

UNIT -1

I & WT

Modem: Modulator and demodulator.

The process of modulation and demodulation in the conversion of digital data into analog form and vice-versa.

Modem are classified on basis of two criteria.

- Data sent per unit time.
- Change in the state of the signal per unit time.

Baud: Modulated signal per second one baud is equivalent to one bit per second.

Feature of modem:

- Speed; The speed at which the modem can send data in bps. Modem speeds are 300,600,1200,2400,4800,9600,14.4K,19.2K, 28.8K bps.
- Auto dial/redial: Smart modem can dial the phone no and redial if received busy signal.
- Auto answer: Most modem can automatically answer the phone when an incoming call come in.
- Self-testing: New modems have self-testing features they can test digital connection from the computer and the analog connection to a remote modem.
- Voice over data: This type of modems allows a voice conversation to take place while data is being transmitted. This requires both source and destination modem have the same feature.
- Synchronous or Asynchronous transmission: new modem allows synchronous or asynchronous transmission.

Function of modem:

- Convert digital signal to analog and vice versa.
- Error correction.
- Compressing the data.
- Modem act as a interface in between computer and telephone.

IP address:

Every machine on internet has unique number called IP address. IP stands for internet protocol.

Every computer on the internet has four-part number address called IP address. Each of the four part is a number between 0 to 225. An IP address look like 205.46.117.104. This is 32-bit address. 4 Octets of 8 bit each separated by dots. The address is divided by two parts.

- Network ID (Network address).
- Host ID (Host address).

Class of IP Addressing: IP address has five classes.

Class A– Very large organization and networks. Large number of hosts or routines like international company. Class A begin with 0xxx. It has approximately 128 blocks. And block size is around 16,772,216.

Class B – Mid sized network. Address begins with 10xx or 128 to 191 decimal Number of blocks 16,384 and block size 65,536.

Class C - Small network. The address begins with 110x or 192 to 223 decimals. 2,097,152 blocks and block size are 256.

Class D - Used for multicasting. Address begins with 1110 or 224 to 239 decimals. 1 block and block size is 268,435,456.

Class E - Used for experiment purpose. Reserved for future use. Its address starts with 1111 or 240 to 254 decimals. One block and block size 268,435,456. It is reserved for future.

IP Address is a unique set of number (such as 172.16.254.1) which identifies a computer location.

An IP address consist of 4 bytes of data so total 32 bits of data for each IP address . The decimal representation is usually used to make IP address.

Internet domain: Domain name is the address where internet users can access the website Domain name used for finding and identifying computers on the internet.

Domain name is a combination of letters and numbers and can be used in combination of the various domain name extensions such as. Com, .net. etc.

Every domain name is unique. No two websites have the same domain name. If some one types in [www.your](http://www.yourdomain.com) domain name. com. It will go to your website and no one else's.

Example of domain names

gov- Government agencies.

edu – Educational institutions.

Org- Organizations (nonprofit)

Mil – Military.

Com – Commercial business.

Net – Network organizations.

Ca – Canada.

Th – Thailand.

In – India.

ISP – Internet Service Provider: ISP is an organization or business offering public access to the internet. It is the get way to internet.

It offers access to the internet, allowing users to travel and explore using tools like internet explorer. These days lots of them are available including BSNL, MTNL etc.

At present VSNL (Vidisha Sanchar Nigam Limited) which is dominating the internet scene in India through its GIAS (Gate say Internet Access Service). Other service provider in India are MTNL (Mahanagar Telephone Nigam Limited .) , Mantra-online, Airtel, Reliance communications ad satyam – online.

CIDR Notation: - Classes inter --domain routing. CIDR is a method for allocating IP addresses and for IP routing. It is a set of IPs that is used to create unique identifiers for networks and individual devices. The IP addresses allow particular information packets to be sent to specific computers.

CIDR Notation: It is a compact representation of an IP address and its associated routing prefix. The notation is constructed from an IP addresses, a slash ('/') character, and a decimal number.

CIDR example:

- CIDR notation of a network address.192.0.2.0/18.
- 18 says that the first 18 bits are the network part of the address.
- The network part is called the network prefix.

Example:

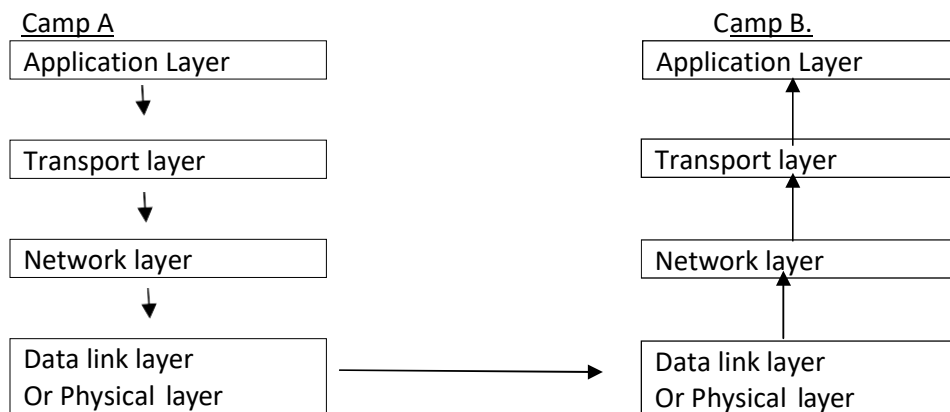
- Assume that a site requires an IP network domain that can support 1000 IP addresses.
- With CIDR, the network is assigned a continuous block of $1024 = 2^{10}(\underline{>1000})$ address with a $32 - 10 = 22$ bit long prefix.

How TCP/IP Works: The internet works by using TCP/IP, TCP/IP allows one computer to talk to another computer via the internet, by sending packets of data to right location.

TCP/DP uses the client – server model of communication.

TCP/IP Functionality is divided into four layers each layer includes specific protocol.

- Application layer: This layer provides data exchange. Its protocols are including the HTTP, FTP, Post office protocol (POP), SMTP.
- The transport layer: It is responsible for end-to-end communication across the network. It provides flow control, multiplexing. This layer includes TCP and UDP Protocol.
- Network layer: It is also called as internet layer. It deals with packets across the network. It includes the ICMP protocol which is used for error reporting.
- The physical layer: It is also known as the network interface layer or datalink layer. It is operating only on a link. It includes the RARP and ARP Protocol. It used Ethernet for LAN.



TCP/IP Protocol Suite:

Internet uses TCP/IP Protocol suite as network and transport layer protocol for providing various services.

TCP/IP is a set of protocols that enables communication between computers. It is known as Transmission control protocol/Internet Protocol.

1. IP (Internet Protocol), 2. TCP, 3. ARP, 4. RARP, 5. ICMP, 6. UDP, 7. OSPF, 8. FTP, 9. SMTP, 10. TELNET, 11. SLIP, 12. PPP.

1. IP (Internet Protocol)

The IP handles the address part of each data packet that is transmitted from one computer to another on the internet.

The features of IP are as follows:

1. IP uses network address ← For addressing.
2. For switching; It uses packet switching method.
3. It uses route selection.
4. Error control.
5. It is the network layer protocol.

Transmission control protocol (TCP) :

TCP is the IP Suites transport layer protocol. TCP is one of the main protocols in the TCP/IP network.

Features of TCP:

1. TCP provides reliable, enhanced error checking.
2. Exchanges stream of data.
3. TCP guarantees the delivery of data in the same order in which they were sent.
4. TCP manages assembly and reassembly of the packets sent over the internet.

ARP (Address resolution protocol):

Typically, ARP used on a LAN. ARP is a network layer protocol. ARP address has the IP address of the network on which the node is located. A host sends out the ARP address, host request to IP address.

Reverse address Resolution protocol(RARP) :

It is also used in LAN. Its function like ARP but in Reverse. To find out the IP address, A host uses RARP. The host broadcasts its physical address and the RARP server replies with the host's IP address .

Internet control message protocol: (ICMP):

ICMP is concerned with connection services ICMP provides error control and network layer flow control .

User Datagram Protocol(UDP) :

UDP is a connection less protocol that works at the transport packets but does not acknowledge the receipt .

UDP Provides two services :

1. UDP uses a port address to achieve packet delivery port address is simply a pointer to the process. Port address helps to distinguish different user requests .
2. A check sum capability to verify that the data that has arrived is exact.

Open shortest path First (OSPF) :

OSPF is a network layer protocol that address route discovery . It is also known as link-state routing protocol.

Advantages:

It requires less network baud width.

It can handle larger network.

The main disadvantage is complicity, high memory requirement

File transfer protocol (FTP) :

1. FTP used for file transfer between inter network mode .
2. FTP functions of the top three layers of the OSI model. (Application, presentation and session layer).
3. FTP allows user to initiate processes on the remote host .

Simple mail Transfer Protocol(SMTP):

SMTP is a protocol for routing e-mail message . It works at the application layer to provide message service.

SMTP uses TCP/IP to route the mail message over the Internet.

Talent :

Tel net is used for remote terminal emulation (better than) .

It enables users to access host based application by emulating one of the host's terminals and functions at the top three layer of the OSI model (Application, presentation and session).

SLIP (Serial Line internet protocol):

The SLIP is using for dial up connections to the Internet .

If you connect to the Internet from your home computer, chances are that you are using one of these protocols . It functions only at physical layer. It does not provide error control.

Point to Point protocol(PPP)

PPP was developed as an improvement to SLIP. It functions both physical and data link layer. PPP has addition functions like error control, security dynamic IP addressing and supports multiple protocol.

UNIT – 2

1 Introduction to Connectivity:

To connect over Computer to internet is known as Internet Connectivity .

We have to take certain decision to connect internet such as

- What type of connection we want?
- What will we use the serviced for ?
- Do we need significant baud width or not ?
- How much money we want to spend?

Type of Internet Account :

There are two possible types of connection.

1. Shell Account.
2. PPP (Point to Point protocol) Account .

Shell Account :

It is a personal account on a server that's connected to the internet via a dedicated, high speed connection. Shell account run with unix operating system. It supports only text-based interface, not a graphical interface.

Disadvantages are :

1. The interface in text based not graphical.
2. Your computer is not in the internet.
3. Limited to running one client at a time .

PPP Account :

It is co connecting multiple computer users on an Ethernet LAN to remote site through customer premises equipment.

1. Through PPP account computer in a full – fledged internet internet hast during we are connected.
2. Our computer does most of the work and the remote computer acts as a channel into the net .
3. For the duration of our internet session our computer is a part of the net .
4. As far the rust of the net is concerned , we are on the net and other internet computers can communicate with our computers directly.
5. When we use PPP, our computer temporarily becomes an internet hast.
6. In PPP connection we can use many clients at a time.
7. PPP is a tunnel into the net.
8. The nature of the tunnel is support as may client as you want to use . If we make too many demand on the system at the same time everything will slow down.

Medium of connectivity :

Following are the communication medium used for internet connectivity.

1. Modem, 2. Dial up connection, 3. ISP , 4. Communication software .

Modem:

- Modem stands for modulation and demodulation.
- It is an electronic device.
- It is used to share information between users and computer.
- It converts digital signal to analog signal and vice versa .

