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SYLLABUS

INTERNET FUNDAMENTALS

Kurukshetra University

UNIT-I: THE INTERNET

Introduction to networks and Internet, history, Internet, Intranet & Extranet, Working of Internet, Internet Congestion, Internet culture, business culture on internet. Collaborative computing on the Internet. Modes of Connecting to Internet, Internet Service Providers (ISPs), Internet address standard address, domain name, DNS, IP.v6. Modems, Speed and time continuum, communication software, Internet tools.

UNIT-II : WORLD WIDE WEB

Introduction, Miscellaneous Web Browser details, searching the www: Directories search engines and meta search engines, search fundamentals, search strategies, working of the search engines, Telnet and FTP, HTTP, Gopher Commands, TCP/IP. Introduction to Browser, Coast-to-coast surfing, hypertext markup language, Web page installation, Web page setup, Basics of HTML & formating and hyperlink creation. Using FrontPage Express, Plug-ins.

UNIT-III : INTERNET PLATEFORM AND MAILING SYSTEMS

Introduction, advantages and disadvantages, User Ids, Pass words, e-mail addresses, message components, message composition, mailer features, E-mail inner workings, E-mail management, MIME types, Newsgroups, mailing lists, chat rooms, secure-mails, SMTP, PICO, Fine, Libra cards catalog, online ref. works.

Languages: Basic and advanced HTML, Basics of scripting languages - XML, DHTML, JavaScript

UNIT-IV : SERVERS

Introduction to Web Servers: PWS, IIS, Apache; Microsoft Personal Web Server. Accessing using these servers.

Privacy and security topics: Introduction, Software Complexity, Attacks, security and privacy levels, security policy, accessibility and risk analysis, Encryption schemes, Secure Web documents, Digital Signatures, Firewalls, Intrusion detection systems

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INTERNET FUNDAMENTALS
B.TECH. (COMPUTER SCIENCE) 4TH SEM.
CSE-204N
PAPER 2017

UNIT - I

Q.1. Explain the concepts of Internet, intranet and extranet.

Ans. Refer Article No.1.3 & 1.4 on Page No. 3 – 7.

Q.2. Write short note on following:

(a) Domain name and DNS

(b) Internet tools

(c) Modems

(d) Communication software

(e) Internet Congestion.

Ans. (a) Domain name and DNS: Refer Q.6, 7 of Article No. 2.5 on Page No. 21.

(b) Internet tools: Refer Q.12 of Article No. 2.9 on Page No. 27.

(c) Modems: Refer Q.10 of Article No. 2.7 on Page No. 24, 25.

(d) Communication software: Refer Q.11 of Article No. 2.8.

(e) Internet Congestion: Refer Article No. 1.5 on Page No. 7.

UNIT - II

Q.3. (a) Explain the pros and cons of search engine.

Ans. Pros and Cons of search engine:

1. Bing

Microsoft's Bing has been presented as a decision engine. As of 2010 Bing also powers yahoo! Search and targets four information categories of search engines: Shopping, Local, Travel and Health.

Pro's of Bing

- ❖ Bing comes packed with search tools such as an Explorer Pane for refining searches, Quick Previews, and Sentiment Extraction for making sense of product reviews.
- ❖ It is known for good add-ons, including travel and local results.
- ❖ Generates comprehensive and relevant image searches with endless scrolling.
- ❖ There are useful features such as the table of contents that shows up often in the upper left column.
- ❖ It has an easily accessible search history with enhanced utility due to the silverlight-enhanced format.

Con's of Bing

- ❖ Although owned by Microsoft, it is relatively young having been unveiled in 2009.
- ❖ Bing tends to lag in search engine optimisation and lead generation as it attracts less site visitors.
- ❖ Technical search results are found to be weak compared to other search engines.

- ❖ Bing buries the news search off the main page and one has to click further.
- ❖ Some typical searches can be weak with less relevant results.
- ❖ Bing and Bing related links like Bing Blog can be sluggish leading to a poor community experience.

2. Yahoo

Yahoo Search is a search engine owned by Yahoo Inc. and is the second largest search directory on the web.

Yahoo Pro's

- ❖ Yahoo has done well to integrate search results with its rich network of content.
- ❖ The new interface is useful for customisation, for instance connecting to other sites such as Gmail without leaving yahoo.
- ❖ Some say that Yahoo's arguably has the best capabilities for appropriate and targeted display advertising.
- ❖ Yahoo has personals advertisements and jobsites on the main page or accessible from the main page.

Yahoo Con's

- ❖ The downside of customization part is that not all sites will be integrated with the new interface and harmonisation takes time.
- ❖ Additional customisation is sleek, but Yahoo performance has seemingly taken a hit as compared to other search engines.
- ❖ Yahoo does not have a book search or desktop search feature.
- ❖ Yahoo does not incorporate user generated videos like Google Video.

3. Google

Ranked number one in market share Google is probably the most renowned search engine. They determined relevancy primarily on their PageRank algorithm.

Google Pro's

- ❖ Holds the all-round reputation for generating the most relevant results.
- ❖ Continually evolves with improvements and updates to enhance quality of results.
- ❖ Offers enhanced and unrivalled features such as Street Views; Google Maps.
- ❖ In Search engine optimization, Google's algorithm here is what most corporations contemplate when optimizing their websites.
- ❖ Google SEO allows websites to attract more visitors, which can translate to greater revenue for the operators or site owners.
- ❖ In relation to other search engines Google returns results very quickly, even on less common or misspelled keywords and with spelling suggestions too.

Google Con's

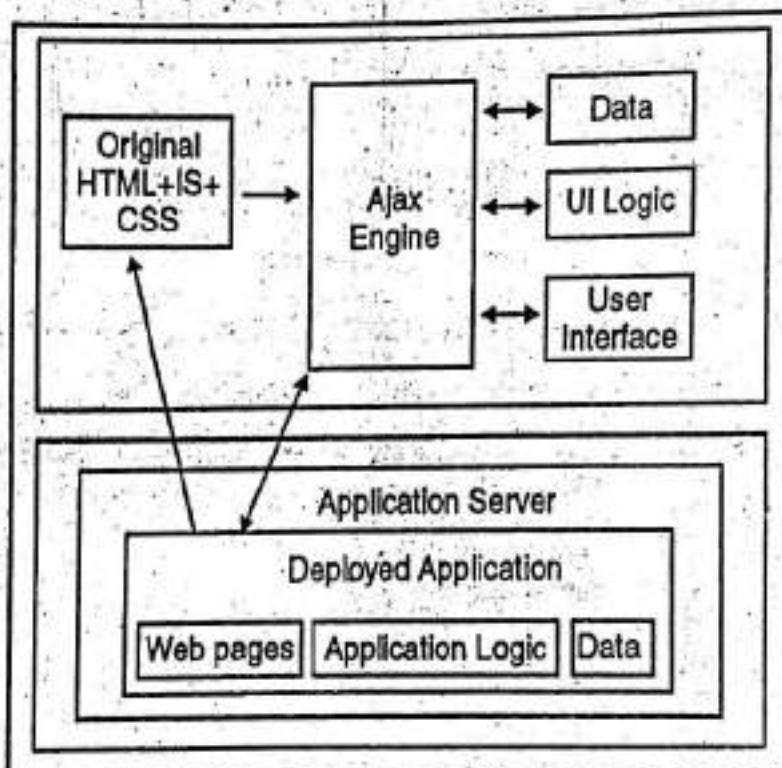
- ❖ Although very few comparative cons, even Google isn't a perfect search engine.

- Some searches still yield results with little relevance on top. For instance searching for reviews will more than likely produce more hits on marketing content products.
- Google search credibility is likely to be strongly influenced by trends in the SEO market which can make relevancy of results less 'natural'. Of course one can argue that all engines can be impacted accordingly.

Q.3. (b) Explain the basics of scripting language.

Ans. Scripting Languages: Scripting languages are like programming languages that allow us to write programs in form of script. These scripts are interpreted not compiled and executed line by line. Scripting language is used to create dynamic web pages.

Client-side Scripting: Client-side scripting refers to the programs that are executed on client-side. Client-side scripts contain the instruction for the browser to be executed in response to certain user's action. Client-side scripting programs can be embedded into HTML files or also can be kept as separate files.

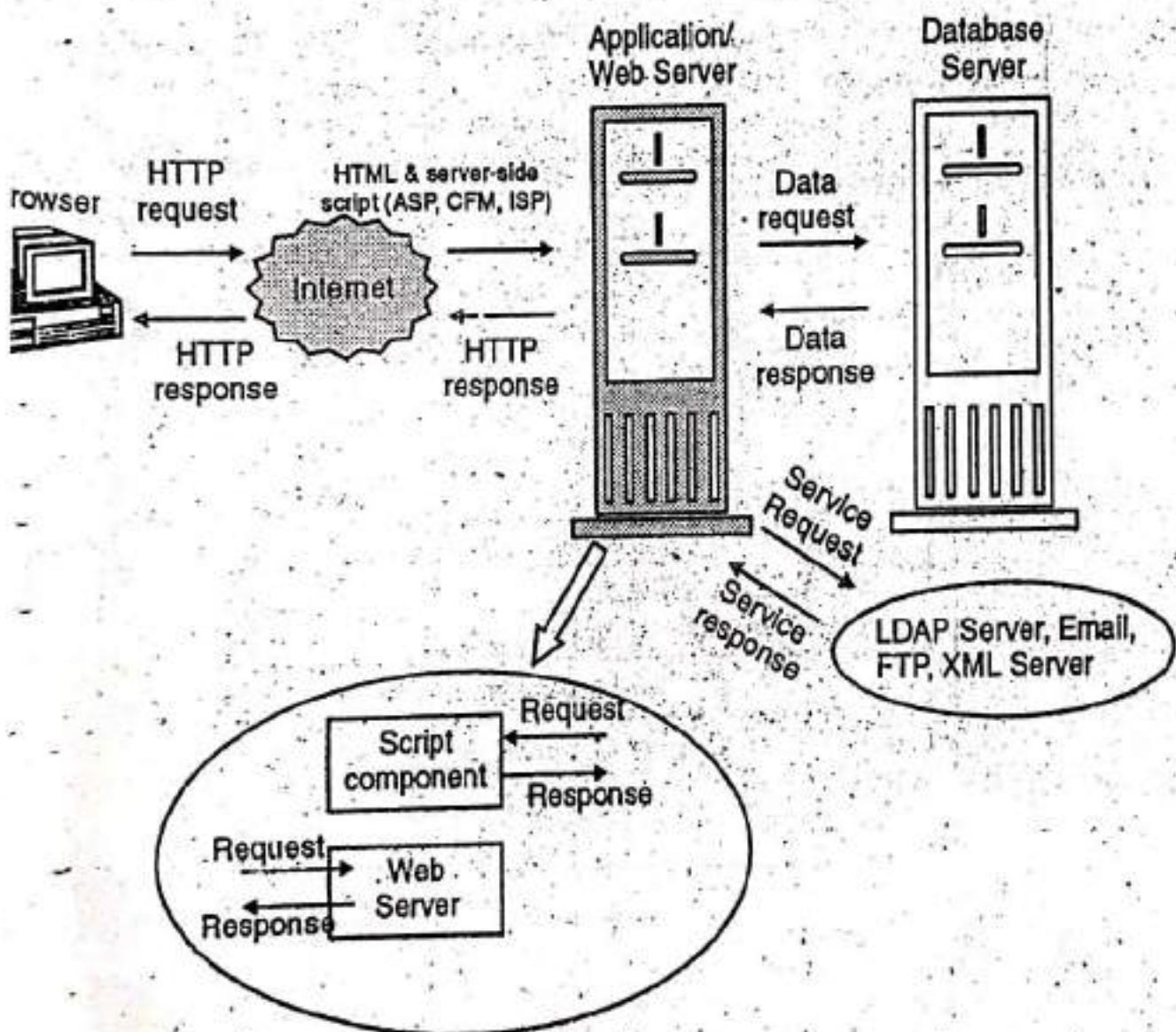


Following table describes commonly used Client-Side scripting languages:

S.N.	Scripting Language Description
1.	JavaScript: It is a prototype based scripting language. It inherits its naming conventions from Java. All JavaScript files are stored in files having .js extension.
2.	ActionScript: It is an object oriented programming language used for the development of websites and software targeting Adobe Flash player.
3.	Dart: It is an open source web programming language developed by Google. It relies on source-to-source compiler to JavaScript.

J.	Scripting Language Description
	<p>VBScript: It is an open source web programming language developed by Microsoft. It is superset of JavaScript and adds optional static typing class-based object oriented programming.</p>

Server-side Scripting: Server-side scripting acts as an interface for the client and also let the user access the resources on web server. It can also collects the user's characteristics in order to customize response.



Following table describes commonly used Server-Side scripting languages:

S.N.	Scripting Language Description
1.	<p>ASP: Active Server Pages (ASP) is server-side script engine to create dynamic web pages. It supports Component Object Model (COM) which enables ASP web sites to access functionality of libraries such as DLL.</p>

S.N.	Scripting Language Description
2.	ActiveVFP: It is similar to PHP and also used for creating dynamic web pages. It uses native Visual Foxpro language and database.
3.	ASP.net: It is used to develop dynamic websites, web applications, and web services.
4.	Java: Java Server Pages are used for creating dynamic web applications. The Java code is compiled into byte code and run by Java Virtual Machine (JVM).
5.	Python: It supports multiple programming paradigms such as object-oriented, and functional programming. It can also be used as non-scripting language using third party tools such as Py2exe or Pyinstaller.
6.	WebDNA: It is also a server-side scripting language with an embedded database system.

Q.4. What are IP? addresses ? Justify their significance; also discuss the structure of IP address.

Ans. Refer Q.4 of Article No. 2.3 on Page No.18.

UNIT - III

Q.5. (a) Create a HTML page that contains all basic tag.

Ans. Refer Q.1 of Article No. 6.1 on Page No. 66.

Q.5. (b) Discuss the different components of common e-mail address format.

Ans. Refer Q.3, 4 of Article No. 5.3, 5.4 on Page No. 52, 53.

Q.6. Write short note on following:

(i) MIME types

(ii) Newsgroups

(iii) Secure e-mails

Ans. (i) **MIME types:** Refer Q.7 of Article No. 5.7 on Page No. 55.

(ii) **Newsgroups:** Refer Q.8 of Article No. 5.8 on Page No. 56.

(iii) **Secure e-mails:** Secure email is a safe, efficient alternative to regular email, fax and post. When you hit the send button on your secureMail, the information contained in it is encrypted, so it can only be read by your intended recipient. By contrast, regular emails can be fairly easily intercepted and read by just about anyone.

The Secure eMail service is an important part of the process of joining up the Criminal Justice System (CJS) in England and Wales. It allows people working across the CJS who choose to participate, to send emails containing 'RESTRICTED' (i.e. sensitive data), in a secure way.

For the first time, it's made it possible for these key groups of people to send emails securely to each other.

Working of Secure eMail

Criminal Justice organisations already have Secure email systems (GSI, GSX and CJX) which are part of the Government Secure Community. They can send and receive sensitive information through these systems.

Such organisations don't have to do anything to ensure that they are connected to the Secure eMail service, as this connects directly into - and is accredited by - the Government Secure Community.

Criminal Justice Practitioners are not a part of this secure community. It falls to the SecureMail service to provide the technology to encrypt the contents of an email when they send it.

This encryption ensures that the email, if intercepted, will be unreadable. Once the email reaches its destination it will be decrypted so that the intended recipient can read it.

UNIT - IV

Q.7. What are web server? Explain the function of following web server in detail:

- (a) Microsoft web server
- (b) Apache
- (c) Personal web server.

Ans. (a) Microsoft web server: Refer Q.1 of Article No. 7.1 on Page No. 78.

(b) Apache: Refer Q.1 of Article No. 7.1 on Page No. 79.

(c) Personal web server.: Refer Q.2 of Article No. 7.2 on Page No. 79.

Q.8. What is digital signature? How it differ from in-person signature? Explain the mechanism of digital signature. How say its having secure feature to tradition security mechanism?

Ans. Refer Q.12 of Article No. 7.10 on Page No. 86.



INTERNET FUNDAMENTALS

B.TECH. (ELECTRICAL) 8TH SEM.

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UNIT - I

Q.1. (a) List the major components used for internet. Explain the working of Internet.

Ans. Major components used for internet: Refer Q. 2 of Article No. 1.2 on Page No. 2.

Working of Internet: Refer Q.5 of Article No. 1.4 on Page No. 6.

Q.1.(b) Make header diagram of IPv4. What is the significance of each field in IPv4 header?

Ans. Internet Protocol being a layer-3 protocol (OSI) takes data Segments from layer-4 (Transport) and divides it into packets. IP packet encapsulates data unit received from above layer and add to its own header information.



Fig. IP Encapsulation

The encapsulated data is referred to as IP Payload. IP header contains all the necessary information to deliver the packet at the other end.

