Broadband: Presently the most common technology having capability of providing the Internet access over remote geographical locations.
- Wireless Fidelity (Wi-Fi): Freely/Paid widely distributed providing access to wireless/mobile devices mainly used in Public Places within a scope of particular range of scope.
- Integrated Services Digital Network (ISDN): Online high speed, high quality data transmission on phone lines.

- Ethernet: Dedicated various speeds leveled used in Wired/Wireless local area Network (LAN).
- Satellite: Provides services in rural regions with a limitation of data limits and speed challenges.

ISP Services

- Internet Access Service: Provides Web/Internet communication medium services on either of the above mentioned ISP's technologies over a large area covering entire globe. A number of access providers also provide email and hosting services.

- E-Mail/Mailbox Service: Provides overall E-mail communication services like sending, receiving, storing, broadcasting and other E-Mail related services. The Internet Access supports this service even.
- Hosting Service: Provides bundle of services as Website/all Web
  Hosting's, File Transfer Protocols (FTP) for uploading/downloading/managing all web Files, Virtual Machines for virtual operations, Cloud universal availability, Web/Physical Servers managers and E-Mail communications.

- Transit Service: Provides Hosting and Internet Access ISP's through speedy high bandwidth connectivity.
- Virtual Service: Provides all cost effective efficient Virtual services supporting all above services and even called as purchase services of Self/Other IPS.
- Free Service: Provides no-charging/free of cost to all the customers doing some branding by advertisement during the user connectivity. It is even called as Freenets.

2.6 STATIC WEBSITES & DYNAMIC WEBSITES

Friends, a website is a collection of related web pages, including multimedia content (that may contain text, images, audio, video), typically identified with a common domain name, and published on at least one Web Server. The Website on the basis of functionalities can be Statics when is a developed in HTML and CSS while Dynamic Website is developed using Scripting Languages. The choice of type of Website is wholly in on the basis of Utility and requirement as Dynamic Website contains Web Server and Database Server to manage all while Static Website can be sun on Server even as displayed in the Figure14.

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Figure14: Dynamic VS Static Website

Facts to ponder:

The decision of Dynamic Website over Static Website Can be understood on the basis of different functionalities as mentioned in the Table 2.3

Table 2.3: Dynamic Website VS Static Website

Developing Technology	PHP, ASP.NET, Java Script, SERVLET and other dynamic scripting languages. Uses both client-side scripting and server-side scripting.	Only HTML and CSS.
Theme & Content	Can be changed Runtime.	Fixed cannot be changed.
Browsing & Loading	Slower to Static as require Server	Speedy as does not require

Criteria
Dynamic Website
Static Website

	Request of Web Pages.	request to Web Server.
Websites content Updates	Automatically	Tedious
Most common are File/URL Extension	.php, .asp and .jsp	.htm or .html
Utility	When frequent Changes in content of Web Pages are required.	When less frequent Changes in content of

		Web Pages and Small Informative Website are required.
Coding	Complex	Simple
Web Hosting with Database Support	Required	Not Required
Prebuilt content	Keeps Changing as per requirement.	Always same at the timer of Loading.

Interactivity	Good User can View and Use the content.	Through Hyperlink.
Sharing elements	Easily share HTML code between Web Pages.	Requires duplication of HTML on every page.

2.7 LET US SUM UP

Hey Friends, now as you have completed this unit, you should able to learn the concept of Internet and it's Related Terminologies which are the building blocks of WWW. Firstly you have learnt Web Browser, Web Server and Distributed Web Server; secondly

the Basic Internet Terminologies: IP Addressing and Domain Name System; Web Hosting, Virtual Host, Multi Homing, Document Root, Cookies; Thirdly Internet Service Provider and their Services; and finally Static Web Sites & Dynamic Web Sites.

2.8 CHECK YOUR PROGRESS

- Define Web Browser, Web Server and Distributed Web Server.
- _____ is a file stored in the User's computer containing information about the access of Web Browser in a form of a small text file produced by a website.[Cookie, Multi Homing, Virtual Host, Web Host]
- Full form for below ○ WWW ○ URL ○ W3C ○ HTTP ○ GUI

- List any four ISP Services.
- _____is even called as Phonebook.

2.9 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- **Definitions:**

  Web Browser: An application Software that we used to view web pages of a website as well as upload or download files on FTP Web Servers can be called as Web Browser.

Web Server: A Web Server is a rich configuration Computer system performing storing, processing and deliver of Web Pages of a Website with the help of application software.

Distributed Web Server:A Distributed Web Server (DWS) is a web server distributed across different geographical locations across the world to enhance the speed of Request-Response communication.

- **Cookie** is a file stored in the User's computer containing information about the access of Web Browser in a form of a small text file produced by a website.
- Full form for below

- WWW: World Wide Web
- URL: Uniform Resource Locator
- W3C: World Wide Web Consortium
- HTTP: Hyper Text Transfer Protocol
- GUI: Graphical User Interface

- ISP Services are: Internet Access Service, Hosting Service, Virtual Service, EMail/Mailbox Service.
- **Domain Name System** is even called as Phonebook.

2.10 FURTHER READING

Following are some Online Reference Reading as PDF:

http://egyankosh.ac.in/handle/123456789/40098 [About Web Browser Pg.: 36-52]

http://www.egyankosh.ac.in/bitstream/123456789/12519/1/Unit-2.pdf [About IP Address Pg.: 1-8]

YouTube Reference:

787E247DC324 [About Internet Terminologies] https://www.youtube.com/watch?v=YOXwcbwSEUo&list=PL04D5

11. ASSIGNMENTS

5. What is Domain Name System? Explain.
6. Explain Working of Web Browser and Web Server.
7. Differentiate between **Static Web Sites & Dynamic Web Sites**.
8. Give the use of Web Hosting and Virtual Host.
9. What are Multi Homing and Document Root?

2.12 ACTIVITIES

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement.

Creative Zone:

- List of various Web Browsers.
- Name various ISPs.
- Give the steps to find IP Address of your Desktop/Laptop.

Analytical Zone:

- List out Popularity of Web Browser according to World Wide Statistics.
- List out various companies Users Statistics those ISPs in India.

Unit 3: Web Server And

Protocols

Unit Structure

1. Learning Objectives
2. Introduction To Web Server and It's Types
3. Domain Name Server
4. Web Protocols
5. Mail Clients and News Groups

7. Check your Progress

8. Check your Progress: Possible Answers

9. Further Reading

10. Assignment

11. Activities

3.1 LEARNING OBJECTIVE

After studying this unit student should be able to:

- Concept and Functions of Web Server
- Main Types of Web Servers
- Web Site name giving process and Domain Name System
- Web Protocols and its functions

3.2 INTRODUCTION TO WEB SERVER AND ITS TYPES

A web server is a system that delivers content or services to end users over the internet. A web server consists of a physical server, server operating system (OS) and software used to facilitate HTTP communication.

Web Server is a combination of hardware (server) and software that provide service to end user on Internet.

Web Server is work as Hardware when we purchase web space (A place where group of web pages called Website hosts) – It also provide basic service base on Operating System (OS) level – It provide group of rules that known as protocol for providing WebPages to our browser (i.e. Internet Explorer, Google Chrome, Mozilla Firefox…..etc) – It also provide Dynamic Data (Data receive from Database or sometimes dynamic data by Library functions). Friends after understanding this we can define Web Server definition as below

“A system (Combination of hardware as well as software) that provide Website’s WebPages from Internet to End users with the help of protocols is called Web Server”

If we look on the functions of Web Server that are as below

- Store Web Pages and provide primary level security of Websites
- Help to Access Website Database (Dynamic Data Access)
- Provide proper response to End users as per their request.
- Bandwidth (Internet signal Strength ratio) controlling on Network traffic
- Serve Virtual Web Service if required

- Support Server side scripting

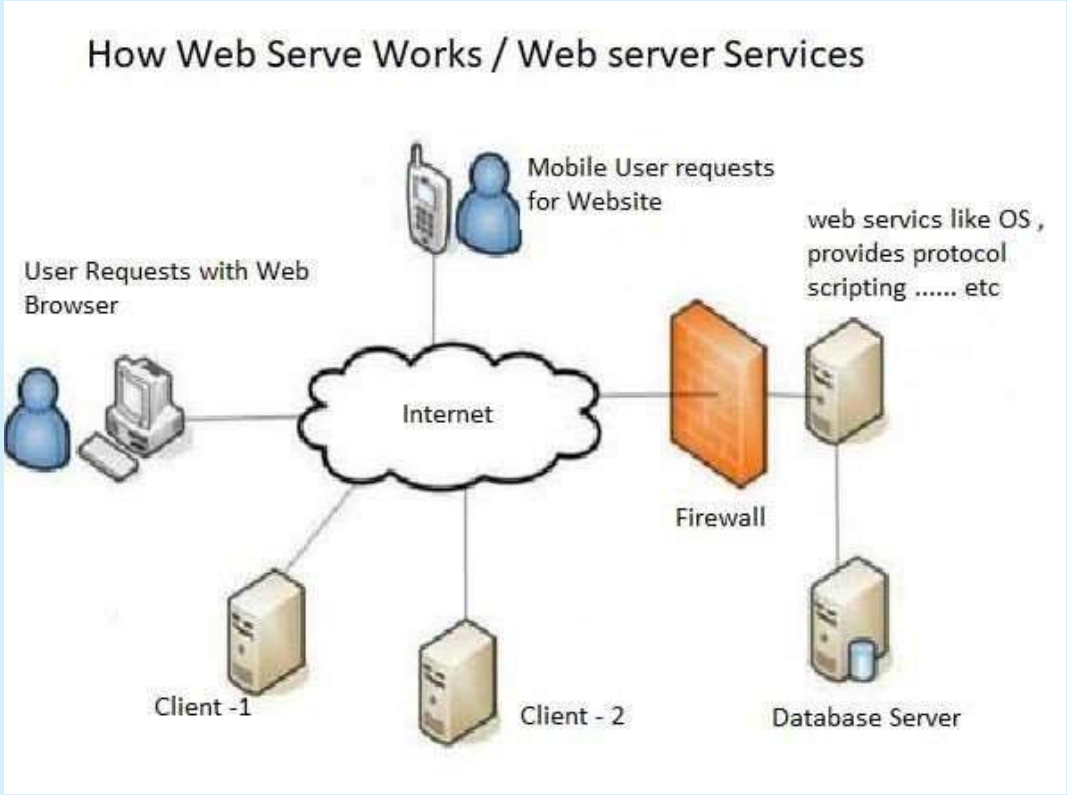


Figure 1: Web Server Application Diagram

Web server comeback to client request by mainly two ways

1. It send the file to the client associate with request URL (Universal Resource Locater)
2. Provides response by proper scripting and communicating with source language (ex. HTML, PHP, ASP.NET …. Etc)

Friends there are number of types of web server but among all them leading are

1) Apache HTTP Web Server

One of the most admired web server in the world developed by the Apache Software Foundation. Apache is open source

software which supports major all operating systems including Linux, UNIX, Windows, FreeBSD, Mac OS X and more.

Approximately more than 70% of machines run on Apache Web Server.

Customization of apache web server is easy as it contains a model base structure. It is also an open source which means that you can add your own modules to the server when to require and make modifications that suit your requirements.

It is more stable than any other web servers and is easier to solve organizational issues. It can be installing on multiple platforms successfully.

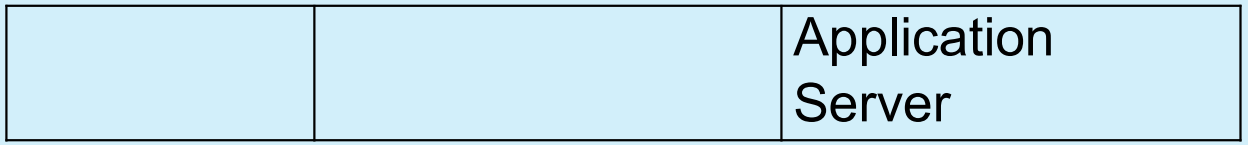
2) MS IIS Web Server

The Internet Information Server (IIS) is a high performance base Web Server from Microsoft. This web server runs on only Windows NT/2000 and 2003 platforms (and may be on upcoming new Windows version also). IIS comes bundled with Windows NT/2000 and 2003; Because IIS is tightly integrated with the operating system so it is relatively easy to administer it.

Friends let take looks on difference between this both the Web server

Developer	Apache Software Foundation	Microsoft
License	Open source i.e. Freely download from Internet	License under Microsoft
Operating System	All Major OS (windows , Linux , Unix , Mac … etc)	Only in major Windows
Popularity	More than 70% developer use this	Approximately 20 – 30 % developer use this web server
Portability	Most portable in terms of	Comparatively less portable

	Operating System as well as functionality	
Modularity	Developer or Administrator can add their own module to the server	Developer or Administrator cannot edit or add any module in it.
Execution speed	It runs in user's space only so it is faster	It runs in User's space as well as Kernel so execute slower than Apache
Inclusion	It works as only Web Server	It works as Web Server as well as

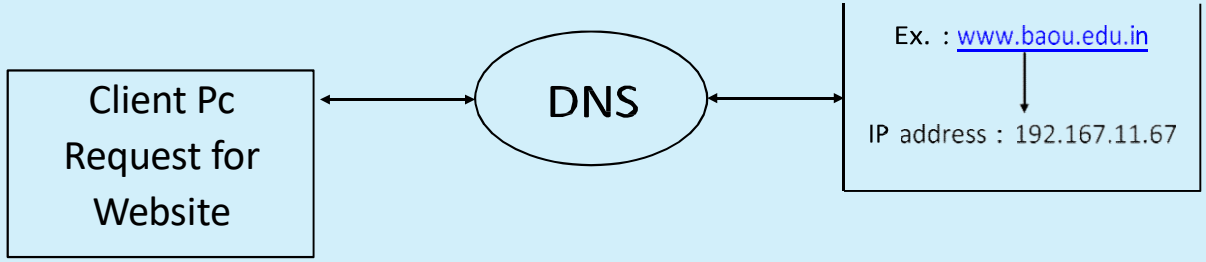


Particular
Apache

MS-IIS

3.3 DOMAIN NAME SERVER (DNS)

“A conversable server that convert any web address (URL) to IP address to access website to local device”



Advantages of DNS

1. DNS is Exclusive - Generally DNS is that the exclusively system within the entire world which will assist you browse the

web. With the web turning into associate degree integral a part of the society, it's more and more become necessary that DNS Servers stay maintained. While not them, then the web wouldn't exist.

2. No need to memorizing IP addresses -DNS servers offer a peachy resolution of changing domain or sub domain names to IP addresses. Imagine however it'd feel having to hit the books the IP addresses of twitter, Facebook, Google or the other website that you just unremarkably frequent on a commonplace. It’d undoubtedly be horrific. Its system additionally makes it straightforward for search engines to be ready to categories and archive info.

3. Save and security sweetening -DNS servers area unit a very important part for the safety of your home or work connections. DNS servers that are designed for security functions sometimes make sure that makes an attempt to hack your server atmosphere area unit disappointed before entry into your machines. However, it's necessary to notice that the word used is increased. This suggests that you just can would like different security measures place in situ to safeguard your information, particularly if it's an outsized organization with a lot of sensitive information.
4. Fast Internet Access - DNS servers have quick web associations -People and organizations that use DNS servers

is ready to profit of high connection speeds that area unit a key feature in a number of these servers.

Disadvantages of DNS

1. Dependency – It is indisputable fact that its written account will only be controlled by a non-profit organization (Internet Society - ISOC) with roots tied in one country. This challenges the construct of internet neutrality and has been a wide propagated argument over the last 3 decades.
2. No Personal Identity for Data Analysis - DNS queries typically don't carry any info regarding the purchasers

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United Nations agency initiated it. This can be one among the explanations why DNS has been common among hackers. This can be as a result of the server aspect can only see the information science address from wherever the question came from and which might occasionally be manipulated by hackers.

3. DNS servers based on the principle of a slave-master relationship. This implies that if the master server is not working or manipulated in any method, then it'll be arduous to access the net page or info that was hosted on the server. Hackers have conjointly used this to their advantage. By targeting the server machine and creating redirects to

alternative pages, they need been ready to realize ways that

of phishing info.

3.4 WEB PROTOCOLS

A protocol basically defines the rules and regulations for communicating between network devises. Network protocol is used for devices which identifies and establish connection with each other, as well as making rules in which data is packed to perform input output. For high performance network some protocols supports data compression designs.

For computer networking packet switching methods are used to send and receive message. The message which is been sent is divided into pieces that are collected at the destination. There are many protocol designed for specific purpose.

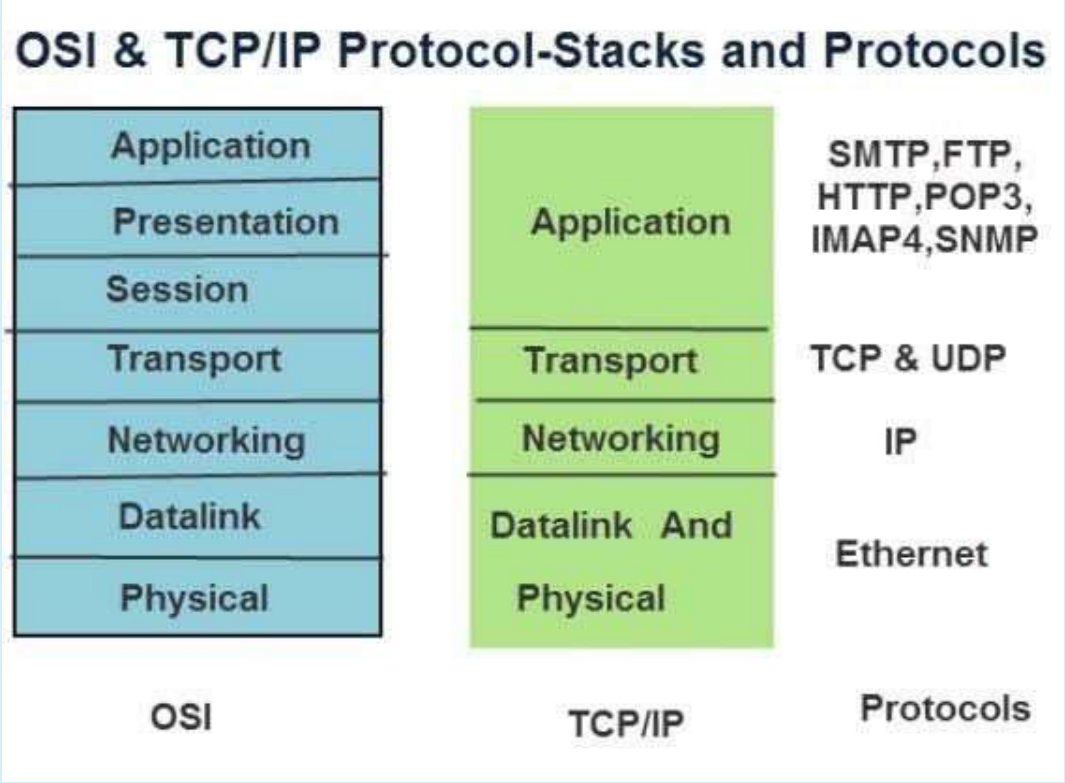

Figure -2: Functions of Various protocols

Friends as per diagram shows the major protocols functionality that comparing of TCP/IP model with the association of Computer Network Model (OSI) by this we can easily understand that OSI model have seven layer for data transmission from one computer to other computer but when we observe about the protocol model it has only two parts

Application layers: It includes 3 layers of OSI model (Applications, Presentation and Session) that work for only application and other process

Data Transmission Layer: It includes 4 layers of ODI model (Transport, Networking, Data link and Physical) that work for how data or internet signal transmit from client Computer to Server.

- **HTTP**

Full form: - Hypertext transfer protocol

Used: - It is basically used on the application layer, it is primarily used on the World

Wide Web

Since: - 1990

HTTP is a protocol used for getting the data from internet such as html documents, basically http is TCP/IP based protocol which helps to put data on World Wide Web.