Dial up connection :

- This is basic type of internet connection.
- The modem dial the telephone every time it wants to connect to the internet.
- Hence the name dial-up connection.

ISP : - It is a business organization that provides the internet facility to consumer.

- It is a gate way to the Net.
- We have to subscribe to a provider for your internet.
- For example- MTNL, BSNL, Airtel, Reliance, etc.

ISDN- Dial up connection :

- It is a dial-up connection through ISDN (Integrated Services Digital Network.)
- It is a high speed dial-up and requires a special type of dedicated digital telephone line .
- It's communication is speed because the signal received are already in digital format .
- It is costly.

Broad band connection :

- It is high speed internet connection.
- It accommodates video, audio, complex graphics.
- In Broad band data transmission occurs in a single medium. That single medium carry several channel at once.
- So broad band cable connections are able to transmit both TV signal and internet at the same time.

Internet through cable:

- It uses cable TV networks (made up of coaxial cable lines that bring TV signal to TV) to bring internet data to PC or TV at a very high speed.
- The TV and internet transmission take place simultaneously on the same cable but at different frequencies .

Internet connectivity through leased line :

- Leased lines are dedicated circuits provided by basic service providers (BSPs) .
- They provide permanent connection.
- It provides permanent, Reliable , high speed connectivity (ampar to dial up connection.
- Price is high compared to dial up connection.

Communication software :

- To access internet we need software that software is known as communication software.
- This Software can display text, video, sound etc. over internet.
- Example – Internet explorer, opera etc.

Wi max :

- Stands for wireless inter operability for microwave Access.
- Wi max uses spectrum to delivery connection to network and handle large inter operable Net.
- Speed can be upto 70 mbps .
- Network range to maximum 90 Kms.
- It supports both fix and mobile net .

Methods of Internet connectivity :

- Connection through LANB.
- Direct connection.
- Remote terminal connection.
- Gate way connection.
- Connecting through a modem .
- High speed data link .

ISDN : Integrated service digital network.

- It is a set of communication protocols for simultaneous digital transmission of voice, video, data and other network services over public switched telephone network.
- Broad band ISDN is name given to entire ISDN service .

Services of ISDN :

1. **Bearer Services** : Bearer service provide means to transfer information (audio, video,text) between the uses of ISDN, Example of bearer services are circuit switching, packet switching, frame switching and cell switching. This service belongs to last three layer of OSI model .
2. **Tele Service**: It provides to transfer information between uses in such a manner that the network may charge or process the contents of information. This service belongs to 4th and seventh layer of OSI model .
3. **Supplementary Services** : It provides additional functionality to tele services and bearer services Example of supplementary service are called waiting, call diverting etc .

ISDN Structure :

ISDN includes a central ISDN office. All the users linked to the office through a digital pipe. The digital pipe may be of different capacities. And different data transfer rates Digital pipes between Central office and customers are multiple channels of different types . There are three type of channels.

1. **B Channel** :
 - a. A bearer channel's data rate is 64 Kbps .
 - b. It carry digital information in duplex mode.
 - c. Used to carry digital data, digital voice and low data rate information .
2. **D Channel** :
 - a. Data channel carry control signal for bearer channels.
 - b. Its data rate is 16 Kbps to 64 Kbps depending upon users .

3. H Channel:
 - a. Hybrid channels.
 - b. Data rate is 384 kbps, 1536 kbps, 1920kbps.
 - c. Used for video and teleconferencing etc.

ISDB used for :

1. Internet access.
2. Telecommunicating / remote access.
3. Video conferencing.
4. Small and home office data networking .

Advantage of ISDN :

1. It is time tested and trusted technology.
2. ISDN is governed by world-wide set of standards.
3. ISDN provides symmetrical transfer rate means transmit rate and received rate is same.
4. It is competitively priced compared to other technology.

Disadvantages of ISDN :

1. An external power supply is required.
2. If power fails, the phones won't work.
3. Special digital phones are required.

VSAT- Very Small Aperture Terminal:

Def VSAT is a two – way ground station that transmits and receives data from satellites. Then the data can redirect to other remote terminals or hubs around the planets.

VSAT consist of two units: Outdoor unit and indoor unit .

Outdoor unit consists of an Antenna and Radio frequency. Transceiver (RFT) . The indoor unit functions as a modem and interface with the end user equipment like stand alone PCS, LANS, Telephones or EPABX.

The outdoor unit mounted on wall. And the indoor unit located near existing computer.

Advantage of VSAT:

1. VSAT is an ideal option for networking .
2. Last mile problem: VSATs located at premise guarantee seamless communication even across the last mile .
3. Reach: VSAT reaches unrestricted and unlimited reach.
4. Time: VSAT deployment takes no more than 4-6 weeks.
5. Network management: Simple.
6. Maintenance: A single point contact for operation, maintenance, Rapid fault finding, trouble shooting is simple for client.

7. Cost : VSAT networking offers significant savings over two to three year compared to leased line .

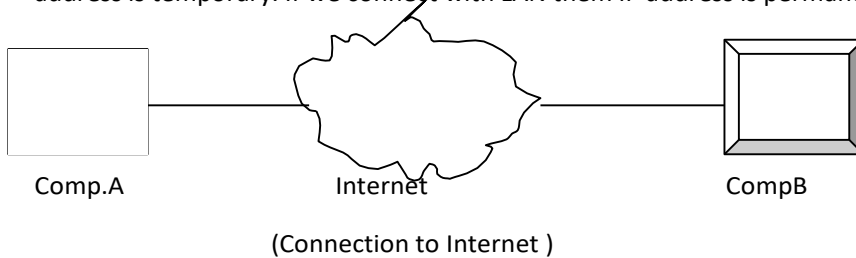
RF Link (Radio frequency Link).

1. It is another way to connect one organization to the internet through RF modem.
2. RF has wireless and high frequency signals.
3. Its frequency range is few KHZ to 1GHZ.

Working of Internet : The working of Internet can be in following steps .

1. Connection to internet.
2. Communication with other computers.
3. Networking Infrastructure.
4. Internet Infrastructure.
5. Internet routing heir archly .
6. Domain name resolution.

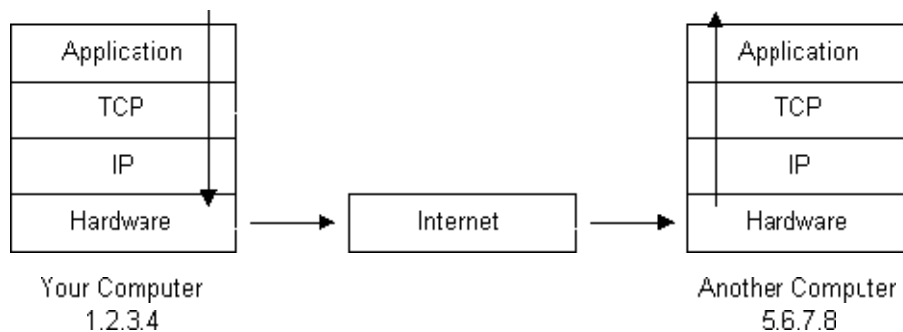
Connection to internet: Two computers connected to the internet. Computer A with IP address 1.2.3.4 is connected to computer B with IP address 5.6.7.8. If internet connection through ISP then IP address is temporary. If we connect with LAN them IP address is permanent.



Communication with other computer :

Every computer needs to communicate on the internet. It is usually built into the computer’s OS. The Protocol stack used on the internet is referred to TCP/IP.

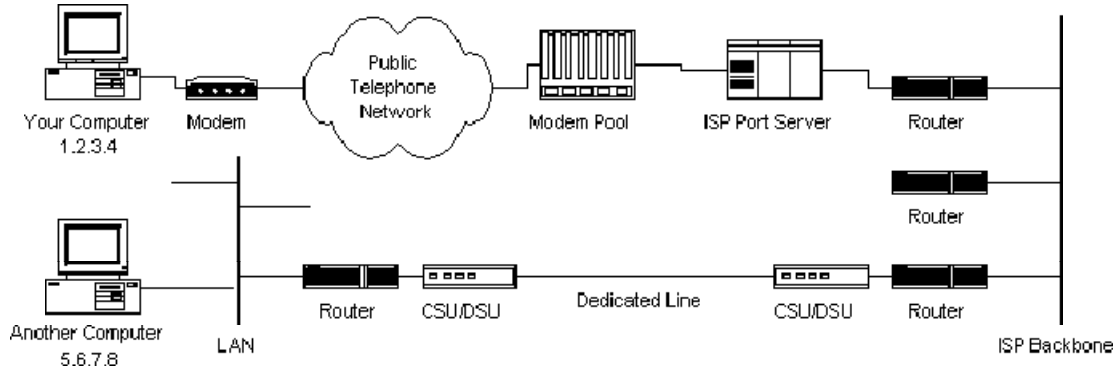
If we send a message “ Hello” from Computer with IP address 1.2.3.4 to IP address 5.6.7.8 .



(Flow of message in internet)

Net working Infrastructure :

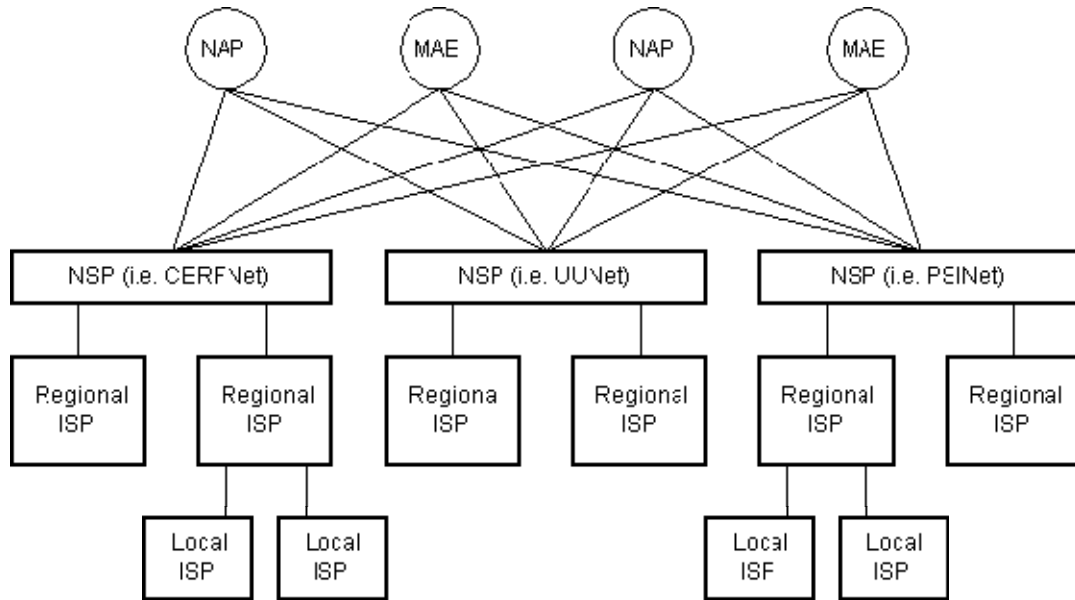
How packets travel from one computer to another over the internet .



CSU/DSU – Channel Service Unit/ data service Unit is a digital interface device used to connect DTE such as Router to DCE such as Digital signal .