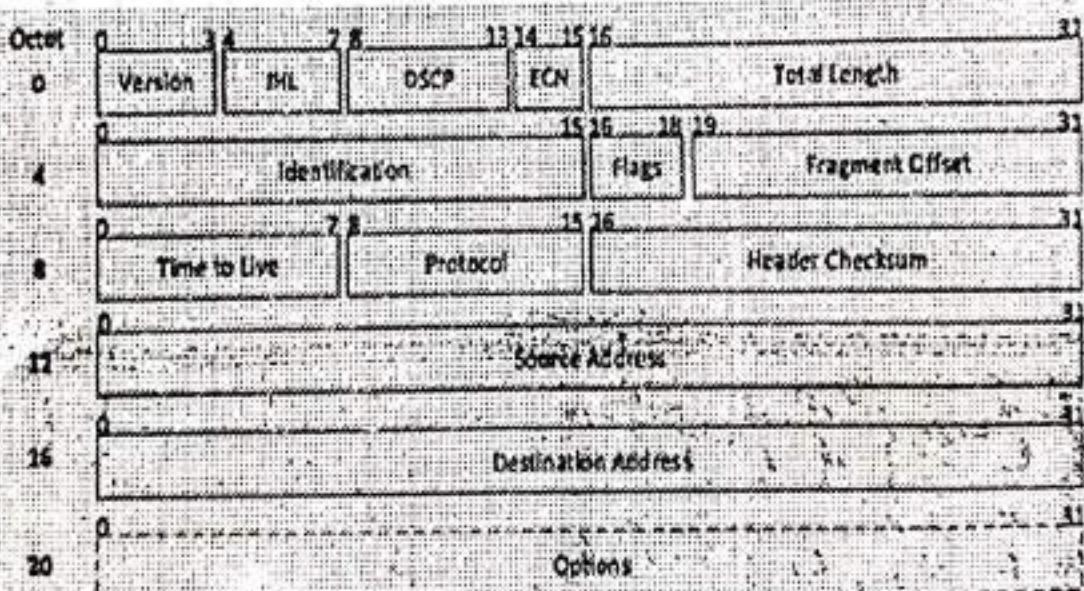


Fig. IP Header

IP header includes many relevant information including Version Number, which, in this context, is 4. Other details are as follows:

- ◆ **Version:** Version no. of Internet Protocol used (e.g. IPv4).
- ◆ **IHL:** Internet Header Length; Length of entire IP header.
- ◆ **DSCP:** Differentiated Services Code Point; this is Type of Service.
- ◆ **ECN:** Explicit Congestion Notification; It carries information about the congestion

- ◆ seen in the route.
- ◆ Total Length: Length of entire IP Packet (including IP header and IP Payload).
- ◆ Identification: If IP packet is fragmented during the transmission, all the fragments contain same identification number, to identify original IP packet they belong to.
- ◆ Flags: As required by the network resources, if IP Packet is too large to handle, these 'flags' tells if they can be fragmented or not. In this 3-bit flag, the MSB is always set to '0'.
- ◆ Fragment Offset: This offset tells the exact position of the fragment in the original IP Packet.
- ◆ Time to Live: To avoid looping in the network, every packet is sent with some TTL value set, which tells the network how many routers (hops) this packet can cross. At each hop, its value is decremented by one and when the value reaches zero, the packet is discarded.
- ◆ Protocol: Tells the Network layer at the destination host, to which Protocol this packet belongs to, i.e. the next level Protocol. For example protocol number of ICMP is 1, TCP is 6 and UDP is 17.
- ◆ Header Checksum: This field is used to keep checksum value of entire header which is then used to check if the packet is received error-free.
- ◆ Source Address: 32-bit address of the Sender (or source) of the packet.
- ◆ Destination Address: 32-bit address of the Receiver (or destination) of the packet.
- ◆ Options: This is optional field, which is used if the value of IHL is greater than 5. These options may contain values for options such as Security, Record Route, Time Stamp, etc.

Q.2. (a) Define IP properties: Subnet Mask, DNS Server, Default Gateway and WINS Server with suitable example.

Ans. (i) Subnet mask: A subnet allows the flow of network traffic between hosts to be segregated based on a network configuration. By organizing hosts into logical groups, subnetting can improve network security and performance.

Like IP addresses, a subnet mask contains four bytes (32 bits) and is often written using the same "dotted-decimal" notation.

For example, a very common subnet mask in its binary representation

11111111 11111111 11111111 00000000

is typically shown in the equivalent, more readable form

255.255.255.0

Applying a Subnet Mask

A subnet mask neither works like an IP address nor does it exist independently of them. Instead, subnet masks accompany an IP address and the two values work together. Applying the subnet mask to an IP address splits the address into two parts, an "extended network address" and a host address.

For a subnet mask to be valid, its leftmost bits must be set to '1'. For example,

00000000 00000000 00000000 00000000

is an invalid subnet mask because the leftmost bit is set to '0'.

Conversely, the rightmost bits in a valid subnet mask must be set to '0', not '1'. Therefore,

11111111 11111111 11111111 11111111

is invalid.

All valid subnet masks contain two parts: the left side with all mask bits set to '1' (the extended network portion) and the right side with all bits set to '0' (the host portion), such as the first example above.

(ii) DNS Server: Refer Q.6. of Article No 2.5 on Page No. 21.

(iii) Default gateway:

A default gateway is used to allow devices in one network to communicate with devices in another network. If your computer, for example, is requesting an internet webpage, the request first runs through your default gateway before exiting the local network to reach the internet.

An easier way to understand a default gateway might be to think of it as an intermediate device between the local network and the internet.

It's necessary for transferring internal data out to the internet, and then back again.

So, the default gateway device passes traffic from the local subnet to devices on other subnets. The default gateway often connects the local network to the internet, although internal gateways for communication within a local network also exist.

Types of Default Gateways

Internet default gateways are typically one of two types:

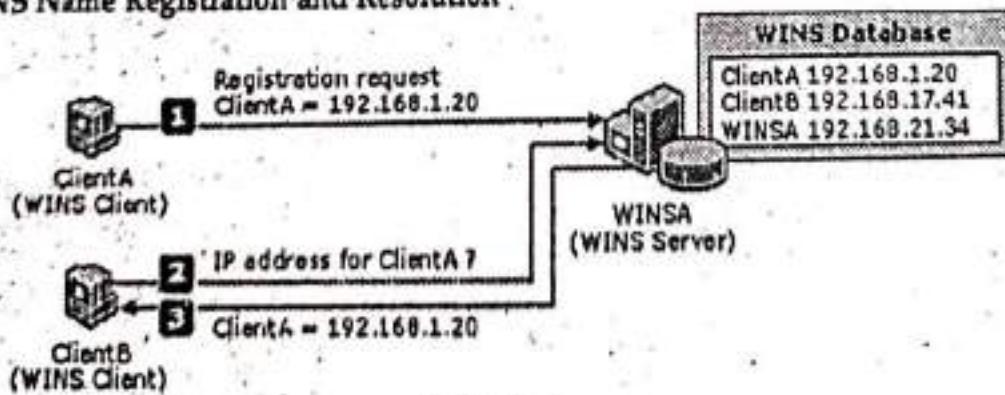
1. On home or small business networks with a broadband router to share the internet connection, the home router serves as the default gateway.
2. On home or small business networks without a router, such as for residences with dial-up internet access, a router at the internet service provider location serves as the default gateway.

(iv) WINS Server:

Although NetBIOS and NetBIOS names can be used with network protocols other than TCP/IP, WINS was designed specifically to support NetBIOS over TCP/IP (NetBT). WINS is required for any environment in which users access resources that have NetBIOS names. If you do not use WINS in such a network, you cannot connect to a remote network resource by using its NetBIOS name unless you use Lmhosts files, and you might be unable to establish file and print sharing connections.

The following figure illustrates the role of WINS for computers that use NetBIOS names. Typically, DHCP is used to assign IP addresses automatically.

WINS Name Registration and Resolution



In a typical scenario, the following occurs:

1. ClientA, which uses NetBIOS and is a WINS client, sends a name registration request to its configured primary WINS server (WINSA) when it starts up and joins the network. WINSA adds ClientA's NetBIOS name and IP address to the WINS database.
2. When ClientB needs to connect to ClientA by its name, it requests the IP address from the WINS server.
3. The WINS server locates the corresponding entry in its database and replies with ClientA's IP address.

WINS Benefits:

WINS provides the following benefits over other NetBIOS name resolution methods:

- ❖ WINS name resolution reduces NetBIOS name query broadcast traffic because clients can query a WINS server directly instead of broadcasting queries.
- ❖ WINS enables the Computer Browser service to collect and distribute browse lists across IP routers.
- ❖ The WINS dynamic name-to-address database supports NetBIOS name registration and resolution in environments where DHCP-enabled clients are configured for dynamic TCP/IP address allocation.
- ❖ The WINS database also supports centralized management and replicates name-to-address mappings to other WINS servers.
- ❖ WINS and DNS can be used in the same environment to provide combined name searches in both namespaces.

Q.2.(b) Discuss the role of ISP in internet.

Ans. Refer Q. 3 of Article No. 2.2 on Page No. 17.

Unit-II

Q.3. (a) Discuss the working of search engines.

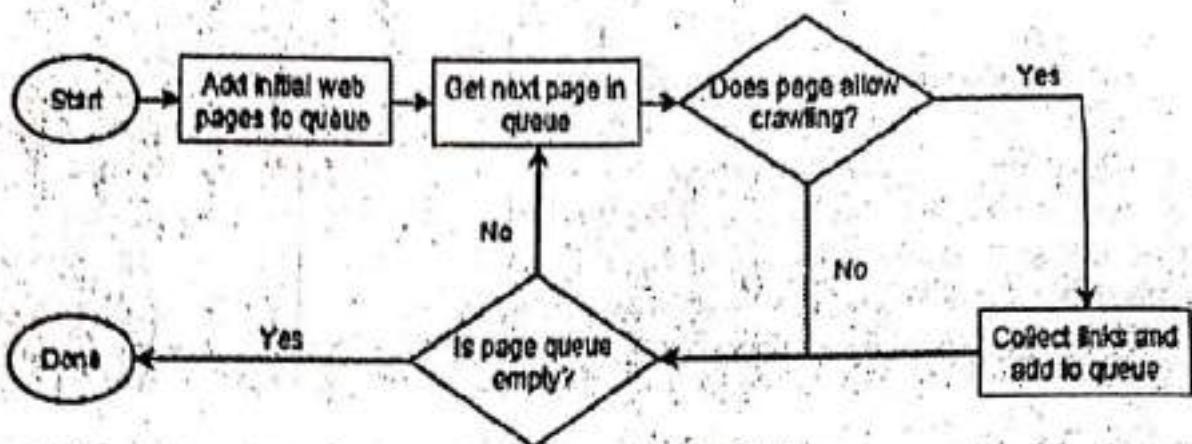
Ans. Every search engine has three main functions:

1. Crawling (to discover content),
2. Indexing (to track and store content),
3. Retrieval (to fetch relevant content when users query the search engine).

1. Crawling (to discover content):

Crawling is where it all begins: the acquisition of data about a website. This involves scanning sites and collecting details about each page: titles, images, keywords, other linked pages, etc. Different crawlers may also look for different details, like page layouts, where advertisements are placed, whether links are crammed in, etc.

But how is a website crawled? An automated bot (called a "spider") visits page after page as quickly as possible, using page links to find where to go next. Even in the earliest days, Google's spiders could read several hundred pages per second. Nowadays, it's in the thousands.



When a web crawler visits a page, it collects every link on the page and adds them to its list of next pages to visit. It goes to the next page in its list, collects the links on that page, and repeats. Web crawlers also revisit past pages once in a while to see if any changes happened.

This means any site that's linked from an indexed site will eventually be crawled. Some sites are crawled more frequently, and some are crawled to greater depths, but sometimes a crawler may give up if a site's page hierarchy is too complex.

2. Indexing (to track and store content):

Indexing is when the data from a crawl is processed and placed in a database.

Imagine making a list of all the books you own, their publishers, their authors, their genres, their page counts, etc. Crawling is when you comb through each book while indexing is when you log them to your list.

3. Retrieval (to fetch relevant content when users query the search engine):

Retrieval is when the search engine processes your search query and returns the most relevant pages that match your query.

Ranking algorithms check your search query against billions of pages to determine each one's relevance. Companies guard their ranking algorithms as patented industry secrets due to their complexity. A better algorithm translates to a better search experience.

They also don't want web creators to game the system and unfairly climb to the tops of search results. If the internal methodology of a search engine ever got out, all kinds of people would surely exploit that knowledge to the detriment of searchers like you and me.

Q.3.(b) Write any 10 tags used in HTML with example.

Ans. Refer Q.8 of Article No. 4.4 on Page 46.

4. (a) Define gopher. Write various gopher commands used in web.

Ans. Refer Q. 10 of Article No. 3.6 of Page No. 39.

Q.4. (b) Explain the working of Telnet.

Ans. Refer Q. 9 of Article No. 3.5 on Page No. 38.

Unit-III

Q.5. (a) Discuss Email management in detail.

Ans. Refer Q.6 of Article No. 5.6 on Page No. 55.

Q.5.(b) Explain various MlME Types.

Ans. Refer Q.7 of Article No. 5.7 on Page No. 55.

Q.6. (a) Explain the working architecture of Email.

Ans. Refer Q.5 of Article No. 5.5 on Page No. 54.

Q.6.(b) Write short notes on PICO.

Ans. Refer Q.10 of Article No. 5.10 on Page No. 57.

Unit-IV

Q.7. Explain the working and architecture of Apache server in detail. Differentiate PWS and Apache Server.

Ans. Refer Q.6 of Article No. 7.5 on Page No. 82.

Q. 8. Write short notes on:

(a) Digital Signature

(b) Intrusion detection System

Ans. (a) Digital Signature: Refer Q.12 of Article No. 7.10 on Page No. 86.

(b) Intrusion detection System: Refer Q.14 of Article No. 7.12 on Page No. 89.



Topics Covered/Syllabus

- ↳ Introduction to Networks and Internet
- ↳ History and Internet
- ↳ Intranet and extranet
- ↳ Working of internet
- ↳ Internet congestion
- ↳ Business cut true on internet

1

CHAPTER

NETWORKS AND INTERNET

1.1. INTRODUCTION TO NETWORKS AND INTERNET

Q.1. What do you mean by term network. Explain the benefits of network.
(KU, 2013, 2012)

Ans. A computer network is a collection of computers and devices connected by communication channels that facilitates communication among users and allow users to share resources with other resources.

Benefits of Network :

1. **Provide Convenience :** Computer on a network can backup their files over the network.
2. **Allow Sharing :** All computer on the network can share resources such as disks and printers.
3. **Facilitate Communications :** Sending and receiving E-mail, Transferring files, video conferencing.
4. **Generate Saving :** Networked computers can provide more computing power for less money.
5. **Provide Reliability :** If one part of network is down useful work may still be possible using a different network path.
6. **Simply scalability :** It is relatively easy to add more computers to an existing network.

Internet is essentially a network of networks and its success depends upon cooperation. Cooperation among the networks and computers that compose the internet is paramount. This cooperation protocol that determines computers connect, send and receive information on the internet is TCP/IP.

Client Server Model

A process on the local host called a client, needs services from a process usually on the remote host called a server.

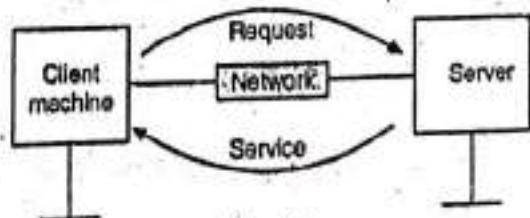


Fig. 1.1

To get the day and time from a remote machine, we need a daytime client process running on the local host and a daytime server.

Operating systems today support both multiuser and multiprogramming environment. A remote computer can run several server programs at the same time. Just as several server programs at the same time, new clients and servers can be added incrementally as more users come on line and the demand for services increases. Many clients can share the resources provided by a single servers, this eliminates the need for each client to have their own "copy" of those resources. Each Internet service has its own associated set of client and servers.

Physical Components : Various software protocols, the internet includes a host of physical components as well. These components include servers, routers and the network themselves servers are computers that answer requests for services such as list servers, mail servers and news server.

A router is a special purpose computers that directs data packets along the network. Router can detect whether part of the network is down or congested and can then re-route traffic. Think of a router as a highly efficient and well functioning traffic cop. Networks provide the physical means to transport packets of information.

The following mediums are used :

- (a) Copper wires, which transmit message as electrical impulses.
- (b) Fiber optics cables, which use light waves to transmit messages.
- (c) Radio waves, microwaves, infrared lights and invisible light which all carry messages through air.

1.2. HISTORY AND INTERNET

Q.2. Define the internet and what is the History behind internet working.

Ans. Internet is a network of networks that makes information easily accessible, even between different types of computer with different capabilities. Transfer of information from one place to another has become a necessity. This led to the development of internet. Internet is sometimes called simply "The net" in which users at any one computer can. If they have permission get information from any other computer.

History : Internet was created on January 2, 1969 when United States computer scientists began researching computer networking. This research was founded by the Advanced Research Projects Agency (ARPA) which gave the internet its first name, the ARPANET. The ARPANET was used to test the use of packet switched networks which are computer networks that transfer information in the form of little packets that move independent of each other through various networks until they reach their final destination. The Department of Defense immediately saw this network as an ideal communication weapon.

If one set of communications lines was destroyed, the little packets of information could continue to find other lines. If one of the packets fails to reach its goal. The sending computer could simply send another packet.