It is standard way for communicating between computer with each other http specifies how request of Clint is sent to the server and how the server respond, any data can be exchanged worldwide

through http protocol message sent by a Clint to the server is called request and the answer is called response

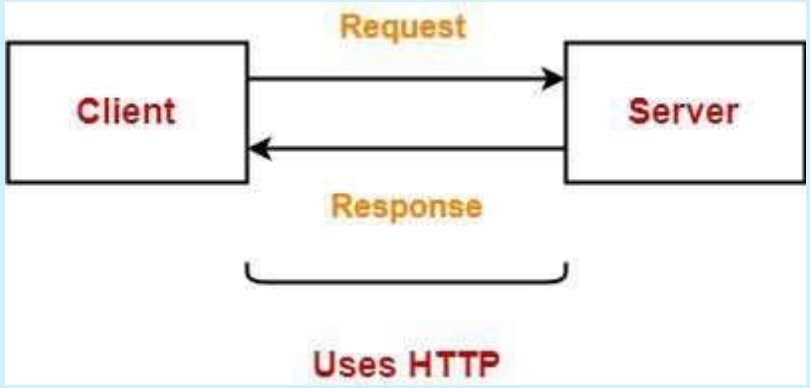

Figure – 3: How HTTP Protocol works

Basic features of http protocol

HTTP is connectionless:

A browser creates an HTTP request as the request is created the Clint waits for the reply. The request is been processed by the server and the response is sent back to the receiver, as the receiver receive the response the connection is disconnected. A new connection established each time when the server and the Clint wants to communicate

HTTP is media independent:

If the Clint and the user know to manage the data (content) then any type of data can be transferred through HTTP, thus it is important to specify the type of data (content) **HTTP is stateless:**

As HTTP is connectionless it is also a stateless protocol, A user and the server are aware of each other during a current connection, as the connection is lost they forget each other, due to this the data can't be retain once the connections is lost

The basic characteristics of HTTP: -

- Through this protocol browser and server can exchange on web
- This protocol is basically based on request response protocol
- New connection is build on each request

- **TCP/IP**

Full form: Transmission Control Protocol/Internet Protocol

Use: it is used on transport layer

TCP/IP is a group of protocols which is used to connect various computers on internet, in private networks it can also be used a communication protocol, TCP/IP specifies data transfer on internet through end to end communication which is broken into packets, if there is any failure in the network TCP/IP recovers it automatically and makes system reliable. **There are two main protocols in TCP/IP**

TCP defines how channels of communication across a network are created by application. The message is assembled in small packets and reassembled on the destination

IP defines the address and route of the packet to reach the right destination, this IP is checked by each gateway computer to determine the address of the message

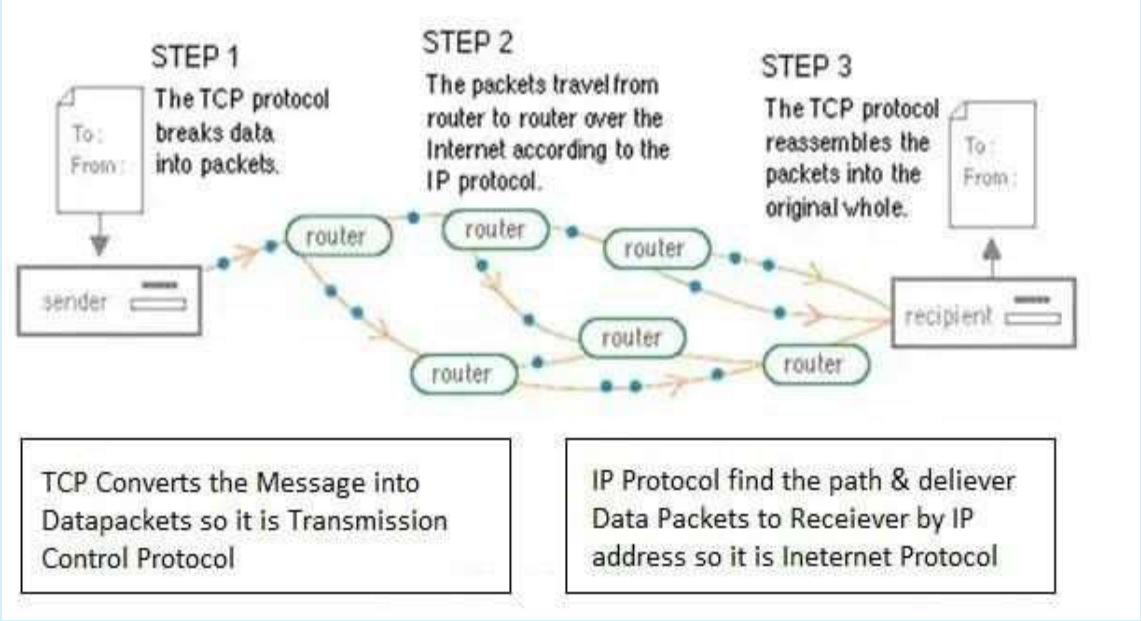

Figure – 4: How TCP/IP works

Features of TCP/IP Multi

vendor support:

Many hardware and software vendors use TCP/IP, it is not limited to only one vendor **Interoperability:**

Due to TCP/IP a user is able to work in a heterogeneous network. A user using a Linux machine can download file from windows machine because of TCP/IP. There are no limits of TCP/IP.

Logical Addressing:

There is a permanent and globally unique address of a network adepter which is known as MAC address. While manufacturing it is burnt into a card. LAN delivers data packets through adapter's

physical address. Network adapters check that the message is

delivered to its own physical address. **Refutability:**

Router can read logical addressing information and send the packet to its receiver. TCP/IP is a routable protocol. Due to this the data can be moved from one place to another.

Name resolution:

It is difficult for humans to remember many IP address IP address are made for computer, so to solve this problem TCP/IP provides us user friendly names which are very easy to remember

- **FTP:**

Full form: file transfer protocol

Use: It is used on the transport layer

FTP is used to transfer file from computers, if we have to download any file from internet it is not possible without FTP, due to FTP we can also transfer web pages, due to FTP we can show web pages created by an individual on the internet, FTP transfer the web page files to the server of the user so he can easily access the web page

As long as two computer are connected to internet they can share the file through FTP, data like music, word document, spreadsheets, power point files, etc can be shared

How FTP works

There are two tasks happening when a file is transferred – uploading and downloading. Uploading means file transfer from computer to server and downloading means file transfer from server to computer. TCP/IP is used by FTP to transfer the file

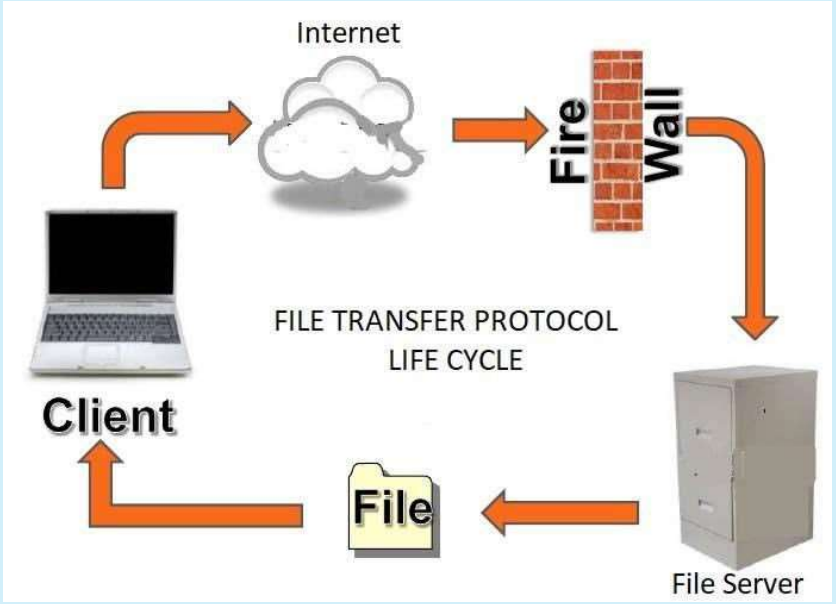

Figure – 5: How FTP Works

Security should be kept in mind if you are using FTP. Otherwise virus can harm your device

Features of FTP: Security:

FTP provides a good security to a computer network so there are less chances of getting data lost. FTP provide password to protect storage location **User access control:**

Due to security and privacy reasons the access should be limited to a very few number of people. FTP provides the facility to allow the access to the selected person

- **SMTP**

Full form: Simple Mail Transfer Protocol

USE: It works on application layer

To send or receive the mail we require SMTP, this protocol allows sending email

through internet. SMTP server is always on listing mode

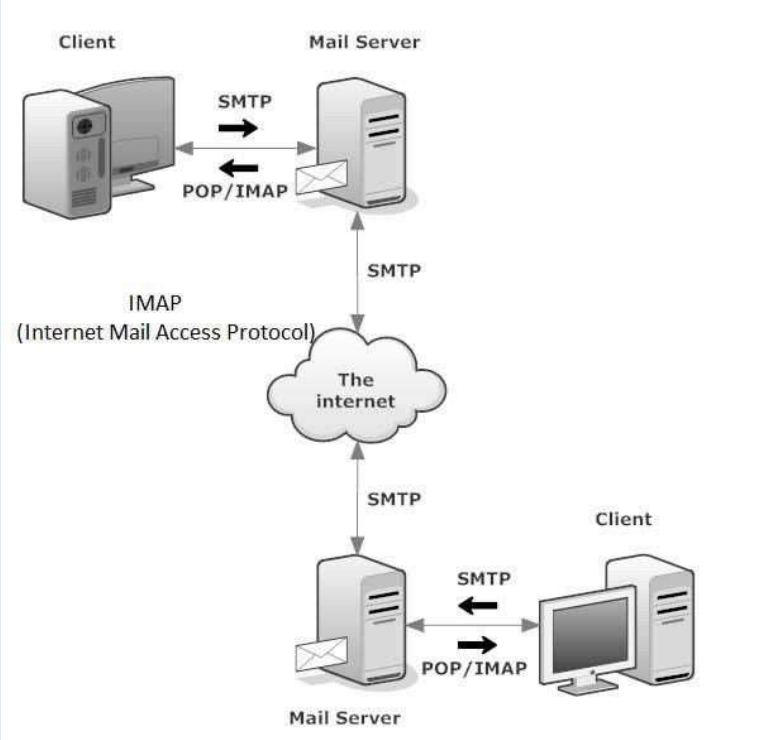

Figure – 6: How SMTP Works

There are two stages of communication between the sender and receiver

- ✓ Sending mail
- ✓ Receiving mail

Sending mail

Through SMTP the mail is sent in a series of request and receive between the Clint and the user **Receiving mail**

The mail is checked by the user agent at the server side, if there is any information it inform about that to the user **Features of SMTP:**

Mail Relaying

Due to mail relaying the mail can be transferred from one server to

another server Mail Forwarding:

SMTP provides the feature of forwarding a mail which we have received from an another person Turning:

Through SMTP the sender of the mail and the receiver of the mail can change their roles

- IMAP

It stands for Internet Message Access Protocol.

The Internet Message Access Protocol works in an application

layer Internet Protocol.

It is used by e-mail clients to retrieve e-mail messages. It retrieves e-mail messages from a mail server over a TCP/IP connection.

In previous years it was known by these following names:-

1. Internet Mail Access Protocol
2. Interactive Mail Access Protocol
3. Internet Mail Access Protocol

IMAP version 4 revision 1 is the current version (IMAP4).

Here, e-mail clients and devices generally leave messages on the server until the user explicitly deletes them. It allows users to organize messages into folders, have multiple client applications know which messages have been read, flag messages for

urgency or follow-up and save draft messages on the server.

Characteristics

- It supports both on-line and off-line modes of operation.
- It allows multiple clients to manage the same mailbox.
- Each make their own changes to the mailbox that will show in other devices connected to the same mailbox.
- IMAP is faster.
- IMAP accounts can keep better track of read, unread, and deleted messages.

- Most implementations of IMAP support multiple logins; this allows the end user to simultaneously connect to the email server with different devices.
- It is the most prevalent Internet standard protocols for e-mail retrieval.
- Virtually all modern e-mail clients and servers support both.

- **POP3**

It stands for post office protocol 3.
POP3 works in an application layer in the OSI model. It is the most recent version of a standard protocol for receiving e-mail. It is a client/server protocol.

Characteristics

- It provides end user ability to fetch and receive e-mail.
- It is built into most popular e-mail products such as Eudora and Outlook Express.
- This standard protocol is built into Netscape and Microsoft Internet Explorer Browsers.
- It is mainly designed to delete mail on the server as soon as the user has downloaded it.
- Here, some implementations allow users or an administrator to specify that mail should be saved for a period of time.
- It is the primary protocol behind email communication.

- It uses TCP/IP protocol stack for network connection and works with Simple Mail Transfer Protocol (SMTP) for end-to-end email communication.
- In this end-to-end mail communication POP pulls messages and SMTP pushes them to the server.
- POP3 accounts allow users to have mailboxes on a server with their domain names.
- In order to set up POP3 email accounts for our web address, your domain must be hosted on server, which has name servers.
- It provides a simple, standardized way for users to access mailboxes and download messages to their computers.

- Its major advantage is that once the mail messages are delivered to the client PC, they can be read with or without connecting to the internet.
- This protocol is supported by almost all e-mail clients.

3.5 MAIL CLIENTS AND NEWS GROUPS

Mail Client

It is a piece of computer hardware or software that accesses a service made available by a server.

The Internet Message Access Protocol (IMAP) is a mail protocol.

IMAP used for accessing email on a remote web server from a local client. Email client is a desktop application that enables users to receive and send emails directly on their desktop.

It's called a client because e-mail systems are based on client-server architecture. It is provides a central interface for receiving, composing and sending emails or configure email address. Email client is also known as email reader or mail user agent (MUA)

Characteristics

- An email client, email reader or mail user agent (MUA) is a computer program used to access and manage a user's email.

- Mozilla Thunderbird and IBM Lotus Notes are popular examples of email clients.
- Email client can be used to configure multiple email addresses from different email service providers.

News Groups

“A discussion group on the internet is called newsgroup.”

Different users share their ideas or thoughts on internet.

It is an internet-based discussion around an individual, entity, organization or topic. Newsgroup is part of "USENET"(user

network), which is service, or facility, on the internet. Newsgroup was created in 1979 by some students to exchange message.

Characteristics

- It is organized into categories and subcategories.
- It is a similar to blogs, but usually has more question and answers.
- Newsgroup is used in a protocol which is NNTP (Network News Transfer Protocol) to read and post message.

- News servers provide the Infrastructure that makes newsgroups work.
- Each news server has special software that maintains a file for each newsgroup serviced by that server.
- To view and post messages to a newsgroup, you need a Newsreader.
- Some newsgroup is moderated by a designated person who decides which postings to allow or to remove.
- Most newsgroups are immoderate.

3.6 LET US SUM UP

Hey Friends now you complete this unit after completing this unit you should able to learn and clear some basic questions like ……. What is web server? How web server works ? – Main types of Web Server – How can we register our own web site? On Internet by DNS - Web Server provides any services by some standard rules and regulation known as Protocols – You learnt about some main Protocols with their characteristics – Protocols features and its usability in OSI model.

3.7 CHECK YOUR PROGRESS

- Which Protocol is an associate with Transportation layer?

[TCP, IP, FTP]

- Which Protocol is delivering Data Packets to proper destination?
- Full form for below ○ URL ○ DNS ○ FTP ○ SMTP ○ IMAP
- MUA is work with _____

3.8 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- **TCP/IP -** Protocol is associate with Transportation layer
- **IP** Protocol is delivering Data Packets to proper destination

➢ Full form for below ○ URL – Universal Resource Locater

–Domain Name Server ○ DNS ○ FTP – File Transfer Protocol ○ SMTP

–Simple Mail Transfer Protocol ○ IMAP - Internet Message

Access Protocol. ➢ MUA is work with **News Groups**

3.9 FURTHER READING

Following are some Online Reference Reading as PDF:

http://egyankosh.ac.in/bitstream/123456789/26321/1/Unit-5.pdf

[Pg 82 – 88 For Protocol]

ftp://ftp.dsv.su.se/users/jpalme/The-future-of-e-mail.1.pdf [Pg 1 – 8 Mail Clients and Newsgroups]

http://www.ignou.ac.in/upload/UNIT%20-%202-BSC-011-BL3.pdf [Pg. 39 - 46 for Web Server] **YouTube**

Reference:

https://www.youtube.com/watch?v=eA9mnY1Z2so [About web Server & Protocol]

https://www.youtube.com/watch?v=O--rkQNKqls&list=PLbRMhDVUMngfpeFloB7kyiA40EptH1up [About Web Protocols]

https://www.youtube.com/watch?v=q3MwN9R0Br4 [About DNS and Directory]

10. ASSIGNMENTS

1. Define Web Server? Explain how it works?

2. What is Protocol? Explain any 2 Protocol with its characteristics , Pros and Cons

a. MS-IIS v/s Apache

3. Differentiate the below terms :

b. TCP v/s IP

c. Mail Clients v/s News Groups

d. FTP v/s SMTP

4. What is DNS? How It works , Discuss its advantages in short

3.11 ACTIVITIES

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

Creative Zone:

- Draw How Data Packets Transmission by TCP
- Draw How Data Packets Delivered by IP
- How FTP work during Data Transmission when any File attach with message?

Analytical Zone:

- How many website upload under Apache and MS-IIS from world level and India level

- Find the growth of News Groups in statistics during last 3 years in World and India
- Give only names of Protocols that use File Wall for its works

Unit 4: Recent Internet Technology Applications

4

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Unit Structure

1. Learning Objectives
2. Introduction To E-Mail
3. E-Commerce and Other Services
4. Social Networking
5. Chatting and Instant Messaging

6. Audio and Video Conference

7. Let us sum up

8. Check your Progress

9. Check your Progress: Possible Answers

10. Further Reading

11. Assignment

12. Activities

4.1 LEARNING OBJECTIVE

After studying this unit student should be able to:

- E-Mail and Its services
- Emerging IT service like E-Commerce , B2B Transaction
- E-Service like E-Learning , E-Banking , E-Governance
- Social Networking to Social Media platform of Chatting , Audio – Video Conferencing

4.2 INTRODUCTION TO E-MAIL AND ITS SERVICES

“A service that can send and receive immediately message across the world with the help of Internet is called Electronic Mail or E-Mail”

Friends, to understand Email it is necessary to compare Email with Traditional Mail

So let’s take a look of this comparison.

Particular	Traditional Mail	Email
Process manage	By Human	By Internet

Address	It has addressed with the recipient's Name , Street address , City , State , Country with Zipcode	It always written in a standard format like username , the '@' symbol and last email provider's domain Username includes alphabets, numbers , special symbols (except '@')
Requirement	In Traditional Mail in a sealed envelope or packing	In Email required Internet , Account in Email provider
Time	It takes time like days , weeks or sometimes months i.e. it takes long time and	It immediately delivery so it takes no time and fasted process

	waste time	
Dependency	Process depend on distance between sender and receiver	Process depend on Internet and it's speed
Main entity includes	Sender – receiver – post box – post office – transportation	Sender – receiver – Inbox – Compose mail – Internet
Power	No need to power supply	Power supply is required because manage by Electronic devices
Digital Literacy	No need to have Digital literacy	Digital literacy is must

Example	Dr. A. B. Jadeja Jyotirmay Parisar, Opp. Shri Balaji Temple, SarkhejGandhinagar Highway, Chharodi, Ahmedabad, Gujarat 382481	abhijit.highereducation@gmail.com ———

Structure of Email

To receive emails, you may would like associate email account associated an email address. Also, if you would like to send emails to others, you may have to be compelled to acquire their email

addresses. it is important to be told the way to write email addresses properly as a result of if you are doing not enter them precisely right, your emails won't be delivered or could be delivered to the incorrect person. Email addresses are always written in a standard format that includes a **user name**,

the **@** (at) symbol, and the **email provider's domain** The **User name** is the name that we **choose as unique**.

i.e. : abhijit.highereducation@gmail.com (in this ex. abhijit.highereducation is **User name**)

The **Email provider** is the website that host our Email account

(in this ex. gmail.com is

i.e. : abhijit.highereducation@gmail.com

Email provider)

Advantages of Email

- **Productivity tools:** Email is typically prepackaged with a calendar, address book, instant electronic communication, and additional for convenience and productivity.
- **Access to web services:** If you wish to register for Associate in nursing account like Facebook or order merchandise from services like Amazon, you may would

like Associate in Nursing email address thus you'll be safely known and contacted.

- **Easy mail management:** Email service suppliers have tools that permit you to file, label, prioritize, find, group, and filter your emails for straightforward management. You'll even simply management spam, or junk email.
- **Privacy:** Your email is delivered to your own personal and personal account with a countersign needed to access and consider emails.
- **Communication with multiple people:** you'll send Associate in Nursing email to multiple people directly,

providing you with the choice to incorporate as few as
or as
many of us as you wish during a spoken language.