Modem Pool: Group of modem.

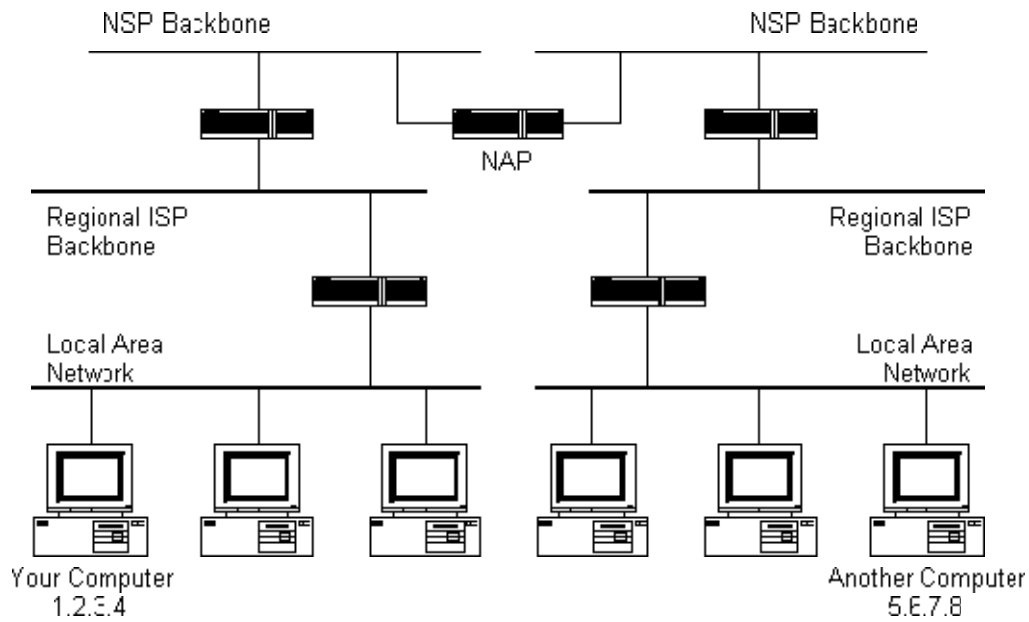
Internet Infrastructure :



NAP – Network Access point.

MAE – Metropolitan Area exchanges.

The internet Routing Hierarchy:

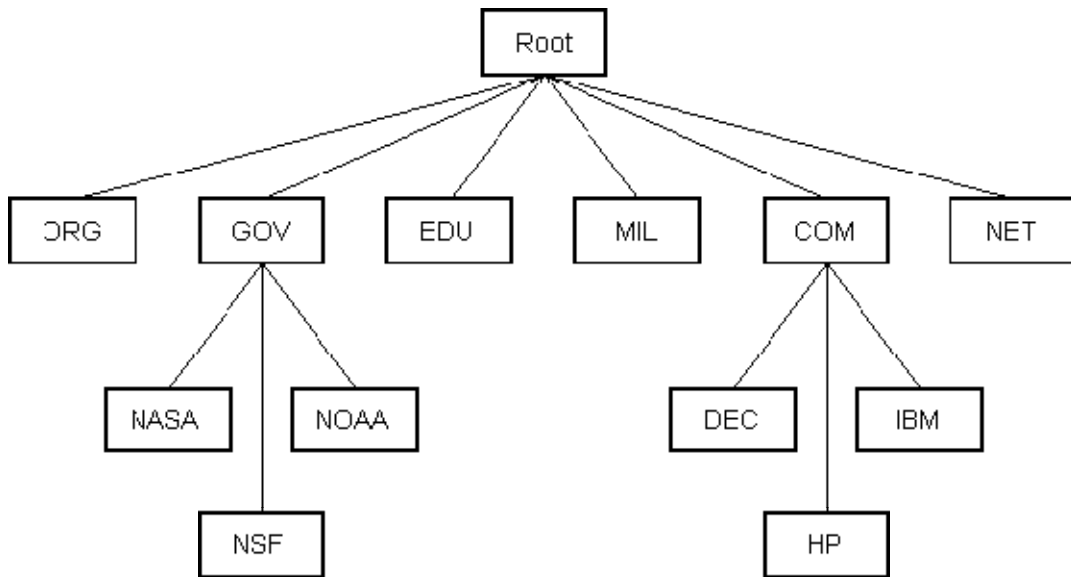


(Internet Routing Hierarchy)

NSP- Network Service Provider

NAP- Network Access Point

Domain names and address resolution:



(Domain names and address resolutions)

www.: 1. World wide web, commonly known as the web.

2. It is an information system, where documents and other web resources are identified by URL (Uniform Reserve Locator) such as <https://example.com> which may be interlinked by hypertext (HTML), and are accessible over the internet .
3. When we use a web browser the web appears as a collection of text, picture, sounds and digital movies.

Reason for success of the web.

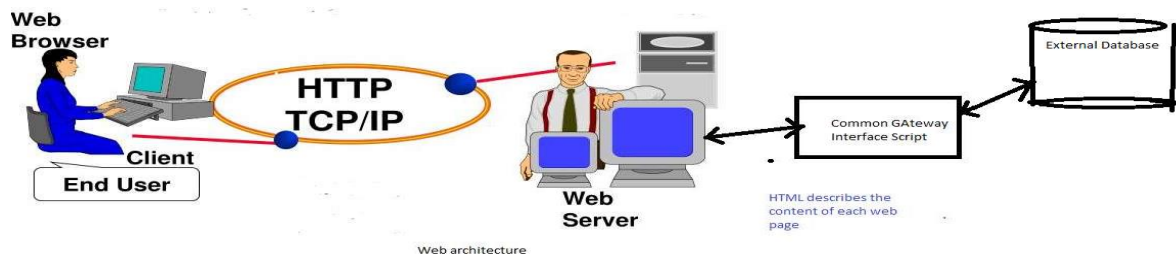
1. Easy of navigation and use.
2. Easy of publishing content.
3. New distribution models.
4. Enabling new inter-business applications.

Web architecture :To use web we need a special software called as web browser. Web browser is the interface between user and internet. It sends the necessary command to request data from other computers and them formats them for user’s screen.

Documents are formatted using HTML.

The web is consist of three part architecture.

1. HTML - Hypertext markup language, the format for web pages, provide both formatting and hyperlink.
2. HTTP : Hyper text transfer protocol, the protocol for communications between web sevens and browsers.
3. CGI: Common gate way interface. The interface for invoking programs from web servers.



Web Page :

1. A webpage is an independent part of website that contains the link to other webpages in website
2. Webpage can be static or dynamic.
3. Static page always shows the same page.
4. Dynamic page content always change each time.
5. WebPages are typically written in scripting languages such as PHP, Perl , ASP or JSP .
6. Webpage is not same as website.
7. Website is the collection of relevant web pages.

Web Servers:

- Web server is the program resides in server computer to serve the request of the client software .
- The server content is accessed using web browsers .
- The server content is accessed using web browsers .
- Example of web servers are Tomcat , Weblogic, Apache,IIS etc.

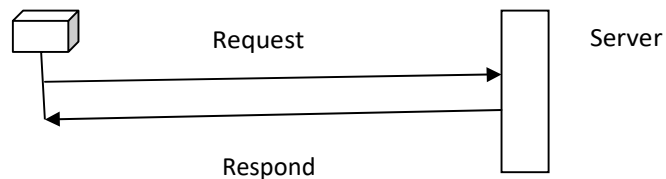
Application level protocol:

Application level protocols are HTTP,FTP, TCP/IP .

HTTP –_Hyper text Transfer protocol is an application level protocol for distributed, Collaborative, hypermedia information systems. This is the foundation for data communication for the www.

HTTP used to connect to web servers on the internet or interact.

Its primary function is to establish a connection with the server and send HTML pages back to the user's browser.



(HTTP Request and Respond).

HTTP interaction works in following ways.

1. The browser established a connection with the server.
2. The browser send a request to server.
3. The server sends response to the client –(browser).
4. Both browser and server disconnect and transaction ends .

Web browser: Web browser is a software for communicating with web server on the www. When a user requests a web page from a particular website, the web server and them display the page on the user's device.

Features of Web browser :

The most popular web browser is Netscape Navigator and Internet explorer .

- The web browser should be able to look at the web pages and connect to various sites.
- Browser has readily available command through menus, icons and buttons.
- Browser searches information on the current page as well as search www itself.
- Save, print, and send web pages in a file on your computer.
- Web browser able to handle text, Image, of www and hyper link to digital video and information.
- Web browser interacts with web, computer's OS, Other programs, called Plug-ins that gives the browser-enhanced features.
- Easy to use .

U R L s (Uniform Resource Locators).

URL is the address of a specific webpage or file or the internet.

URL is consisting of 4 parts.

1. Protocol name.
2. The location of the site.
3. The name of the organization.
4. A suffix that identifies the kind of organization.

Structure of URL:

<http://www.address.edu:1234/path/subdir/file.text.http> is service type (first part is service specifies.)222.address.edu:1234-Internet address with part number 1234, the internet address with default port number will be [www.address.edu.path/subdir/file.txt](http://www.address.edu/path/subdir/file.txt) is: Resource location (we are giving the path of file.ext file on the server computer.

Services: The first part specifies (HTTP) specifies the access method. This is the part before colon.

Address and port number: The second part is address of the server. Indicated by double forward slash(11), Address can also certain the port number which is optional. Where :1234 means port number 1234. If we use default port no. i.e //www.address.edu/.

Resource location; forward slash after the host and port specifications indicates the end of the address and the beginning of the specification for the file/resources to be accessed.

Hyper text: It is a text, links to other text. When ever we click on this text. Then next page or some other text displays. This is called hypertext. By default the colour of Hypertext is blue and this text is underlined .

Characteristics of good hypertext:

Lots of documents.

Lots of links.

Range of details.

Correct link .

Hyper Links :

A link from a hypertext – document to another location, activated by clicking on a highlighted word or image.

Hyper link is made up of four main parts.

- A monitor that identifies the targeted location.
- A string for the location within the target.
- A displayable, name for the target..
- A string that can contain additional parameters.

Hyper media :

Hyper media , an extension of the term hypertext. It includes graphics, audio, video, plain text and hyperlinks.

Search engine :

A program that searches documents for specified keywords and characters specified by the user, used especially for finding particular sites on the www.

Example 1. Google.com, 2. Yahoo.com, 3. Freefind.com, 4. Excite.com, 5. Hotbot.com, 6. Lycas.com, 7. Dogpile.com.

Working of search engine:

- A search engine works by sending a spider to fetch as many documents as possible.
- Another program called indexer, reads these documents embedded on the webpage. This process is called indexing. This information is then stored in the Google index.
- Each search engine uses algorithm to create its indices such that, only meaningful results are returned for each query.

Proxy server : A proxy server is an application that manages control traffic between a protected internal network and Internet.