- ▼ In 1983, the military portion of ARPA net near moved on to the MIL net at ARPA net was officially disbanded in 1990.
- ▼ In the late 80's the national science foundation's NSF net began its own network and allowed everyone to access. It was, however, primarily the domain of teach computer science graduates and universities professors
- ▼ In 1992 the world wide system and software were released and in late 1993, NCS (The nation centre for super computing applications) released version of hosa
- ▼ In 1994, netscape communications released the netscape navigator browser. Navigator was widely distributed across the global via internet.
- ▼ In December 1994, bill gate ordered microsoft to redirect its focus towards the internet and then in august 1995. The company introduced internet explorer, browser that went into hand to hand completion with netsacpe navigator.

By 1996, the hottest menu item in the cyber cafe was java, sun's programming language for creating internet and internet applications.

- ▼ In 1997, and beyond interanets are redefining the way they corporate would communicate intranets are expanding into extranets or internet that are behande with an internet web site to expand the type and range of information available

1.3. INTRANET AND EXTRANET

Q.3. Explain the term Intranet and Extranet.

Ans. Intranet :

- (i) An intranet is a private network that is contained within an enterprise. In many cases it consist of many interlinked local area networks and also the leased lines in the wide area network.
- (ii) Typically an intranet includes connections through one or more gateway computers to the outside internet.
- (iii) The main purpose of an intranet is to share company information and computing information and computing resources among employees.
- (iv) An intranet can also be used to facilitate working in groups and for teleconference.
- (v) An intranet uses TCP/IP, HTTP, and other internet protocols and in general look like a private version of the internet.
- (vi) With tunneling, companies can send private message through the public network.
- (vii) Using the public network with special encryption, decryption and other security safeguards to connect one part of their intranet to another.

Working of an internet :

- (i) Consider an example of e-mail. In order to send a message from sender to receiver the sender must know the address of receiver. Once the message has an address on it, the interconnected internet systems take over.
- (ii) The e-mail handling system on the sender's computer packages the message and prepare it for shipping. The message is then broken into pieces called *packets*.

- (iii) Packets are the basic unit of measurement on the internet. Packets may have different size depending upon the application that packs them.
- (iv) The packets are all addressed to the final destination. The path from sender to receiver may have different networks in it. Also, the packets that contain the message may not have the same path.
- (v) Along the possible paths are special purpose computers called routers. These computers do nothing but look at network addresses and trace out from the address what is the current best route to the destination address.
- (vi) Routers make their decisions based on information that is constantly reaching them from all over the net.
- (vii) They hear from other routers about links that are down, about others that may be congested and slow etc.
- (viii) Each time a packet reaches a router, its address is examined and the packet is forwarded either to another router nearer to its ultimate destination and the packets reach their destination.
- (ix) Then they are reassembled into original message and is delivered to the particular recipient.

Extranet : An extranet is a private network that uses internet technology and the public communication system to securely some part of a business's information or operations with suppliers, vendors partners customers, or other business.

An extranet can be viewed as part of a company's intranet can be viewed as part of company's intranet that is extended to users outside the company. It has also been described as a way to do business with other companies as well to sell products to customers.

An extranet requires security and privacy. These can include fire wall server management the issuance and use of digital certificates or similar means of user authentication encryption of message and the use of virtual private network (VPNs) that tunnel through the public network.

Working of an Extranet :

- (i) An extranet is made up of web pages that are held on a server. The content of these pages may be similar or identical to those on the internet. The extranet server must be connected permanently to the Internet with a public IP address.
- (ii) Users viewing pages on the extranet need to enter a username and password to gain access.
- (iii) Different users, such as staff and pupils, can be given permission to view different areas of the extranet. These broad groups can also be split into smaller groupings pupils could be in year groups, and staff in departments or management groups.
- New content for the extranet is written as a web page. The page may display information display or it may carry links to other files such as word processed documents. Few pages added to the extranet have to be linked to existing pages to make them accessible.

Q.4. Difference between internet intranet and extranet. Also explain the importance of internet in present century.

Ans.

<i>Internet</i>	<i>Intranet</i>	<i>Extranet</i>
1. It is shared content accessed by members within a single organization.	1. It is shared content accessed by groups through cross enterprise boundaries.	1. It is a global communication accessed through the web.
2. Intranet is a private network it is often for a given company where it is called by company's staff.	2. Extranet is also a private network, when a external user need to access a company network requires to login with password.	2. Internet is a world wide web network it is for-public users.
3. An organization's internet network commonly using many of the same services as the internet such as web and e-mail.	3. The bridge between the above two features provided by the organization's, intranet which are also available on the internet, usually via an encrypted connection for security.	3. The world wide network of computers through which we are all sharing information.
4. Example—A networked system for placing sales orders at a retail store, which can only be accessed from computers inside the store.	4. Example—Warehouses which have their inventory systems linked so they can all check each other's current inventory. Only those warehouses have access to the system.	4. Example—google, yahoo is an internet website.
5. Intranet is the network within a closed group such as within a company.	5. Extranet is the sharing of files with people in another location such as with a client.	5. Internet is for sending message and getting information to from the world.
6. Intranet allows restricted access to only members of an organization.	6. Extranet allows limited access to non-members of an organization.	6. Internet allow unlimited access to the network.
7. Intranet uses internet protocol technologies.	7. Extranet uses internet protocols, network connectivity.	7. Internet uses standard internet protocol suite (TCP/IP).
8. Intranet is highly secured.	8. Extranet is less secured as compared to intranet but more secured than internet	8. Internet is not secured.
9. Intra means with in. It is entirely internal network.	9. It is a type of internal private internet that is not entirely internal.	9. Internet is interconnected collection of networks.
10. Intranet is a private network.	10. Extranet is a private network.	10. Internet is a public network.

Importance of Internet in present century :

Internet is very famous nowdays for satisfying people with various services relocated to various different fields. It is a very versatile facility which can help you in completing many tasks easily and conveniently with few clicks. Almost everything is now available over internet in this age of advancement of technologies.

- (i) Information at our fingertips, and if we don't even know how to spell correctly.
- (ii) Can mail across the world within minutes where snail mail used to take 3-4 days in the states and 2 weeks overseas.
- (iii) We are connected to a lot of people who have similar interests if we know the right place to find them on the internet.
- (iv) There is a lot of knowledge and information to be absorbed.
- (v) It is open 24 hours a day, and we can find anything we want there.
- (vi) The technology also helped organizations to enhance the level of communication with employees and customers.
- (vii) It provide a medium to publish information or content in regard to the product or services that reaches out to millions of people across the globe.
- (viii) Customer support and service has been enhanced to a whole new level.
- (ix) Technology has also increased exposure to different areas of the market, increase in quantity and quality, increase in sales, reduction in costs, increase in access to information, increase in supply chain etc.

1.4. WORKING OF INTERNET

Q.5. Explain the working of internet.

Ans. Internet working is send a message to the receiver and we know the address of the receiver.

e.g : E-mail

- (i) In order to send a message from send to receiver, the sender must know the address of the receiver. The E-mail handling system on the sender's computer packages the message and prepare it for shipping.
- (ii) The message is then broken into pieces caused packets. Packets are the basic unit of measurement on the internet. Packets may have different size depending upon the application that packs them.
- (iii) The packets are all addressed to the final destination. The path from sender to receiver may have that contain the message may not have the same path.
- (iv) Along the possible paths are speical purpose computers do nothing but look at network addresses and trace out from the address what is the current best route to the destination address.
- (v) Routers make their decision based on information that is constantly reaching them from all over the net. They hear from other routers about links that are down, about others that may be congested and slow etc.

- (vi) Each time a packet reaches a router, it's forwarded either to another router near to its ultimate destination. Then the are assembled into original message and delivered to the particular recipient.
- (vii) The internet works amazingly well for such a heavily used system.
- (viii) The number of users and their demands continue to grow almost without bound.

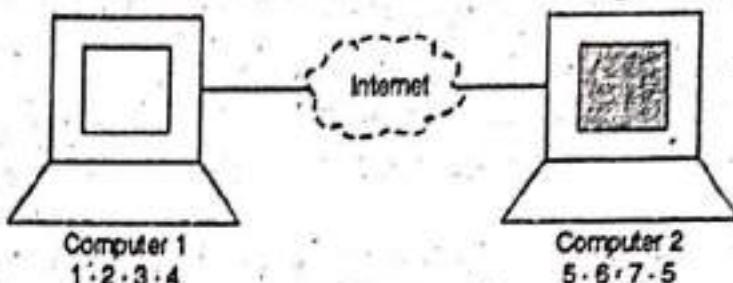


Fig. 1.2

1.5. INTERNET CONGESTION

Q.6. What do you mean by internet congestion ?

Ans. When the receiver not receive the data as same speed of leaving the data from the sender. Then problem occur is called internet congestion.

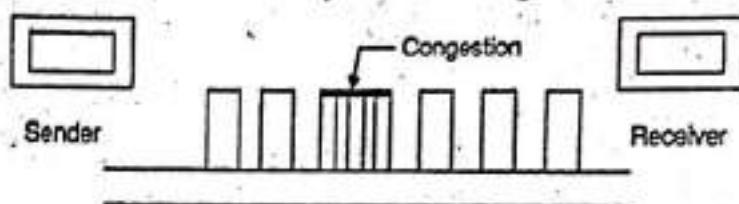


Fig. 1.3

- (i) Internet works amazingly well for such as heavily used system. However the number of users and their demands continue to grow almost without bound.
- (ii) Once you get network connection by assuming that you have a modem with speed 28 kbps or higher the factor limiting how quickly you can view web page often becomes the speed with which your computer sends pages.
- (iii) The computer speeds depends on a complex balance of CPU speed, Memory quantity, disk speed and so on. But the rate of growth of the internet is so rapid that is hard for technological improvement to keep up.
- (iv) When we transmit data from one computer system to another computer system then sometimes our transmit Rate of data is higher than the receiving rate.
- (v) Then congestion occurs between the links from where we are transmitting data to host B than congestion occurs between the line and host A transmitting data at the same speed.
- (vi) But host 'B' is not receiving data in the same speed then problem comes.
- (vii) In modern networks, avoiding congestive collapse involves the application of network congestion avoidance techniques alongwith congestion control, such as:
 - Exponential backoff protocols that use algorithm feedback to decrease data packet throughput to acceptable rates.

- Priority techniques to allow only critical data stream transmission.
 - Allocation of appropriate network resources in anticipation of required increases in data packet throughput.
- (vii) Congestion has been described as a fundamental effect of limited network resources, especially router processing time and link throughput. Traffic directing processes, performed by routers on the Internet and other networks, use a microprocessor.
- (viii) Cumulative router processing time greatly impacts network congestion. In fact, intermediate routers may actually discard data packets when they exceed its handling capability.

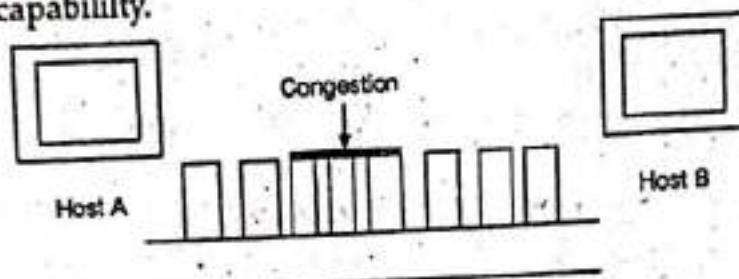


Fig. 1.4

1.6. BUSINESS CUT TRUE ON INTERNET

Q.7. In what way does the internet provider equal opportunity for all business elaborate ?

Ans. Web provides equal opportunity for all business because :

- (i) Low cost start up
- (ii) Accessible by all
- (iii) Technology availability
- (iv) Equal visibility for large and small enterprises.
- (v) Comparison of products and price made possible
- (vi) Speed of 24/7
- (vii) Low entry barriers
- (viii) There is no distinction on the basis of power, religion, sex, ethnicity race, caste or involuntary personal attributes such as disability age gender or sexual orientation.
- (ix) It emphasizes procedural and legal means.
- (x) Individuals should succeed or fail based on their own efforts and not extraneous circumstances such as having well-connected parents.

Q.8. What do you mean by standard address ?

Ans.

- (i) Internet Protocol provides the service of communicate unique global addressing amongst computers.

- (e) IP supports unique addressing for computers on a network.
- (f) IP address is a unique identifier for a node or host connection on an IP network. An IP address is a 32 bit binary number usually represented as 4 decimal values, each representing 8 bits, in the range 0 to 255 known as octets, separated by decimal points. This is known as "dotted decimal" notation.
- (g) Every IP address consists of two parts, one identifying the network and one identifying the node.
- (h) The class of the address and the subnet mask determine which part belongs to the network address and which part belongs to the node address.
- (i) This combination is unique i.e. no two machines can have same IP address. IP packages the transport layer protocol data into structure called data grams.
- (j) Every IP datagram packet transmitted over TCP/IP network contains IP addresses of the source system that generated it and the destination system for which it is intended in its IP header. The structure of IP header is as shown below.

0	3	7	15	24	31
Ver	IHL	Service type		Total Length	
Identification			Flags	Fragment Offset	
TTL	Protocol			Header Checksum	
32 bit Source Address					
32 bit Destination Address					
Option and Padding					

- (k) IP addresses are 32 bit long. They are notated as four 8 bit decimal numbers, separated by periods. For example - 192.168.2.45. This is known as dotted decimal notation.
- (l) Each of the 8-bit numbers is sometimes called an octet or a quad because each quad is the decimal equivalent of 8 bit binary number, this possible values will range from 0 to 255. Full range of IP addresses is 0.0.0.0 to 255.255.255.
- (m) There are 5 different address classes. You can determine which class any IP address is in by examining the first 4 bits of the IP address:
 - Class A addresses begin with 0xxx, or 1 to 126 decimal
 - Class B addresses begin with 10xx, or 128 to 191 decimal
 - Class C addresses begin with 110x, or 192 to 223 decimal
 - Class D addresses begin with 1110, or 224 to 239 decimal
 - Class E addresses begin with 1111 or 240 to 254 decimal
- (n) Addresses beginning with 01111111, or 127 decimal, are reserved for loopback and for internal testing on a local machine. Class D addresses are reserved for multicasting. Class E addresses are reserved for future use. They should not be used for host addresses. We can see how the class determines, by default

which part of the IP address belongs to the network (N, in blue) and which part belongs to the node (n, in red),

Class A = NNNNNNNN. nnnnnnnn. nnnnnnnn.nnnnnnnn

Class B = NNNNNNNN.NNNNNNNN.nnnnnnnn.nnnnnn

Class C = NNNNNNNN.NNNNNNNN.NNNNNNNN.nnnnnnnn

In the example 140.179.220.200 is a Class B address so by default the network part of the address defined by the first two Octets (140.179.x.x) and the node part is defined by the last 2 Octets (x.x.220.200). Suppose 140.179.0.0 specifies the network address for 140.179.220.200. When the node section is set to all "1"s, it specifies a broadcast that is sent to all hosts on the network. 140.179.255.255 specifies the example broadcast address.

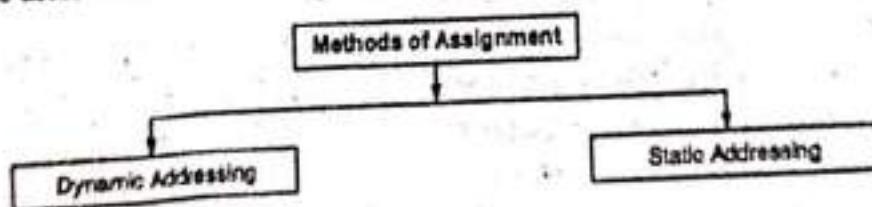
Methods of Assignment :

1. Dynamic Addressing :

- (i) These addresses are most frequently assigned on LANs and Broadband networks by Dynamic Host Configuration Protocol (DHCP) server.
- (ii) They are used because it avoids the administrative burden of assigning specific static addresses to each device on a network.
- (iii) It also allows many devices to share limited address space on a network if only some of them will be online at a particular time.
- (iv) DHCP is not the only technology used to assign dynamic IP addresses, Dial up and some Broadband networks use dynamic address features of the point to point protocol.

Static Addressing :

- (i) Static addressing is essential in some Infrastructure situations such as finding the Domain Name Service directory host that will translate domain names to numbers.
- (ii) Static addresses are also convenient but not absolutely necessary, to locate server inside an enterprise.
- (iii) An address obtained from a DNS server comes with a time to live, or caching time after which it should be looked up to confirm that it has not changed.



Q.9. Write notes on the following : (a) ISDN, (b) Subnetting.

Ans. (a) ISDN : (Integrated Services Digital Network) has as its primary goal the integration of voice and nonvoice services. It is already available in many locations and its use is growing slowly. Many corporate managers have an intercom button on their

telephone that rings their secretaries instantly. One ISDN feature is telephone with multi buttons for instant call setup to arbitrary telephones anywhere in the world. Another feature is telephone that displays the caller's telephone number, name and address or display while ringing. That allows the telephone to be connected to a computer so the caller's database record is displayed on the screen as the call comes in.

Example : a stockbroker could arrange that when she answers the telephone, the caller's portfolio is already on the screen along with the current prices of all the called stocks.

(b) Subnetting :

- (i) Subnetting an IP Network can be done for a variety of reasons. Including organization, use of different physical media such as Ethernet, FDDI, WAN etc. Preservation of address space and security.
- (ii) The most common reason is to control network traffic.
- (iii) In an Ethernet network, all nodes on a segment see all the packets transmitted by all the other nodes on that segment.
- (iv) Performance can be adversely affected under heavy traffic loads, due to collisions and the resulting retransmission. A router is used to connect IP networks to minimize the amount of traffic each segment must receive.