- **Accessible anyplace at any time:** You don't have to be reception to urge your mail. You'll access it from any pc or mobile device that has an online affiliation.

Webmail Providers

- Google's Gmail
- Yahoo
- Microsoft's
- Hotmail.com

Outlook.com

Email Productivity Features

- **Instant messaging**, or **chat**, that you has **text-based conversations**
- An **online address book**, where we can store **contact information** for the people you contact.
- An **online calendar** to facilitate **organizes our schedule** and **shares it** with other people.
- A **public profile** that we can use for basic social networking purposes, like sharing photos, previous work or school history, and status updates, among other things with expanding our social network.

- Google Drive for Gmail only. • Google Docs for Gmail only.
- 15 GB (Giga Bytes) Inbox for Gmail only.
- We can send Emails up to 25 MB (Mega Bytes) data attachment for Gmail only.

4.3 E-COMMERCE AND EMERGING SERVICES

Friends, now a day's everyone are familiars about E-commerce; if we think beyond this now "Digital India and Digital Payment" is also part of E-Commerce. E-commerce also known as "Online Shopping"

Define: “An Electronic structure where potential Buyer and potential seller meet with the use of Internet only and transaction perform is called E-Commerce”

Figure -1: Bock Diagram of E-commerce

If we want to understand the types and subtypes of E-commerce we can understand by Block diagram that display as below

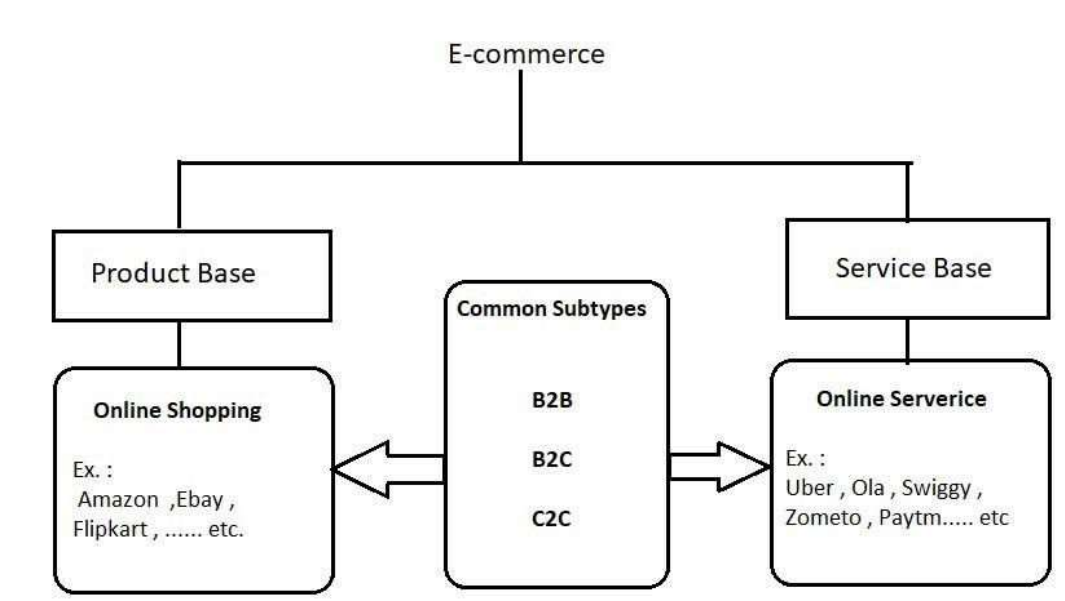

Figure -2: Types and Subtypes of E-commerce

Product Base E-Commerce:

“An E-Commerce where money transaction performs on Product purchase and sell is called Product Base E-Commerce” (Ex. Person X purchase mobile via www.amazon.co.in)

Service Base E-Commerce:

“An E-Commerce where money transaction perform on purchase of specific service is called Product Base E-Commerce” (Ex. Person X give order of online Food Delivery via zomato, use urbanclap, Use swiggy … etc)

B2B E-commerce - B2B or business-to-business is that the form of e-commerce within which the mercantilism takes place between 2 businesses or organizations/companies while not the involvement of client.

Characteristics

- Transaction between two or more business organization
- Product or service transaction is always in bulk.
- Majority branded business provides this process.
- Some out sourcing work in this process.
- No Client Involvement

- Ex. : Intel Company provides various types of processor and chipset to other brand of laptop like Lenovo , HP , IBM , Sony ….etc

B2C e-commerce - In recent times, B2C or business-to-consumer e-commerce has business or service transaction between one business to N customer or consumers is called B2C

Characteristic

- It a lot of unremarkably called on-line selling and involves customers buying product and services on-line. Amazon.com, dingle computers, Drugstore.com, Travelocity, etc are a number of the flourishing samples of B2C e-commerce.

- B2C e-commerce has expedited a click and drag on-line store in situ of the standard brick and mortar selling stores.
- It's reduced dealings prices by increasing consumers' access to data thereby easing the total procedure of shopping for and commerce product and services.
- Customers will currently simply compare varied options offered by completely different brands over an equivalent product and add genuineness to their call.
- Additionally to the current, we tend to even have some smart on-line reviewers like rotten tomatoes, top10reviews, etc, that has on-line reviews for varied merchandise and services and

helps customers in creating a best obtain each on-line still as offline.

C2C e-commerce - Consumer-to-consumer commerce is that the trade between 2 shoppers or potential seller as public and potential buyer as public is called C2C".

Characteristics

- C2C transactions bear associate degree analogy with the standard commercialism strategies cherish sales promotions, auctions and alternative vertical industries.
- Fashionable websites facilitating C2C e-commerce area unit eBay, BaZee.com, Napster, etc. the buyer commerce over on-

line bazaar helps patrons to barter and patronize a selective value.

- Ex.: www.olx.in , www.quicker.com , www.olacabs.com , www.uber.com ….. etc

Friends, if want to understand the pros and cons of E-Commerce we need to compare Traditional Commerce with Electronic Commerce

Particular	T-Commerce	E-Commerce
Seller Side		
Objective	It product base transaction here	It is customer base transaction

	product is centre focus	here customer is centre focus
Setup Cost	Set up cost is very high	Set up cost is not very high
Maintenance	Very High maintenance	Very low maintenance
Other Expense	Other Expense like showroom, furniture, light bill, etc	Less other expense
Man Power	Maximum man power require	Less man power require transportation (logistics) is third party service

Process	Some time semi manual , manual or electronic base	100% IT base because it is Online
Transparency	Business transaction is not 100% transparency	Business transaction is 100% transparency
Stock Management	It may be manipulate because it is manual	It is trusted and 100% transparence because items stock is online
Buyer Side		
Shopping Time	Shopping timing is limited	24 x 7 shopping

Choice of product	Product choice is limited	Product choice from wide range
Payment	Payment is not flexible	Payment is flexible ex. : cash
	because Credit card , Debit card , Cash	on delivery , credit card , debit card , Easy EMI with not paper work
Return policy	Return policy is not flexible	Any product return policy is very flexible
Exchange offer	Exchanging product is not reliable and may	Exchanging product is reliable

	be not good value of product	and good value to product
Time Consuming	It is very time consuming because buyer has to visit the shop or place	It is less time consuming because buyer can buy from digital device
Other Cost	For buying product buyer has to travel from one place to other place this is additional cost	No need to travel from one place to another place because buying from digital device
Limitation of E-Commerce		

Digital Literacy	No need of literacy or digital literacy	Digital literacy is must (digital device operation require for shopping)
Product Verification	Product can buy on the basis of seeing , touching or smelling of product	Product cannot really seen , touch or smell when purchasing product
Product	All types of product selling	Some product like vegetables, fruits, gold …. Etc not trust worthy

		now days for online shopping.

Figure – 3: Online Shopping Process Life Cycle

E-Banking

Online banking, conjointly called E-banking.

“An Online system that associates electronic payment system that allows customers of a bank or different financial organization to conduct spread money of monetary of economic transactions through the web site or Smartphone is called E-banking.” The web industry can generally connect with or be a part of the core industry operated by a bank and is in distinction to branch banking that was the normal method customers accessed banking services. Some banks operate as a "direct bank" (or “virtual bank”), wherever they believe fully on net banking.

Internet banking code provides personal and company banking services giving options like viewing account balances, getting statements, checking recent dealings and creating payments. Access is typically through a secure computing device employing a username and positive identification, however security could be a key thought in net banking and plenty of banks conjointly supply 2 issue authentications employing a (security token).

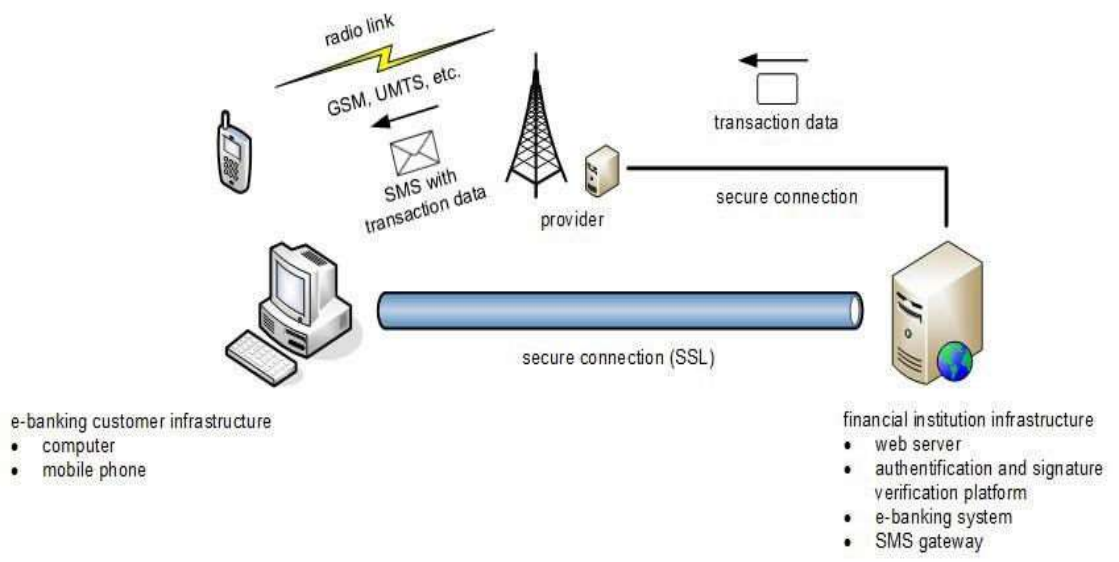

Figure – 4: Process Architecture of E-Banking

Friends, we discuss the **Advantages of E-banking** we need to understand as per two types.

1) Non-Transaction base advantages.
2) Transaction base advantages.

1) Non-Transaction base advantages.

- Easily to Viewing account balances
- Easily to Viewing recent transactions
- Easy to Download bank statements, for example in PDF format
- Easy to View images of paid cheques
- Easy to Order new cheque books
- Easy to Download periodic account statements
- Easy to download applications for M-banking, E-banking etc.

2) Transaction base advantages.

- Easy to transfers fund between the customer's linked accounts.

- Easy to Pay third parties, including bill payments (see, e.g., BPAY) and third party fund transfers. (see, e.g., FAST)
- Easy to Investment purchase or sale.
- Easy to Loan applications and transactions, such as repayments of enrollments
- Easy to Credit card applications
- Easy to Register utility billers and make bill payments 3) Economic institution administration.

4) Management of number of users having varying levels of authority. 5) Business approval process.

6) So flexible that anywhere anytime finance transaction can perform. **Disadvantages of E-banking**

- Basic requirement is Internet.
- User must aware about method of E-banking.
- Data privacy is must if any account password or PIN or Transaction code share with anyone it will be high risk of Online financial fraud.

E-Learning

Friends, Understanding eLearning is easy.

“ELearning is learning methodology by electronic technologies to access instructional program outside of a standard schoolroom.”

In most cases, it refers to a course, program or degree delivered entirely on-line. There square measure several terms accustomed describe learning that's delivered on-line, via the net, starting from Distance Education, to processed electronic learning, on-line learning, web learning and lots of others.

We tend to outline eLearning as courses that square measure specifically delivered via the net to somewhere apart from the schoolroom wherever the faculty member is teaching. It’s not a course delivered via a DVD or compact disc read-only memory, video tape or over a television station. It’s interactive therein you'll be able to additionally communicate together with your lecturers, professors or alternative students in your category. Generally it's

delivered live, wherever you'll be able to “electronically” raise your hand and move in real time and generally it's a lecture that has been recorded. There’s continuously an instructor or faculty member interacting /communicating with you and grading your participation, your assignments and your tests. ELearning has been evidenced to be a self-made methodology of coaching and education is turning into the way of life for several voters in North geographical area.

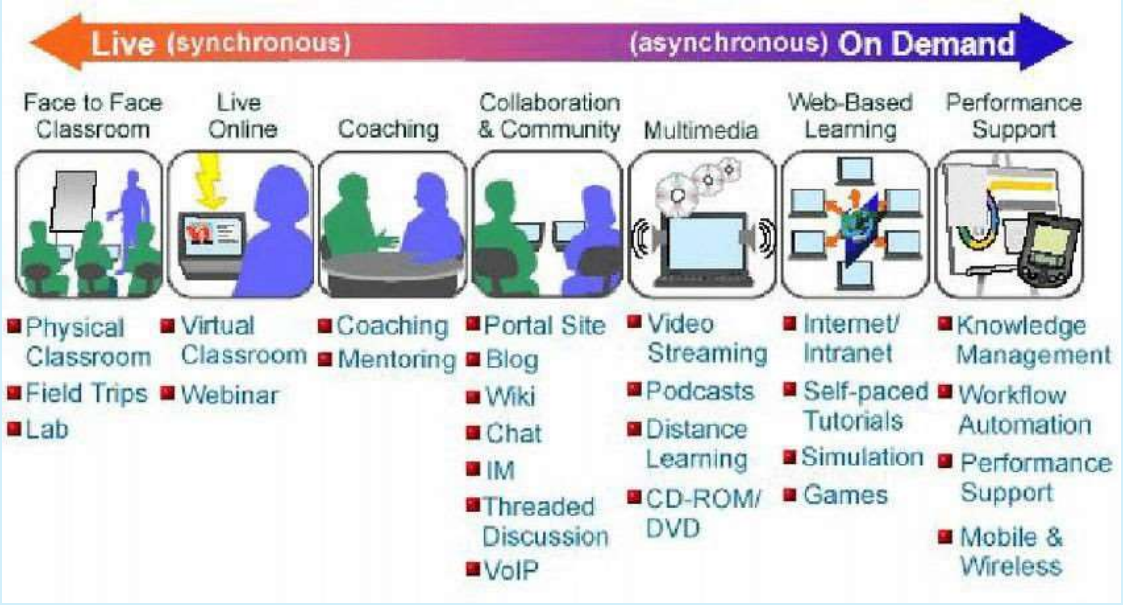

Figure -5: Methods of E-Learning

Methods of E-Learning

1. **Collaboration& Community :** A learning method where Learning base general website approach to general topic learning is called coloration & Community

   Ex.: Wiki, Blog, Chat,
2. **Multimedia :** A learning method where E-Contents available as in Offline or Online as form of Multimedia and animation based in form of CD , DVD ,

   Podcast or Video Streaming is known as Multimedia

   Ex.: CD, DVD, Podcast, Video Streaming
3. **Web Based Learning :** A learning method where E-contents provides Online by various ways like Simulation , Games ,

Self paced Tutorials via Internet or Intranet is known as Web Based Learning

4. **Performance Based Learning : A** learning method where Online as well as Offline E-content available as per course or demand wise that can personalize progress report (Dash board) as well as E-evaluation system develop under Blended learning approach is called Performance Based Learning

Advantages of E-Learning

- Class work will be scheduled around personal and skilled work, leading to versatile learning.

- Reduces travel value and time to and from college
- Learners could have the choice to pick learning materials that meets their level of information and interest
- Learners will study where they need access to a pc and web
- Self-paced learning modules permit learners to figure at their own pace
- Flexibility to affix discussions within the bulletin board rib discussion areas at any hour, or visit with classmates and instructors remotely in chat rooms
- Different learning designs are self-addressed and facilitation of learning happens through varied activities

- Development of pc and web skills that are transferable to alternative aspects of learner's lives
- Successfully finishing on-line or computer-based courses builds understanding and certainty and encourages students to require responsibility for his or her learning

Disadvantages of e-Learning

- Unmotivated learners or those with poor study habits could fall behind.
- Lack of acquainted structure.

- Students could feel isolated or miss social interaction so the

  necessity to understanding totally different learning designs and individual learner desires.

  - Instructor might not forever be offered on demand.
  - Slow or unreliable web connections will be frustrating.
  - Some courses like ancient active courses will be troublesome to simulate.

E-Governance

Friend simply understanding is

E-governance = Electronic (ICT based) + Government Service

E-governance is more about government than about "e" improves efficiency, improves services helps achieve specific outcomes can contribute to broad policy objectives can be a major contributor to reform can help build trust between governments and citizens can open up the policy process challenges existing ways of working seamless government services will drive agencies closer together "ICT and Internet based services of Government that interact with citizens to increase reliability and transparency is called E-Governance"

Figure – 6: Process Architecture of E-Governance

E-Governance is defined as the application of electronic means in the interaction between government and citizens and government and business, to simplify and improve democratic, government and business, to simplify and improve democratic, government and business aspects of governance. Many developing country governments face these problems of inefficiency, internal and external communications breakdowns, poor service delivery, and

corruption. Civil society organizations often lack the capacity to use ICT (Information and Communication Technology) effectively, even though ICT can be a powerful tool for making information available to the public and preventing corrupt practices.

Advantages

- Generate reliability between citizen and Government.
- Better and faster process of Government.
- Reduce corruption in Government.
- Creating better business environment.
- Increase public participation in Government process.
- Better productivity and efficiency of government agencies.
- Better quality of life from unsatisfied communities.

- Reduce cost of running Government. **Disadvantages**

  - Literacy ratio in country.
  - Digital literacy is necessary.
  - Limited Mobile users.
  - Slow speed of Internet.
  - High Internet costs as telecommunication infrastructure

    country still not reach up to 4G speed of Internet.

4.4 SOCIAL NETWORKING

Hey friends simply understand social media as

Social media = Sharing various types of Information among group of people via Internet

Social networking could be an internet based mostly communication media that permits users to possess conversations, share info and make contents. There square measure various social media sites like blogs, social networking sites, instant electronic messaging, photo-sharing sites, video-sharing sites and additional. Billions and billions of individuals across the globe use social networking sites to share and create connections on a private level. As Associate in nursing introduction to social networking sites individuals use social media to speak with friends, family and to find out new things that

interests them and that is amusing. Business homes use social media to possess language with their target market, get feedback from customers, promote, and elevate their complete. Professionals additionally use social media to extend their information in their various fields and build a network of execs from similar trade.

Figure – 7 : Social Networking example

While there square measure several social media sites within the internet, Associate in nursing introduction to social networking sites just like the ones listed below is extremely necessary.

Facebook: This is a social networking site, which permits people or group of people to connect with network as friends, business houses and organizations. It is perfect site for companies to build up their overall brand understanding and post contents, videos, photos, event listing and links.

LinkedIn: This is a business related social media platform primarily used for skilled networking. It is an ideal site to post

updates, job postings, academic programs, events and projects for knowledge sharing purpose.

Twitter: This micro-blogging site allows users to post their thoughts towards worldwide. Business houses and individuals looking to engage their group at a high regularity rate should consider using Twitter. **Advantages:**

- Always connected with group of people.
- Finding people very easily.
- Finding people with similar interest.
- Use as promotional tools.
- Information spread rapidly. **Disadvantages:**
- Big issue on Data Privacy.

- It consumes lots of time.
- Sometimes unreliable information.
- It increases problems in relationship.
- It reduces the personal touch day by day.

Types of Social Networking

1. Social Connections

Figure – 8 : Types of Social Networking

"A type of Social networking by which we can keep in touch with friends and family members"

List of the most commonly used websites for building social connections online.

Facebook: Possibly the most popular social media utility, Facebook offers a way for users to build connections and share information with people, group of people and organizations they choose to interrelate with online.