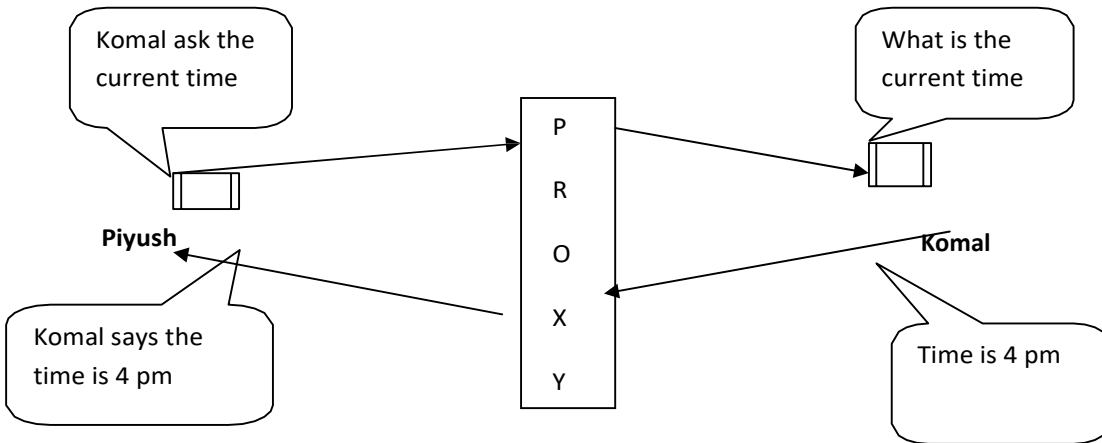
- Proxy servers run on a machine that is part of a firewall.
- To use a proxy server a user.

1. Log on to the proxy server.

2. A connection to the internet, is then made by the proxy server.

- It is an intermediary server separating end user from the websites they browse.

- Proxy servers provide varying levels of functionality security .



(Working of proxy server.)

Proxy server has following basic functionalities.

1. Firewall and network data filtering.
2. Network connection sharing.
3. Data caching.

Proxy server allows hiding, canceling and making your network id anonymous by hiding IP address.

Purpose of proxy servers:

Following are the reasons to use proxy servers.

- Monitoring and filtering.
- Improving performance.
- Translation.
- Accessing services anonymously (not identify by name)
- Security .

Monitoring and filtering : Proxy server allow us to do several kind of filtering such as

- Content filtering.
- Filtering encrypted data.
- By; pass filters.

Improving performance: It faster the service by process of retrieving content from the caches which was saved when previous request was made by the client.

Translation : It helps to customize the source site for local users by excluding source content or substituting source content with original local content.

Accessing services anonymously.

In this the destination server receives the request from the proxy server thus does not receive information about the end user .

Security: The proxy server hides the identity of the user hence it protects from the hacker attacks.

Common Gate way Interface (CGI):

CGI is a standard method used to generate dynamic content on web pages and web applications. It defines how information is exchanged between the web server and a custom script .

URI (Uniform Resource Identifier) :

URI is a string of characters used to identify a name of a web resource.

URI is simple formatted, case-insensitive string containing name, location etc. to identify a resource . For example a website name, a website services etc.

Example : URI = <http://abc.com:80/- smith/home.html>

Dream Weaver :

Adobe dream weaver is a application software that allows to create and develop websites. Dream weaver is considered WYSIWYG (What you see in what you get.) meaning that when we format our web page, we see the results of formatting. It is also support cascading style sheets. (CSS) and Java Script, asp(active server page) and PHP (Hyper text preprocessor.)

Internet security.

Internet security: It is consist of a range of security tactics for protecting activities and transactions conducted online over the internet. This means that tons of data and sensitive information are constantly being shared over the internet .

Types of Security :

1. **Network layer security:** TCP/IP can be secure with the help of cryptographic methods. Protocols developed for securing communications on the internet. These protocol includes SSL (Secure sockets layer), TLS (Transport layer security) for web traffic PGP (Pretty Good Privacy) for e-mail and IP sec (Internet protocol security) for network layer security .
2. **IP Sec Protocol:** It is a group of protocols that are used together to set up encrypted connections between devices. It helps keep data sent over public networks secure. IP sec is often used to set up VPNs (Virtual Private networks) and it works by encrypting IP packets, along with authenticating the source where the packets come from.
3. **E-mail Security:** E-mail security is the term for any procedure that protects e-mail content and accounts against unauthorized access. E-mail service providers have email security measures in place to secure client accounts and information from hackers. When a user finishes composing the message and sends it. The message is transferred into a standard format that is RFC2822 formatted message. Afterward message transmitted after that Mail user agent (MUA) and Mail transfer agent (MTA) operating on the mail server. Once the mail server receives and processes the message, several events occur. Recipients server identification, connection establishment, message transmission, DNS services, Mail server determines the mail server for the recipients. Then server opens up a connection to the recipient mail server and sends the message.

Pretty Good privacy (:PGP):

PGP provides confidentiality by encrypting messages to be transmitted. E-mail messages can be protected by using cryptography in various ways. Such as

- Signing an email message to ensure its integrity and confirm the identity of its sender.
- Encrypting the body of an e-mail message to ensure its confidentiality.
- Encrypting the communication between mail servers to protect the confidentiality of both the message body and message header.

Multipurpose Internet mail Extension (MIME) :

MIME is an Internet standard that extends the format of email messages to support text in character sets other than ASCII, as well as attachments of audio, video, images and application programs. Message bodies may consist of multiple parts, and header information may be specified in non ASCII character sets.

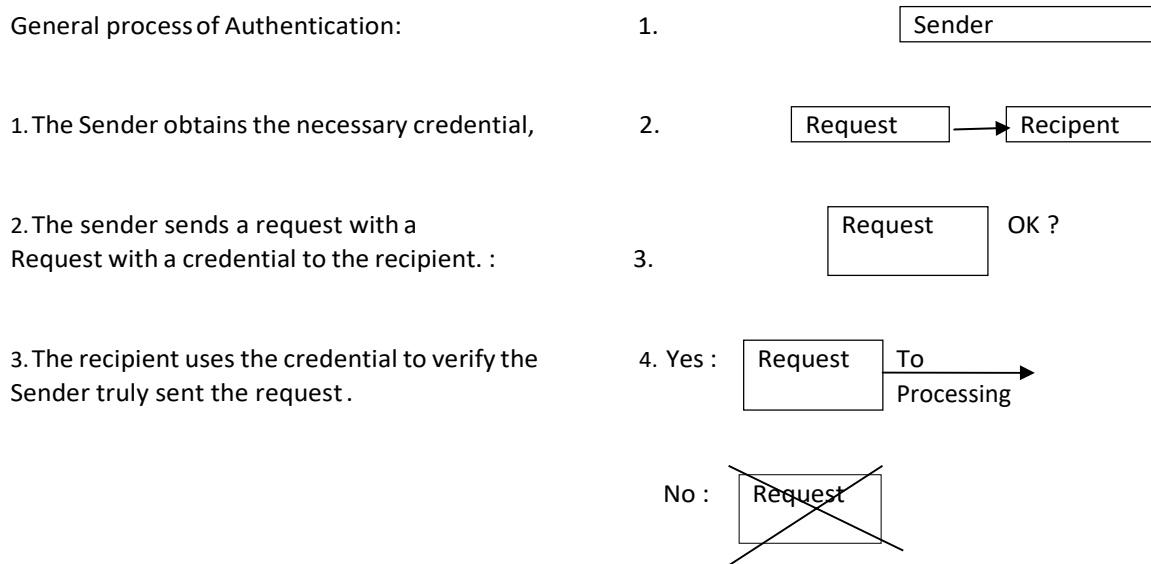
E-mail messages with MIME formatting are typically transmitted with protocols SMTP, POP.

Message Authentication code : This is a cryptography method uses a secret key to encrypt a message .

Authentication and Authorisation : Authentication is a process for identifying and verifying who is sending a request.

Authorization is a process to provide access rights to the individuals.

General process of Authentication:



4. If yes, the recipient processes the request. If no, the recipient rejects the request and responds accordingly.

Types of Authentication: There are several ways to authenticate a person or information on a computer.

1. Password: The use of a user name and password provides the most common form of authentication. Enter name and password, If checks the pair against a secure file to confirm. If name and password match them you are allowed.
2. Pass Cards: These Cards can range from a simple candy with a magnetic strip, similar to a credit caned, to sophisticated smart cards that have an embedded computer chip.
3. Digital signatures: A digital signature is basically a way to ensure that an electronic document (e-mail, spread sheet, text file) is authentic.

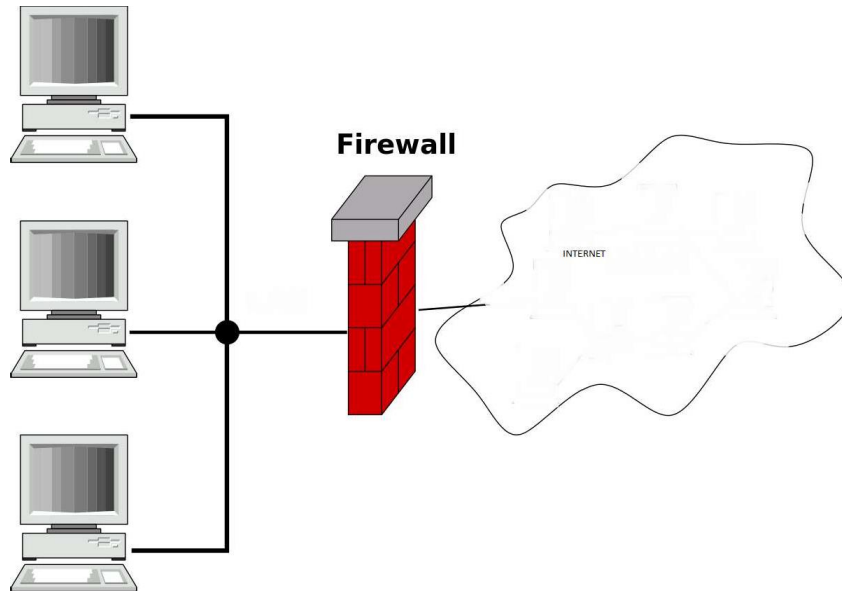
More sophisticated firms of authentication are

- Finger print scan.
- Retina scan.
- Face scan
- Voice identification.

Firewalls : A firewall is a computer program that monitors the flow of information from the internet to our computer.

There are two types of firewall available.

1. Hardware firewall: It is a equipment – that sits between internet and our computer. Ex- broad band router. The benefit of using a hardware firewall is it connects multiple computer systems that are connected at the same time.
2. Software firewall: It works some way as hardware firewall. It is a program installed in our computer. Ex-Norton 360, Norton Internet security, kaspersky internity security .



Advantages disadvantages of Hardware Firewall.

Advantage

- 1 OS independent.
- 2 Not possible to malicious attack.
- 3 Better performance.
- 4 Focuses on only firewall related duties.

Disadvantage.

1. Can be single point of failure.
2. Higher overhead.
3. Higher cost to implement and maintenance.

Soft ware firewall

Advantage

- 1 Less expensive to implement and maintain.
- 2 Lower overhead .

Disadvantage .