Subnet Mask : Applying a subnet mask to an IP address allows you to identify the network and node parts of the address. The network bits are represented by 1's in the mask and the node bits are represented by 0's

Class A = 255.0.0.0 = 1111111.00000000.00000000.00000000

Class B = 255.255.0.0 = 1111111.1111111.00000000.00000000

Class C = 255.255.255.0 = 1111111.1111111.1111111.00000000

Q.10. What is network ? Explain the concept of internet working along with network criteria ?

Ans. A Computer network is a collection of computers and devices connected by communication channels that facilitates communication among users and allows users to share resources with other users.

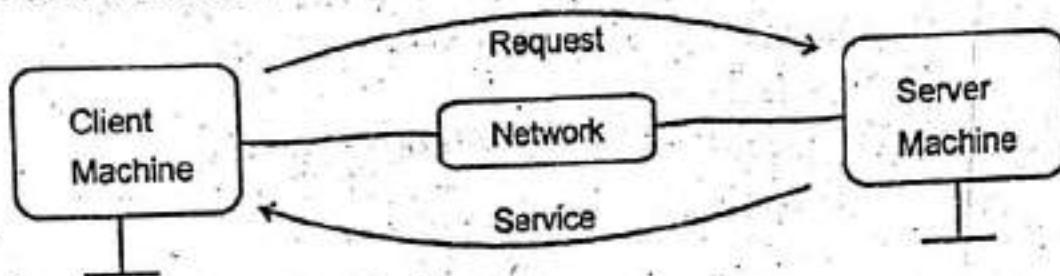
Network Benefits :

1. **Provide Convenience :** Computer on a network can back up their files over the network.
2. **Allow Sharing :** All computers on the network can share resources. Such as disks and printers.
3. **Facilitate Communications :** Sending and receiving E-mail, transferring files, video conferencing.
4. **Generate Savings :** Networked Computers can provide more computing power for less money.

5. Provide reliability : If one part of network is down. Useful work may still be possible using a different network path.
6. Simply Scalability : It is relatively easy to add more computers to an existing network.

Internet is essentially a network of networks and its success depends upon "Cooperation". Cooperation among the networks and computers that compose the Internet is Paramount. This cooperation Protocol that determines how computers connect, send and receive information on the Internet is TCP/IP.

Client Server Model :



- (i) A process on the local host called a client, needs services from a process usually on the remote host called a server. For example : to get the day and time from a remote machine, we need a daytime client process running on the local host and a daytime server process running on a remote machine.
- (ii) Operating System today support both multiuser and multi programming environment. A remote computer can run several server programs at the same time. Just as several server programs at the same time.
- (iii) Just as Local Computers can run one or more client program at the same time, New clients and servers can be added incrementally as more users come on Line and the demand for serveries increases.
- (iv) Many clients can share the resources provided by a Single Server, this eliminates the need for each client to have their own "Copy" of those resources.
- (v) Each Internet service has its own associated set of client and servers.

Physical Components : Various Software Protocols, the Internet includes a host of physical components as well. These components include servers, routers, and the network themselves, servers are computers that answer requests for services, such as list servers, mail servers and news server.

A router is a special purpose computers that directs data packets along the network. Router can detect whether part of the network is down or congested and can then re-route traffic. Think of a router as a highly efficient and well functioning traffic cop. Networks provide the physical means to transport packets of information. The following mediums are used :

- (A) Copper Wires, which transmit messages as electrical impulses.
- (B) Fiber optic cables, which use light waves to transmit messages.
- (C) Radio waves, microwaves, infrared lights and invisible light which all carry

QUICK REVIEW

Q.1. Define Networks and Internet.

Ans. Network : A Network is a collection of computers and devices connected by communication channels that facilitates communication among users and allow users to share resources with other resources.

Internet : Internet is a network of networks that make information easily accessible even between different types of computer with different capabilities. Transfer of information from one place to another has become necessity. Internet is sometimes called simply the net in which users at any one computer can, if they have permission get information from any other computer.

Q.2. Explain the term Intranet one extranet.

Ans. Intranet : An intranet is a private network that is contained within an enterprise. The main purpose of an intranet is to share company information and computing resources among employees.

Extranet : An extranet is a private network that uses internet technology and the public telecommunication system to securely share part of business information or operations with suppliers, vendors, partners, customers and other business.

Q.3. Benefits of network

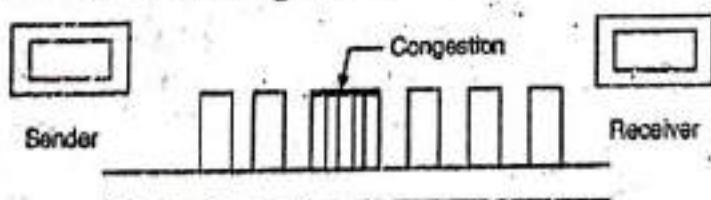
- | | | |
|-------------|---------------------------------|---------------------------|
| Ans. | (i) Provide convenience | (ii) Allow sharing |
| | (iii) Facilitate communications | (iv) Generate saving |
| | (v) Provide reliability | (vi) Simplify scalability |

Q.4. Explain the working of Internet.

Ans. In order to serve a message from sender to receiver, the sender must know the address of the receiver. The message is then broken into pieces called packets. Packets are the basic unit of measurement on the internet. Packets may have different size depending upon the application they carry them. The packets are all addressed to the final destination.

Q.5. What do you mean by Internet congestion?

Ans. When the receiver does not receive the data at same speed of leaving the data from the sender. Then problem occurs is called internet congestion.



2

CHAPTER

Topics Covered/Syllabus

- ↳ Modes of connecting to Internet
- ↳ Internet service providers (ISP)
- ↳ Internet address
- ↳ Standard address and domain name
- ↳ Domain name system (DNS)
- ↳ IPv6
- ↳ Modems
- ↳ Communication software
- ↳ Internet tools

MODES OF CONNECTING TO NETWORK

2.1. MODES OF CONNECTING TO INTERNET

Q.1. What are the different types of modes available for connecting to the internet and who provide these connections ?

Ans. How fast and how often you need to transfer data will determine which connection option is right for your business. There are various modes of connecting to the Internet.

1. Dial Up Connection
2. Cable Modem
3. DSL (Digital Subscriber Line) Connection
4. ISDN
5. Wireless Connection.

1. Dial Up Connection :

- ▼ A dial up connection is a method of accessing the Internet, when using a dial up connection your modem dial a number that connects your modem to the servers.
- ▼ This connection is maintained until you disconnect it, one of the main issues with a dial up connection is that while connected to the Internet you will not be able to make or receive phone calls.
- ▼ This is the case if you have only have one phone number, if you need to use your phone and the Internet at the sometime you would need additional hardware modems are hardware devices that connects your computer to the Internet.
- ▼ A dial up modem converts digital signal sent by the computer to analog signals for transmission through the standard Telephone Lines.

- ▼ A dial up modem also converts incoming analog signals from a Telephone Line and converts it to a digital signal for the computer.

Advantages :

- (i) Fairly, an inexpensive way to connect a single user remote to a network.
- (ii) Transferable i.e. It can be used from other location.
- (iii) Adequate for most connectivity.

Disadvantages :

- (i) Ties up your Telephone Line.
- (ii) Slow for large file downloads or multimedia web pages.
- (iii) Need to dial and re-establish your connection frequently.

2. Cable Modem :

- ▼ The Cable modem has become one of the leading technologies for high speed connectivity. Many people already have a cable connection making it an attractive option.
- ▼ Cable modems are capable of 10 Mbps (Megabits per Second) but the effective speed varies between 1.5 and 2.5 Mbps.
- ▼ This is between 30 and 50 times faster than the standard V.90 modem.
- ▼ Due to the nature of the technology, the transmission speeds very significantly. Every user within local segment shares the same bandwidth. More importantly they can potentially access computer, Printers and other connected appliances.

Advantages :

- (i) Frees our Telephone Line
- (ii) Due to high speeds fast downloading accessible.
- (iii) Your connection is always ON – no need to perform any start up or Log on sequence.

Disadvantages :

- (i) Installation costs for the cable.
- (ii) The monthly rates are significantly higher if you are not a cable TV subscriber.
- (iii) There is a substantial cost to install the video cable.

3. DSL (Digital Subscriber Line) Connection :

- ▼ DSL - high speed telephone connection is an alternative to the cable modem is the DSL service provided by Bell Canada. DSL uses your regular telephone line.
- ▼ It shares the line so that you can use the telephone while connected to the Internet. Phone calls use about 1% of the line capacity.
- ▼ This leaves 99% available for the Internet connection. The ADSL high speed modem enables simultaneous transmission of voice and data through your existing telephone wire.

Advantages :

- (i) Due to high speed the data downloads in seconds.

- (ii) The data connection is always connected.
- (iii) Installation of DSL is very easy.

Disadvantages :

- (i) Slightly slower than cable modem.
- (ii) Need to install filters on all telephones in your house.

4. ISDN (Integrated Service Digital Network)

- ▼ It connect ISDN is a digital network that is capable of producing maximum transmission speeds of about 1.4 mbps.
- ▼ Speeds of 128 kbps are however more common in this digital technology.
- ▼ ISDN is an International communication standard for sending voice video and data over digital telephone line or normal telephone wires.
- ▼ In analog network, a two wire Loop from the telephone Company's Local Centre office to the customer's premises, support a single transmission channel, which can carry only one service – voice, data or video at a time. Same pair of twisted copper wires is logically divided into multiple channels. First type of channel is Bearer or B channel. This type of channel can carry about 64 kbps of data.
- Second type of channel is used for link management and call setup. This channel known as *the signal or D channel*.

Advantages :

- (i) Speed : Its speed is high.
- (ii) Multiple Devices : We can connect multiple computers/device with this.
- (iii) Connection Time : The time of making connection is considerably low.

Disadvantages :

- (i) More Expensive : ISDN is more expensive as compare to others.
- (ii) ISDN need specialized equipments.

5. Wireless Connection :

- ▼ This connection uses the electromagnetic airwaves (Radio or infrared) to transmit and receive data over the air minimizing the need for wired connections.
- ▼ This technology allows users to access shared information without looking for a place to plug-in and network managers can set up or augment networks without installing or moving wires.
- ▼ When it works end-users communicate in a wireless environment through the use of wireless LAN adapters.
- ▼ These are implemented as PC cards in notebook or Palmtop Computers, as cards in desktops or integrated by the manufacturer in hand held computer.
- ▼ The adapters provide an interface between the user and the airwaves via an Antenna, which may be a small antenna on the PC card itself.
- ▼ If the antenna on the card fails to pick up the signal, an external antenna may need to be installed.

Advantages :

- (i) It increases mobility of data.
- (ii) Productivity Convenience.
- (iii) Installation Speed and Simplicity.
- (iv) In wireless connecting security is high.

Q.2. Describe the necessary component that enable connection to the internet.

Ans. There are number of components that value connection to the internet :

1. Modem :

- (i) Internet is giant network of computer. These computers are all interconnected through the telephone, cable and other systems.
- (ii) Support that you make a telephone call to your friend in another city.
- (iii) You can make a call because there is a telephone line between the two of you and they each have telephones that act as interpreter. Your telephone takes your voice and translates it into electrical signals that can be sent down the telephone line. The telephone at your friend's end converts the electrical signals back into your voice. Modem is modulator demodulator. It lets you connect your computer to a standard telephone line so you can transmit and receive electrically transmitted data.

2. Network Cables : The fundamental difference between 10 Base 2 and 10 Base-T/100 Base T is the move from coaxial cable to twisted pair wiring, usually category 5 cables, although never cabling is now being deployed.

3. Network Topology : In this, you will be going from a linear topology to a star topology. The distance covered by 10 Base-T/100 Base-T are shorter than those allowed using 10 Base 2 but because of the star topology and the uses of switches, you will actually find it easier to great extent.

4. ADAPTERS : Older networks adapter might have only a BNC connector on them. You will need the cards that provide on RJ-45 jack for 10 Base-T or 100-Base-T. This connector looks much like ordinary telephone jack but is slightly larger.

5. Cable Connector : Instead of BNC connector, twisted pair cabling uses RJ-45 connectors.

6. Hubs and Switches : Hubs can also be called either multi port repeaters or connectors. They are physically hardware devices. Some hubs are basic hubs with minimum intelligence. Switches are the current technology for connecting network LAN segments as well as for connecting individual network nodes to the network. Switches operate like bridges in that they keep track of which network nodes is located on each port by remembering MAC addresses kept in system memory.

2. INTERNET SERVICE PROVIDERS

Q.3. Explain the term ISP. How can we choose it ?

Ans. ISP :

- (i) An internet service provider is a business that sells computer access to the internet. If a connector to the internet is not available through an account at work or school you may want to consider an ISP.

- (ii) There are commercial on-line service provider such as America on-line (AOL). These commercial providers are designed to be user friendly and are intended for people with little or no computer experience.
- (iii) They usually provide their own interfaces and proprietary services such as collection message boards char rooms and new host.
- (iv) ISPs offers a no-frills cheaper alternative to commercial providers people who are wise in the ways of the internet find such a service appealing to connect to the internet via ISP following equipment is necessary.
 - ▼ Modem
 - ▼ Telephone line
 - ▼ Computer with TCP/IP networking software installed.

Choosing on ISP :

- (i) To select an ISP, you need to find out which ISPs are in your area, if you currently have access to the internet you can check the web for lists of providers in a specific area. There are other alternatives also.
- (ii) These include looking up ISPs in the offline yellow pages or talking to your friends.
- (iii) Once you have compiled a list of ISP's contact them by phone or e-mail to get answers to the question posed here.
e.g. One of them may not carry a news group you always read or another may not provide an access no for you to use when you travel. Next if possible test the ISP's access lines by using your modem to connect to their.
- (iv) Connect at different times of the day to establish when and if busy signals are going to be a problem.
- (v) Also try calling their toll free technical support no. if they have one.

2.3. INTERNET ADDRESS

Q.4. Explain the IP addressing scheme used in internet working and also explain how these addresses are assigned in practice ?

Ans. Internet Protocol provides the service of communicate unique global addressing amongst computers.

- (i) IP supports unique addressing for computers on a network. IP address is a unique identifier for a node or host connection on an IP network.
- (ii) An IP address is a 32 bit binary number usually represented as 4 decimal values, each representing 8 bits, in the range 0 to 255 known as octets, separated by decimal points.
- (iii) This is known as "dotted decimal" notation. Every IP address consists of two parts, one identifying the network and one identifying the node.
- (iv) The class of the address and the subnet mask determine which part belongs to the network address and which part belongs to the node address.
- (v) This combination is unique i.e. no two machines can have same IP address. IP packages the transport layer protocol data into structure called data grams. Every

IP datagram packet transmitted over TCP/IP network contains IP addresses of the source system that generated it and the destination system for which it is intended in its IP header. The structure of IP header is as shown below.

0	3	7	15	24	31		
ver	IHL	Service type	Total Length				
Identification			Flags	Fragment Offset			
TTL	Protocol		Header Checksum				
32 bit Sources Address							
32 bit Destination Address							
Option and Padding							

- (vi) IP addresses are 32 bit long. They are notated as four 8-bit decimal numbers, separated by periods. For example - 192.168.2.45.
- (vii) This is known as dotted decimal notation. Each of the 8-bit numbers is sometimes called an octet or a quad because each quad is the decimal equivalent of 8-bit binary number, this possible values will range from 0 to 255.
- (viii) Full range of IP addresses is 0.0.0.0 to 255.255.255.
- (ix) There are 5 different address classes. You can determine which class any IP address is in by examining the first 4 bits of the IP address.
 - Class A addresses begin with 0xxx, or 1 to 126 decimal
 - Class B addresses begin with 10xx, or 128 to 191 decimal
 - Class C addresses begin with 110x, or 192 to 223 decimal
 - Class D addresses begin with 1110, or 224 to 239 decimal
 - Class E addresses begin with 1111 or 240 to 254 decimal.

Addresses beginning with 01111111, or 127 decimal, are reserved for loopback and for internal testing on a local machine. Class D addresses are reserved for multicasting. Class E addresses are reserved for future for future use. They should not be used for host addresses. We can see how the class determines, by default, which part of the IP address belongs to the network (N, in blue) and which part belongs to the node (n, in red).

Class A = NNNNNNNN.nnnnnnnn.nnnnnnnn.nnnnnnnn

Class B = NNNNNNNN.NNNNNNNN.nnnnnnnn.nnnnnn

Class C = NNNNNNNN.NNNNNNNN.NNNNNNNN.nnnnnnnn

In the example 140.179.220.200 is a Class B address so by default the network part of the address defined by the first two Octects (140.179.x.x) and the node part is defined by the last 2 Octects (x.x.220.200). Suppose 140.179.0.0 specifies the network address for 140.179.220.200. When the node section is set to all "1"s, it specifies a broadcast that is sent to all hosts on the network. 140.179.255.255 specifies the example broadcast address.

- Methods of Assignment :

1. **Dynamic Addressing** : These addresses are most frequently assigned on LANs and Broadband networks by Dynamic Host Configuration Protocol (DHCP) server. They are used because it avoids the administrative burden of assigning specific static addresses to each device on a network. It also allows many devices to share limited address space in a network if only some of them will be online at a particular time. DHCP is not the only technology used to assigning dynamic IP addresses, Dial up and some Broadband networks use dynamic address features of the point to point protocol.