Twitter: Share your thoughts and keep up with others via online information network. **Google +:** This relatively new entrant to the social connection marketplace is designed to allow users to build circles of contacts that they are able to interact with and that is integrated with other Google products

2. Multimedia Sharing

"A type of Social networking makes it simple to share video and photography content online is Multimedia sharing "

List of the most commonly-used websites for building Multimedia Sharing.

YouTube: A platform that allows us to share and view video content

Flickr: This site provides a powerful option for organizing digital photographs online, as well as we can share with others also.

3. Professional

"A type of Social network that are designed to provide opportunities for careerrelated growth is known as Professional social networking"

Some of these types of networks offer a general forum for professionals to connect, while others are focused on particular occupations or interests.

A few examples of professional social networks are as below.

LinkedIn: More than 135 million members since November of 2011 to till, LinkedIn had, making it the biggest online professional network.

Classroom 2.0: Social network particularly designed to help academicians/teachers connect, share and help each other with professionally by teaching – learning purpose

4.5 CHATTING AND INSTANT MESSAGING

Instant electronic messaging (IM) could be a catch-all name for a spread of various services that primarily offer users with the chance to interact in period of time communication.

Typically direct by text oral communication, messengers usually conjointly offer a spread of further practicality that varies wildly from supplier to supplier. This additional practicality has, on some platforms, lead to them being thought-about as full-blown social media networks, on a par with Facebook, Twitter and alternative platforms.

In 2015, itinerant electronic messaging apps were employed by one.4bn customers and eMarketer predicts that, by 2018, the

amount of chat app users worldwide can reach 2 billion, representing eightieth of Smartphone users worldwide.

In a shell, it's solely a matter of your time before everybody and their granny, in much each country on the earth, area unit victimization IM.

Famous names for Chatting and Instant Messengers are as below.

WhatsApp

Owned by Zuckerbeg & Co. and with over 1bn users, most of that area unit technical school savvy millennially, WhatsApp is that the clear competitor within the IM community and therefore the solely

really international IM service with any vital uptake altogether continents round the world.

Offering text chat, voice recording, media sharing, cluster broadcasts and a strong network, you'd for sure bet your house on this IM large being the one to pave the means for the long run of IM [insert emoticon face emoticon].

Facebook Messenger

Formed from the net chat perform of the social network, Facebook courier has created real inroads within the EMEA and U.S. regions with over 800m users. However it’s cleared that with bound

restrictions in places like Asia, its move out of those 2 markets and into the APAC region is a tricky one to tackle.

WeChat

With 650m users, primarily within the APAC region, WeChat is, considerably, dominant within the Chinese market giving users the possibility to speak during a 'walkie talkie' vogue oral communication, also as alternative typical options like cluster chats and video calls.

WeChat is additionally a social network Associate in nursing a long transactional platform. It offers its users the chance to buy, ask brands, order taxis (its 'Didi Dache' service is basically China's Uber) and browse the news.

Comparing Chat with Instant Messaging

Chat	Instant Messaging
• It is One to many communication process.	• It is One to One communication process
• Concept of Chat room is established for multiple communications.	• Concept of One to One messaging with individuals
• Basic purpose is as per common interest or topic base group of people	• Basic purpose is just instant message and communication by internet

• Ex. : Whatsapp	• Ex. : Facebook messenger

Instant Messaging

Advantages:

- It's immediate: you don't need to wait for the other person to ensure his email.
- It's great for rapid messages, questions, or notifications.
- Compared to email, it's easier to carry on a conversation or multiple conversations.
- You can stay logged in while doing other things on your computer, which makes it easy to handling multiple tasks.

Disadvantages:

- If someone is not online, you may have to contact him another way.
- It's not as convenient as email for lengthy or complicated messages.

4.6 AUDIO AND VIDEO CONFERENCING

Audio conferencing

Audio conferencing is that the conduct of associate audio conference (also known as a phone call or audio teleconference)

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between 2 or a lot of folks in numerous locations employing a series of devices that enable sounds to be sent and received, for the aim of communication and collaboration at the same time.

An audio conference might involve exclusively 2 parties, or several parties concerned at constant time. Audio conferencing is conducted either through phone line or the web by mistreatment devices like phones or computers. If one solely desires to pay attention, he/she simply wants speakers. If he/she decides to talk further, he/she may have an electro-acoustic transducer further.

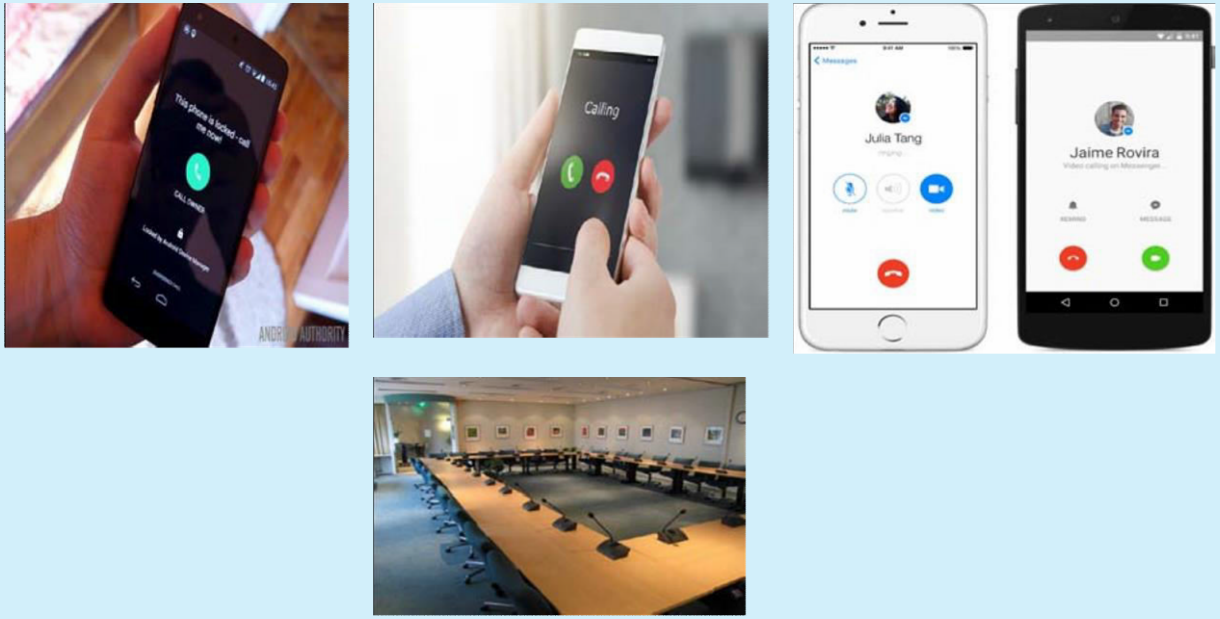

Figure – 9: Example of Audio Conference

Advantages:

- It is Cost effective Communication tool.
- Easy to accessible.
- Save lots of time and money.

Disadvantages:

- Communication is just verbal.
- Sometimes quality of communication is not full reliable.

Video conferencing

“Telecommunication technologies that enable video with audio telecommunication with the help of Internet is called Video conferencing”

This is a very broad category of online tools, incorporating a range of options from free one-to-one audio conferencing all the way to more sophisticated and expensive tools such as Polycot which

allow multiple sites with entire classes participating using video and audio.

Figure – 10: Video Conferencing/Calling Smartphone Apps. Advantages:

- Audio as well as video both benefits.
- Free to download. (No Cost)

- More reliable than Audio conferencing.
- It saves lots of time of travel if anyone wants to meet other people.
- Some companies now a day's use it as interview and training part to save time and money.

Disadvantages:

- Communication between limited numbers of systems.
- It is free so sometimes Audio and video quality is not 100% reliable.
- Video calling / conferencing use high bandwidth of Internet data packets so it not completely free.

4.7 LET US SUM UP

Hey Friends now you complete this unit after completing this unit you should able to learn Emerging technologies use as core part of Internet – Basic communication EMail then Various most popular service of Internet like E-Commerce, E-Banking – ELearning, Business transaction of B2B of E-Commerce, Internet Service that all major people connected with it as Social Media networking like Chatting, Instant Messaging and Finally Audio and Video Conferencing

4.8 CHECK YOUR PROGRESS

- Give the name of Web Mail Service providers?
- An Intel Company provides mother boards to major laptop brands is known as

  _____ [B2B , B2C , C2C , None of this]
- Full form for below ○ B2B ○ B2C ○ E-Mail ○ C2C ○ OTP
- Give names of 4 components of Process Architecture of E-Governance ➢ _____and _____are main part of any E-Mail

4.9 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- Web Mail Service providers :- **Google , Yahoo , Hotmail , Outlook**
- An Intel Company provides mother boards to major laptop brands is known as :- **B2B**
- Full form for below
  - B2B: Business To Business
  - B2C : Business To Consumer / Customer
  - E-

- C2C : Customer to Customer
- E-Mail : Electronic Mail
- OTP : One Time Password

- 4 Components of Process Architecture of E-Governance are : **Process , People , Technology , Resource**
- **User Name** and **E-Mail Provider** are main part of any E-Mail

4.10 FURTHER READING

Following are some Online Reference Reading as PDF:

https://www.inf.unibz.it/~ricci/IT/slides/1-www.pdf [About Internet Technology Uses]

http://www.ignou.ac.in/upload/B2U1cit-002.pdf [Pg 5 – 15 About E-Commerce]

YouTube Reference:

https://www.youtube.com/watch?v=tfPfwDrfSP8 [About E-Mail]

https://www.youtube.com/watch?v=-Y9pvVWanL4 [About E-Banking]

https://www.youtube.com/watch?v=yGTovSBTfTs [About E-Learning]

https://www.youtube.com/watch?v=tbRF_ELh0Nc [About Social Networking]

https://www.youtube.com/watch?v=-oUOoHU8QfA [About Video Conferencing]

https://www.youtube.com/watch?v=xKJjyn8DaAw [About E-Commerce]

11. ASSIGNMENTS

1. What is E-Mail? Discuss advantages and disadvantages of E-Mail

2. What is E-Banking? Discuss advantages of E-Banking

3. Differentiate the below terms :
   a. Chat v/s Instant Messaging
   b. B2B v/s C2C
   c. Amazon v/s Swiggy
   d. Audio Conference v/s Video Conference

4. What is E-Learning? Explain any 2 method of E-Learning with its Advantages and Disadvantages

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4.12 ACTIVITIES

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

Creative Zone:

- List out G-Mail services provide by Google
- Draw Payment Process diagram for any Online Shopping
- Draw History Time line of E-Commerce Development
- List various Service Providing by E-Banking
- List 2 to 3 out some website or Mobile app that provide E-Learning

- Which chatting smart phone app u use most give 2 to 3 reasons.

Analytical Zone:

- How many users use Facebook Messenger in world level as well as at India
- Provide statistics of E-Banking users in India
- Provide statistics comparison of buyers of Amazon v/s Flipkart

Block-2

Developing

Web Pages

Using

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<Week 9>
<Slides 300-340>

HTML

Unit 1: HTML Tags 1

Unit Structure

1. Learning Objectives.
2. Introduction to HTML and HTML Tags.
3. Heading Tag.
4. Linking Tags.
5. Images Tags.
6. Special Characters and Horizontal Rules Tags.
7. Lists.
8. Meta Elements.
9. Let us sum up.
10. Check your Progress

11. Check your Progress: Possible Answers.
12. Further Reading.
13. Assignment.
14. Activities.

1.1 LEARNING OBJECTIVE

The Block 2 - Unit 1 aims to develop skills of developing Webpages using Hyper Text Markup Language (HTML). After studying this Unit student should be able to:

- Understand the basic concept of HTML.
- Able to work in HTML Environment.
- Design a Webpage of Websites using various tags like: HTML, giving Heading, introducing Link, setting Internal Links,

inserting Images using Special Characters and Horizontal Rules, preparing List and using Meta Elements.

1.2 INTRODUCTION TO HTML AND HTML TAGS

Hypertext Markup Language (HTML) is the standard markup language mainly used for developing Webpages of a Website that can even be called as a Web Application.The Web Application is viewed in Web Browser that receives the Webpages designed in either from the local Computer System Storage or a Web Server and transforms it to multimedia Webpages.

- **Facts to Ponder:**
  - The World Wide Web Consortium (W3C) describes specifications, hence influencing the functionalities of HTML. The W3C has defined HTML as an application of the Standard Generalized Markup Language (SGML). The W3C maintains both the HTML as well as Cascading Style Sheet (CSS) standards and has increased the use of CSS in additional to HTML. ○ Most recent version of specification for the HTML is 5.0.

- HTML develops the structure of a Webpage semantically and in the beginning included views for the appearance of the document in a Web Browser.
- The main advantage of using HTML is that it can embed the Scripts such as JavaScript in form of programs which influence the behavior and content of Webpages and even embeds Cascading Style Sheet (CSS) that describe the look and layout of content on Webpage.
- Along with developing and designing Webpages, it is even used for Intranet, Internet as well as extranet

Applications, Help Files, Network Applications and other specific domains.

- **Working in HTML Environment**

The working Environment of HTML is user friendly and is operationally feasible as it does not require very many special, specific, specialization skills. The Technical requirements of HTML requirement are even feasible and it can be implemented on every kind of Computer System.

- **HTML Environment:** The Environment or Tools required for working in HTML are:

- HTML Editor: It is required to create and save HTML document. It can be classified in two categories – Text Based HTML editor (Ex: Notepad, WordPad, Edit plus) and What You See Is What You Get (WYSIWYG) based Text editor. The Text based Editors are most commonly used. The HTML webpage that is developed in notepad is saved with .html or .htm as file extension.
- Web Browser: Web Browser is software which is used to view documents websites that are developed in HTML and Web Development languages. The role of Web Browsers is not to display the HTML tags, but use them

to understand the content of the Webpage in a Website. Some commonly used Web Browsers used to view HTML Documents are Google Chrome, Microsoft Internet Explorer, Netscape Navigator, Mozilla Firefox, Opera and others.

- **HTML Tags**

- HTML Tags also called as HTML Element is used to indicate the structure and format of a Web Document.
- HTML Webpages are developed and designed using HTML Elements.

- The language provides a means to develop and Design structured documents by having HTML Elements for Text like headings, paragraphs, lists, links, quotes and other forms.
- Tags in HTML consist of Alphanumeric Tags, which are located within opening and closing angular brackets (<>). Example: <TAG>
- The Alphanumeric Tags are not case sensitive that means the tag <html> and <HTML> has the same meaning.
- Spaces are not allowed between the angle brackets and the Tag text.
- The HTML Tags are of two types:

- ✓ Container Tag:HTML tags come in pairs with an opening tag (for example : <TAG_NAME>) and closing tag (for example : </ TAG_NAME >), these tags are known as Container Tag.
- ✓ Empty Tags: Some tags (for example : <img>) that do not require closing tag, is known as Empty tag.
  - Every Tag has some properties that are known as attributes that are written within the opening tag specifying its value. The syntax is as follows : ▪ <TAG ATTRIBUTE = “value “> // Opening Tag ▪ .....
  - Content
  - .....

. </TAG>

// Closing Tag

- **Structure of HTML Document**

  The basic Skeleton Structure of HTML Document is as displayed below: **<HTML>**

  <HEAD>

  <TITLE>

  </TITLE>

  </HEAD> <BODY>

  <TAG_1>.....</TAG_1>

<TAG_2>.....</TAG_2>

...

...

<TAG_N>.....</TAG_N>

</BODY>

</HTML>

The meaning of each tag is elaborated in the Table 1.

Table 1: Basic HTML Tags

Basic HTML Tags	Description
<HTML>.....</HTML>	HTML document starts with <HTML> opening tag and ends with </HTML> tag.

	Rest all Tags are embedded within it.
<HEAD>.....</HEAD>	It contains opening and closing <TITLE>.....</TITLE> Tags, sometimes other Scripts and styles even.
<TITLE>.....</TITLE>	The opening and closing <TITLE>.....</TITLE> Tags defines the title displayed on the Title Bar of the Web Browser Tab.

<BODY>.....</BODY>	The entire visible part of the HTML document is between <BODY>.....</BODY>. All the elements like text, audio, video that is displayed on Web Browser are defined within <BODY>.....</BODY> Section.

<TAG_1>.....</TAG_1> & **<TAG_N>.....</TAG_N>**	These are the various Tags to display text, audio, video and other styling in the HTML Document. These are detailed further in this Chapter.

- **Steps to create an HTML Webpage**

  Example 1: Creating a HTML Webpage.

  Solution:

  ✓ Step 1: Open any text Editor (EX : NOTEPAD) as displayed in the Figure 1.

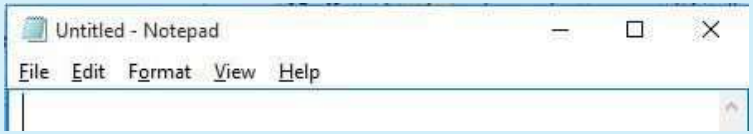


Figure 1: Notepad Interface

✓ Step2: Write the HTML code for your Webpage & displayed in Figure 2.

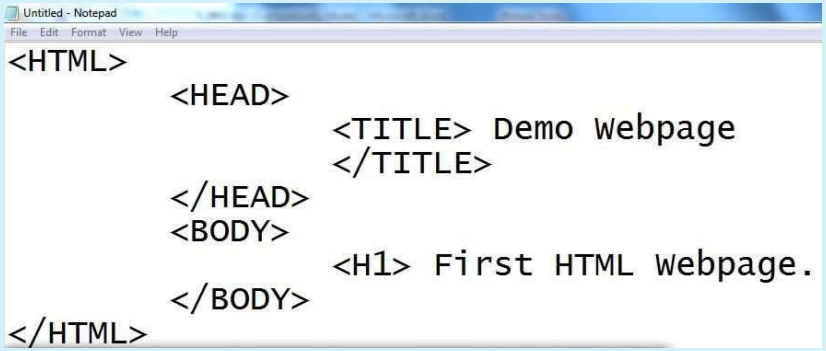


Figure 2: HTML Code

✓ Step3: Click on Save option in File menu and in the Save As dialog box give the File Name with .htm or .html extension. The file will be saved as HTML Document.

Figure 3: Interface

✓Step4: Open the File in the Web Browser to view the output as displayed in Figure 4.

Figure 4: HTML Document view in Web Browser

- **Basic useful HTML Tags**

There are various basic of Tag that supports and fulfils the Text, Paragraph, Page formatting as well as additional requirements of HTML Document. Some such Tags are as detailed in the Table 2.

Table 2: Some Basic HTML Tags

<P>... </P>	Defines a paragraph	Container Tag	ALIGN VALUE=left/right /center/justify	<P align="left">Left Align paragraph</P> <P

Tag Description Type Attribute Use

				align=“center”>Cen ter Align Paragraph </P> **Output:** Left Align paragraph Center Align Paragraph

 	It starts a new line where paragraph is not required. It forces a line break wherever and is similar to single spacing in	Empty Tag	NIL	<P>This is a para graph with line breaks</P> **Output:** This is a para graph with line breaks

	a document.			

<!-->	Inserts a comment in the HTML source code anywhere in the document and the	Empty Tag	NIL	<P> The html comment would <!—This is a comment -->be displayed like this in Web Browser.</P> **Output:** This html comment would be

	browser will ignore everything inside the brackets. Used to self notes or a helpful			displayed like this in Web Browser.

	message to someone looking at the source code.			

Note for Practical: All the Sample code given in Examples must be typed in notepad with entire HTML Structure saved with .html or .htm extension and finally open in web browser to get the output.

1.3 HEADING TAG

Explanation: The Heading Tag provides heading or the titles in the HTML document to show the proper document structure in the Web Browser.

Purpose: Specifies Heading/Sub-Headings/Titles/Sub-Titles in the HTML Document. **Type:** Container Tag. **Syntax:**

- HTML has six levels of headings, presented as **<H1>, <H2>, <H3>, <H4>, <H5>,** AND **<H6>**.

- The **<H1>** Tag defines the main/most important Heading, while **<H6>** Tag defines the Lowest Sub-Heading/least important Heading.
- Example: <H1> Main Heading </H1>

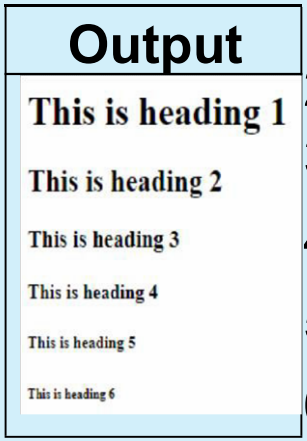
Attribute: Align = Specifies the alignment of Heading. Values = left (default), right, center and justify. Example: align="center".