1. Requires additional hardware.
2. Possible to malicious attacks.
3. Lower performance .

Component of firewall : Firewall consist of following components :

1. **Chokes** : It is a device that resistance to certain types of signal. Chokes are implemented with routines. If restricts the free flow of packets between networks.
2. **Gates**: Specially designed programs, devices within the firewall's perimeter that receives signal from external network.
3. **Network client software**: This software includes program such as telnet, FTP.
4. **Proxy server**: In case of firewall, proxy is a program that forwards a request through firewall.
5. **Network server** : Many network server can function as proxies. They implement simple store and forward. Some server can operate proxies includeSMTP.

Firewall features : Following are the features.:

1. **In bound and out bound filtering**:
Filtering is when a firewall examines information passing through it and determine if that information is allowed to transmitted and received should be discarded based on rules.
2. **Stealth mode**: When we are connected to the internet and our computer cannot be detected via our computer is called stealth mode. When we are in stealth mode the firewall does not send this information it seems like we are not even connected. Due to hackers will not continue targeting our computer they think we are not on line .
3. **Privacy Protection**: Many firewall ability to block spyware, hijackers and adware from reaching our computer. This allows protecting our computer being infected.
4. **Application Integrity**: Application Integrity is when the firewall monitors the files on our computer for modification in the file or how they are lunched. When it detects such a change it will notify the user of this and not allow the application to run or transmit data to the internet.
5. **Intrusion Detection** : Intruders use various methods to penetrate the security of our computer. Intrusion detection scans incurring data for signatures and notifies us when such attacks are recognized.
6. **Notification**: Notifications allow to seeing the activity of what is happening on firewall and for the firewall notify us about penetration attempt to our computer.

Importance of firewall :

A firewall provides not only real security – it often plays an important role as a security blanket for management.

A firewall can act as our corporate “ ambassador” to the internet.

Firewall Protection :

A firewall refers a network device which blocks certain kinds of network traffic, forming a barrier between a trusted and an entrusted network. Firewall security attempts to block the spread of computer attacks.

Limitation of firewall :

- A firewall cannot prevent users or attackers with modem for dealing into or out of the internal network, thus by passing the firewall and its protection completely.
- Firewall can not enforce our pass word policy or prevent misuse of pass words.

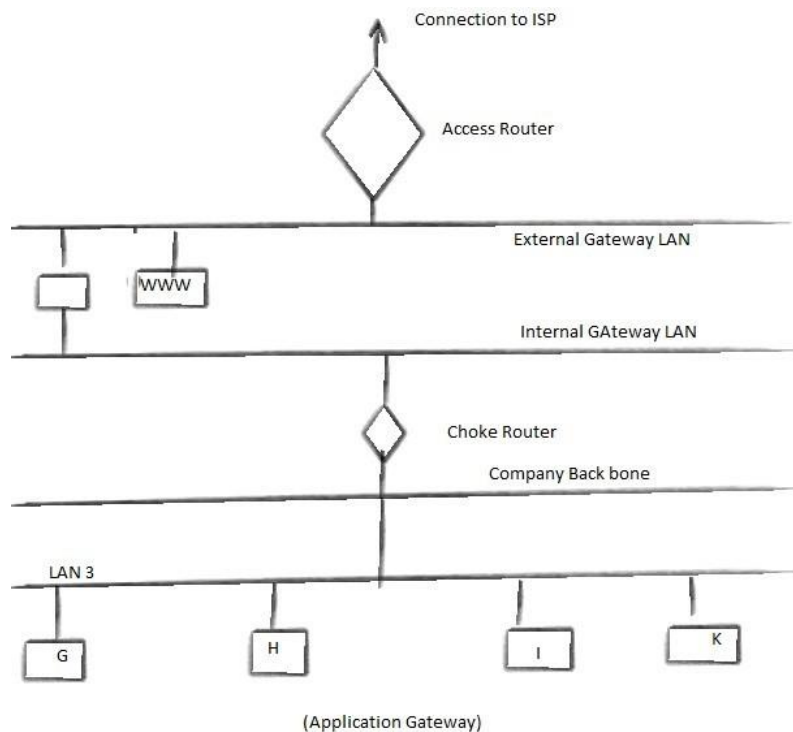
Technique of Firewall: Whether we purchase firewall software or hardware depending upon the types of firewall as follows :

1. Application Gate way or Proxy gate way.
2. Packet filtering.
3. Circuit gateways.
4. Stateful packet Inspection.
5. Internet connection firewall.
6. Hybrid firewall .

Application Gateway or Proxy gateway:

These are made up of hosts that run special software to act as a proxy server. This software runs at the Application layer of OSI model .

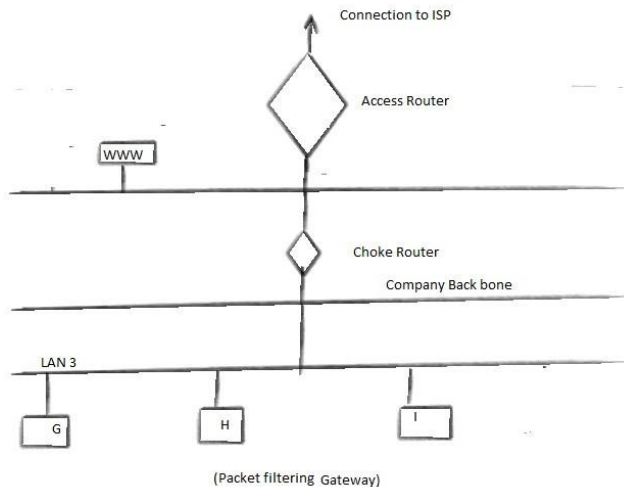
These are the slowest, because more processes to be stunted in order to request serviced.



Packet filtering :

A packet filtering firewall examines each packet that crosses the firewall and tests the packet according to a set of rules, packet filters work by inspecting the source and destination IP and port address. It works at transport layer or session layer of OSI model.

- There is less over head.
- Packet filtering done with router.



Circuit gateway:

- This firewall works the session layer of OSI model.
- They are fast and transparent .
- They provide no protection from attacks .
- Do not check the data in packet.
- This is least used type of firewall .

Stateful firewall:

Is a firewall that monitors the full state of active network connections. Means constantly analysing the complete context of traffic and data packets ,seeking entry to a network rather than discrete traffic and data packets in insulation.

Internet connection firewall :

Window XP firewall is internet connection firewall. ICF makes active packet filtering, it means that the ports on the firewall are opened as long as we needed. The type of technology prevent hackers from scanning computer's port and resources.

Hybrid systems.

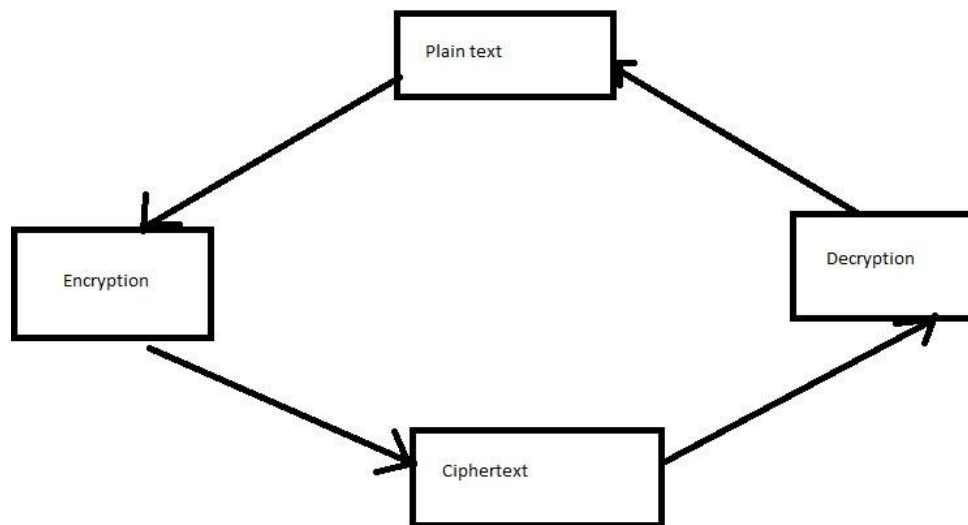
It combines the flexibility of application gateways and speed of packet filtering. It works on application and session layer of OSI model.

Encryption and Decryption:

The process of converting information on data into a code, especially to prevent unauthorized access is known as Encryption.

Decryption: The convention of encrypted data into original form is called Decryption. It is a reverse process of encryption. Only authorized person can decrypt because a secret key or pass word is required.

Element of an encryption system :The main element of an encryption system are the plain text, cryptographic algorithm , the key and the Cipher text.



1. Plain text – is the raw data or information to be encrypted.
2. Cryptographic algorithm or Cipher is a mathematical rule that defines how the plain text is combined with a key.
3. The key is a string of digits.
4. Cipher text is the encrypted message.

Example – we take a phrase “Web store” and add 2 characters of each letter the phrase become “ Ygd uvqtg” then

“Web Store” is plain text

“ add x characters to each letter” is the cipher .

“2” is the key.

“Ygd uvqtg” is the cipher text.

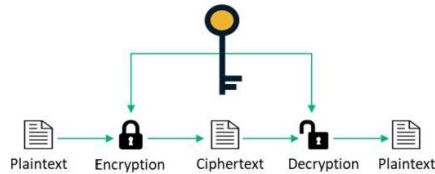
There are two types of secret key commonly used .

- Secret key
- Public key

Difference between secret-key and public key.

Symmetric Key

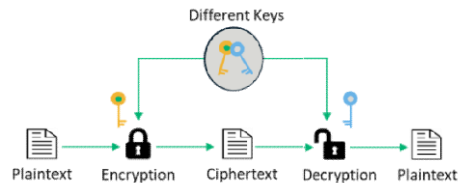
- 1 It is also known as secret key or single key.
- 2 Only one key used for encryption and decryption.
- 3 One key shared with sender and receiver



- 5 Encryption process is speed.
- 6 The length of the key is 128 or 256 bits based on security requirement .
- 7 Mostly used in large chunk of data to be transferred.
- 8 The secret key is shared constantly so risk is higher.

Asymmetric key

- 1 It is also known as public key .
- 2 Two different keys are used for encryption and decryption.
- 3 Encryption uses public key and decryption uses private key .



- 5 The process is slower.
- 6 Length of the key is 2048 bits or larger.
- 7 Smaller transaction.
- 8 The private key is not shared, process is more secure.

Secure socket layer (SSL) :

SSL is a protocol, developed by Netscape communicate.

It has two layers.

- SSL record protocol.
- SSL Handshake protocol.
- SSL addresses the security issues like privacy integrity and authentication. SSL located at the transport layer.

SSL technology allow web browsers and web servers to communicate over a secure connection. In this secure connection, the data that is being sent is encrypted before being sent and then is decrypted upon receipt and before processing.

Use of SSL :

SSL used to secure server to browser transactions .

This generally includes the securing of any information passed by a browser (such as customer's credit card number or pass word) to a web server (such as an online store or online banking application).

SSL uses public key cryptography.

UNIT -4

E-mail : E-mail is a system in which a computer user can exchange message with other computer using a communication network.

Adv. E-mail.

- Send message anytime, anywhere .
- Send message to multiple recipients.
- Easy to use.
- Forward information.
- E-mail is fast.
- Attach digital files.
- Send message around the world.
- Cost effective.
- No other person can read, the letter.
- Since the message lies in computer we can always access and use it .