Static Addressing : Static addressing is essential in some Infrastructure situations such as finding the Domain Name Service directory host that will translate domain names to numbers. Static addresses are also convenient but not absolutely necessary, to locate server inside an enterprise. An address obtained from a DNS server comes with a time to live, or caching time after which it should be looked up to confirm that it has not changed.

2.4. STANDARD ADDRESS AND DOMAIN NAME

Q.5. What do you mean by

(a) Domain Name

(b) Standard Address ?

Ans. (a) A domain name is an identification string that defines a real of administrative autonomy, authority or control within the internet.

Domain names are formed by the rules and procedures of the domain name system (DNS). Any name registered in the DNS is a domain name.

In general a domain name represents an internet protocol (IP) resources such as a personal computer used to access the internet, a server computer hosting a web site or the web site itself or any other service communicated via internet.

Purpose :

1. Domain names serve a names for internet resources such as computers networks and services. A domain name represents an internet protocol resource.
2. Domain names are also used as simple identification labels to indicate ownership or control of a resource.
3. Domain names provide easily recognizable and memorizable names to numerically addressed internet resources.
4. Domain names are used to establish a unique identify.
5. A generic domain is a name that defines a general category.

(b) **Standard Address** : It is a numerical label assigned to each device participating in a computer network.

It serves two functions :

- ▼ Host or network interface identification and location addressing
- ▼ An address indicates where it is.

The addresses are usually written and displayed in human-readable notations. The internet assigned numbers authority manages the IP address space allocations globally and delegates five regional internet registries to allocate IP address blocks to local internet registries and other entities.

2.5. DOMAIN NAME SYSTEM (DNS)

Q.6. What is DNS ? Explain its working.

Ans.

- (i) Domain Name System (DNS) is an Internet directory service. DNS is how domain names are translated into IP addresses, and DNS also controls e-mail delivery. If your computer cannot access DNS, your web browser will not be able to find web sites and you will not be able to receive or send e-mail.
- (ii) The Domain Name System is also associated with various information with domain names : Most importantly, it serves as the "phone book" for the Internet by translating human readable eg. 208.77.188.166, which networking equipment needs to deliver information. A DNS also stores other information such as the list of mail servers that accept e-mail for a given domain. By providing a world wide keyword based redirection service, the Domain Name System is an essential component of contemporary Internet use.

Working of Domain Name System (DNS) : Domain Names are arranged in a tree and are cut into Zones and each is served by a name server.

- **The Domain Name Space :** Domain Name Space consists of a tree of domain names. Each node or leaf in the tree has zero or more resource records, which hold information associated with the domain name.
- The tree Sub divides into Zones beginning at the root zone. A DNS Zone Consists of a collection of connected nodes authoritatively served by an authoritative DNS name server, when a system administrator wants to let another administrator control a part of the domain name space within the first administrator's zone of authority, control can be delegated to the second administrator. This splits off a part of the old zone into a new zone, which ceases to be authoritative for the new zone.
- **Part of Domain Name :** A domain name consists of two or more parts or labels, which is conventionally. Written separated by dots, such as rahulsaini.com
- The right most label conveys the top level domain for example the address www.rahulsaino.com has the top-level domain com.
- Each label to the left specifies a Sub-division, or Sub-domain of the domain above it. For example, rahulsaini.com comprises a subdomain of the com domain.
- A host name refers to a domain name that has one or more associated addresses: i.e., the "www.rahulsainicoal" and 'example.com' domains are both hostnames, however, the 'com' domain is not.

DNS Servers : The Domain Name System Consists of a hierarchical set of DNS Servers. Each domain or subdomain has one or more authoritative DNS Server that

publish information about that domain and the name server of any domains "beneath" it. The hierarchy of authoritative DNS Servers matches the hierarchy of domains. At the top of the hierarchy stand the root name servers : the servers to query when looking up a top level domain name.

DNS Resolvers : A resolver looks up the resource record information associated with nodes. A resolver knows how to communicate with name server by sending DNS queries heeding DNS Responses.

A DNS query may be either a recursive query or a non recursive query :

1. A non-recursive query is one where the DNS server may provide a partial answer to the query. DNS server must support non-recursive queries.
2. A recursive Query is one where the DNS Server will fully answer the query. DNS Server are not required to support recursive queries.

Q.7. What is the purpose of using DNS ? What are the three different terms which constitute each entry in a DNS data base. Explain them.

Ans. DNS Purpose : It is a Mechanism that assigns easy to remember names to IP address, Domain is a large group of computers on the Internet under this scheme each computer has an IP address and a domain name. Domains have been made on the base of organisation type or geographic location. For eg. Domain name yahoo.com where com represent the yahoo is a commercial organisation. In the DNS database the three items are :

1. Network ID
2. DNS Domain Name
3. Forward Lookup Zone name

1. Network-ID : It is the IP address of a system which is unique and identify on the Internet for e.g. 192.162.101.126

2. DNS Domain Name : It is the name given to a collection of network devices that belong to a domain which is managed according to some common property of the members, used for identification, reference and access to Internet resources.

There are several types of domain as :

1. Top Level
2. Second Level
3. Lower Level

Top Level Domain is which is always either one of a small list of generic names like com, edu, gov, net, mil, acc, to commercial, educational government networking organisation & military etc. **Second Level Domain** : Below the top level domain in the domain name hierarchy are the second level domain to the left of top level domain like Aman, Shani.org then shani is second level domain.

Lower Level Domain : These are the domain written in the immediately to left of a second level domain.

3. Forward Look up Zone Name : In this the complete parent name in the hierarchy tree. For looking that particular domain belong to which top level domain.

Forex : Computer	(DNS Vancouverdom	Network ID 192.168.101.126	DNS Primary Suffix name) Vancouverdom. nwtraders.com.
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2.6. IPv6

Q.8. Explain IPv6. What are the advantages of having IPv6 over IPv4 ?

Ans. Version of IP currently being used on the Internet is IPv4. Its new version called IPv6 resolves unanticipated IPv4 design issues. IPv6 have advantage over IPv4.

1. Addressing has been expanded from 32 bits to 128 bits.
2. Number of backbone routing entries can be restricted by advocating route aggregation. This simplified routing hierarchy offer far better route summarization.
3. New type of address was created called an "anycast address".
4. IP mobile roaming support.
5. IPv6 specification encourages the use of encryption but it is not mandated.
6. That supports special handling of flogged traffic which allows particular packet to be given more priority on network links for low latency applications.
7. IPv6 has less overhead on switches and routers, especially on Internet backbones.
8. It also provides the network with a minimal danger OP distribution.
9. IPv6 headers are of arbitrary length.
10. IPv6 can encode an action to take on a router/host should perform if the option itself is unknown.

Q.9. Discuss the main features of addressing scheme IPv6 ?

Ans. IPv6 is a conservative extension of IPv4. Most transport and application layer protocols need little or no change to operate over IPv6.

Larger Address Space : The most important feature of IPv6 is a much larger address space than in IPv4 : addresses for IPv6 are 128 bits long, compared to 32 bits in IPv4. The very large IPv6 address space supports a total of 2^{128} address or approximately 5×10^2 addresses for each of the roughly 68 billion (68×10^9) people alive in 2010. In another perspective, this is the same number of IP addresses per person as the number of atom in a metric ton of carbon.

While these nos are impressive, it was not the intent of the designers of the IPv6 address space to assure geographical saturation with usable addresses. The longer addresses allows a better, systematic, hierarchical allocation of addresses and efficient route 2⁶⁴ addresses, the square of the size of the entire IPv6 address space which is 2¹²⁸. Actual address space utilization rates will be small in IPv6.

Stateless Address Auto Configuration (SLAAC) : IPv6 Hosts can configure themselves automatically when connected a routed IPv6 network using Internet Control Message Protocol Version 6 router discovery messages. When first connected to a network a host sends a link local router specification multicast request for its configuration.

netters : if configured suitably routers respond to such a request with a router advertisement packet that contains network-layer configuration parameters. If IPv6 less address auto configuration is unsuitable for on application configuration, a work may use stateful configuration with host configuration Protocol Version 6 or may be configured statically.

Multicast : The transmission of a packet to multiple destination in a single sendation, is part of the base specification in IPv6.

Pv6 multicast addressing shares common features and protocols with IPv4 multicast. Iso provides changes and improvement by eliminating the need for certain protocols. ast address assignments a 64 bit routing Prefix, yielding the small subnet size available v6.-

Mandatory Support for Network Layer Security - Internet Protocol Security was finally developed for IPv6 but found wide spread deployment first in IPv4, into which is back engineered. IP sec is an integral part of the base Protocol Suite in IPv6. IP Sec port is mandatory in IPv6, this is IPv4, where it is optional.

MODEMS

Types of Modems : Depending upon how your computer is configured and yourferences, you can have an

1. External modem
2. Internal modem
3. PCMCIA

Fortunately, there is one standard interface for connecting external modems to uppers called RS-232.

Consequently, only external modem can be attached to an computer that has an RS-port, which almost all personal computers have. There are also modems that come as expansion board that you can insert into a vacant expansion slot. These are some es called onboard or internal modems.

1. External modem : This is the simplest type of modem to install because you don't ne to open the computer. As the name implies they are placed outside the computer. External modem vary in size, but are typically slightly larger than a paper back book. ey consist of two cables one that plugs into the computer's serial port, and the other it plugs into the telephone (or cable) system via a connector on the wall. External modems have their own power supply.

2. Internal modem : Internal modems are generally much smallerian size. As the me implies they are placed inside computer. They only have one connection, since the odem to computer connection is hidden inside your machine. Most internal modems me installed in the computer you buy. Internal modems are more directly integrated to the computer system and therefore do not need any special attention. Internal modems e activated when you run a communications program and are turned off when you it the program. This convenience is especially useful for novice users. Internal modems usually cost less than external modems but the price difference is usually small.

3. PCMCIA : These modems, designed for portable computers, are the size of a credit and fit into the PC card slot on notebook and handheld computers. These modems

are removed when the modem is not needed. Except for their size, PC card modems are like a combination of external and internal modems. These devices are plugged directly into an external slot in the portable computer, so no cable is required other than the telephone line connection. The cards are powered by the computer, which is fine unless the computer is battery operated. Running PC card modem while the portable computer is operating on battery power drastically decreases the life of your batteries.

Q.10. What is meant by the term MODEM ? Explain them with their speed and time continue ?

Ans. A modem is connected between a computer and a telephone network. It connects computers by a telephone line. This device converts a digital signal from one computer into an audio signal suitable for transmission over a telephone line. The tones can then be passed as normal analog speech. At the receiving end, the tones are converted back to the digital before being applied to another computer.

Speed and Time Continuum : A modem's speed is measured in bits per second (bps) the number of Os and it can send or receive in one second. This is sometimes referred to as the modem's baud rate, for high speed modems, baud rate and bps are essentially the same, almost all modems transferred data at a rate of 2400 Bps (bits per second). Today modems not only run faster they are also loaded with features like error control and data compression.

e.g. 14.4 modems sends data at 14,400 bits per second, A 28.8 modem is twice as fast, sending and receiving data at a rate of 28,800 bits per second.

2.8. COMMUNICATION SOFTWARE

Q.11. Explain different communication software along with their description ?

Ans. Communication Software is used to provide remote access to systems and exchange files and messages in text, audio and/or video formats between different computers or user IDs. This includes terminal emulators file transfer programs, chat and instant messaging programs as well as similar functionality integrated within MUDs.

(i) E-mail : The internet for years has been facilitating communication. The electronic mail popularly known as e-mail is one of the most popular services available through the internet. It emerged as an inexpensive and efficient means of communication between researchers, scientists, people in Hi-tech jobs and those in academy. E-mail allows the user to send the mail to another internet user in any part of the world in a real time manner. The message takes from few seconds to several minutes to reach its destination as it has to pass from one network to another until it reaches its destination. It is simple to use. E-mail is an offline communication i.e., when one user sends messages files to the another user, then the messages file gets stored in an electronic box at the server. When the recipient logs on to the internet, then he can either download it on his computer or else can read it directly from the server to which he is connected.

E-mail etiquettes : There are certain rules that one should follow to make the messages, to be sent, more effective. The rules are as follows :

1. Don't be a novelist : Message should be concise and to the point. It should be in such a way that it is clearly understood by the recipient; It should not include long stories but should contain the message you want to convey in a precise manner. This point is extremely important in the way that some organisations receive hundreds of e-mail messages a day, so they want to see a message that includes everything and still it is to the point.

2. Too much punctuation : Don't get caught up in grammar and punctuation, especially excessive punctuation. You'll see lots of e-mail messages where people put a dozen exclamation points at the end of a sentence for added emphasis. Exclamation points (called bangs in computer circles) are just another form of ending a sentence. If something is important it should be reflected in your text, not in your punctuation.

3. Formatting is not everything : Formatting can be everything while sending the official letters, but it is not that important consideration while writing an e-mail.

4. Abbreviations : Abbreviation usage is quite rampant with e-mail. In the quest to save keystrokes, users have traded clarity for confusion (unless you understand the abbreviations). Some of the more common abbreviations are listed in the table below.

- (a) **Advanced E-mail Parser :** Software allows to create the incoming e-mail processing system automatically.
- (b) **G-Lock Easy :** Bulk E-mail software that can be used for e-mail marketing, messages are sent directly from your PC to the recipient's mail server.
- (c) **Page Gate : Messaging Server Software** sends e-mail messages or e-mail notification to pagers and Cell Phones.
- (d) **Poco Mail :** A specific focus to allow you to take full potential of e-mail, whether you get one or one hundred messages a day.

(ii) Wireless Software : Wireless Communication is the transfer of information without the use of wires, the distance involved may be short or long. The term is often shortened to wireless. It encompasses various types of fixed, mobile and portable two way radios, Cellular Phones, personal digital assistants (PDAs),

- (a) **Page Gate :** Network paging gateway that allows text messages to be sent to cell phones, pagers and PIMs from any combination of six different interfaces.
- (b) **Notepager Pro :** Send text or SMS messages to pager, Mobile Phones, and PIMs using easy to use desktop applications.
- (c) **Notepager Net :** Full features network paging S/W that allows for all users on a network to share a common modem, phone line and database to facilitate the sending of text messages to pagers, cellular phones or other messaging devices.

(iii) Internet Communication Software :

- (a) **Feed for All :** Easily Create, edit and publish New RSS Feeds can be quickly and easily created with feed for all, advanced features enable you to create professional looking RSS feeds quickly.
- (b) **Pysoft Broad Caster :** Tool for delivering live audio and video to Internet viewers. It can be broadcast from anything that plugged in into your computer.

(c) ISDN Phone :

- (a) Make phone calls from your PC. Voice data can be recorded and stored disk.
- (b) Find the class of following IP addresses :
- | | |
|------------------|-------------------------------|
| (i) 237.14.2.1 | Ans. : Class D |
| (ii) 208.35.54.1 | Ans. : Class D |
| (iii) 114.34.2.8 | Ans. : Class A |
| (iv) 129.14.6.8 | Ans. : Class B |
| (v) 255.0.0.0 | Ans. : Subnet mask of Class A |

Q.18. Explain world wide wait problem ?

Ans. The phrase world wide wait is very common now those days especially overe where connections are notoriously slow, for example in Spain, internet user say esperar mundial.

The literal translation of this phrase is "wait in the world network". It refers the evi increasing always experienced when trying to access in information on the internet. Wi the advent of the world wide web and the development of graphical browsers come surge of internet in the internet. This increase in the number of internet users coup with the accompanying requests for web pages containing elaborate in line images, sou and vide clips has degraded the speed of information super high way sometimes, appear to have a traffic jam. Although new technologies are being employed to remedy t situation the problem persists and is getting worse.

2.9. INTERNET TOOLS

Q.12. Discuss different tools on internet.

Ans. There are many tools on internet

- (i) Telnet
- (ii) File transfer protocol (FTP)
- (iii) Gopher.

(i) Telnet : Telnet stands for telecommunications network. It is one of the old protocols in the TCP/IP suite, first developed in the 1960s to allow a user on one comput system to directly access and use another system. It is most often used for remote logi with telnet client software on a user's machine establishing a session with a telnet serv on a remote host let the user work with the host as if connected directly. To ensu compatibility between terminals and hosts that use different hardware and softwar communication between telnet client and server software is based on a simplified, friction data representation the can be enhanced through the negotiation of options. Window has telnet built in (via the run dialog box or using the address box on the vbrowser), it easy to log into a telnet account or site on the Internet once you have a internet connectio running on computers.

Topics Covered/Syllabus

- ↳ Introduction to www and web browser
- ↳ Searching the www
- ↳ Search strategies
- ↳ Transfer protocol
- ↳ Telnet
- ↳ Gopher protocol

3
CHAPTER

WORLD WIDE WEB

3.1. INTRODUCTION TO WWW AND WEB BROWSER

Q.1. What is world wide web (WWW) ?

Ans. The world wide web is a user-interface to the internet. The internet is a set of computer connected to each other with a network.

- ▼ Each of these computers either knows how to speak, a language called TCP/IP.
- ▼ The world wide web is an easy to use, transparent user interface to these computers. You don't need to know where the computers are or how many exist in order to use the world wide web.
- ▼ The world wide web is to the internet is as similar microsoft window is to DOS.