Example 2: HTML Program is demonstrating types of Heading Tag.

Solution:

```
<HEAD>
 <TITLE>Heading Example</TITLE>
```

```
<BODY>
  </HEAD>
    <H1>This is heading 1</H1>
    <H2>This is heading 2</H2>
    <H3>This is heading 3</H3>
    <H4>This is heading 4</H4>
    <H5>This is heading 5</H5>
    <H6>This is heading 6</H6>
</BODY>
```



1.4 LINKING TAG

The Linking Tag is used to provide the Links or the connectivity in a HTML Document. The link can be categorized as:

- External Link: Between different Web Pages of a Website.
- Internal Link: within a single Web Page itself.

Both the types are explained in details below.

- **External Link Explanation:**
  - The Link Tag Links Document, Image and even email.
  - It puts a Hyperlink in a Web Page and such Links can be categorized as: Text Link (Link among different Web Pages of a Website or other linked websites using a text),

Image Link Tags (Image is Linked to a another Webpage), and can be a specific Email Link.

- Link can be applied to a Text or the Images. The linked text is called as Hypertext/Hotword and the portion of linked image is called as Hotspot. ○ When a cursor is moved over Hypertext or Hotspot its shape changes from standard arrow cursor into hand shaped mouse cursor representing it as a Linked Text/Image. Once it is clicked the respective linked document or locating is reached.

- In the Web Browser the standard format for Hypertext is blue underlined text in a HTML Document. Once the link is visited the color of Hypertext/Hotspot may change.

Purpose: Allows linking in HTML document and can be used for navigation between many different Web Pages of a Website containing.

Type: Container Tag.

Syntax: Hyperlink can be generated by putting text between opening closing Anchor tag. <A> and </A> tag. **Attributes:**

- HREF: Defines the link address that signifies the path of the Hyperlinked HTML Document. The value in it must

be source file completed address or name with extension (if file exist in the same folder where the Linked Document is located). Example :

- Text Link : < A HREF="baouregistration.html"> Registration </A>
- Image Link : <A HREF="http://www.baou.edu.in/"><IMG SRC="logo.gif"></A>
- Email Link : < A HREF="mailto:feedback@baou.edu.in?subject=Email Assistance"> Email Help Desk </A>

- TARGET: Defines where to open the linked document.

Example :

< A HREF="baouregistration.html" TARGET="blank">

Registration </A>

Example 3: HTML programs to demonstrate Text Link. **Solution:**

<HEAD>

<TITLE>HTML Text Link**<TITLE>**

</HEAD> <BODY>

<P>This is a link to **<A HREF**

="http://www.google.com">GOOGLE.com**</A></P>**

</BODY>

Output	

Example 4: HTML programs to demonstrate Image Link. **Solution:**

<HEAD>

<TITLE>HTML Image Link**<TITLE>**

</HEAD> <BODY>

<P>Click on below picture to visit my homepage :

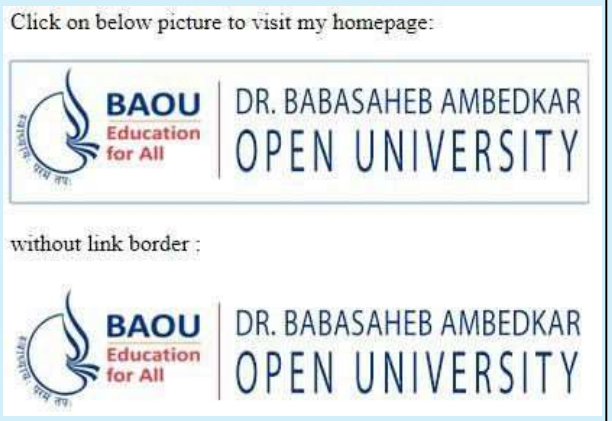
<A HREF= “http://www.baou.edu.in/home”><IMG SRC=“baou_logo_n.png”></A>with link border :

</P>
<P>Click on below Image to visit the homepage:**

**<A HREF= “http://www.baou.edu.in/home”><IMG SRC=“baou_logo_n.png”></A>

without link border :

</P>
</BODY>

Output	

Example 5: HTML programs to demonstrate Email Link.

Solution:

```
<HEAD>
    <TITLE>HTML Email Link</TITLE>
</HEAD>
```

<BODY>

Click on below link to send us your comments. **
**

<A

HREF="mailto:triumphricha@gmail.com?subject:comme

nts about your site">Email Me**</A>**

</BODY>

Output

Note: Once Email Me is clicked using outlook account an email can be send using Outlook Express Account.

- **Internal Linking Tag**

Explanation: In HTML document when a link is set within a single Webpage it is known as Internal Link. It is used for navigation within a Webpage. **Purpose:** Used to set linking within a Webpage for navigation in different section of a Webpage in a HTML Document.

Type: Container Tag.

Syntax:

- The Internal Link/Hyperlink can be established either by providing an absolute path or relative path.

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- The opening and closing Anchor tag <A> and </A> tag is used for anchor point name, which is referred to an internal link into a same page.
- Internal link name is followed by hash Symbol (#). Wherever, there is a click on such Anchor link, the referred link automatically scrolls to the desired position in the Webpage.

Attributes:

- HREF: Defines the Internal link address that signifies the path of the linked HTML Document. The value in it must be source

file completed address or name with extension (if file exist in the same folder where the Linked Document is located). The internal links are should be followed by # symbol.

Example: < A HREF="#SelfLearningContent1"> Self Learning Content 1 </A>.

- NAME: Identifies the element with a unique name. Example:
  - < A HREF="#TOP">Reach Top of Page</A>
  - <A NAME="TOP">Reach Top of Page</A>

Example 6: HTML programs to demonstrate Internal Link Tag. **Solution:**

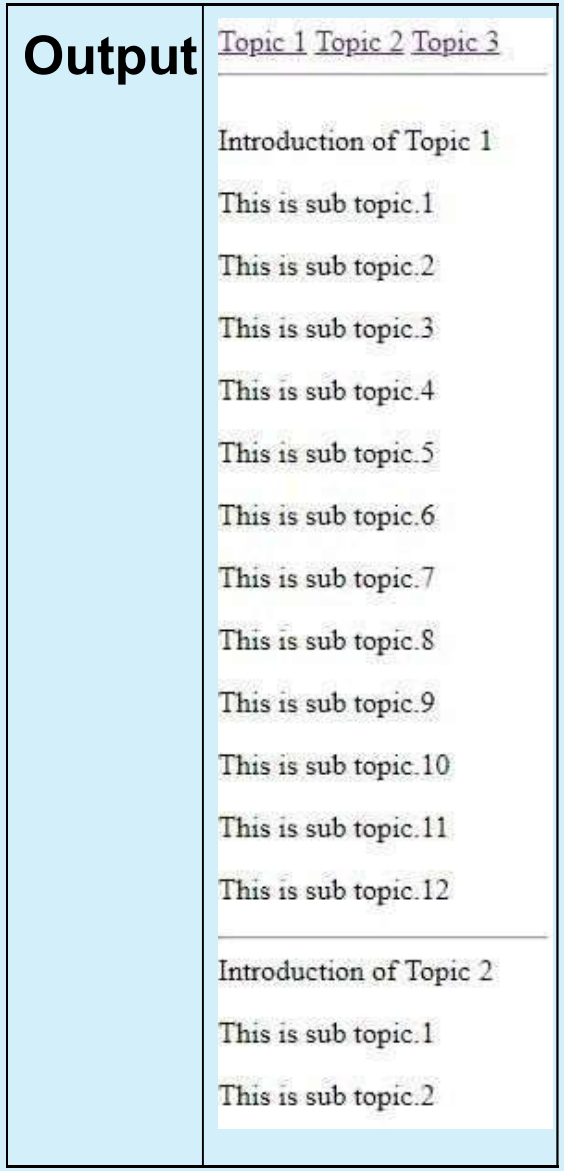
<HEAD>

```
   <TITLE>HTML Internal Link Tag </TITLE>
</HEAD>
<BODY>
   <A HREF="#topic1">Topic 1</A>
   <A HREF="#topic2">Topic 2</A>
   <A HREF="#topic3">Topic 3</A>
    <HR>
    <BR>
   <A NAME="topic1">Introduction of Topic 1</A>
   <P>This is sub topic.1</P>
   <P>This is sub topic.2</P>
   <P>This is sub topic.3</P>
   <P>This is sub topic.4</P>
```

```
<P>This is sub topic.5</P>
<P>This is sub topic.6</P>
<P>This is sub topic.7</P>
<P>This is sub topic.8</P>
<P>This is sub topic.9</P>
<P>This is sub topic.10</P>
<P>This is sub topic.11</P>
<P>This is sub topic.12</P>
<HR>
<A NAME="topic2">Introduction of Topic 2</a>
<P>This is sub topic.1</P>
<P>This is sub topic.2</P>
```

```
<P>This is sub topic.3</P>
<P>This is sub topic.4</P>
<P>This is sub topic.5</P>
<P>This is sub topic.6</P>
<P>This is sub topic.7</P>
<P>This is sub topic.8</P>
<P>This is sub topic.9</P>
<P>This is sub topic.10</P>
<P>This is sub topic.11</P>
<P>This is sub topic.12</P>
  <HR>
```

Output



```
<A NAME="topic3">Introduction of Topic 3</A>
 <P>This is sub topic.1</P>
 <P>This is sub topic.2</P>
 <P>This is sub topic.3</P>
 <P>This is sub topic.4</P>
   <HR>
</BODY>
```

Note: Whenever Topic 1/Topic2/Topic 3 is clicked the location of the active content is to its respective marked area. Similarly the

navigation can be done to Top/Bottom/Particular Location within a Webpage.

1.5 IMAGES TAGS

Explanation: The Image HTML Tag displays the image/s that can improve the design and the appearance of a Webpage of a Website. The browser puts the image where the image tag occurs in the document. If you put an image tag between two paragraphs, the browser shows the first paragraph, then the image, and then the second paragraph.

Purpose: Used to insert image in HTML

Document **Type:** Empty Tag.

Syntax: The IMG Tag is used to display Image in the HTML Document. Example :

<IMG..... > **Attributes:**

- SRC: Specifies the path of the Image File Source.
- HEIGHT: Specifies the height of the inserted Image. Values is assigned in pixels or percentages. Example : HEIGHT=200.

- WIDTH: Specifies the width of the inserted Image. Values is assigned in pixels or percentages. Example : WIDTH=“100”.
- ALT: A mandatory attribute that specifies an alternate text for an image, when the image cannot be displayed. Example: ALT=“BAOU”.
- BORDER: Specifies Image border thickness. Values is assigned in pixels, value 0 means Image with no border should be displayed. Example: BORDER=0.

- ALIGN: Sets the alignment of the image according to the Webpage margins. Values = left (default), right, center and justify. Example: ALIGN= “center”

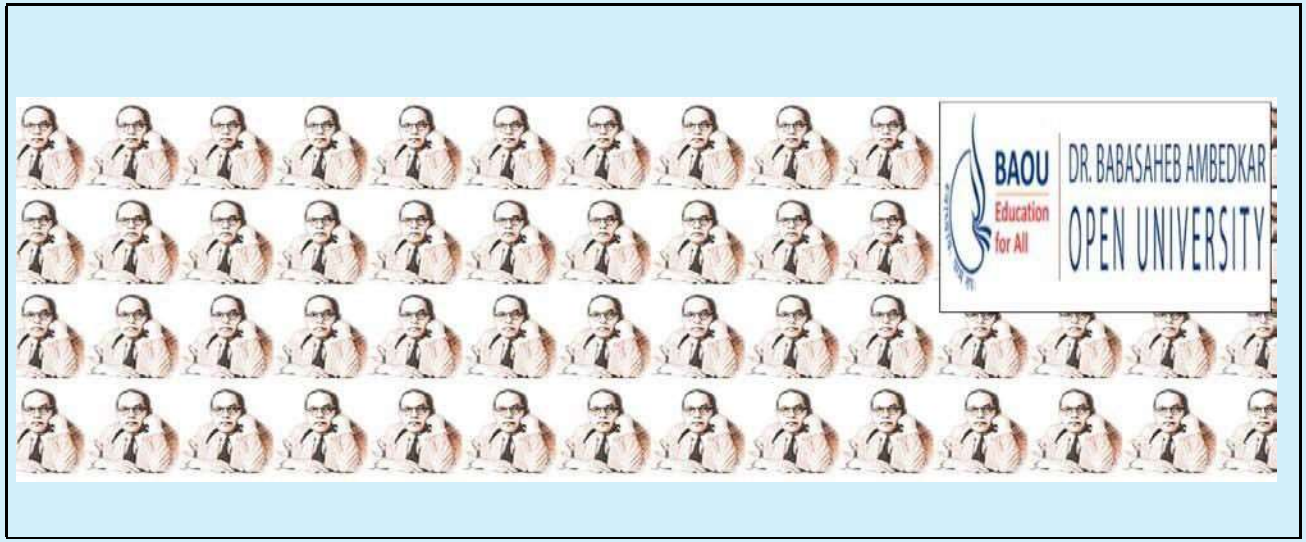
Example 7: HTML programs to demonstrate Image as Background as well as desired location.

Solution:

```
<HEAD>
   <TITLE>HTML Image Tag</TITLE>
```

```
</HEAD>
<BODY BACKGROUND="baba_img_n.jpg">
<IMG SRC="baou_logo_n.png" ALIGN="RIGHT"
ALT="BAOU"
BORDER=1 WIDTH=350 HEIGHT=250>
</BODY>
```

Output



1.6SPECIAL CHARACTERS AND HORIZONTAL TAGS

- **Special Characters**

Explanation: Many special symbols are needed to be included in HTML

Document these are known as Special Characters. These are also known as Character Entities/Entities.

Purpose: Used to insert Symbols or Punctuation in HTML Document. Example: “, &, <, >, Space and others.

Syntax: The Character Entity is begins with ampersand Symbol, followed by entity number or defined Entity Name and ends with a semicolon. To include Special Characters either of the two methods can be used:

- Entity Number: The Special Character/Entity is identified by a defined Entity Number. Example: Quotation mark Symbol (“) can be included by using the format and Entity Number "
- Entity Name: The Special Character/Entity is identified by a defined Entity Name. Example: Quotation mark Symbol (“) can be included by using the format and Entity Name "
- Some Special Characters/Entities which are used in HTML Document are described in Table 3.

Table 3: Some Special Characters/Entities in HTML Document

Description	Entity Number	Entity Name	Symbol
Quotation mark	"	"	“
Ampersand	&	&	&
Less than	<	<	<
Greater than	>	>	>
Non-breaking Space			

Inverted exclamation	¡	¡	¡
Cent sign	¢	¢	¢
Pound sterling	£	£	£
Yen sign	¥	¥	¥
Copyright	©	©	©
Registered trademark	®	®	®
Fraction one-fourth	¼	¼	¼
Fraction one-half	½	&frac21;	½

Fraction three-fourths	¾	¾	¾
Inverted question mark	¿	¿	¿
en dash	–	–	–
em dash	—	—	—
dagger	†	†	†
Horizontal ellipsis	…	…	…
Euro	€	€	€
trademark	™	™	™

Example 8: HTML programs to demonstrate Special Characters.

Solution:

```
<HEAD>
  <TITLE>HTML Special Characters</TITLE>
</HEAD>
<BODY>
  <H1><U>Using Special Character</U></H1>
  <H2>With Entity Number </H2>&#38;
  <H2>With Entity Name </H2>&amp;
</BODY>
```

Output

Using Special Character

With Entity Number

&

With Entity Name

&

- **Horizontal Rules Tag**

Explanation: The Horizontal Rules or Horizontal Line is used to draw a

Horizontal Line either for representing different section of Content, Horizontal Rule (HTML 4.01) or a thematic break (HTML 5). However, the Horizontal Rule Tag that displays a horizontal rule in visual browsers, but is now defined in semantic terms, rather than presentational terms.

Purpose: Used to insert a Horizontal line to separate content (or define a change) in a HTML Document.

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Type: Empty Tag.

Syntax: The HR Tag is used to display Horizontal Line in the HTML Document. Example: <HR >

Attributes:

- ALIGN: Sets the alignment of the Horizontal Rule according to the Webpage margins. Values = left, center, right. Example: ALIGN= “center”
- NOSHADE: Specifies that a Horizontal Rule should render in one solid color (noshaded), instead of a shaded color.Example: NOSHADE

- SIZE: Specifies the height of a Horizontal Rule. Value is given in pixels or %. Example: SIZE = 100
- WIDTH: Specifies the width of a Horizontal Rule. Value is given in pixels or %. Example: WIDTH = 100

Example 9: HTML programs to demonstrate Horizontal Rule Tag.

Solution:

```
<HEAD>
   <TITLE>HTML Horizontal Rule Tag </TITLE>
</HEAD>
<BODY>
```

```
<H1>HTML</H1>
<HR ALIGN="LEFT" NOSHADE SIZE=10
WIDTH=400>
<P>HTML is a language for developing Webpages
of a Webs
</BO
```

Output

1.7 LISTS

Explanation: The information or the content can be represented in the form of list in the HTML Documents. In HTML the list can be represented in two ways, Ordered List and Unordered List.

Purpose: Used to represent the contents in form of Ordered List (sequential Numbers/Alphabets) or Unordered List (Bullets) in a HTML Document.

Type: Container Tag.

•**Ordered List Tag:**An ordered list is represents list of items that are marked with

Numbers/Alphabets.

Syntax:

- An Ordered list starts with the opening <OL> tag and ends with Closing </OL> Tag having list of Items in between.
- Each list item starts with the opening <LI> tag and ends with Closing </LI> Tag having in between one Item name per <LI>...</LI> tag.
- By default the list items will be marked with number.

Attributes:

TYPE: Defines the type of the list item marker as mentioned below.
- TYPE="1" : List items will be marked with numbers (Default).
- TYPE="A" : List items will be marked

with uppercase letters. ○ TYPE="a" : List items will be marked with lowercase letters. ○ TYPE="I" : List items will be marked with uppercase roman numbers.

- TYPE="i" : List items will be marked with lowercase roman numbers.

Example 10: HTML programs to demonstrate Ordered List Tag.

Solution:

```
<HEAD>
   <TITLE>HTML Ordered List Tag </TITLE>
</HEAD>
```

```
<BODY>
    <H2>Ordered List with Alphabets</H2>
     <OL type="A">
    <LI>List Item 1</LI>
    <LI>List Item 2</LI>
    <LI>List Item 3</LI>
     </OL>
</BODY>
```

Output

Ordered List with Alphabets

A. List Item 1
B. List Item 2
C. List Item 3

•**Unordered List Tag:**An ordered list is represents list of items that are marked with Particular Symbols called as Bullets.

Syntax:

- An Unordered list starts with the opening <UL> tag and ends with Closing </UL> Tag having list of Items in between.
- Each list item starts with the opening <LI> tag and ends with Closing </LI> Tag having in between one Item name per <LI>...</LI> tag.
- By default the list items will be marked with small black circles Bullets.

Attributes:

TYPE: Defines the type of the list item marker as mentioned below. ○ TYPE="disc" : List items will be marked with a small black circle Bullet

(default).

○ TYPE="circle" : List items will be marked with a circle. ○ TYPE="square" : List items will be marked with a Square.

○ TYPE="none" : List items will not be marked.

Example 11: HTML programs to demonstrate Unordered List Tag. **Solution:**

```
<HEAD>
   <TITLE>HTML Ordered List Tag </TITLE>
</HEAD>
<BODY>
   <H2>Unordered List with Circle Bullets</H2>
   <UL type="circle">
   <LI>List Item 1</LI>
   <LI>List Item 2</LI>
   <LI>List Item 3</LI>
     </UL>
```

</BODY>

Output	

1.8 META ELEMENT TAG

Explanation: The Meta Element Tag of HTML provides Metadata that signifies data/information about another data. Metadata is machine parsable and is not displayed on the Webpage.

Purpose: The Meta Elements are usually used to specify page description, keywords, author of the document, last modified and another metadata. The metadata or the information about another data can be used by browsers to display content or reload page, Search Engine's keywords and even other Web Services.

Type: Empty Tag. **Syntax:**

- The <META> tags are embedded within <HEAD> Tag of HTML Document.
- Metadata is always passed as name/value pairs. **Attributes:**
- NAME: Specifies a name for the metadata. Values = application-name, author, description, generator, keywords and viewport.