Dis adv. E-mail .

- Delivery is not guaranteed .
- No guarantee of privacy.
- The recipient needs to scan the mail for viruses.
- Checking and deleting these unwanted mails can unnecessarily consumption of time.
- Very difficult to find out the e-mail address of some body unless he tells us .

User ID and password :

password is a secret word or string of characters that is used for authentication.

E-mail Address:

An e-mail address is required to send and receive e-mail. They usually consist of three parts (1) a user name (2) @ symbol, and a domain name .

E-mail message component :

1. To – Receptient address.
2. CC- Carbon copy (It is optional).
3. BCC – Blind carbon copy, other recipients (optional).
4. Subject – Main topic of the message.
5. Attachment – name of the file that we will send. Ex-Document, Photo.
6. Body- contains the message itself, which can be any length.

Writing E-mail.

Reading E-mail.

Replying E-mail.

Sending attachments:

Opening attachments:

Managing message : Create folders.

E-mail protocols:

Def : Protocol is about a standard method used at each end of communication. Following are the e-mail protocols.

1. IMAP (Internet message Access Protocol.): It is a standard protocol for accessing e-mail from our local server. It is a client / server protocol in which e-mail is received and held for us by our internet server.
2. POP (Post office protocol) : Through this protocol we access mail boxes and download message to our computer .
3. SMTP (Simple mail transfer protocol) : This protocol used by the mail transfer Agent (MTA) to deliver our e-mail to the recipient's mail server. This protocol only used to send mail not to receive them.
4. HTTP : It is not a dedicated protocol for e-mail communication. Used for accessing mailbox. This protocol can be used for compose or retrieve e-mail.

Tel net :

- Tel net is a protocol.
- It is the part of the TCP/IP suite .
- It is quite similar to the Unix .
- Tel net used for remote login to internet computer .
- Telnet allows us to log into computers on the internet and use online database, chat services etc.
- Telnet is also used to refer to the software that implements the client part of the protocol.
- Telnet establish a connection using the Telnet protocol.
- A Telnet program must be installed on our local computer and configured to our web browser in order to work .

(FTP) File Transfer Protocol:

FTP is a internet protocol for transmitting files between computers on the internet over TCP/IP connections. It is a client server protocol where a client will ask for a file, and a local or remote server will provide it .

FTP transfers on the www without the need for special software.

FTP used for download:

1. Connect to the server.
2. Find the file/folder we want to download.
3. Choose the appropriate download made.
4. Begin the transfer and get the file .

FTP used for upload :

1. Connect to the server (and login).
- 2.If we are using fetch, choose to “put” files/folder .
3. Find the file/folder we want to upload, Double click a folder to open it .
4. Choose the Appropriate upload made .

Begin the transfer.

News groups :

News groups or discussion groups are used to exchange messages and files through use net. It is established in 1980. It is the oldest computer networks.

These groups allow people to post publicly accessible message, which are distributed across news servers on the internet.

How to news groups work :

- To join news group have an e-mail account.
- There you can look for groups.
- Click to final news group. You click there link.
- Option to join the group will shown.
- Once the connection established, news reader downloads all the messages posted.
- News reader sends message to the news server.
- The news server connects to one or more news server.

Types of news groups: Two main types of news group.

1. Immoderate news groups – It has unrestricted posting. Everything posted included in the discussion.
2. Moderated news groups – where message are posted by moderators before appearing on the news group. In a moderated newsgroup, a moderator must approve posts for discussion.

Binary newsgroup : This is a text based discussions. A large number of newsgroups are now used for file sharing. These news groups primarily provide links to files, after have the term binaries in their name .

Chart room : Chartroom is a virtual room on the internet. To connect a chart room a computer and

internet connection of any speed required chat rooms required client programs with IRC (Internet relay chat) .

Virtual chat rooms (graphical Multi-user environment) feature a 3D or 2 environment where people are free to make their own .

Internet Relay chat(IRC) – IRC is an application layer protocol that facilitates communication in the form of text . The chat process works on a client/ server networking model.

IRC service provides a way for many users to communicate about a given topic. Each communication occurs on a separate channel. IRC servers on the internet accept and relay messages to connected users, each of whom is running on IRC client. The clients all use the IRC protocol.

Web Chat: Web chat is a system that allows users to communicate in real –time using easily accessible web interface. It is a type of internet online chat. It has two categories one is textual and other is graphics and even 3D.

Video Conferencing :

Video conferencing uses telecommunication of audio and video for meeting. This can be a simple conversation _between two people (Point-to-Point) or several sites (muti point) with more than one person at different sites.

Through video conferencing we can share documents, computer displayed information and white boards . High quality conference needs 768 Kbps of bandwidth possible conference required at least 10 mbps.

Need of video conference :

- A live conversation is needed .
- Visual information.
- The parties of the conversation can not physical come to the same location.
- The time of travel is consideration.
- Student interviews with an employer in another city .

E-Commerce:

E-commerce is associated with buying and selling information, products , services via computer network.

E- commerce is very beneficial to consumer on line ordering helps consumer to buy online products without any physical involvement .

E-commerce can be defined in three prospects .

1. Communication prospective .
2. Business prospective.
3. Service prospective.

1. Types of E-commerce :

Business to Business : B2B refers commerce between business , Business can after deal with hundreds or thousands of other businesses, either as customers or supplier.

2. Business to customer:

B2C e-commerce mean E-commerce involving an individual and a shop selling goods.

3. Customer to Customer

It takes place on the internet, without any business as middleman.

Advantage of E-Commence :

1. It increase sales and decrease costs of goods.
2. It enables people to work from home and added benefits of reduction in traffic and pollution.
3. It provides the buyers a wide range of choices.
4. Advertising on the web can make the firm globalize.

Disadvantage of E- commerce:

1. Frauds are not completely eliminated in a E-commerce transactions.

Cyber laws are not properly enacted and the existing ones are not clearly defined.

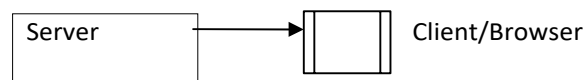
UNIT : 5

Static Websites :

A static website contains web pages with final content. Each page is carded in HTML and displays he same information to every visitors. This is the most basic type of website and are the easiest to create. Do not require any web programming or data base design.

Static web pages contain fixed code, the content of each page does not change unless it is manually updated by webmaster. This works well for small websites, but it can make large sites with hundreds or thousands of pages difficult to maintain. Static sites contain a lot of pages are after designed using templates. This makes it possible to update several pages at once, and also helps provide a consistent logout throughout the site (Templates: Template is a file that serve as a starting point for a new document, when open a template it is preformatted in same way).

Example of static websites :



www.Yashamanshaspial.com

www.rajputanasecurityguard.com

etc.

Adv: Quick to develop

Cheap to develop

Cheap to hast

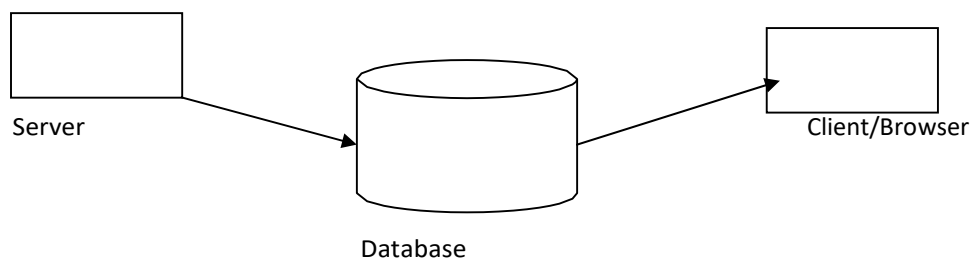
Disadvantage:

- Requires web development expertise to update site.
- Site not as useful for the user.
- Content can get stagnant.

Dynamic web site :

A dynamic website contains information that changes, depending on the viewer of the site, the time of the day, the time zone, the native language of the country the viewer is in on many other factors .

Dynamic websites contain web pages that are generated in real time. These pages include web scripting code, such as PHP or ASP. When a dynamic page is accessed, the code within the page is passed on he web server and resulting HTML is sent to the client web browser.



Most large websites are dynamic. Dynamic websites access information from a database are also called database – driver websites.

Example of Dynamic websites are writing blogs, e-commerce sites, calendar, to-do sites and other types of sites which needs updating frequently .

Advantage Of dynamic websites:

- Much more functional website.
- Much easier to update.
- New content brings people back to the site and helps in search engines.
- Can work as a system to allow staff or users to collaborate.

Disadvantage of dynamic websites:

- Slower, more expensive to develop.
- Hosting costs a little more.

Web Portal:

Web portal is a specially designed website that brings information from delivers sources in a uniform way. Each information source gets its dedicated area on the page for displaying information.

Example of portal :

Rediff, Yahoo etc.

Classification of web portals .

Web portal are classified as horizontal and vertical.

Horizontal web portals : 1) Govt. portals, educational portals, (operate portals, cultural portals .)

Vertical Portals : Also known as vertical . These are user-centric portals, that provide information related specific company, interest, or services.

Social networking sites : Social networking platforms may allow organizations to improve communication and productivity by spreading information among different groups of employees in a efficient manner .

Advantages :

- Facilities open communication.
- Allows employees to discuss ideas, post news, ask questions and share links.
- Provides an opportunity to widen business contact.
- Targets a wide audience, making it a useful and effective recruitment tool.
- Improves business reputation and client base with minimal use and advertising .
- Expand market research, implements campaigns.

Disadvantages .

- Open up the possibility for hackers to can not fraud and virus attacks.
- Increases the risk of people falling online scams.

General policy use social networking:

- Define what social networking is particular to your organization .
- Establishes a clear and defined purpose for the policy.
- Communicates benefits of social networking and of having a policy.
- Provides a clear platform for educating employers.
- Provides examples of policy violations.
- Outline disciplinary measures to be taken for policy violations.
- Example : Face book, Twitter, orkut, my opera etc.

RSS feeds :

RSS is about web feeds directly to computer.

RSS takes the latest head lines from different websites and pushes those headlines down to our computer for quick scanning.

The RSS stands for many versions of the same thing .

- Really simply syndication.
- Rich site summary (Rs 0.91)
- - Real time simple syndication (RSS.20

Each of the above meaning and purpose is same.

Purpose of RSS :

1. News : Fresh news updates.
2. Hobby interests: We can get hobby advice .
3. Photos : Excellent way to get the latest photo from photographer .
4. Reading friends blogs.
5. Politics:
6. Jokes and inspirational quotes.
7. Currency exchange rates.

How RSS works :

1. Behind the scenes: RSS headlines are simple text files, The publishing web master submits to a special feed server. The RSS feed server pushes the text file to the screens of its subscribers.
2. To get started : Choose an RSS tool. Most RSS tool are free to use .
3. Set up screen : Load the RSS feeds into reader tool.
4. Then start reading web feed news .

Examples of RSS Readers:

- My yahoo Reader.
- Blog lines. com.
- Newsgator.com
- Google Reader

Blog :

Blog is a online journal or informational website displaying information in the reverse chronological order. The latest posts appearing first, at the top. It is a platform where a writer r a group of writers share their views on an individual subject .