History :

- ▼ The world wide web was originally developed in 1990 at CERN <<http://www.cern.ch>> the european laboratory for practical physics. It is now managed by the world wide web consortium <<http://www.w3.org>>
- ▼ The www consortium is funded by a large number of corporate members including AT and T abode system, INC, microsoft corporation and sun-microsystem INC. Its purpose is to promote the growth of the web by developing technical specification and reference software that will be freely available to everyone.
- ▼ The consortium is run by MIT <<http://www.lcs.mit.edu>> with INRIA <<http://www.inria.fr>> acting as european host, in collaboration with CERN. Write in brief about web browser.

Web Browser :

- (f) A page is accessed and its contents displayed by means of a program known as a browser that runs on the user/client machine.

- (ii) The browser locates and fetches each requested page and key interpretation command that the page contains are displayed.
- (iii) If the user clicking the moves on a linkage point within the displayed page, the page that is linked to that point is accessed by the browser and displayed in the same way.
- (iv) There are number of browser programs available some popular example : Netscape navigator, internet explorer.
- (v) A web browser consists of multiple software components that work together to provide the required services.
- (vi) Most of the web browser generally consist of three basic components controller, client programs interpreter. Web browser explores information on the web via HTTP protocol.
- (vii) It is capable of managing HTML, displaying text, graphics, audio and video using buttons and menu options provided.

3.2. SEARCHING THE WWW

3.2.1 Directories Search Engine

Q.2. Write short note on directories search engine.

Ans.

- (i) When searching for information on the web the user does not have a URL but rather he or she is interested in pages related to a specific topic. For this a directory is required.
- (ii) This is analogous to a telephone directory for each entry, a web directory contains some information that describes the contents of the page plus its URL. A second issue relates to the size of the directory.
- (iii) The no. of web pages is already vast and is increasing continuously.
- (iv) It would be totally infeasible to have a single large directory since the time required to carry out each search operation would be endless.
- (v) To make searching the latter faster, the directory is fragmented into many operational sections.
- (vi) This is based on geographic location and at local level, the directory is divided into business and residential subscribers.

Q.3. What do you mean by a *web directory*? How will you make a search through a *web directory*?

Ans.

- (i) A *web directory* or *link directory* is a directory on the world wide web. It specializes in linking to other web sites and categorizing those links.

Telnet is a client/server protocol that uses TCP to establish a session between a user terminal and a remote host. The telnet client software takes input from the user and serve it to the server, which feeds it to the host machines' operating system. The telnet server takes output from the host and sends it to the client to display to the user. While telnet most often used to implement remote login capability, there is no concept specific pertaining to logins in the protocols, which is general enough to allow it to be used for variety of functions. There are two types of software that let you make a Telnet connection.

- NCSA Telnet, better telnet, MacSampson
- X-window software

(ii) **File transfer protocol (FTP)** : FTP is the standard mechanism provided by TCP/IP for copying a file from one host to another. Transferring files from one computer to another is one of the most common tasks expected from a networking or internet working environment. It is mainly used for downloading the files (receiving the files from remote computer to your computer and uploading the files (sending the files from your computer to remote computer).

Features of FTP

1. FTP also works on the client server technology. Therefore, you can load, client FTP programs like Cute FTP, eFTP, and WS-FTP. FTP daemon, which is a server programme, runs on the FTP server and handles all FTP transactions.
2. FTP servers provide a storage place for useful files and programs.
3. You can log on to these servers and download the files to the local computer. For this you have to know the server name and where the file is located.
4. On some FTP sites you can only view or download files. Only the people who run or own the sites can rename, delete, or upload files.
5. You cannot move files within or between FTP sites. You can move files from an FTP site to a temporary location on your computer or a network drive and then upload them to another FTP site or a different folder on the same site.
6. Some programs may support opening and saving files from FTP servers by typing an FTP address in the file open or file save dialog box.
7. It is command driven therefore commands like open, get, etc., are used.

(iii) **Gophers** : As we know that all kinds of information are available through the internet, but much of it can be difficult to find without the guide. So for this purpose a tool known as Gopher is assemble. Gopher are the electronic guides which makes it easy to navigate through huge masses of information either on a local computer or through the internet or we can say that gopher organizes the directories of documents, images programs and other resources into some logical menus.

The first gopher was created at the university of Minnesota (home of the golden gophers) to provide the easy access to information all over the university's campus.

Q.13. Explain the examples of internet service provider (ISP) with working.

Ans. Example :

1. BSNL : Servicing all of India except Mumbai and Delhi. ETTH, Triple-play broadband services provided by ADSL and VDSL also providing Internet services over GPRS, 3G, as well as WiMax.
2. MTNL : Servicing Mumbai and Delhi. Triple play broadband services provided by ADSL under the "Tri-band" band. Also providing GPRS and 3G Internet services.
3. IITN : IITN broadband; FITH broadband and based line provider in Bangalore.
4. Nextra : Broadband over fiber; download and upload speeds up to 100 mbit/s.
5. Spectranet : Broadband over fiber cable.

QUICK REVIEW

Q.1. What are the different types of modes's available for connecting to the internet?

Ans. How fast and how often you need to transfer data will determine which connection option is right for your business :

- (i) Dial up connection
- (ii) Cable modem
- (iii) Digital subscriber line (DSL)
- (iv) Integrated service digital network (ISDN)

Q.2. Explain the IP addressing scheme.

Ans. Internet protocol provides the service of communicate unique global addressing amongst computers. It supports unique addressing for computers on a network. IP address is a unique identifier for a node or host connection on an IP network. An IP address is a 32 bit binary number usually represented as 4 decimal values.

Q.3. What do you mean by domain name?

Ans. A domain name is an identification string that defines a real or administrative autonomy, authority or control within the Internet. Domain names are formed by the rules and procedures of the domain name system. Any name registered in the DNS is a domain name.

Q.4. Explain standard address.

Ans. Standard Address : It is a numerical label assigned to each device participating in a computer network.

It serves two functions :

- ▼ Host or network interface identification then location addressing.
- ▼ An address indicates where it is.

Q.5. What is meant by the term modem?

Ans. A modem is connected between a computer and a telephone network. It connects computers by a telephone line.



- (ii) A web directory is not a search engine and does not lists of web pages based on key words. Instead it lists web sites by category and sub category.
- (iii) Most web directory entries are also not found by web crawlers that by human.
- (iv) The categorization is usually based on the whole web site rather than one page or a set of keywords, and site are often limited to inclusion in only a few categories, web directories contain collection of RSS feeds instead of links to web sites.
- (v) You select the category for the topic in which you are interested. You continue to move down through heirarchy, selecting subcategories and narrowing the search at each level, until you are presented with a list of hyperlink that pertain to your topic.
- (vi) As you begin to zero in on your topic, you may find other interesting items of which you were previously unaware.
- (vii) You may reach the bottom of the information you were after. When traversing a directory downward you are moving toward more specific topic, you may want to do this by using a search engine or meta search engine.
- (viii) Assuming at a very specific topic in a directory structure involves traversing between five and ten hyperlink levels.

To find information about wake boarding using the look around directory we traversed the following sub topics.

Home → sports → all sports → sports A – Z → sports W – Z → wakeboarding.

We could also have arrived at wakeboarding by traversing sub topic.

Home → sports → outdoor → recreation → extreme → sports.

Individual sports → wakeboarding

To find information about wakeboarding using the yahoo ! directory.

Home → recreation → sports → waterskiing → wakeboarding.

Here are some interesting directories of subject guides.

About.com : WWW.about.com

Argus clearing house : A selective collection of topics.

Guides : Scholarly internet resource

Pinakes : A subject launch pad.

WWW.hw.ac.uk/libwww/irn/pinakes/pinakes.html

3.2.2 Meta Search Engine

Q.4. Explain meta search engine.

Ans.

- (i) Meta search engine or all-in-one search engine perform a search by calling on more than one other search engine to do actual work.

- (ii) A meta search engine does not maintain its own database of information, by submitting searches to other search engines, it queries the database of the search engine.
- (iii) The particular set of search engine that each meta search engine will send a query to varies for instance, as of this writing the meta search engine dogpile submit its search queries to look smart go to find what open directory and google.
- (iv) As of this writing meta search engine meta search engine crawler submit its search queries to altaniate direct bit, excite find what and google.
- (v) Many meta search engine will collate the search results into one list remove duplicates and then rank. The pages according to how well they match your query.
- (vi) Dogpile will provide results from each search engine separately.
- (vii) Advantages of a meta search engine is that you can access a number of different search engine with a single query.
- (viii) The disadvantages is that you will often have high noise to signal ratio, that is a lot of the matches will not be interest to your.
- (ix) This means you will need to spend more time evaluating of the results and deciding which hyperlink to follow.

2.3. SEARCH STRATEGIES

Q.5. What are the different search strategies used in search engines ?

Ans. There are different search strategies used in search engines :

1. **Spider Class :** On the internet there are many search down the entire length of the website no matter how many the level of directories. These are called *deep spider class* search engines.
2. **Phrase searching :** When using search terms containing more than one word in a specific order to enclosing the words in equation marks the engine returns only documents containing the exact phrase.
3. **Capital Sensitivity :** If you were interested in document relating to the country of china, capitalizing the word and using can engine that support capital sensitivity narrow down the no. of results returned eliminating documents that capital relate to china dishes or cookery. However, that in many instances it is better to leave keyword uncapitalized to allow the engine results the contain keywords in either form.
4. **Boolean logic :** The most useful failure in defining search criteria. Boolean operators AND, OR, NOT, Near and parent are in many ways analogous to mathematical operator in they shape the execution of a complex equation.
5. **Media field search :** Ther are some search engines with the help of this we can search a particular type of media field e.g. if you want the image of the national flag of India then you could specify this to the search engines. So that only images or video clips could be searched for the right information.

6. URL Search : URL search limits search results to web pages where the keyword appear in the URL or websites add new. A URL search can narrow very broad results to webpages devoted to the keyword topic.
7. Date capabilities : Many search engines offer the ability to limit searches by webpage creation dates. This is a very useful tool for people doing continues research on a specific topic. It enables them to limit the results to pages created since their last search. It is also useful when searching for current event topics.
8. Link Search : It is used when want to know that what websites are linked to a particular site of interest. For example if you have a home page and you are wondering if anyone has put a link to your page on their searches for conducting backward citations.
Link : WWW.Coke.Com
9. Domain search : It allows you to limit results to certain domain such as websites from the united kingdom (U.K.) educational institution (.edu) or government specifies the IP address of the web server, the first step in establishing the connection between the systems is to discover the address sending a name resolution request to a DNS server. This address makes possible the IP protocol to address traffic to the server. Once the TCP connection is established browser and the server can exchange HTTP message. HTTP consists of message types, request and response.

Q.6. Name any five browser and explain any three of them.

Ans. (a) Web Browser : A page is accessed and its contents displayed by means of a program known as a browser that runs on the user/client machine.

The browser locates and fetches each requested page and by interpreting the formatting commands that the page contains, the page contents are displayed. If the user clicking The Mouse on a linkage point within the displayed page, the page that is linked to that point is accessed by the browser and displayed in the same way. There are number of browser programs available, some popular examples : being Netscape Navigator, NSCA Mosaic and Microsoft Internet Explorer.

A web browser consists of multiple Software Components that work together to provide there required services. Most of the web browser generally consist of three basic components controller, client programs, Interpreter.

Web browser explore Information on the web via HTTP protocol. It is capable of managing HTML, displaying text, graphics, audio and video using buttons and menu options provided.

(b) Coast to Coast Surfing :

- (i) Web provides a means of accessing an enormous collection of Information Including text, graphics, Audio, Video, Movies and so on.
- (ii) One of the most exciting aspects of the web is that information can be accessed in a non linear and experimental fashion.
- (iii) Unlike reading a book by flipping to the next page in sequential order, you can "jump" from topic to topic via Hyperlinks.

- (iv) This nonlinear approach to information gathering & browsing is sometimes referred to as "surfing the web". As a reader, you have the option to select what to explore next.
- (v) Different readers will proceed through the same web presentations in totally different ways, depending on their backgrounds, needs and personalities.
- (vi) There are some terminologies those are related to the web:
 - Pages or Web Pages
 - Browser
 - Hypermedia
 - Web Presentation
 - Hyperlink
 - Multimedia
 - Surfer
 - Web Master

(c) FTP (File Transfer Protocol) : FTP is a widely used Internet application protocol that has been designed to enable a user at a terminal to initiate the transfer of the contents of a named file from one computer to another using the TCP/IP protocol suite. The two computers may use different operating systems with different file system and possibly, different character sets. It also supports the transfer of a number of different file types of such as character and binary. It is specified in RFC 959. FTP has been designed to enable files stored in many different types of computer to be transferred, to gain an understanding of FTP's operation without including too much detail. FTP is based on a client/server Architecture. An FTP server manage a file system. The client may be a command line FTP, a modem web browser or FTP software's such as cute FTP, WS-FTP which you can easily download run the Internet.

(d) Telnet : Internet allows easy access to resources stored at remote computers somewhere else in the world from your own computer through a service known as Telnet. Users can Logon to their office computers from their home or when they are on a business trip. Similarly we have uploaded files on a FTP server. If you want to perform some administration services on these files like setting permissions than you can use the FTP client. But some FTP clients do not perform all these administrative activities so in that case you have to explicitly logon to the remote FTP server using the Telnet Service and use the Unix Commands to performed these operation on the files.

Telnet is a character based communication protocol that provides a remote logon capability. It is a part of the TCP/IP suite, the networking protocol of the Internet. It enables the user on a PC to logon to a remote computer and use remoter computer's resources with an illusion of working directly on the remote computer. Telnet uses client server approaches. The client i.e. Local Computer first connects to the Internet and then contacts the server with the Telnet program using IP Address/Name of the server whose resources you want to use.

There are Five Web browser :

- | | |
|-----------------------|----------------------|
| 1. Mozilla Fire Fox | 2. Internet Explorer |
| 3. Netscape Navigator | 4. Mosaic |
| 5. Opera Web Browser. | |

1. Internet Explorer : This is one of the most popular web browser and is a part of Microsoft's windows suite of software.

2. Fire Fox : It is a secure, fast and customizable browser. It provides all facilities that are available in Internet Explorer and Netscape Navigator.

3. Mosaic : The first graphical web browser, Mosaic was developed by researcher at the National Centre for the Supercomputing Applications at University of Illinois in 1992.

4. Netscape Navigator : It is a graphical based web browser that was developed by more and reason at Netscape Communication Corp. Which is now being acquired by America online (AOL).

Q.7. Explain the working of TCP/IP ?

Ans. TCP/IP uses a layered model and it has four layers :

1. Application Layer 2. Transport Layer 3. Network Layer 4. Internet Layer

1. Application Layer : This layer is broadly equivalent to the application, presentation and session layers of the OSI model. It gives an application access to the communication environment.

- File Transfer Protocol : (FTP) This protocol is used for transfer files between different hosts.
- Telnet : This protocol enables users to execute terminal sessions with remote hosts.
- Hyper Text Transfer Protocol : This protocol is used for transfer files and these files consist of a mixture of text and graphics. It uses a stateless connection and object oriented protocol with simple commands that supports selection and transport of objects between the client and the server.

Some More Protocols :

- Domain name service (DNS)
- Routing Information Protocol (RIP)
- Simple Network Management Protocol (SNMP)
- Network File System (NFS)

2. Transport Layer : This protocol just above the Inter network layer is the host-to-host layer. It is responsible for end to end data integrity. These are mainly two protocols used in this layer are Transmission Control Protocol (TCP) and user Datagram Protocol (UDP) both protocols deliver data between the application layer and the inter network layer.

- UDP (User Datagram Protocol) : UDP gives application programs direct access to a datagram delivery service, like the delivery service that IP provides. This direct access allows applications to exchange messages over the network with a minimum of protocol overhead. UDP is an unreliable, connectionless datagram protocol. "Unreliable" merely means that the protocol has no technique for verifying that the data reached the other end of the network correctly.
- Transmission Control Protocol : Applications that require the host-to-host transport protocol to provide reliable data delivery use TCP because it verifies that data is delivered across the network accurately and in the proper sequence. TCP is a reliable, connection oriented byte-stream protocol. Also GCP enables hosts to maintain multiple, simultaneous connections.

3. Internet Layer : This layer is responsible for the routing and delivery of data across networks. It allows communication across networks of the same and different types and carries out translation to deal with dissimilar data addressing schemes. TCP/IP protocol at the inter network layer is the Internet protocol (IP) which provides the basic packet delivery service for all TCP/IP networks. The IP addresses are used by the Inter network and higher layers to identify the physical address that matches a given IP address.

IP is a connectionless protocol, which means that IP does not exchange control information to establish an end-to-end connection before transmitting data.

4. Network Layer : TCP/IP reference model does not really say much about what happens here, except to point out that the host has to connect to the network using some protocol so it can send IP packets over it. This protocol is not define and varies from host and network to network.

3.4. TRANSFER PROTOCOL

Q.8. Describe file transfer protocol (FTP).

Ans. FTP (File Transfer Protocol) : FTP is a widely used Internet application protocol that has been designed to enable a user at a terminal to initiate the transfer of the contents of a named file from one computer to another using the TCP/IP protocol suite. The two computers may use different operating systems with different file system and possibly, different character sets. It also supports the transfer of a number of different file types of such as character and binary. It is specified in RFC 959. FTP has been designed to enable files stored in many different types of computer to be transferred, to gain an understanding of FTP's operation without including too much detail. FTP is based on a client/server Architecture. An FTP server manage a file system. The client may be a command line FTP, a modern web browser or FTP software's such as cute FTP, WS-FTP which you can easily download run the Internet.