- CONTENT: Gives the value associated with the http-equiv or name attribute. Values = text.
- HTTP-EQUIV: Provides an HTTP header for the information/value of the content attribute. Values = content-type, default-style, refresh.

Example 12: HTML programs to demonstrate Meta Tag. **Solution:**

```
<HEAD>
 <TITLE>HTML Meta Tag </TITLE>
 <META NAME="description" CONTENT="Description for Website">
```

```
    <META NAME="keywords" CONTENT="HTML, CSS, XML, JavaScript">
    <META NAME="author" content="Mr. XYZ">
    <META NAME="viewport" content="width=device-width, initial-scale=1.0">
  </HEAD>
  <BODY>
  <P>!!!All Meta Data/ information go in the Head section of HTML Document!!!</P>
  </BODY>
```

Output

!!!All Meta Data/ information go in the Head section of HTML Document!!!

1.9 LET US SUM UP

Hello Friends, now as you have completed this unit, you should be able to learn the concept, working and importance of Hyper Text markup Language. The various HTML Tags like formatting; paragraph; Heading; Link; Images; Special Characters; Horizontal Rules; Lists and meta element tag attributes, purpose and implementation should have been understood.

1.10 CHECK YOUR PROGRESS

- Define:Hyper Text Markup Language and HTML Tags.
- _____Tag starts a new line where paragraph is not required in HTML Document. [<p>, <BR>, <!-->, None of these]
- Full form for below
  - HTML
  - SGML
  - WYSIWYG
- HTML has 10 levels of Headings represented by Heading Tags.[True/False].
- The Entity Name for Trademark Special Character is _____.

- The HTML Tags can be _____and _____Tags. [Specific/Container/Empty/Core]

1.11 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- Definition:

  Hyper Text Markup Language: Hypertext Markup Language (HTML) is the standard markup language mainly used for developing Webpages of a Website that can even be called as a Web Application.

HTML Tags: HTML Tags also called as HTML Element is used to indicate the structure and format of a Web Document.

- **
** Tag starts a new line where paragraph is not required in HTML Document.
- Full forms
  - HTML : Hyper Text Markup Language
  - SGML : Standard Generalized Markup Language
  - WYSIWYG : What You See Is What You Get
- HTML has 10 levels of Headings represented by Heading Tags.**False**

➢ The Entity Name for Trademark Special Character is™

The HTML Tags can be **Container** and **Empty** Tags. ➢

1.12 FURTHER READING

Online Reference Reading as PDF:

http://egyankosh.ac.in/bitstream/123456789/9954/1/Unit-2.pdf

[About Basic HTML Tags Pg. 31-43]

Online Reference Reading as Video:

- https://www.youtube.com/watch?v=QEtWL4lWlL4&list=PLFDF119180A90877 9 [About HTML tags]
- https://www.youtube.com/watch?v=omuyzDmNaf4 [About HTML tags]

13. ASSIGNMENTS

1. Explain the Structure of a HTML Document
2. Write Steps to Create a HYML Document.
3. Give difference between :
   a. External and Internal Link Tag of HTML.
   b. Ordered and Unordered List of HTML
4. Write a short note on Image Tag of HTML.
5. How to insert a Horizontal Line in HTML Document? Explain.

1.14 ACTIVITIES

Creative Zone:

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

- Design a Webpage using Image, Link, paragraph and Horizontal Line Tag.
- “Hypertext Markup Language is the standard and most powerful markup language for creating web pages and web applications”, justify the statement in your opinion.

Code Zone:

Note: All the activities can be performed taking reference of all Examples provided in this Unit.

sequential

Write a Program in HTML for HTML Document to:

- Create a First HTML Webpage having basic HTML Tags.
- Demonstrate <H1> to <H6> Heading Tags.
- Create External link of: Text, Image and Email.
- Generate an Internal Link within a HTML Document.
- Insert an Image in Background and any desired location • Insert a Special Character Copyright © Symbol.
- Insert a Horizontal Line between two paragraphs.
- Generate an Ordered List for 3 items of Type “1”.
- Generate an Unordered List for 3 items of Type “square”.
- Execute Meta Element Tag.

Unit 2: Designing HTML

Table 2

Unit Structure

1. Learning Objectives.
2. Introduction to Designing Tables in HTML.

3. HTML Table Main Tags.
4. <TABLE> Tag.
5. <CAPTION> Tag.
6. <TH> Tag.

2.7. <TR> Tag. 2.8. <TD>

Tag.

9. Let us sum up.
10. Check your Progress.
11. Check your Progress: Possible Answers.
12. Further Reading.
13. Assignment.

2.14. Activities.

2.1 LEARNING OBJECTIVE

Hello Learners, in the Block 2 - Unit 2you will be able to learn and understand Designing HTML Table Using Hyper Text Markup Language and its associated Attributes used to incorporate a table in a Webpage of a Website. After studying this Unit student should be able to:

- Organize Data in form of Tables in Webpage using <TABLE> Tag.
- Provide Title to a Table using <CAPTION> Tag.
- Format table using Table Tag attributes like: BORDER, BORDERCOLOR, FRAME, RULES, CELLSPACING, CELLPADDING, ALIGN, BGCOLOR, HEIGHT AND WIDTH.
- Give Table Heading using Table Heading <TH> Tag.

- Insert and manage Table Row using <TR> Tag.
- Add the data in the Table Cell using <TD> Tag and its attributes.

2.INTRODUCTION TO DESIGNING TABLES IN HTML

Explanation:

- A table is a grid structured into columns and rows like a Spreadsheet in a Webpage of a Website Design.
- A Table is a collection of related data arranged in from of cells, rows and columns in a tabular format.

- The Data in Cell can be in form of text, Hyperlinks, images, nested tables or other.
- The tables are considered as two dimensional complex structures of rows and Columns of Cell
- An example of basic Table representation is shown in Table 1 below where the first Row represents Table Header Row 1/ Column 1,Table Header Row 2/ Column 2 and so on while the second row represents Table Row 1/Table Data 1, Table Row 2/Table Data 6 and so on.

Row 1/ Column 1	**Row 2/ Column 2**	**Row 3/ Column 3**	**Row 4/ Column 4**
Table Row 1/Table Data 1	Table Row 1/Table Data 2	Table Row 1/Table Data 3	Table Row 1/Table Data 4
Table Row 2/Table Data 5	Table Row 2/Table Data 6	Table Row 2/Table Data 6	Table Row 2/Table Data 8
.	.	.	.
.	.	.	.
.	.	.	.

Table 1: Basic Table Structure

Table Row	Table Row	Table Row	Table Row
N/Table Data N	N/Table Data N	N/Table Data N	N/Table Data N

Table Header Table Header Table Header Table

Header

Purpose: The Table in Webpage a technique to organize and display data in columns and rows that can be useful for:

- Numeric and Text Data summary and presentation.
- Category wise communication.
- Results Displays.
- Comparative Data Analysis.
- Creating Database

2.3 HTML TABLE MAIN TAGS

Explanation: The main Tag is used to design the basic structure of table. All the Tags and sub-Tags are Container

Tags. The main tags used to create a Table in HTML are listed and defined in the below Table 2.

Table 2: HTML TABLE MAIN TAGS

Tag	**Description**
<TABLE>... </TABLE>	• Defines a Table with this tag. • It is used to insert table on a Webpage of a Website.
	• Tag wraps up a table and all its related elements.
<CAPTION>...</CAPTION>	• Defines a caption of a Table.

	Used to describe • the Title for the Table.
<TH>...<TH>	• Stands for Table Header. • Defines Table's Header. • By default the contents declared as Table Header are displayed in a unique style format i.e. bold.

<TR>...</TR>	• Stands for Table Row. • Defines Table's each Row. • Used to begin new row in a Table.
<TD>...</TD>	• Stands for Table Data. • Defines Table's Data of each cell. • Using it data cells is described.

Note for Practical: All the Sample code given in Examples must be typed in notepad with entire HTML Structure

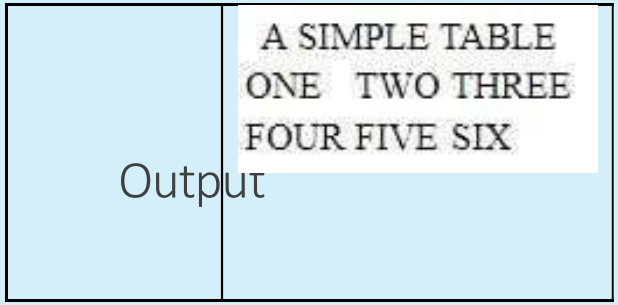
saved with .html or .htm extension and finally open in web browser to get the output.

Example 1: HTML program to demonstrate basic Table Tag and its utility in HTML Document.

Solution:

```
<HEAD>
   <TITLE>HTML TABLE MAIN TAGS</TITLE>
</HEAD>
<BODY>
    <TABLE>
       <CAPTION>A SIMPLE TABLE</CAPTION>
```

```
                <TR>
                  <TD>ONE</TD>
                   <TD>TWO</TD>
<TD>THREE</TD>                    </TR>
                <TR>
                  <TD>FOUR</TD>
                  <TD>FIVE</TD>
                   <TD>SIX</TD>
                </TR>
    </TABLE>
</BODY>
```



2.4 <TABLE> TAG

Explanation: The <TABLE> Tag is the main external tag within which all the other tags used to create a Table structure are defined.

Purpose: Creates a Table like structure in a Webpage of a Website in a HTML Document.

Type: Container Tag

Syntax: The table grid is created by enclosing table details with opening <TABLE> Tag and a Closing </TABLE> Tag. Example : <TABLE>... Other related tags used to create a Table ... </TABLE>

Attributes: The <TABLE> Tag has various attributes that contribute to formatting and customization of the Table Structure. The <TABLE> Tag attributes are listed and described in the below.

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- **<TABLE> Tag BORDER Attribute:** The BORDER attribute is used to specify the border of a Table in a Webpage of a Website of HTML Document. The value of the attribute is given in pixel. Like : <TABLE BORDER=3>...</TABLE>

Example 2: HTML programs to demonstrate BORDER attribute of <TABLE> Tag.

Solution:

```
<HEAD>
   <TITLE>HTML TABLE BORDER ATTRIBUTE</TITLE>
</HEAD>
```

```
<BODY>
   <TABLE BORDER=1>
      <CAPTION>A SIMPLE TABLE</CAPTION>
         <TR>
            <TD>ONE</TD>
<TD>TWO</TD>
<TD>THREE</TD>
         </TR>
         <TR>
           <TD>FOUR</TD>
           <TD>FIVE</TD>
           <TD>SIX</TD>
```

</TR>

</TABLE> **</BODY>**

OUTPUT	A SIMPLE TABLE ONE TWO THREE FOUR FIVE SIX

- **<TABLE> Tag BORDERCOLOR Attribute:** The BORDERCOLOR Attribute is used to specify the Border Color of a Table in a Webpage of a Website of HTML Document. The value of the attribute is given in Hexa value or Color Name. Like : <TABLE BORDERCOLOR= “green”>...</TABLE>

Example 3: HTML programs to demonstrate BORDERCOLOR attribute of <TABLE> Tag.

Solution:

```
<HEAD>
    <TITLE>HTML TABLE BORDERCOLOR ATTRIBUTE</TITLE> </HEAD>
  <BODY>
   <TABLE BORDER=1 BORDERCOLOR="red">
      <CAPTION>A SIMPLE TABLE</CAPTION>
         <TR>
```

```
                    <TD>ONE</TD>
<TD>TWO</TD>
<TD>THREE</TD>
                </TR>
                <TR>
                  <TD>FOUR</TD>
                  <TD>FIVE</TD>
                  <TD>SIX</TD>
                </TR>
</TABLE>        </BODY>
```

OUTPUT

A SIMPLE TABLE

ONE	TWO	THREE
FOUR	FIVE	SIX

- **<TABLE> Tag BGCOLOR Attribute:** The BGCOLOR Attribute is used to specify the background color of a Table in a Webpage of a Website of HTML Document. The value of the attribute is given in Hexa value or Color Name.

  Like : <TABLE BGCOLOR= “green”>...</TABLE>

  Example 4: HTML programs to demonstrate BGRCOLOR attribute of

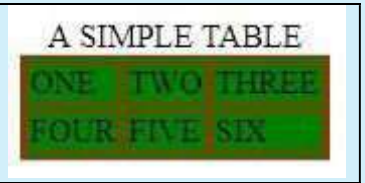
  <TABLE> Tag.

  Solution:

  <HEAD>

```
<TITLE>HTML TABLE BGCOLOR ATTRIBUTE</TITLE>
</HEAD>
<BODY>
<TABLE BORDER=1 BORDERCOLOR="red"
BGCOLOR="green">
<CAPTION>A SIMPLE TABLE</CAPTION>
<TR>
<TD>ONE</TD>
<TD> TWO</TD>
<TD>THREE</TD>
</TR>
```

```
            <TR>
              <TD>FOUR</TD>
              <TD>FIVE</TD>
              <TD>SIX</TD>
            </TR>
        </TABLE>
    </BODY>
```

OUTPUT	

- **<TABLE> Tag BACKGROUND Attribute:** The BACKGROUND Attribute is used to set an image as the

background of a Table in a Webpage of a Website of HTML Document. The value of the attribute will be path of an image. Like :

<TABLE BACKGROUND = “baba_img_n.jpg”> ...</TABLE> **Example 5:** HTML programs to demonstrate BGRCOLOR attribute of

<TABLE> Tag.

Solution:

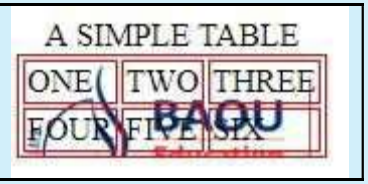
<HEAD>

<TITLE>HTML TABLE BACKGROUND ATTRIBUTE**</TITLE>**

</HEAD>

```
<BODY>
<TABLE      BORDER=1 BORDERCOLOR="red"
      BACKGROUND="baou_logo_n.png">
     <CAPTION>A SIMPLE TABLE</CAPTION>
          <TR>
           <TD>ONE</TD>

           <TD>TWO</TD>


          <TD>THREE</TD>
          </TR>
          <TR>
           <TD>FOUR</TD>
           <TD>FIVE</TD>
```

```
<TD>SIX</TD>
</TR>
</TABLE>
</BODY>
```

OUTPUT	

- **<TABLE> Tag FRAME Attribute:** The FRAME Attribute allows to state which portion of the border in a Table of a Webpage in a Website of HTML Document will be displayed (render). The values of the attribute that can be specified for

FRAME attribute are: above - displays top edge only. below – displays bottom edge only.

border – displays all four sides. box – display all four sides(like border).

hsides – displays top and bottom edges.

lhs – displays left edge only. rhs – displays right edge only.

void – displays no border.

vsides – displays left and right sides.

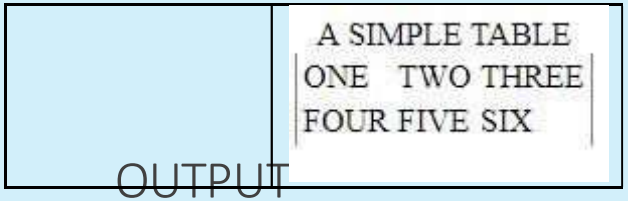
Example : <TABLE FRAME = “above”> ...</TABLE>

Example 6: HTML programs to demonstrate FRAME attribute of <TABLE> Tag.

Solution:

```
<HEAD>
   <TITLE>HTML TABLE FRAME ATTRIBUTE</TITLE>
</HEAD>
<BODY>
   <TABLE FRAME ="vsides">
      <CAPTION>A SIMPLE TABLE</CAPTION>
         <TR>
```

```
                    <TD>ONE</TD>
<TD>TWO</TD>
<TD>THREE</TD>
                </TR>
                <TR>
                  <TD>FOUR</TD>
                  <TD>FIVE</TD>
                  <TD>SIX</TD>
                </TR>
  </TABLE>      </BODY>
```



- **<TABLE> Tag RULES Attribute:** The RULES Attribute like FRAME attribute also deals with the BORDER attribute, differs that RULES deals with the inside border edges in a Table of a Webpage in a Website of HTML Document. The values of the attribute that can be specified for RULES attribute are: all – displays all borders.

  cols – displays border between cells.

groups – displays borders between all cell

group none – hides all interior borders.

rows – displays borders between rows only.

Like : <TABLE RULES = “cols”> ...</TABLE>

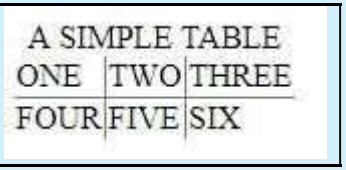
Example 7: HTML programs to demonstrate RULES attribute of <TABLE> Tag.

Solution:

```
<HEAD>
<TITLE>HTML TABLE RULES ATTRIBUTE</TITLE>
</HEAD>
<BODY>
```

```
<TABLE RULES ="all">
    <CAPTION>A SIMPLE TABLE</CAPTION>
        <TR>
         <TD>ONE</TD>

         <TD>TWO</TD>


        <TD>THREE</TD>
        </TR>
        <TR>
         <TD>FOUR</TD>
         <TD>FIVE</TD>
          <TD>SIX</TD>
        </TR>
```

```
</TABLE>
  </BODY>
```

OUTPUT	

•**<TABLE> Tag CELLSPACING Attribute:** The CELLSPACING Attribute specifies the amount of space between cells of a Table in a Webpage of a Website in HTML Document. The values of the CELLSPACING attribute can be specifies in pixels OR percentage.

Like : <TABLE CELLSPACING=1> ...</TABLE>

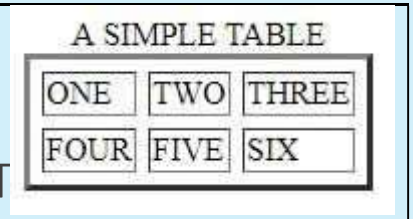
Example 8: HTML programs to demonstrate CELLSPACING attribute of <TABLE> Tag.

Solution:

```
<HEAD>
    <TITLE>HTML TABLE CELLSPACING ATTRIBUTE</TITLE>
</HEAD>
<BODY>
<TABLE BORDER=3 CELLSPACING=6>
    <CAPTION>A SIMPLE TABLE</CAPTION>
        <TR>
```

```
                    <TD>ONE</TD>
<TD>TWO</TD>
<TD>THREE</TD>
                </TR>
                <TR>
                  <TD>FOUR</TD>
                  <TD>FIVE</TD>
                  <TD>SIX</TD>
                </TR>
      </TABLE>
      </BODY>
```

OUTPUT



- **<TABLE> Tag CELLPADDING Attribute:** The CELLPADDING attribute specifies the amount of space between the cell border and the cell contents of a Table in a Webpage of a Website in HTML Document. In other words it can be used to specify the space between cell boundary and text. The values of the CELLPADDING attribute can be specifies in pixels OR percentage. Like : <TABLE CELLPADDING =1> ...</TABLE>

Example 9: HTML programs to demonstrate CELLPADDING attribute of <TABLE> Tag.

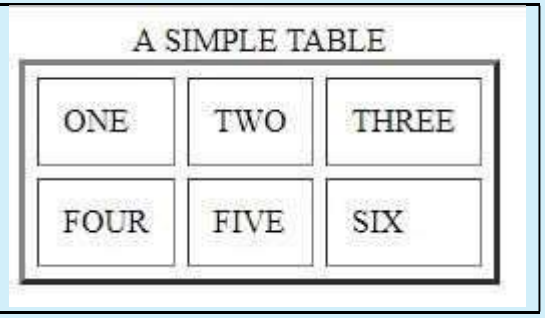
Solution:

```
<HTML>
  <HEAD>
    <TITLE>HTML TABLE CELLPADDING ATTRIBUTE</TITLE>
  </HEAD>
  <BODY>
    <TABLE BORDER=3 CELLSPACING=6 CELLPADDING=12>
      <CAPTION>A SIMPLE TABLE</CAPTION>
```

```
<TR>
 <TD>ONE</TD>

 <TD>TWO</TD>


<TD>THREE</TD>
</TR>
<TR>
 <TD>FOUR</TD>
 <TD>FIVE</TD>
 <TD>SIX</TD>
</TR>

</TABLE>
```

```
</BODY>
</HTML>
```

OUTPUT



- **<TABLE> Tag ALIGN Attribute:** The ALIGN attribute is used to align the Table in Left, Center or Right in HTML Document. The values of the ALIGN attribute are left, center and right.Like : <TABLE ALIGN =“center”> ...</TABLE>

  Example 10: HTML programs to demonstrate ALIGN attribute of <TABLE>

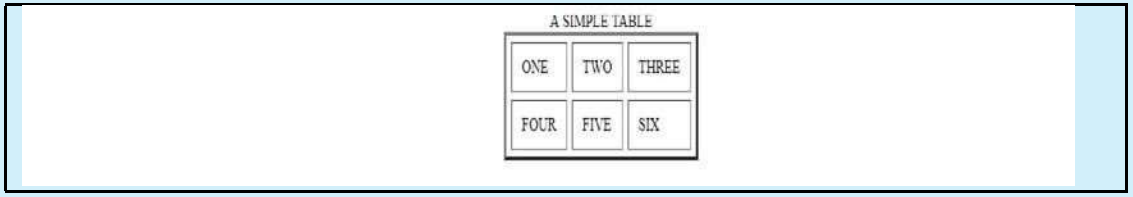
Tag.