Blogging :

Blogging is a collection of skins that one needs to run and supervise a blog. Necessities of a webpage with tools to make the process of writing, posting, linking and sharing content easier in the internet.

Blogger :

Blogger is sense one who runs and controls a blog. He/she shares opinion and knowledge on different topics for a target audience.

Netiquette: Netiquette is the combination of net and etiquette . It is defined as a set of rules for acceptable online behavior and politeness followed by users of on line and digital technology such as the internet, email and chat rooms.

Netiquette guidelines are

- Appropriate use of language and tone.
- Expectations for grammar, text, fonts and columns.
- Respect and consideration for other students.
- Issues of privacy and information sharing outside of class.

If we pay attention to netiquette.

- Our communication will be better.
- We will gain more credibility.
- We will get helpful answers more readily hen we have questions to take or need help on the internet.

UNIT-6

Developing portals using HTML

Design a web page :

To design a web page following steps or required.

1. Gathering information.
2. Determine your Audience.
3. Create a story board.
4. Plan your Navigational tools.
5. Create an Aesthetically Appealing web page.
6. Establish credibility.

Gathering Information:

1. What kind of information are presenting(Home page)?
2. How did present the information(Page layout)?
3. Does web page download quickly?
4. Can Navigate easily throughout their activity?
5. Does this site engage the visitor?
6. Is the content rich enough that I will want to return again?
7. Do all of the links work?
8. Have they included a contact resource person?
9. Does it tell when the page was last updated?
10. How could you improve this WebPages ?

Determine your audience :

Audience will affect the design and content of our project. If our target is educators, our presentation will be different than if we were creating a page intended for children use. It is better to offer separate page for educators and children.

Creat story board:

1. As we begin designing the top structure should be menu format pointing to available resources.
2. Include folders near the top of structure, so that new resources can be added at a later date .
3. Create a story board, it's helpful to write each concept or activity. It is a blue print for a web project .

Plan your Navigational tools :

- Plan how people will navigate within your activity.
- Every page should have a link the main page or home page.
- If your activity contains more than one file, you need to plan how visitors will advance to the next page or return to the previous page.

Creat on Aesthetically Appealing web page :

Visual presentation plays an important role to appeal . Include the following items in webpage .

1. Graphics : Web graphics are visual representations used on web site to enhance the representation of an idea or feeling, in order to reach the website user.
2. Add back ground colour or back ground image.
3. Vary your font colour.
4. Vary your font size .

Establish credibility:

This can be a standard closing at the end of each webpage that simply copy and paste from one web page to the other. We should include the following information.

- The name of the author of this activity.
- E-mail address of the contact person for this activity.
- When was this page last updated and links were checked.
- The name of the organization .

Good web design:

A good website design is a critical component. It does not mean creating a few pages of text. It has an importance attached to it. Therefore website design a unique blend of artistic skill and technical skill. It also involves the knowledge of constantly changing technology .

Basic need of designing site:

1. Layout: There is no definitive right or wrong way of approaching it. Make sure that the layout works for the site. Layout primarily consist of
 - a) White space: It is a space between elements on a page. It is referred as navigation space. A good use of white space make a good design.
 - b) Flow : Flow in guiding the user through page. Effective flow takes in all aspects of web design including properties that are not directly related to layout such as colour, size of element, typography and images .
 - c) Alignment : Alignment helps create a good flow .
2. Navigation : Navigation is one of the most important things to designing a website, through which user interact with site .

Easy to use navigation is essential to a good website . To make navigation easy, the sites navigation bottoms should be grouped together. Make sure that links on all pages are working .

3. Typography : Typography is the out and technique of arranging type to make readable. It's important to consider following things.

- a) Font choices.
- b)Font sizes.
- c) Spacing.

d) Line length.

e) Colour.

F) Paragraphing.

4. **Clarity** : Clarity is super important in web design clarity depend upon the pixels . Design need to be clear on what they want/need(i.e. goals and objectives), and everything involved in the process needs to make séance

5. **Consistency**: Meaning making everything match. Heading sizes, Font choices, Coloring, Spacing, design element , Photo choice, bottom style etc. Everything should be in them to make your design coherent (systematic) between pages and on the same page .

6. **Usability**: Usability refers to how easy a website is for visitors to interact with. For example, some sites are visually stunning but difficult to navigate, which makes it hard for users to find what they need. Such websites are on the low end of the usability scale .

Ads : Too many advertisements on site make bad experience for users. Try for well placed highly noticeable ads instead.

Thinks that blink: Blinking can be irritating and we don't want to irritate our readers.

Noise: Lot of people like to add music to their website but if its loud song it may create noise.

Graphics : It is an important part of websites. Some points while adding graphics to website.

- Buttons are not big and unfashionable.
- Every graphic has an all label.
- Every graphic link has a matching text link.
- Graphics and back grounds use browser-safe-colour.

Content: Content is why people visit a website. The design exists to present this information in an organized way and add functionality and style.

Content should be at the core of the design process. Knowing what we have to work with, or want to include, shapes the payment and flow .

Maintenance: Maintenance includes hasting web page and updating it so that the content remains current .

HTML Introduction : Hyper text mark up language in the standard mark up language for documents designed to be displayed in a web browser. It can be assisted by technologies such as cascading style shuts and scripting languages such as Java Script.

Adv. Of HTML:

1. It is cary o understand and can be easily modified.
2. Easily design the web pages along with text.
3. Graphics, video, sound can be used and imported to give attractive look to the web pages.

4. Effective presentation can be made with all formatting effects.
5. HTML documents can be displayed on platform like windows, Unix, Macintosh.

HTML document structure :

This structure divided into two parts Head and body .

Head Contains : information about the document such as title not displayed.

Body contains the text, i.e. where we place the document material to be displayed Elements allowed inside the head, such as title, are not allowed inside the body and vice versa .

Structure of HTML documents .

<pre>< html > < head > < title > < /title > < / head > < body > < / body > < / html ></pre>	<p><u>Example</u></p> <pre>< html > < head > < title > Introduction to HTML < /title > < / head > < body > This is the first page of HTML < / body > < / html ></pre>
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HTML Tags/elements:

HTML is a Tag based language Tag is an element that instructs the web browser how to show and what to show. A Tag of text enclosed in angular brackets < > . Tags are not case sensitive i.e. < tag-name> and < TAG-NAME > has the same effect. Tags are two types .

1. Container Tags . (2) Empty Tags.
 1. Container Tags . These Tag include both ON and OFF tags. On tag is < > and OFF tag is < / >. < / > this sign marks the difference between starting and ending tags. If tags are nested, keep these tag sets balanced.
 2. Correct way

Tag 1
Tag 2

Tag 2
Tag 1
 2. Incorrect way .

Tag 1
Tag 2

Tag 1
Tag 2
3. **Empty tags :** These tags include only the ON Tag . These elements do not enclose any data .

Description of various Tags:

1. **ADDRESS tag** – This should be used to enclose information address (may be mail address or physical phone no. etc).
2. Appearance – < ADDRESS > – < /ADDRESS >

3. Attributes – None.

2. **APPLET tag** : It used to include Java applets . The CODE indicates the location of the application CODE BASE can be used to specify on absolute URL for the applet.

1. Appearance – < APPLET CODE = String HEIGHT = r WIDTH = r >

4. < /APPLET >

Attributes : - CODEBASE= URL, CODE = String, Name = String ,ALT =String, ALIGN = Left/right/top/middle/bottom,HEIGHT = r,WIDTH=4, HSPACE = r, VSPACE =r .

The Name attribute in the name of the applet, WIDTH and HIGHT is specify the width and height of the applet window. HSPACE and VSPACE in the spacing around the applet.

3. **AREA Tag** :- The< area > tag defines an area inside an image map .

4.**Anchor tage**- It is used to define the beginning and end of hypertext link. Search engines use the tag to determine the subject matter of the destination URL.

5.**BASEFONT Tag** : It defines the default font family, font size and colour for the text in the HTML documents.

6. **BASE Tag** : < base > BASE tag is used to indicate the correct location of the document .

7. **BIG Tag** : <big > is used to make the text one size bigger, < small to medium, medium to large, large to x large >.

8. **BLOCKQUOTE Tag**: This tag specifies a section that is quoted from another source. This element is found in the <body >tag.

9. **BODY Tag** : <body > tag defines the documents body. The < body > element contains all the content of an HTML document, such as headings, paragraphs, Images, hyperlinks , tables, lists etc. There can only are <body > element in HTML document.

10. **BR Tag** : < BR > tag is used to line breaks within text. No and
 tag require . CLEAR attribute is used when IMG image in text . If that image uses ALIGN = LEFT or ALIGN = RIGHT, the text will flow around it.

11. **B Tag** : < B >tag specifies bold text without any extra importance .

12.**Caption tag** : The <CAPTION > tag provide a caption for a table . A caption functions like a heading for a table caption help user to find a table and understand what is about .

13. **CENTER Tag** : <CENTER >Tag is used to center the text horizontally in the HTML.

14. **CITE Tag** : < CITE >< \CITE > Tag defines title of a creative work . (e.g a book, a poem, a movie , a painting etc. A person name is not the title of a work.

15. **CODE Tags** : < CODE >< \CODE >tag is used for small piece of ode that appear inside a paragraph of text . The content inside is displaced in browser's default mono space font.

16. **DD Tag** : < dd >tag is used to described a term/name in a description list .

The<dd > tag is used in conjunction with < dl >define description list >and< dt > < defines temporary>.

Example : <dl>

```
< dt >Coffee < /dt >  
< dd >black hot drink < /dd >  
< dt >milk ( /dt>  
< dd > white cold drink </dd >  
< /dl >
```

17. **DFN Tags** : <DFN > < /DFN >stands for definition elements.

18. **DIR Tags** : < DIR > < / DIR > tags used for list directory titles.

19. **DIV tags** : - < DIV > < /DIV > tag defines a division or a section in an HTML documents.

20. **DL Tag** : < DL > < /DL >presents a description list . The element encloses a list of grouts terms < specified using the < dt > element) and description and provided by < dd > elements) .

21. **DT Tag** : < DT > < /DT > tags specifies a term/ name in a description list . < DT > tag is used in conjunction with < dl > > defines a description list > and < DD > describes each term / name) .

22. **EM tag** = < EM > < \EM > tag used for emphasized text. The content inside is typically displaced in italic.

23. **FONT Tag** : < Font > < \Font > tag can be used to change font size , colour and face of text in the HTML .

24. **FORM Tag** : < FORM ACTION = URL: > < \FORM > used to creat an HTML form for user input.

25. **FRAMNESET Tag** : < FRAMESET >< \Frameset > tag define a frame set . Frame set are COLS and ROWS. They brake the column and frames .

26. **H1 Tag** : < HI > < \HI >tags are used to define HTML headings.

Only use one < h1 > per page – should represent the main heading / subject for the whole page . H1 is the most important header in the document. There are six header tags available from H1 to H6. H1 displays the text in largest font supported . H2 displays the text less larger than H1 and so on . H6 displays the smallest text.

27. **HEAD Tag** : < HEAD >< \HEAD> tag provide the information about the document . < Head >element is a container for metadata < data about data >and in placed between the < HTML>tag and (body >tag 28.HR Tag : < HR >Tag displayed as a horizontal rule that is used to separate content in a HTML page .