(i) Software available for FTP : Depending on what you are planning to do with your FTP software you should pick best one. There are many software available. The three software packages are :

1. Cute FTP
2. FTP Explorer
3. Elite FTP

Each of these has its own good and bad points.

1. Cute FTP used to be the best shareware FTP program around. It is easy to use and has many functions. Unfortunately, because it has become so popular, the latest version only allows you to transfer one file at a time unless you register.

2. FTP explorer is not such a good program as cute FTP but it is freeware so there are no annoying nag-screens.

3. Elite FTP is not such a good program for uploading standard files but better if you are working with CGI as you can send commands to the server by typing them in this will work for CGI as it does not work with some servers properly and for some reason can't rename files.

In the beginning NVT uses 7-bit ASCII format for data and reserves the high bit set for commands.

(ii) **Options and option negotiation :** Having telnet clients and servers act as NVTs avoids incompatibilities between devices, but does so by stripping all terminal specific functionality to provide a common base representation that is understood by everyone. Since there are many cases where more intelligent terminals and computers may wish to use a more advanced communication feature or service, (Telnet defines a rich set of options and a mechanism by which a Telnet client and server can negotiate their use). If the client and server agree on the use of an option it can be enabled; if not, they can always fall back on the NVT to ensure basic communication.

(iii) **Symmetric operation :** While telnet is a client/server protocol, it is specifically designed to not make assumptions about the nature of the client and server software. Once a telnet session is established, they can each send and receive data as equals. They can also each initiate the negotiation of options. This makes the protocol extremely flexible.

Using telnet : In order to initiate a Telnet session, we must know the address of the remote host computer.

The syntax for using Telnet is :

Telnet <address of remote host>

For example : telnet leo.math.tau.ac.il - This will initiate an interactive session with the leo server at the school of Exact science at the tel aviv university.

Every telnet site has two address : one composed of words that are easier for people to remember; The other numerical address better suited for computers. Many remote hosts require you to have an account to login (you must have a user id and a password). However, there are some remote hosts that do not require users to have an account. Users can login with the general user id and password are usually not required (it is inserted automatically).

3.5. TELNET

Q.9. Describe Telnet.

Ans. Telnet : Internet allows easy access to resources stored at remote computers somewhere else in the world from your own computer through a service known as Telnet. Users can logon to their office computers from their home or when they are on a business trip. Similarly we have uploaded files on a FTP server. If you want to perform some administration services on these files like setting permissions than you can use the FTP client. But some FTP clients do not perform all these administrative activities so in that case you have to explicitly logon to the remote FTP server using the Telnet Service and use the Unix Commands to performed these operation on the files.

Telnet is a character based communication protocol that provides a remote logon capability. It is a part of the TCP/IP suite, the networking protocol of the Internet. It enables the user on a PC to logon to a remote computer and use remote computer's resources with an illusion of working directly on the remote computer. Telnet uses client server approaches. The client i.e. Local Computer first connects to the Internet and then contacts the server with the Telnet program using IP Address/Name of the server whose resources you want to use.

Telnet is based on three main principals :

1. The concept of the network virtual terminal (NVT).
2. The concept of negotiations.
3. A symmetrical view of terminals and processes.

(i) Network virtual terminal is a device used by Telnet to enable a local computer to communicate with a remote machine. To make telnet interoperable between as many systems as possible, it must accommodate the details of heterogeneous computers and operating systems. To accommodate heterogeneity, Telnet defines how data and command sequences are sent across the internet. The definition is known as the network virtual terminal (NVT). The NVT defines how data and commands are sent across the internet. The NVT is a bi-directional character device that has a printer and a keyboard. The printer responds to incoming data and the keyboard produces outgoing data which is sent over the telnet connection. The NVT is viewed as a half duplex device. The network virtual terminal implements a client server architecture. A Telnet client transfers characters between the user's terminal and a remote service. On one side it uses the local operating system functions when it interacts with the user's terminal. On the other side, it uses a TCP connection when it communicates with the remote service. Figure below shows the use of the network virtual terminal (NVT) format by TELNET.

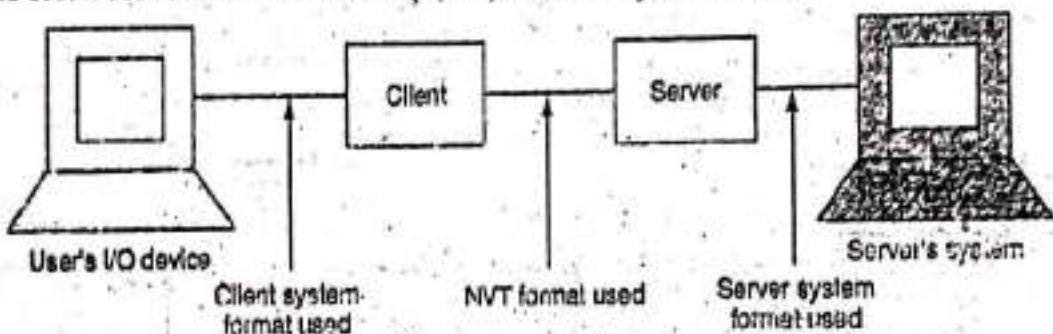


Fig. 1. Network virtual terminal (NVT) format by TELNET

The Telnet protocol defines the character set for the virtual terminals. Several of the keys correspond to conceptual operations instead of data values. The chief advantage of using a network virtual terminal is that it permits clients from a variety of computers to connect to a service. In short the main objectives of the network virtual terminal.

- Enable telnet to interoperate between heterogeneous systems.
- Defines how data and commands are sent across the internet.
- Client and server translate data and command from operating system format to NVT format, and vice versa.
- All communications involves 8-bit bytes.

3.6. GOPHAR PROTOCOL

Q.10. Write about gopher protocol ?

Ans. The gopher protocol is a TCP/IP application layer protocol designed for distributing, searching and retrieving documents over the Internet. The gopher protocol

was strongly oriented towards a menu-document design and presented an alternative to the world wide web in its early stage but ultimately HTTP became the dominant protocol. The gopher ecosystem is often regarded as the effective predecessor of the world wide web.

The protocol is simple to negotiate making it possible to browser without using a client a standard gopher is simple.

Gopher Menu Items : Let us define the different type of gopher items that you see on the menu.

1. *Root gopher* : The top level gopher; that is the menu where you entered gopherspace. It is found at the top of the menu selection.
2. *The slash character (/)* at the end of a menu item indicates that selecting this item will take you to another gopher menu (like a sub menu)
3. *A period (.)* at the end of a gopher item indicates that selecting this line will take you to a text file.
4. *A question mark (?)* at the end of a line indicates that a searchable index dialog box will pop up if this item is selected.
5. *<tel>* when you select a line ending with this reference, you will start to telnet to another computer.

QUICK REVIEW

Q.1. What is world wide web ?

Ans. The world wide web is a user interface to the internet. The internet is a set of computers connected to each other with a network. The world wide web is an easy to use, transparent user interface to these computers.

Q.2. What do you mean by web directory ?

Ans. A web directory or link directory on the world wide web. It specializes in linking to other web site and categorizing those links. A web directory is not a search engine and does not lists of web pages based on keywords.

Q.3. What are different search strategies used in search engines ?

Ans. There are different search strategies used in search engines :

- | | |
|------------------------|-----------------------|
| 1. Spider class | 2. Phrase searching |
| 3. Capital sensitivity | 4. Media/field search |
| 5. URL search | 6. Data Capabilities |

Q.4. Define Gopher Protocol.

Ans. The gopher is a TCP/IP application layer protocol designed for distributing, searching and retrieving documents over the internet.

Q.5. Define FTP.

Ans. FTP is a widely used internet application protocol that has been designed to enable a user at a terminal to initiate the transfer of the content of a mane file from one computer to another using the TCP/IP protocol suite.

Topics Covered/Syllabus

- ↳ Introduction to browser
- ↳ Cost to coast surfing
- ↳ Hyper text markup language
- ↳ Basics of html and formatting

4

CHAPTER.

BROWSER

4.1. INTRODUCTION TO BROWSER

Q.1. (a) What is browser, explain in brief ?

Ans. Web Browser :

- (i) A page is accessed and its contents displayed by means of a program known as a browser that runs on the user/client machine.
- (ii) The browser locates and fetches each requested page and by Interpreting the formatting commands that the page contains, the page contents are displayed.
- (iii) If the user clicking The Mouse on a linkage point within the displayed page, the page that is linked to that point is accessed by the browser and displayed in the same way.
- (iv) There are number of browser programs available, some popular examples : being Netscape Navigator, NSCA Mosaic and Microsoft Internet Explorer.
- (v) A web browser consists of multiple Software Components that work together to provide there required services.
- (vi) Most of the web browser generally consist of three basic components controller, client programs, Interpreter. Web browser explore information on the web via HTTP protocol. It is capable of managing HTML, displaying text, graphics, audio and video using buttons and menu options provided.

(b) Explain the various features of web browser ?

Ans. Various Features of Web Browser :

1. Links that change in color when they have been used : Words or phrases on a web page that are appear underlined and in color blue if you have not yet followed them. Purple if you have. Click once on a link to follow a new page.
2. A Window Displaying the Current Page : This window behaves like any other window or a Mac or Windows computer it can be opened, closed, resized, and moved around on the screen. Scroll Bars at the right side and bottom of the window allow you to

see parts of a page that are not currently visible. The title of the current page appears in the windows title bar.

3. A Row of Buttons at The Top of The Browser Window :

During its transfer over the Internet.

Content length that represents the length of the message body.

Some of these button are :

(i) **Home button** : No matter where you are on the web, the button with a picture of a house will bring you back to the home page you have specified in your.

(ii) **Back and forward buttons** : Adorned with left and right pointing arrows, these button will take you back through the pages you have visited since starting up the browser program. Logically enough, the forward button is only active if you have used the back button. You can also use the menu to retrace the history of your web browsing session.

(iii) **Stop button** : This button always allows you to abort an attempt to retrieve a page from a web browser. If a page is loading very slowly, you may want to change your mind and look at something else.

(iv) **The Go menu** : The Go menu maintains a list of the pages you have visited since starting the browser program. You can go back to any of these pages by selecting their titles. This is more efficient than clicking on the back button repeatedly.

(v) **Preferences** : Your web-browser can be configured in many ways by selecting preferences from the edit menu. You can hide and show different sets of controls and also tell the web browser whether it should automatically display images when it load a page. There are other preferences that you can set includes the URL for your home page, the fonts used to display text on web pages, your e-mail address, and many other settings.

Q.2. Explain UDP.

Ans. UDP (User Datagram Protocol) :

(i) UDP gives application programs direct access to a datagram delivery service, like the delivery service that IP provides.

(ii) This direct access allows applications to exchange messages over the network with a minimum of protocol overhead. UDP is an unreliable, connectionless datagram protocol.

(iii) "Unreliable" merely means that the protocol has no technique for verifying that the data reached the other end of the network correctly.

A number of good reasons exists to choose UDP as a data transport service.

1. If the amount of data being transmitted is small, the overhead of creating connections and ensuring reliable delivery may be greater than the work of retransmitting the entire data set. In this case, UDP is the most efficient choice for a host to host transport layer protocol.

2. Applications that fit a query response model are excellent candidates for using UDP. The response can be used as positive acknowledgement to the query if the response is not received within a certain time period, the application just sends another query. Still other applications provide their own techniques for reliable

data delivery and do not require that service from the transport layer protocol. Imposing another layer of acknowledgement on any of these types of applications is redundant.

3. When error correction is not required, UDP provides unreliable datagram service that enhance network through put at the host to host transport layer.

Q.3. Explain VOIP (voice over Internet Protocol).

Ans. VOIP :

- (i) *Voice Over Internet Protocol* is a general term for a family of methodologies, communication protocols, and transmission technologies for delivery of voice communication and multimedia sessions over Internet Protocol (IP) networks such as the Internet.
- (ii) Synonyms with VOIP are Internet telephony, voice over broadband and broadband phone.
- (iii) Internet telephony refers to communication services – voice, facsimile and voice messaging applications that are transported via Internet, rather than the public switched telephone network.
- (iv) The basic steps involved in originating an Internet telephone call are conversion of the analog voice signal to digital format and compression/translation of the signal into Internet protocol packets for transmission over the Internet, the process is reversed at the receiving end.

Q.4. Explain ICMP.

Ans. *Internet control message protocol (ICMP)* is used to test the internet when something unexpected occurs the event is reported by the ICMP.

ICMP message is encapsulated in an packet.

Message Type	Description
Destination unreachable	Packet could not be delivered
Time exceeded	Time to live field
Parameter problem	Invalid header field
Source quench	Choke packet
Redirect	Teach a router about geography
Echo request	Ask a machine if it is alive
Echo reply	Yes I am alive
Time stamp request	Same as echo request but with time stamp
Time stamp reply	Same as echo reply, but with timestamp

4.2. COST TO COAST SURFING

Q.5. Describe coast to coast surfing.

Ans. Web provides a means of accessing an no. of collection of information including text, graphics, audio, video, movies and so on. One of the most existing aspects of the web

information can be accessed in a non linear and experimental fashion. Unlike reading book by flipping to the next page in sequential order, you can "jump" from topic to topic via hyperlinks.

The non linear approach to information gathering and browsing is sometimes referred to as "surfing the web". As a reader you, have the option to select what to explore next. Different readers will proceed through the same web presentations in totally different ways depending on their background need and personalities. There are some technologies which are related to the web.

- ▼ Page on web pages
- ▼ Browser
- ▼ Hyper media
- ▼ Web presentation
- ▼ Hyperlinks
- ▼ Multimedia
- ▼ Surfer
- ▼ Web master

HYPER TEST MARKUP LANGUAGE

Q.6. Write about on HTML tags ?

Ans. HTML files are different from other text files because they include special codes called *HTML Tags*. Example :

 This is bold

Types of Tags :

- **Container Tags :** These tags include both the ON and OFF tag. The ON is denoted by <> and OFF is denoted as </> i.e. (/) sign marks the difference between starting and ending tag). If tags are nested, always keep these tags sets balanced.

- *Correct Way* -

Tag1

Tag2

Tag2

Tag1

- *Incorrect Way* -

Tag1

Tag2

Tag1

Tag2

- **Empty Tags :** These tags include only the ON tag. These elements do not enclose any data.

Q.7. Write about hyperlink and HTTP.

Ans.

- (i) **Hyperlink** are the threads that inter connect the web. A link is also called a uniform resource locator (URL) and is the portion of text or graphic that transfer you to another associated web pages when you click on it take links is underlined and in blue, browser sites (gov) we can perform their search in the following manner : + domain : edu + "cancer" + smoke.

- (ii) **HTTP** : The standard web transfer protocol is HTTP (Hyper text transfer protocol). Communication between web server and their browser client is provided by an application layer protocol called hyper text transfer protocol.

The HTTP protocol consists of 2 fairly distinct items. The set of requests from browsers to servers and the set of response going back the other way. We will now treat each of these in turn. All the newer versions of HTTP supports two kinds of requests.

Simple request and full request. A simple request is just a single GET line naming the page desired, without the protocol version. Unless the user or the hyperlink sometimes gives graphics with a link. Cursor turns into a hand when containing links. Some pictures contain more than one link and the x-y position coordinates of the cursor in the graphics may be displayed on the status bar which the websites uses to determine which link in the page. The location of the link being moused over will be displayed in the status line. It is very helpful if you understand URLs. An experienced user, upon seeing a URL will know where the document is stored and approximately how long it should take to download.

Each HTTP message consists of the following elements.

1. Start line : Contains a request command or reply status indicator, plus a series of variables.
2. Headers (optional) : Contains a series of zero or more fields containing information about the message or the system sending it.
3. Empty line : Contains a blank line that identifies the end of the header section.
4. Message body (optional) : Contains the payload being transmitted to the other system.

HTTP Requests :

The start line for all HTTP requests is structured as follows :

Request type

Request URI

HTTP Version

Version 1.1 of the HTTP standard defines seven types of request messages, which use the following values for the request type variable :

Get, Head, Post, Options, Put, Delete, Trace, Connect

For example :

1. Get : Contains a request for information specified by the request URI variable. This type of request accounts for the vast majority of request messages.

2. Head : Functionally identical to the GET request, except that the reply should contain only a start line and headers; no message body should be included.

The Request URI variable contains a Uniform Resource Identifier (URI) a text string that uniquely identifies a particular resource on the destination system. In most cases, this variable contains the name of a file on a web server that the client wants the server to send to it, or the name of a directory from which the server should send the default file.

The HTTPVersion variable identifies the version one HTTP protocol that is supported by the system generating the request. Currently, the three possible values for this variable are as follows :

• HTTP/0.9

• HTTP/1.0

Thus, when a user types the name of a web site into a browser, the request message generated contains a start line that appears as follows :

GET/HTTP/1.1

The GET command requests that the server send a file. The use of the forward slash as the value for the request URI variable represents the root of the web site, so the server will respond by sending the default file located in the server's home directory.

4.4. BASICS OF HTML AND FORMATTING

Q.8. Discuss the following tags of HTML using suitable examples.

Ans. (i) Marquee : The marquee tag is a nonstandard HTML element which causes text to scroll up down left or right automatically.

The marquee makes the webpages appear more attractive by moving the objects it. A specific area can also be specified under marquee to highlight the moving text.