Solution:

```
<HEAD>
   <TITLE>HTML TABLE ALIGN ATTRIBUTE</TITLE>
</HEAD>
<BODY>
      <TABLE BORDER=3 CELLSPACING=6
      CELLPADDING=12   ALIGN="CENTER">
       <CAPTION>A SIMPLE TABLE</CAPTION>
          <TR>
           <TD>ONE</TD>
```

```
        <TD>TWO</TD>
        <TD>THREE</TD>
        </TR>
        <TR>
         <TD>FOUR</TD>
         <TD>FIVE</TD>
          <TD>SIX</TD>
        </TR>

</TABLE>
  </BODY>
```

OUTPUT



- **<TABLE> Tag HEIGHT AND WIDTH Attribute:** The HEIGHT AND WIDTH attribute is used to specify the height and width of the table respectively. The values of the HEIGHT AND WIDTH attribute can be specifies in pixels OR percentage.Like : <TABLE HEIGHT = “100px” WIDTH =“40px”> ...</TABLE>

  Example 11: HTML programs to demonstrate HEIGHT AND WIDTH attribute of <TABLE> Tag.

  Solution:

```
<HEAD>
<TITLE>HTML TABLE HEIGHT AND WIDTH ATTRIBUTE</TITLE>
</HEAD>
<BODY>
    <TABLE BORDER=3 CELLSPACING=6
        CELLPADDING=12 HEIGHT="200px"
        WIDTH="80px" >
    <CAPTION>A SIMPLE TABLE</CAPTION>
        <TR>
        <TD>ONE</TD>
```

```
        <TD>TWO</TD>
      <TD>THREE</TD>
      </TR>
      <TR>
       <TD>FOUR</TD>
       <TD>FIVE</TD>
        <TD>SIX</TD>
      </TR>

</TABLE>
  </BODY>
```

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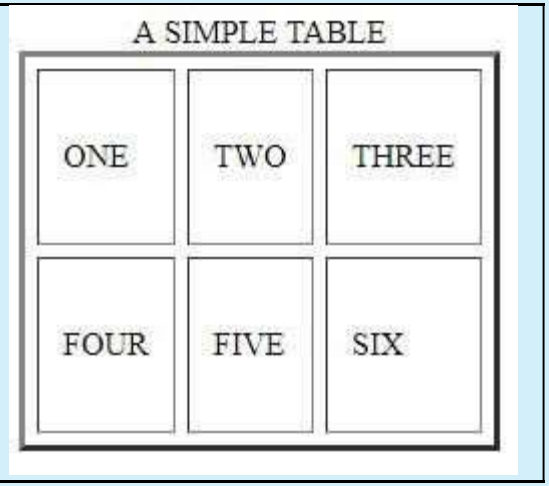
OUTPUT	

2.5 <CAPTION> TAG

<CAPTION> Tag: The <CAPTION> TAG <TABLE> Tag defines the title of a Table attribute in a HTML Document. The Title is written

in between the opening <CAPTION>and closing </CAPTION> Tag. This tag is specified opening <TABLE> and closing </TABLE> Tag.Like : **<CAPTION>**Table Title **</CAPTION>**

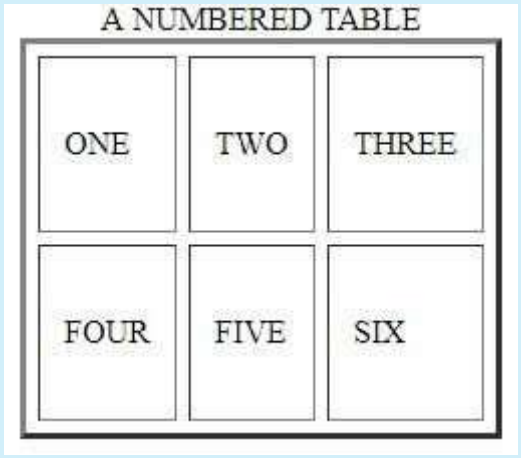
Example 12: HTML programs to demonstrate <CAPTION> TAG.

Solution:

```
<HEAD>
 <TITLE>HTML TABLE CAPTION TAG</TITLE>
</HEAD>
<BODY>
```

```
<TABLE BORDER=3 CELLSPACING=6
      CELLPADDING=12      HEIGHT="200px"
      WIDTH="80px" >
<CAPTION>A NUMBERED TABLE</CAPTION>
      <TR>
        <TD>ONE</TD>
         <TD>TWO</TD>
<TD>THREE</TD>
      </TR>
      <TR>
            <TD>FOUR</TD>
            <TD>FIVE</TD>
```

```
</TR>
</TABLE> <TD>SIX</TD>
</BODY>
```

OUTPUT	

2.6 <TH> TAG

<TH> Tag: The Table Header <TH> Tag is used to specify a Header Row within a Table in a HTML Document. The Header Text is written in between the opening

<TH>and closing </HR> Tag. This tag is specified opening <TABLE> and closing </TABLE> Tag. The content specified between Header Row is formatted distinctly as

Bold. Like: **<TH>**Header Text **</TH>**

Example 13: HTML programs to demonstrate <TH> TAG.

Solution:

```
<HEAD>
 <TITLE>HTML TABLE HEADER ROW TAG</TITLE>
</HEAD>
```

```
<BODY>
  <TABLE BORDER=3 CELLSPACING=6
CELLPADDING=12
  HEIGHT="200px" WIDTH="80px" >
    <CAPTION>A NUMBERED TABLE</CAPTION>
      <TR>
        <TH>HEADER ROW 1</TH>
        <TH>HEADER ROW 2</TH>
        <TH>HEADER ROW 3</TH>
      </TR>
      <TR>
```

```
                <TD>ONE</TD>
<TD>TWO</TD>
<TD>THREE</TD>
            </TR>
            <TR>
              <TD>FOUR</TD>
              <TD>FIVE</TD>
              <TD>SIX</TD>
            </TR>
      </TABLE>
</BODY>
```

OUTPUT

A NUMBERED TABLE

HEADER ROW 1	HEADER ROW 2	HEADER ROW 3
ONE	TWO	THREE
FOUR	FIVE	SIX

2.7 <TR> TAG

<TR> Tag: The Table Row <TR> Tag is used to specify a Table Row within a Table in a HTML Document. The Table Row Text is written in between the opening <TR>and closing </TR> Tag. This

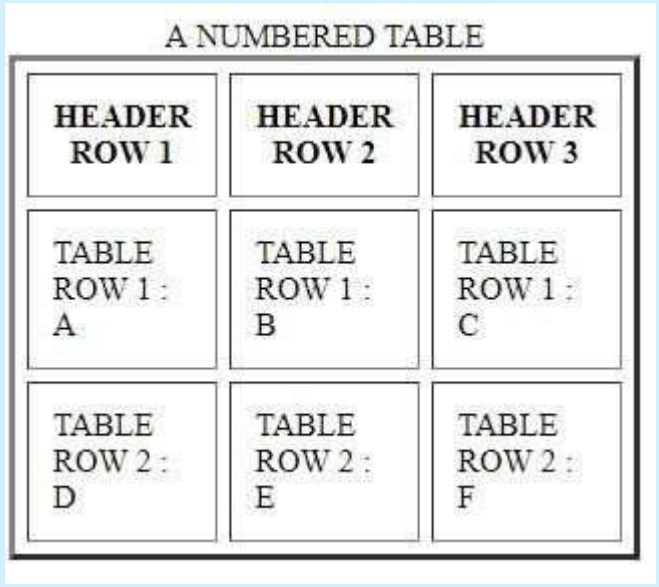
tag is specified opening <TABLE> and closing </TABLE> Tag. Every row in a Table is specified with separate opening <TR>and closing </TR> Tag, that means total number of rows will be equivalent to total number of opening <TR>and closing </TR> Tag. Like: **<TR>...</TR>** **Example 14:** HTML programs to demonstrate <TR> TAG.

Solution:

```
<HEAD>
 <TITLE>HTML TABLE ROW TAG</TITLE>
</HEAD>
<BODY>
```

```
<TABLE BORDER=3 CELLSPACING=6 CELLPADDING=12
    HEIGHT="200px" WIDTH="80px" >
    <CAPTION> A NUMBERED TABLE</CAPTION>
        <TR>
          <TH>HEADER ROW 1</TH>
          <TH>HEADER ROW 2</TH>
          <TH>HEADER ROW 3</TH>
        </TR>
        <TR>
          <TD>TABLE ROW 1: A</TD>
        <TD>TABLE ROW 1: B</TD>
        <TD>TABLE ROW 1: C</TD>
```

```
            </TR>
            <TR>
              <TD>TABLE ROW 2: D</TD>
              <TD>TABLE ROW 2: E</TD>
              <TD>TABLE ROW 2: F</TD>
            </TR>
        </TABLE>
</BODY>
```

OUTPUT	

2.8 <TD> TAG

<TD> Tag: The Table Data <TD> Tag is used to specify a Table Data within a Row of a Table in a HTML Document. The Table

Data Text is written in between the opening <TD>and closing </TD> Tag. This tag is specified main opening <TABLE>, opening <TR>, closing </TR> Tag and closing </TABLE> Tag. Every Table data that means Cell Data in a Table is specified with separate opening <TD>and closing </TD> Tag, that means total number of cell will be equivalent to total number of opening <TD>and closing </TD> Tag. Like: **<TD>Cell Text</TD>** **Example 15:** HTML programs to demonstrate <TD> TAG.

Solution:

```
<HEAD>
   <TITLE>HTML TABLE DATA TAG</TITLE>
</HEAD>
```

```
<BODY>
    <TABLE BORDER=3 CELLSPACING=6
    CELLPADDING=12 HEIGHT="200px"
    WIDTH="80px" >
     <CAPTION> A NUMBERED TABLE</CAPTION>

        <TR>
          <TH>HEADER ROW 1</TH>
          <TH>HEADER ROW 2</TH>
          <TH>HEADER ROW 3</TH>
        </TR>
        <TR>
          <TD>TABLE ROW 1: Cell DATA 1</TD>
```

```
                <TD>TABLE ROW 1: Cell DATA
                2</TD>
              <TD>TABLE ROW 1: Cell DATA 3</TD>

            </TR>
            <TR>
              <TD>TABLE ROW 2: Cell DATA 4</TD>
              <TD>TABLE ROW 2: Cell DATA 5</TD>
              <TD>TABLE ROW 2: Cell DATA 6</TD>
            </TR>
        </TABLE>
    </BODY>
```

OUTPUT

A NUMBERED TABLE

HEADER ROW 1	HEADER ROW 2	HEADER ROW 3
TABLE ROW 1 : Cell DATA 1	TABLE ROW 1 : Cell DATA 2	TABLE ROW 1 : Cell DATA 3
TABLE ROW 2 : Cell DATA 4	TABLE ROW 2 : Cell DATA 5	TABLE ROW 2 : Cell DATA 6

- **Attributes of <TD> tag:** The <TD> Tag has a list of attributes that can be used to format the Table Data content as well as enhance the table features.The various <TD> Tag attributes are specified in the below Table 3.

<TD> Tag Attributes	Description
ALIGN	Specified to control the horizontal alignment of the contents of a cell. The values of the ALIGN attribute are left, center and right. Example : <TD ALIGN =“center”> ...</TD>

Table 3: <TD> Tag Attributes

WIDTH	Specified to define width of cells. WIDTH attribute can be specifies in pixels OR percentage. Example : <TD WIDTH =“40px”> ...</TD>
BACKGROUND	Specified to set an image as background in a data cell. The value of the attribute will be path of an image.

	Example : <TD BACKGROUND = “baba_img_n.jpg”> ...</TD>
BGCOLOR	Specified to change background color of data cells. The value of the attribute is given in Hexa value or Color Name. Example : <TD BGCOLOR= “green”>...</TD>

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ROWSPAN	Used to specify the span of a cell. The value is given in numbers. Example : <TD ROWSPAN= 2>...</TD>
COLSPAN	Used to specify the span of a cell. The value is given in numbers. Example : <TD COLSPAN= 2>...</TD>

VALIGN	Specifies the vertical alignment when cells has span of more than one row. The values can be : Top, Middle and Bottom. <TD VALIGN =“MIDDLE”>...</TD>

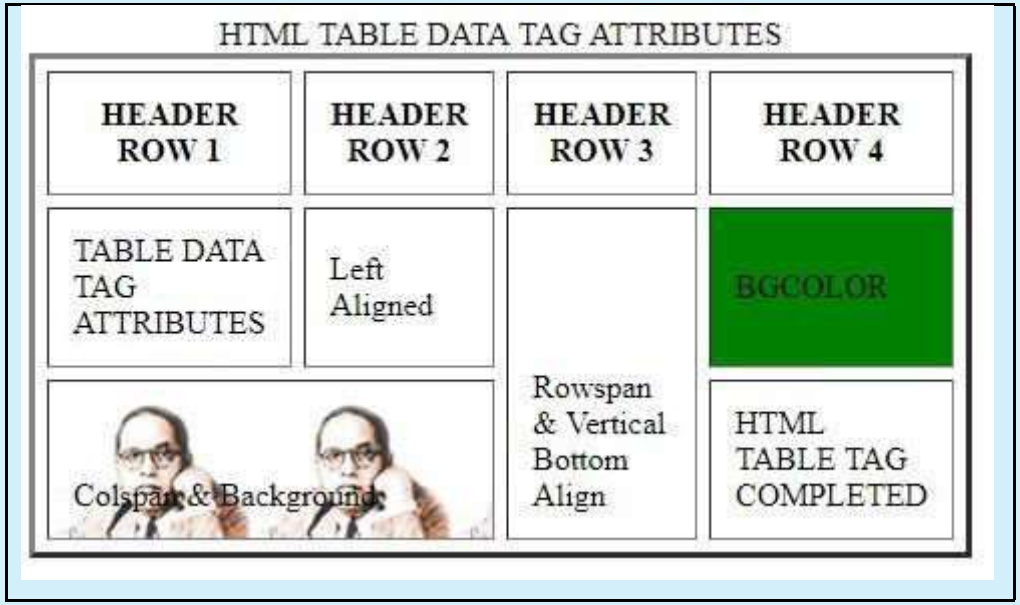
Example 16: HTML programs to demonstrate Attributes of <TD> Tag. **Solution:**

```
<HEAD>
 <TITLE>HTML TABLE DATA TAG ATTRIBUTES</TITLE>
</HEAD>
<BODY>
  <TABLE BORDER=3 CELLSPACING=6
CELLPADDING=12
        HEIGHT="200px" WIDTH="80px" >
      <CAPTION>HTML TABLE DATA TAG
ATRIBUTES</CAPTION>
        <TR>
            <TH>HEADER ROW 1</TH>
```

```
<TH>HEADER ROW 2</TH>
<TH>HEADER ROW 3</TH>
<TH>HEADER ROW 4</TH>
</TR>
<TR>
<TD>TABLE DATA TAG ATTRIBUTES</TD>
<TD ALIGN="LEFT" >Left Aligned</TD>
<TD ROWSPAN=2 VALIGN="BOTTOM">Rowspan &
Vertical Bottom
Align</TD>
<TD BGCOLOR="GREEN">BGCOLOR</TD>
</TR>
<TR>
```

```
<TD COLSPAN=2 BACKGROUND="baba_img_n.jpg"
                    VALIGN="BOTTOM">Colspan &
                    Background</TD>
                <TD >HTML TABLE TAG COMPLETED
            </TD>
        </TABLE>
    </BODY>
```

OUTPUT



Friends, some Other <TABLE> Tags that are seldom used due to some deformity constraints of a table are:

- **<THEAD> Tag**: Specifies a set of header rows. The constraint is that it can be specified only one time in a table within a HTML Document.

- **<TBODY> Tag:** Specifies the table body. Similar constrains as <THEAD> that it can be specified only one time in a table within a HTML Document.

- **<TFOOT> Tag:** Specifies a set of footer rows. Similar constrains as <THEAD> and <TBODY> that it can be specified only one time in a table within a HTML Document.

2.9 LET US SUM UP

Hello Friends, now as you have completed this unit, you should be able to learn the concept of Designing Tables in HTML. Along with this you must have understood HTML Table Tags like HTML Table Main Tags, <TABLE> Tag, <CAPTION> Tag, <TH> Tag, <TR> Tag and <TD> Tag.

C

HE

CK

YOUR PROGRESS

- Define: HTML Table and <TABLE> Tag.
- The _____Attribute is used to specify the background color of a Table in a Webpage of a Website of HTML Document. [BGCOLOR,BACKGROUND, BORDERCOLOR, NONE OF THIS]
- Give full form for below :
    - TH

- TR
- TD

- The CELLPADDING Attribute specifies the amount of space between cells of a Table in a Webpage of a Website in HTML Document. [True/False]
- The CELLSPACING attribute specifies the amount of space between the cell border and the cell contents of a Table in a Webpage of a Website in HTML Document.[True/False]
- The <CAPTION> TAG <TABLE> Tag defines the _____of a Table attribute in a HTML Document. [Title/Caption/Header/Footer]

2.11 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

➢ **Definition:**

- HTML Table: A table is a grid structured into columns and rows like a Spreadsheet in a Webpage of a Website Design.
- <TABLE> Tag: The <TABLE> Tag is the main external tag within which all the other tags used to create a Table structure are defined.

- The **BGCOLOR** Attribute is used to specify the background color of a Table in a Webpage of a Website of HTML Document. ➢

  Full forms are:

  - TH = Table Header
  - TR = Table Row
  - TD = Table Data

- The CELLPADDING Attribute specifies the amount of space between cells of a

  Table in a Webpage of a Website in HTML Document. **False**

- The CELLSPACING attribute specifies the amount of space between the cell border and the cell contents of a Table in a Webpage of a Website in HTML Document. **False**
- The <CAPTION> TAG <TABLE> Tag defines the **Title** of a Table attribute in a HTML Document.

2.12 FURTHER READING

Online Reference Reading as PDF:

https://www.w3.org/TR/html401/struct/tables.html [ABOUT HTML TABLE TAG]

Online Reference Reading as Video:

https://nptel.ac.in/courses/106105084/15[ABOUT HTML TABLE TAG]

13. ASSIGNMENTS

6. Give the purpose of Table in HTML Document.
7. List and explain HTML Table Main Tags.
8. Give difference between :
    a. <CAPTION> TAG VERSUS <TH> TAG

b.

R > TAG

VERSUS <TD> TAG

9. List and define all attributes of <TABLE> tag
10. Write a short note onattributes of <TD> tag.

2.14 ACTIVITIES

Creative Zone:

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

- Design a Table having all attributes of <TABLE> Tag.
- “The **HTML** <table> **element** represents tabular data — that is, information presented in a two-dimensional table comprised of rows and columns of cells containing data”, justify the statement in your opinion.

Code Zone:

Note: All the activities can be performed taking sequential reference of all Examples provided in this Unit.

Write a Program in HTML for HTML Document to:

- Create a Table having 2 Rows and three columns.

- Demonstrate Table Attributes: CAPTION, BORDER, BORDERCOLOR, BGCOLOR, BACKGROUND, CELLSPACING, CELLPADDING, ALIGN, HEIGHT, WIDTH.
- Create Table Header in a table having 2 Rows and three columns.
- Generate a Table :

Device	Brand	Feature
Mouse	Logitech	Wireless
Laptop	Lenovo	360 degree rotation

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Unit 3: Designing HTML Forms 3

Unit Structure

1. Learning Objectives.
2. Introduction to Designing Forms in HTML.
3. Processing Forms in HTML.

4.Creating Forms using HTML <FORM> TAG and <INPUT> Tag.