29. **HTML Tag** : < HTML > < \HTML >tag represents the root of an HTML document. < HTML > tag is the container for all other HTML elements .

30. **IMG Tag** : < IMG > tag is used to insert images within text . Images are not technically inserted into a web page. Images are linked to web pages. The < img >tag creates a holding space for the referred images.

The (img) tag has two attributes.

- Src– Specifies the path to the image.
- Alt – Specifies an alternate text for the image .

31. **Input Tag** : < input type = text >

This tag is most useful. It defines an input field when the user can enter data .

The < input > element is the most important form element . The < input >element can be displayed in several way, depending on the type attribute .

32. **ISINDEX Tag** : < ISINDEX >tag is used for querying a document through a text field. The tag can be used anywhere but head tag is preferable .

33. **I Tag** : < I > < \I > tag defines a part of text. The content inside is typically displayed in Italic. This tag is often used to indicate technical term, a phrase from another language .

34. **KBD Tag** : < KBD > < \KBD >tag used to indicate text that should be entered by the user KBD indicates input .

35. **Link Tag** : < Link rel = String href = URL >The < Link > tag defines the relationship between the current document and an external resources .

- It is used to indicate relationship between documents.

36. **LI Tag** : < LI > < \LI >tag defines a list item. The < LI >tag is used inside ordered lists < OL > un order lists < ul > . In < UL > the list items will usually be displaced with bullet points . In < OL >, the list items will usually be displayed with numbers or letters .

37. **MAP Tag** : < MAP NAME = string > < \MAP > tag define an image map . An image map is an image with clickable areas. The < Map >element is associated with < img > 's use map attribute and creat relationship between the image and the map .

38. **MENU Tag** : < MENU > < \MENU >tag defines a list/menu of commands.

39. **META Tag** : < META NAME = String content = string > tag defines metadata absent an HTML document . Meta data is data about data. < Meta > tags always go inside the < head >element, and are typically used to specify character set , page description, keywords, author of documents etc.

40. **OL Tag** : < OL > < \OL > tag mark up an ordered list of items can be numerical or alphabetical type of attributes .

- 1 – Arbin numbers default < 1,2,3,4 >
- a – Alphanumeric , lower case < a,b,c,d.... >
- A – Alphanumeric, upper case< A,B,C,D.... >
- i – Roman numbers, lower case < i,ii,iii,iv >
- I – Roman numbers, upper case (I,II,III,IV)

41. **OPTION Tag** : < Option > < /Option > tag defines an option in a select list to indicate an option .

42. **PARAM Tag** : < PARAM NAME = X VALUE = Y >tag is used to pass the parameters to the object that has been embedded using (object >element. We can use more than one < Param > tag within an < object >element in any order, but each tag must contain name and value attribute and should be placed at the start of the content .

43. **PRE Tag** : < PRE > < /PRE > tag defines preformatted text .

44. **P Tag** : < P > < /P > tag represents a paragraph paragraphs and usually represented in visual media as blocks of text separated from adjacent blocks by blanks lines and / or first – line indentation .

45. **SAMP Tag** : < SAMP > < / SAMP > tag in sample text is used to enclose inline text which represents sample < or quoted) output from a computer program. It difference from ked TEXT THAT USER MUST ENTER WHERE AS < Samp > text can also be o/p .

46. **SCRIPT Tag** : < SCRIPT > < /SCRIPT> tag defines a client – side script .

47. **SELECT Tag** : < SELECT> < /SELECT> tag is used to create a drop down list .

48. **SMALL Tag** : < SMALL > < /SMALL > tag is enclosed text in a smaller font if available and ignore the tag otherwise .

49. **STRIKE tag** : < STRIKE >< /STRIKE > tag is specify that the enclosed text should be rendered in a strike –through appearance .

50. **STRONG Tag** : is used to indicate strongly emphasized text.

51. **STYLE Tag** : <STYLE></STYLE> tag is included only to ensure upward compatibility .

52. **SUB Tag** : tag specifies that the enclosed text should be rendered in subscript , with the enclosed text slightly lower than the surrounding text. This is mainly used for chemical formulas .

53. **SUB Tag** : tag specifies that the enclosed text should be rendered in super script.

54. **TABLE Tag** : (TABLE) (/ TABLE) tag stands with an optional caption followed by one or more rows.

55. **TD Tag** : <TD> </TD > tag used to mark up individual call inside the row of a table .

56. **TEXT AREA tag** : < /TEXT AREA> </ TEXT AREA > tag is used inside FORMs, set up an area in which the user can type text.

57. **TH Tag** : < TH > </TH > tag is like TD , TH is used for a table cell . TH should be used when the cell's content is heading of some sort .

58. **TITLE Tag** : < TITLE > </TITLE > tag is must have exactly one TITLE element. This element provides the title of the document, usually displayed top of the browsers window .

59. **TR Tags** : < TR > </TR > tag defines a row in an HTML table . A < TR > element contains are or more < th > or < td > elements.

60. **TT Tags** : < TT > </TT > tag specifies teletype. Text element that the enclosed text should be rendered in a teletype .

61. **UL Tags** : < UL > tag defines an unordered list . Use the < UL > tag with the < Li > tag to create unordered lists .

62. **U Tag** : < U > </U> is used to indicate the enclosed text should be underlined .

63. **VAR Tag** : < VAR > </VAR > is used to mark up variables.

HTML ANCHOR TAG : (< a > 1)) is used to mark the text as a hypertext link that a user can click to display the document which is anchored to it . It is a container tag .This gat can be used in two ways .

- The text or image that is clicked to activate the link.
- The address that will be opened using the defined link.
- There links are used in the following ways.
- - To jump from one section of the page to another within the same web page .
- - To link to another page within the same website.
- To link to another page or website any where in the world .

Creating Hyperlink to a document : Hyperlink to a document is created using HREF attribute of anchor tag . Which marks the beginning of the link to another document, resource or a particular place in another document.

The syntax is < A HREF = " Path of the File name ">name of the link < \A >

1. HREF – hypertext reference.
2. Path of the file name can be absolute or relative address.
3. Name of the link to be underlined or colored.

To create a link:

1. Highlight the text (or image) hat we would like to turn into a link.
2. Click the create hyperlink icon in the problem.
3. Select link to a file.
4. Click next.

5. Select existing local file, and click next .

Creating a link within a web page :

The syntax is

< A HREF= # Link name "> name of the link and the same document < \A >

Link name – name of the section we are linking or jumping to

- # sign tells the anchor tag that it is looking for the section within the same document.

Creating link to Another website :

The syntax is

< A HREF = " http://www.google.com "> search engine < \A >.

It display the text " search engine" Colored and underlined. When this highlighted text is clicked the control moves to the " google c.com" specified the value of attribute HREF.

HTML Table Tag:

Tables are displaying information in a precise form Table can effectively give all necessary information Tables are defined with the < table >tag . A table is divided into rows (Ltr >tag) and each row is divided into data cells (Ltr > tag), td in the table data which is the content of a data cell. A data cell can certain text, image, lists, paragraphs, forms, horizontal rules, etc.

HTML FRAMES:

HTML frames are used to divided browser window into multiple sections where as each section can load a separate HTML document. A collection of frames in the browser window is known as frame set . The window is divided into frames in a similar way the tables are organized into row and columns.

Advantage :

1. Frames be an excellent navigation tool if used properly .
2. Site maintenance is relatively easy with frames.
3. With frames, we can display contents of other websites without learing user site.
4. With <NO FRAME >tag we can add alternative content for browsers which do not support the < FRAME >tag

Disadvantage :

1. Framed sites are not inde4xed well by search engine.
2. Users cannot bookmark individual pages.
3. Frames are not supported by older browsers.

HTML FORMS :

HTML forms used for more interactive website HTML form is used to collect user input. The user input is most after sent to a server for processing . There are many way to handle HTML form like e-mail, login common gate way Interface script, perl script and more .

Disadvantages of HTML :

1. HTML can creat only static and plain pages .
2. Need to write a lot of code for making a simple webpage.
3. Security features are not good in HTML.
4. GUI is embedded in the data.
5. Searching for information in the data is tough.

Separating style from structure with style sheet:

Style sheet means to separate style from content.

Style sheets allows to control the fonts, colours, leading, margins, type faces and other aspects without compromising its structure .

Cascading style sheet (CSS) are used to format the layout of web pages. They can be used to define text styles, table sizes and other aspects of web pages .

CSS rules : A CSS rule set consists of one or more statements in the following forms.

Selector { Property : Value }

Selector

{

Property : Value;

Property : Value

Property : Value

}

The selector defines what elements the rule will be applied to following it is a declaration block, denoted by curly bracket ({}) . Multiple declaration are separated by semicolon(;) .The declaration consist of property and a value Separated by Colon(□ , Properties are identifiers such as font-size, background colour ,etc. The values depend on the individual property.

We can also insert comments any where white space is permitted.

Selector { \ * a comment for this rule */

Property : Value ;

Property : Value;

Property : Value;

Selectors :

Selectors consist of a tag name . Multiple tag name can be specified by separating them with comma(,)

```
h1 { back ground –colour : #ffff00 }
```

```
h2 { back ground –colour : # ffff00 }
```

```
h3 { back ground –colour : # ffff00 }
```

The above may be written as

```
h1,h2,h3 { back ground –colour : # ffff00 }. This is known as grouping.
```

Types of CSS : There are three types of CSS styles.

1. Inline styles : Inline styles are written directly in the tag on the document
< a href = “ “ style = “ text – decoration: none;” >
2. Internal / Embedded styles : Embedded style are embedded in the head of the document.
< style type = “ text /css” >

P{ color:#00f; }

< /style >
3. External styles : External styles are written in separate document and then attached to various web documents.
< Link rel =” style sheet” type=” text/css”href=styles.css”/ >

Internal style sheets :

Internal style sheets would like this

```
< style type =” text/Css “ media =” all “ >
```

```
< 1 –
```

```
P { font : 1em Times Serif;Color:#coo}
```

```
h1 { font : 2em Times Serif;Color:# foo}
```

```
- >  
- < /style >
```

Advantage :

1. Internal style sheets affect only the page they or on .

2. Internal style sheet can use classes and IDs.
3. Internal style sheet don't require that we upload multiple files.
4. Internal styles may have higher importance than external style sheets.

Disadvantage:

1. They affect only the page they are on .
2. Internal style sheets increase page load times.

External style sheet :

An external style sheet is a separate file where we can declare all the styles that we want to use on our website. Then we link to the external style sheet from HTML pages. Only need to set the styles once for each elements. CSS in the easiest way to link or import an external style sheet. External style sheet is a file with a .css extension that contains style definition.

The external style sheet can be linked multiple pages . If the link to the external style sheet is placed after the internal style sheet in HTML < head >, the external style sheet will override the internal style sheet.

Advantages :

1. We can control the look and feel of several documents at once.
2. We can create classes of styles that can be used on many different HTML documents .
3. We can easily group our style to be more efficient.

Disadvantage.

1. External style sheets can increase the download time, if they are extremely large.
2. If we have a small number of styles, they can increase the complexity of our site .