5. Text Input Controls.
6. Checkbox and Radio Option Control.
7. Select Box and File Select Box Control.
8. Hidden Controls.
9. Clickable, Submit and Reset Button Control.
10. Let us sum up.
11. Check Your Progress
12. Check your Progress: Possible Answers.
13. Further Reading.

14. Assignment.
15. Activities.

3.1 LEARNING OBJECTIVE

Hello Learners, in the Block 2 - Unit 3 you will be able to learn and understand

Designing HTML Forms Using Hyper Text Markup Language and its associated Attributes used to incorporate different Form Controls in a Webpage of a Website as following:

- Concept of Form in HTML Document.
- Creating and Designing Form in HTML Document using <FORM> Element.

- Adding HTML Form Controls in the HTML Document like :

  Different Text Inputs, Checkboxes, Radio Box, Select Box, File Select boxes, Hidden

  Controls, Clickable Buttons, Submit and Reset Buttons

3.2 INTRODUCTION TO DESIGNING FORMS in HTML

Friends, a Form are an element that is used to take input in form of some required data from the user/visitor with his/her consent in a Website for future/further reference. This type of

_____ form is known as Web Form. Example: Suppose any Internet user wants to use Email service of Website, before using any such service the user need to register on the Website with details like Name, Date of Birth, ID, Password, Contact Number and others.

Facts to Ponder:

- A HTML document can have multiple Forms in a document while the Form elements cannot be nested.
- The Forms in HTML Document can be coded effortlessly.

- Main Purpose of form is to collect User Inputs from Web Document.
- It supports to submit data from its controls to the Web Server.
- It is used to define and restrict the data input from User.
- The form can incorporate many controls like different types of Text field, Radio Buttons, Check boxes, Menu buttons, Scrolling lists, Buttons and others.

3.3 PROCESSING FORMS in HTML

Learners, broadly a Form in HTML document are used to display Information as well as it is a mode of communication between User and a Web Server. The processing of the HTML Document Form is elaborated below.

- The HTML Forms also known as Web-Forms/Fill-Out Forms firstly takes required inputs in a Form from the User/Visitor of a Website.
- The simplest and commonly used approach to manage the data submitted by user in HTML Form is, sending the information to a server side dedicated application developed mostly in scripting language or other platform.
- Following same the information is posted to a Back-end Application such as Common Gateway Interface (CGI) script written in Active Server Page or PHP or other residing on a Web Server. Nowadays the CGI Script are written in

Computer Languages like Perl and Python, while when fast processing is required it is written in C, C++ or JAVA.

- The information received on a Web Server will be processed as per the requirement by the backend script or a program having the well defined processing logic. In the Latest Trends the Server Side programming is replaces by another approach of processing the HTML Forms. The approach performs all processing through an Email where User/Visitor needs to first confirm the data/information to further progress the action before a backend Software handles all.

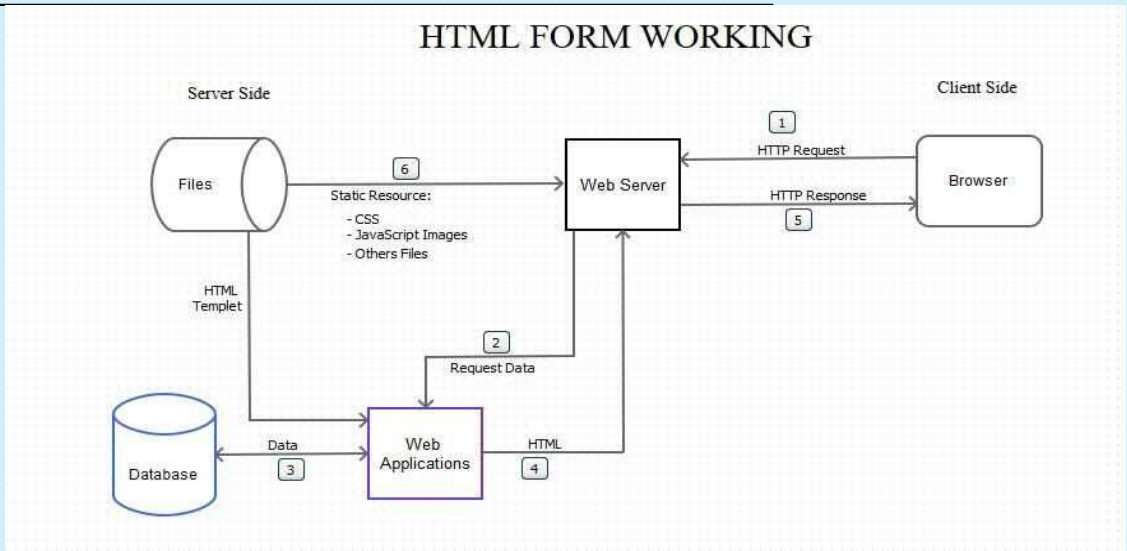

Figure 1: Process of Forms in HTML

The Figure 1 displays the User Side and Client Side HTML Form Processing that can be elaborated by below steps

Step 1: At Client Side the User/Visitor sends the HTTP requests through the Web

Browser to the Web Server for a Web Document having

Step 2: At Server side the Web Server Request the Data and sends information to the Backend Web Applications. The information is transferred to the Backend Application Software. The approach by which the data reached destination depends upon scripting logic. Usually the Web Application as well as CGI is developed by the same

developer hence the required encoded format can be customized according to the Website Owner.

Step 3: The Backend Web Applications at Server Side searches the data from the Database and receives the requested Data from the local Database and other related Database at Server end. The Backend Application Software can even process the information stored in database and even stores it at Database Server.

Step 4: The Web Application then submits the data to the Web Server. Step 5:

Step 5: A Webpage is generated by Backend Application Software that is returned as a response to the User/Visitor.

Step6: The Web Server even receives the Static Web Resources from File Database at Server End that is send as response to the User/Visitor at Client End so that he/she can further progress as per his/her requirement.

3.4 CREATING FORMS USING HTML <FORM> TAG AND <INPUT> TAG

- **<FORM> TAG**

Explanation: The HTML Forms are mainly use for user input from a Web Page as in some Email Service Providers website, E-

Commerce, Tutorials and other interactive websites. An HTML form contains Form Elements that are different types of input elements, like text fields, checkboxes, radio buttons, submit buttons, and more.

In the HTML structure the Web Form is defined in the <BODY> … </BODY> Tag section of HTML Structure as shown below:

```
<HTML>
    <HEAD>
      <TITLE>
      </TITLE>
    </HEAD>
    <BODY>
```

```
        <FORM>
         …
         …
         …
        </FORM>
      </BODY>
</HTML>
```

Purpose: Used to take various types of inputs of the User from the Webpage of HTML Document. **Type:** Container Tag **Attributes:**

- NAME: Denotes a specific unique name of FORM. Eg. : NAME=”UNIQUE” ○ ACTION: Defines the action to be

performed when the form is submitted. It is used to send the data of FORM to the web page on the server when the user clicks submit button.Example. : ACTION=”TOI.ASP”

- TARGET: Specifies if the submitted result will open in a new browser tab, a frame, or in the current window.The default value is "_self" which means the form will be submitted in the current window.To make the form result open in a new browser tab, use the value "_blank". Example. : TARGET=”_SELF”

- METHOD: Specifies the HTTP method (GET or POST) to be used when submitting the form data:
  - GET METHOD: When GET is used, the submitted form data will be visible in the page address field.
  - POST METHOD: The POST method does not display the submitted form data in the page address field.

    Example: METHOD=”post”

- **<INPUT> TAG**

Explanation: The <INPUT> element is the most important FORM element. The <INPUT> element can be displayed in several ways, depending on the type attribute.

Purpose: Specifies Input Control or field to receive the Input from the user in a webpage. Type: Empty Tag Attributes:

- NAME: Denotes a specific unique name of the input element. Example. :

  NAME= "StudentID"
- TYPE: Specifies the type of data collected through input field. Its values can be Text, checkbox, radio, select, file, hidden, submit, reset and others.

  Example:

<INPUT TYPE="text"> : Defines a one-line text input field<INPUT TYPE="radio"> : Defines a radio button (for selecting one of many choices)

<INPUT TYPE="submit"> : Defines a submit button (for submitting the form).

- CHECKED: Indicates that the input element is checked when it is loaded at first time in the Web Browser.
- VALUE: Defines the default value of the Element. Example. : VALUE="M.SC.(IT)"

Example 1: Program to demonstrate <FROM> TAG AND <INPUT> TAGSolution:

```
<BODY>
<FORM ACTION="</action_page.php>">
<H1> Details of Student </H1>
<HR><BR>
  Enter Your Name :<BR>
<INPUT TYPE="text" value="Student_name">
<BR>
<BR>
  Enter Your College Name :<BR>
<INPUT TYPE="text"   value="Clg_name">
```

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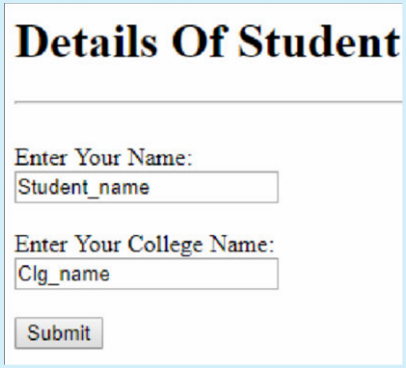
```
<BR><BR>
<INPUT TYPE="submit" value="Submit">
</FORM>
</BODY>
```

Output



Note for Practical: All the Sample code given in Examples **must be typed in notepad with entire HTML Structure saved with .html or .htm extension and finally open in web browser to get the output.**

---

5. TEXT INPUT CONTROLS

Explanation: **Specifies Text input from the user in a Webpage. There are 3 types of Text Input Controls:**

- Single-Line Text Input Control

- Password Input Control
- Multi-Line Text Input Controls
- **Single-Line Text Input Control:** This control is used for scenarios that require only one line of user input,such as search boxes or names. They are created using HTML < INPUT > tag but type attribute is set to Text.

Syntax :< INPUT TYPE="TEXT">

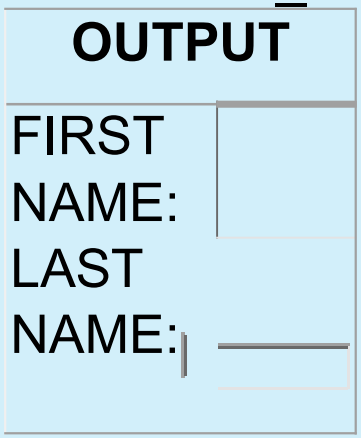
Attributes:

- TYPE: Indicates the type of input control and for text input control it will be set to text.

- NAME: Gives a name to the control which is sent to the server to be recognized and get the value.
- VALUE: Provides an initial value inside the control.
- SIZE: Allows specifying the maximum number of characters a user can enter into the text box.
- MAXLENGTH: Allows specifying the maximum number of characters a user can enter into the text box.

Example 2: **HTML program to demonstrateSingle-Line Text Input Control. Solution:**

FIRST NAME :< INPUT TYPE="TEXT" NAME="FIRST_NAME"/> LAST NAME :< INPUT TYPE="TEXT" NAME="LAST_NAME"/>



- Password Input Control: This is also a single-line text input but it masks the character soon as a user enters it. They are also created using HTML < INPUT > tag but type attribute is set to password.

Syntax :< INPUT TYPE= “password”>

Attributes:

- **TYPE:** Indicates the type of input control and for password input control it will be set to password.
- **NAME:** Gives a name to the control which is sent to the server to be

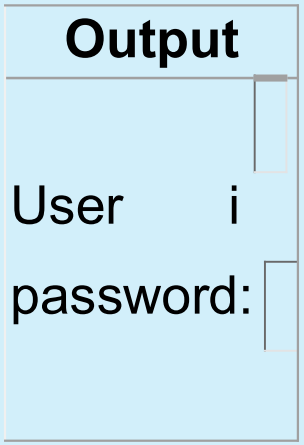
recognized and get the value.

- **VALUE:** Provides an initial value inside the control. ○ **SIZE:** Specify the width of the text-input control in terms of characters. ○ **MAXLENGTH:** Specify the maximum number of characters a user can

enter into the text box.

Example3:

```
USER ID :< INPUT TYPE="TEXT" NAME="USER_ID"/>
PASSWORD :< INPUT TYPE="PASSWORD"
NAME="PASSWORD"/>
```



- **Multi-Line Text Input Control**: Used when user is required to give details that may be longer than a single sentence.

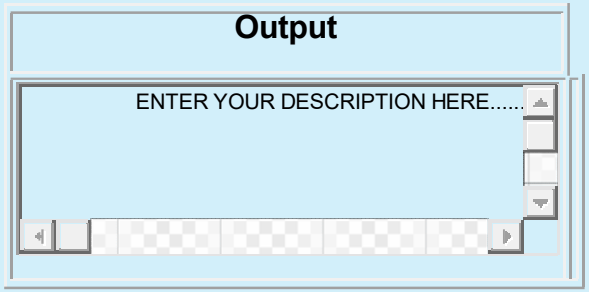
Multi-line Input Controls are created using < TEXTAREA > Tag. It is a container Tag. **Syntax:**< TEXTAREA > tag.

Attributes:

- NAME: Give a name to the control which is sent to the server to be recognized and get the value.
- Rows: Indicates the number of rows of text area box.
- Cols: Indicates the number of columns of text area box.

Example4:

< TEXTAREA ROWS="5" COLS="50" NAME="description"> enter Your Description Here..... < /TEXTAREA >.



6. CHECKBOX AND RADIOBOX CONTROL

- Checkbox Control: Used when more than one option is required to be selected.

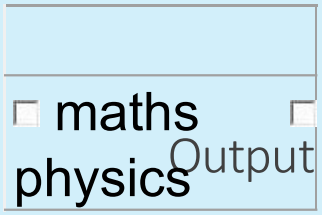
They are also created using < INPUT> tag but type attribute is set to CHECKBOX. Syntax :< INPUT TYPE= “checkbox” >

Attributes: ○ TYPE:Indicates the type of input control and for checkbox input control it will be set to checkbox.

- NAME:Gives a name to the control which is sent to the server to be recognized and get the value.
- VALUE:Used if the checkbox is selected.
- CHECKED:Set to checked if you want to select it by default.

Example5:

```
< INPUT TYPE="CHECKBOX" NAME="maths" VALUE="ON">maths
< INPUT TYPE="CHECKBOX" NAME="physics" VALUE="ON">physics
```



- **Radio Control:** Used when out of many options, just one option is required to be selected. They are also created using < INPUT> tag but type attribute is set to RADIO.

  Syntax :< INPUT TYPE= “radio” >

  Attributes:

  - TYPE:Indicates the type of input control and for checkbox input control

  it will be set to radio.

- NAME:Gives a name to the control which is sent to the server to be

recognized and get the value. ○ VALUE:Used if the

radio box is selected. ○ CHECKED:Set to checked

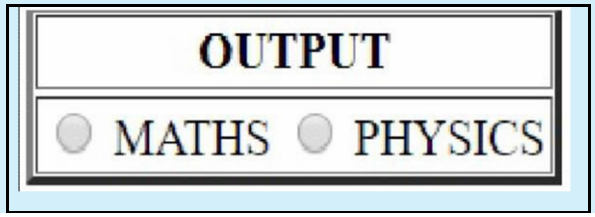
if you want to select it by default.

Example6:

< INPUT TYPE="RADIO" NAME="SUBJECT" VALUE="MATHS"> MATHS

< INPUT TYPE="RADIO" NAME="SUBJECT" VALUE="PHYSICS">

PHYSICS



3.7 SELECT BOX AND FILE SELECT BOX CONTROL

- **Select Box**: Select box,also called drop down box which provides option to list down various options in the form of drop down list, from where a user can select one or more options.

Syntax:<SELECT NAME="dropdown">

< OPTION VALUE="maths" Selected>maths

< /SELECT>

Attributes: ○ NAME: Gives name to the control which is sent to the server to be recognized and get the value. ○ SIZE:Used to present a scrolling list box.

○ MULTIPLE:if set to multiple then allows a user to select multiple items from the menu. ○ CHECKED:checked set to checked if you want to select it by default.

Example7:

< SELECT NAME="dropdown">

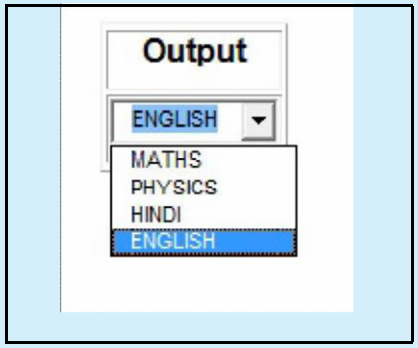
< OPTION VALUE="MATHS" selected>MATHS

< OPTION VALUE="PHYSICS" selected>PHYSICS

< OPTION VALUE="HINDI" selected>HINDI

< OPTION VALUE="ENGLISH" selected>ENGLISH

< /SELECT>



- **File Select/Upload Box Control:** If you want to allow a user to upload a file to your web site, you will need to use a file select/upload box, also known as a file select box. This is also created using the < input> element but type attribute is set to file.

  Syntax:<INPUT TYPE="file">

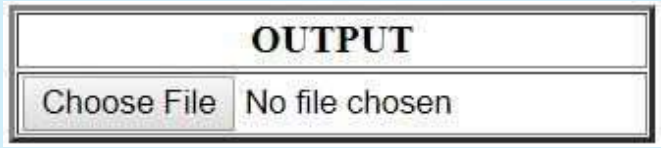
  Attributes:

  - Name: **Gives name to the control which is sent to the server to be recognized and get the value.**

accepts. Accept:specifies the type of files that the server

Example8:

< INPUT TYPE="file" NAME="fileupload" ACCEPT="image/*" />



3.8 HIDDEN CONTROLS

Friends, Hidden form controls are used to hide data inside the page which later on can be pursued to the server; this control

hides inside the code and does not appear on the actual page. For example, following hidden form is being used to keep current page number. When a user will click next page then the value of hidden control will be sent to the web server and there it will decide which page will be displayed next based on the passed current page.
Syntax:<INPUT TYPE="HIDDEN">

Example9:

< P> this is page 10

< INPUT TYPE="HIDDEN" NAME="PAGENAME" VALUE="10"/>

< INPUT TYPE="SUBMIT" NAME="SUBMIT" VALUE="SUBMIT"/> < INPUT TYPE="RESET" NAME="RESET" VALUE="RESET"/>

Output
This is page 10
SUBMIT RESET

3.9 CLICKABLE, SUBMIT AND RESET BUTTON CONTROL

Friends, the clickable controls are the controls that perform an action after the clicking on it. Two Clickable Controls most commonly used are:

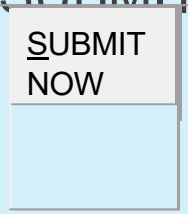
- **Submit Button Control**
- **Reset Button Control**

- **Submit Button Control**
  Explanation: The submit button is used whenever you want to confirm and submit the provided details in the Form.
  Syntax: < INPUT TYPE="SUBMIT">

Example10:

```
< INPUT TYPE="SUBMIT" VALUE="SUBMIT NOW"/>
```

Output



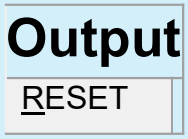
- **Reset Button Control**

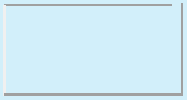
Explanation: The reset button is used to clear the inputs by the user while filling a Form in a Webpage of a Website.

Example11:

```
< INPUT TYPE="RESET" VALUE="RESET"/>
```

Output





3.10 LET US SUM UP

Hello friends, now as you have completed this unit, you should be able to learn the concept, working and importance of Forms in HTML. The various HTML FormsControls like Text Input Control, Check Box Control, Radio Button Control, Select Box Control, File Select Box Format, Submit Button, Reset Button purpose and implementation should have been understood.

3.11 CHECK YOUR PROGRESS

- Define: 1. Forms
  2. Checkbox
  3. Radio Button
  4. File Select Box
- _____Tag is used to create any kind of form button like Radio Button, Check Box, Select Box, etc. [INPUT, TAG, ELEMENT, FORM]
- How many types of Text Input Control are there?

➢ Write difference between select box and file select box.

3.12 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

➢ Definition:

1.Forms: A Form are an element that is used to take input in form of some required data from the user/visitor with his/her consent in a Website for future/further reference.

2.Checkbox: Used when more than one option is required to be selected.

3.Radio Button:Used when out of many options, just one option is required to be selected.