It is denoted by keyword <Marquee>

HTML Marquee behavior

- ←→ Scroll ←→
- ←→ Slide ←→
- ←→ Alternate ←→

(ii) Tr-table row : The <tr> tag defines a row in HTML table.

A <tr> element contains one or more <th> or <td> element. It also supports the global attributes in HTML.

(iii) td : The <td> tag defines a standard cell in a HTML tags.

An HTML table has 2 kinds of cells :

- ▼ Header Cells : Contains header information (Created with the <th> element)
- ▼ Standard cells : Contains data (Created with the <td> element).

The text in <th> element are bold and centered by default.

The text in <td> element are regular and left-aligned by default.

(iv) title : <title> tag is used to give the title to the webpage.

It defines the title in the browser toolbar provides a title for the page when it is added to favorites display a title for the page search-engine results.

(v) Li : List tag

The tag defines a list item. The tag is used in ordered lists () unordered lists () and in menu lists (<menu>).

(vi) Input : <input>

The <input> tag specifies an input field where the user can enter data.

<input> element are used within a <form> element to declare input field that allow users to input data.

(vii) p : paragraph tag

<p> tag defines a paragraph browser automatically add some space (margin) before and after each <p> element the margin can be modified with CSS (arith the margin properties)

Q.9. What is static website ? Explain HTML

Ans. A static web page called flat page stationary page is a web page that is delivered to the user exactly as stored in contrast to dynamic web pages which are generated by a web application.

Static web pages are often HTML documents stored as files in the file system and made available by the server over HTTP.

Static web pages are suitable for the contents that never or rarely need to be updated. However maintaining large no of static pages as files can be impractical without automated tools.

Advantages of Static Websites :

1. Quick to develop
2. Cheap to develop
3. Cheap to host

Disadvantages of Static Websites :

1. Requires web development expertise to update site.
2. Site not as useful for the user.
3. content can get stagnant.

HTML : Hyper text markup language. It the standard markup language used to create webpages. Web browser can read in HTML files and render them into visible or audible need pages.

HTML describes the structure of a websites semantically along with causes for presentation marking it a markup language, rather than a programming language.

Structure of HTML :

```
<html>
  <head>
    <title> </title>
  <body>
    </body>
</html>
```

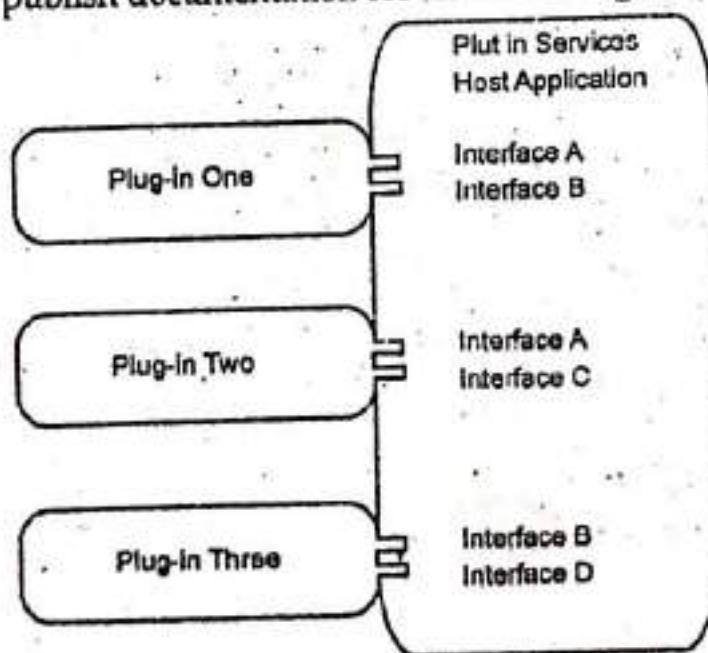
HTML markup consists of several key components including those called tags, character based.

Q.10. What are Plug-ins ? Explain its architecture.

Ans. A plug-in is a set of software components that adds specific capabilities to a larger software application. Example : are plug-ins for the netscape navigator and Internet Explorer. This is to play video, scan for viruses and display new file types. A plug-in is a file that extends the functionality of an application. When a user adds a plug-in to a Software System, the foundation of the original Software System remains intact. The development of Plug-ins requires well defined Application Programming Interface (APIs). Plugins are usually created by people other than the publishers of the software the plug-ins work with. Usually Plug-ins will have no purpose outside the context of the

application. When making an application capable of accepting plug-ins, a developer will define the means by which communication takes place this is known as an interface. Plug-ins can be written in any language you choose. Structuring an application as a well designed host frame work and a set of plug-ins has many benefits to you as an application developer:

- You can implement and incorporate application features very quickly.
- Because plug-ins are separate modules with well defined interface, you can quickly isolate and solve problems.
- You can create custom versions of an application without source code modifications.
- Third Parties can develop additional features without any effort on the part of the original application developer.
- Because plug-ins are language independent, you can reuse legacy code. Plug-in architecture can save both you and your plug-in developers a great deal of time and effort. It also frees you from having to design, implement and test a new plug-in model yourself. Because plug-ins is already documented. You won't have to develop and publish documentation for an entire Plug-in Architecture.



Plug-in Architecture

All Plug-in models require two basic entities the plug-in host and plug-in itself. The host could be an application, Operating System or even another plug-in. The plug-in host's code is structured such that certain well defined area of functionality can be provided by an external module of code a plug-in plug-ins are written and compiled entirely separately from the host, typically by another developer. When the host code is executed, it uses whatever mechanism is provided by the plug-in architecture to locate compatible plug-ins and load them, thus adding capabilities to the host that were not previously available. The plug-in model is flexible enough to be used in at least two fundamentally different ways.

QUICK REVIEW

Q.1. What is Browser ?

Ans. A page is accessed and its contents displayed by means of a program known as *browser* that runs on the user/client machine. Most of web browser generally consists of three basic components controller, client programs interpreter.

Q.2. What is Hyperlink ?

Ans. Hyperlink are the threads that interconnected the web. A link is also called a uniform resources locator (URL) and is the portion of text or graphic that transfer you to an associated web pages when you click unit.

Q.3. Explain coast of coast surfing.

Ans. The non-linear approach to information gathering from growing is sometimes referred to as surfing the web. Web provides a means of accessing an enormous collection of information including text graphics, Audio, video, movies and soon..

Q.4. What is HTTP ?

Ans. The standard web transfer protocol is HTTP (Hyper text transfer protocol). Communication between web server and their browser client is provided by an application layer protocol called hyper text transfer protocol.

Q.5. Explain HMTL.

Ans. HTML stands for hyper text markup language. Is the standard markup language used to create webpages. Web browser can read in HMTL files and render them.



Topics Covered/Syllabus

- ↳ Introduction advantages and disadvantages
- ↳ User id's and passwords
- ↳ E-mail address
- ↳ Message components and message composition
- ↳ E-mail working
- ↳ E-mail management
- ↳ Mime types
- ↳ News group and mailing lists
- ↳ SMTP
- ↳ PICO
- ↳ PINE
- ↳ Library cards catalog and online reference works

5

CHAPTER

MAILING SYSTEMS

5.1. INTRODUCTION ADVANTAGES AND DISADVANTAGES

Q.1. Give introduction to mailing systems with its advantages and disadvantages.

Ans. *Electronic mail*, most commonly referred to as e-mail is a method of exchanging digital message from one another to one or more recipients. E-mail operates across the internet or other computer networks.

Some easy e-mail system required the author and the recipient to both be online at the same time, in common with instant messaging. Today's e-mail systems are based on a store-and-forward model. E-mail servers accept forward deliver and store messages neither the users nor their computers are required to be online simultaneously. They need to connect only briefly, typically to a mail server for as long as it takes to send or receive message.

An internet E-mail message consists of three components the message envelope, the message header and the message body. The message header contains control information including minimally, an originator's E-mail address and one or more recipient addresses. Visually descriptive information is also added, such as subject header field and a message submission date/time stamp.

Advantages :

1. It's free : Once you are online, there is no further expense.
2. Easy to reference : Sent and received message and attachment can be stored safely logically and reliably. It's a lot easier to organize emails than paper.
3. Easy to use : Once you are set up sending and receiving messages is simple. That goes for a host of other E-mail functions data storage and contacts can be accessed quickly and easily.

4. Easy to prioritize : Incoming message have subject lines that means you can delete without opening.
5. Speed : E-mail is as fast a form of written communication as any.
6. Global : Well leased E-mail means you can access your messages anywhere online.
7. Good for the planet : Computers themselves aren't green but E-mail offsets some of the damage by reducing the environmental cost of contact.
8. Information at your finger tips : Storing data online means less large, space taking fill cabinets folder and shelves. You can access information for quicker if you learn how to use e-mail this ways.
9. Leverage : Send the same message to any number of people. Adaptations are simple. If you have a product or service to see, e-mail is an effective medium to get your message out.
10. Send reminder to yourself : E-mail yourself message from work to home or viceversa.

Disadvantages :

1. Emotional response : Some E-mails cause upset or anger. A reply in the heat of the moment can't be easily retracted but it can cause lasting damage.
2. Information overload : Too many people send too much information. They cover their leack citing need to know as the justification.
3. Lacking the personal touch : Some things are best left untyped. E-mail will never best a hand written card or letter when it comes to relationships.
4. Misunderstanding : E-mail from people who don't take the time to read what they write before clicking send. Time is wasted either to clarify or worse, acting on a misinterpretation of the message.
5. No Respite : Your e-mail inbox is like a garden it needs to be constantly maintained. Leave it an will continue to grove.
6. Pressure to reply : Once it's in your inbox, you fell an ever increasing obligation to act on it. Procrastinating doesn't making it go away. Do it, dump it or delegate it.
7. Spam : Having to deal with spam and spoofs is one of the worst avoid able time wasters online. Use some anti spam software.
8. Sucks up your time : Overchecking messages is so common, but it is time wasted on a low value, passive activity. Better to check once or twice a day.
9. Too long : It's hard to say exactly but the longer it goes on, the harder it is to take in. E-mail is suited to brevity keep it short and sweet.
10. Viruses : A virus could seriously affect your computer. If you want to know how to use e-mail effectively, it's worth learning how to deal with these.

5.2. USER ID'S AND PASSWORDS

Q.2. Explain the term user ID and Password.

Ans. User IDs : The synonyms for it are user name and account name. User ID is merely the concatenation of the word "user" and the abbreviation "id" standing for

identification. The user ID identifies you to the computer and it is unique, user ID consists of username and domain name.

<mail to:mohit@yahoo.com>

- **Password :** Password is a secret code that authenticates to the computer and other people. Passwords should be of some character long that contains a number possess a lowercase and uppercase letter.

User ID : Here mohit is the user name. The username often consists of names and/or initials identifying an individual at the organisation. Yahoo is the subdomain of the domain name user name and domain name are separated by at the rate (@) symbol which was developed by ray tomlinson in 1972.

Password

A password should be good if following points cover.

- Be at least five characters long
- Contain a non-alphabetical symbol such as %! The most commonly used non alphabetical symbol is asterisk symbol (*)
- Contain a number
- Possess a lower case and upper case letter.

i.3. E-MAIL ADDRESS

- **Q.3. What do you mean by E-mail addresses ?**

Ans. E-mail address contains two parts :

- (a) User Name
- (b) Domain Name

These two parts are separated by @ symbol.

General form :

Username @ hostname. subdomain.domain

<mail to : username @ hostname.sudomain.domain

E.g. merry @ yahoo.co.in

Mail transfer agents (MTAs) : These are permanently running programs on hosts with permanent Internet connections. An MTA listens for incoming e-mail from both local users and remote MTAs examines the e-mail and either saves it locally for retrieval by the destination user or identifies and contacts a remote MTA. Several MTAs may be involved in the transfer of e-mail from originator to destination, the intermediate MTAs are known as mail relays.

Mail user agents (MUAs) : An MUA is a program that a user runs when he or she wishes to send or receive e-mail. It provides a user interface for composition and local storage of mail Message and value has facilities to communicate with MTAs.

There are numerous MUAs available under modern windows based environments. Typical examples include eudora and microsoft outlook. On unix based systems character based programs such as elm and mail may be encountered. World wide web browsers such as netscape also commonly incorporate MUA functions.

5.4. MESSAGE COMPONENTS AND MESSAGE COMPOSITION

Q.4. What is meant by the term E-mail ? Explain E-mail message format message components and message composition ?

Ans. E-mail is a familiar way of transferring message between two Internet users. E-mail was one of earliest applications to be developed on the Internet, the first E-mail was, reputedly, sent in 1978.

Basic purpose of E-mail is to send the electronic formatted message written in human readable language mainly in English form source place to destination place. E-mail provides the ability to distribute information to large number of people virtually instantaneously and inexpensively.

E-mail is an offline communication i.e. when one user sends messages / files to another users, the messages / files gets stored in an electronic box at the server. When the recipient logs on to the Internet, the messages can be read and the files could be directly saved to hard disk from the server to which the user is connected.

Message Components and Composition : There are various elements on the compose windows. Their description is as follows :

(i) **To :** It indicates the recipient address i.e. the address of the person to whom you want to send a mail.

(ii) **Cc :** It means carbon copy. This field is used when the sender wishes to send the same message to more than one person. This is accomplished by writing address separated by comma. When the person receives the mail then he will be able to see the addresses of all the other persons to whom the mail is being sent.

(iii) **BCC :** It means blind carbon copy. It is similar to Cc except that other people to whom you have sent the message will not be aware that a copy of the message has been sent to particular user.

(iv) **Subject :**

- **Never Leave It Blank :** The header is what tells the reader what's in the message. If its blank, there is no way to tell what the message is about or none important it is.
- **Meaningful :** The header should clearly describe the content of the message. With a meaningful header, you are more likely to be read.

(v) **Body Section :** In this section, we write the message, we wish to send. While writing a message one should follow E-mail that is discussed above.

(vi) **Spell Check :** After writing the message one can use spell checker to correct the mistakes in the message using spell check button.

(vii) **Attachments :** If you want to send the files which includes images, audio, video etc. along with the message, you can accomplish this task using attachment button.

(viii) **Save Draft :** Using this option, you can even save only rough copy of the message.

(ix) **Save Outgoing Message :** You can save a copy of the message and send this to other person.

(x) Dictionary : When you click on it, a dialogue box appears which contains a text button, here you will enter the phrase or a word and if that word exists, the corresponding entry in the dictionary gets displayed.

(xi) Thesaurus : Thesaurus gives multiple words options against the word / phrases entered.

(xii) Quick List : It lists all the addresses.

(xiii) Send : To send the message, you can click on the send button.

5. E-MAIL WORKING

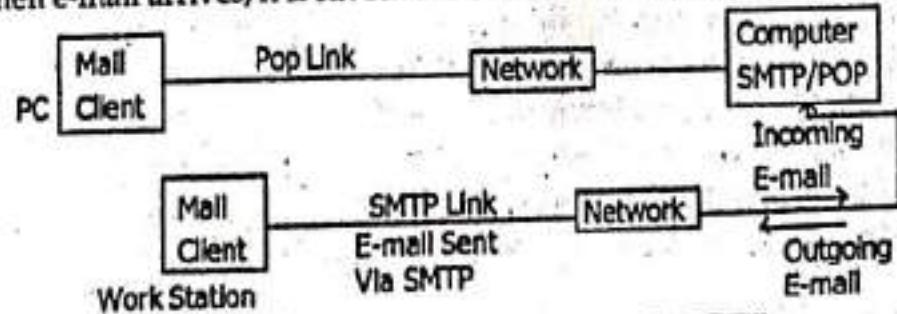
Q.5. How e-mail system works ? Illustrate with diagram.

Ans. E-mail has become an extremely popular communication tool. An E-mail message has always been nothing more than a simple text message. A piece of text sent to a recipient. E-mail messages tend to be short pieces of text, although the ability to add attachments now makes many messages quite long.

1. E-mail Server : If you have an E-mail client on your machine, you are ready to send and receive e-mail. For that we need an e-mail server for the client to connect to, if we know how web server works then we must know that machines on the Internet can run software applications that act as servers. There are web servers, FTP Server, Telnet Server and E-mail server running on millions of machines on the Internet right now. These applications run all the time on the server machine and they listen to specific ports, waiting for people or programs to attach to the port. It would have a list of e-mail accounts, with one account for each person who can receive e-mail on the server.

2. E-mail Client : When we received several e-mail messages today. To look at them you use some sort of e-mail client. Many people use well known, stand alone clients like Microsoft outlook, outlook express. People who subscribe to free e-mail services like Hotmail or yahoo use an e-mail client that appears in a webpage. If you are an AOL customer you use AOL's e-mail reader.

3. Store and Forward Features : A mail server needs to be running nearly all the time, waiting for e-mail messages and routing them appropriately. If a mail server crashes or is down for an extended period e-mail can be lost. The mail server must be a 7 by 24 machine that is it machine running 7 days a week 24 hours a day. It is necessary for PC users to have their inboxes on a very reliable computer on which the mail server is always running. When e-mail arrives, it is saved for the addresses in the inbox until they "Pick it".



up" by downloading the messages. The save and pick up processes comprise the static and forward function. There may be space limitation on the size at your mail box. There is a post office Protocol (POP) to retrieve their e-mail from a remote location. A Protocol is a set of rules that computers use for communicating with one another.

E-mail System : There are no. of people attach with the Internet. And the real E-mail system consist of two different servers running on a server machine. One is called SMTP Server. Simple mail transfer protocol, SMTP Server handles outdoor mail. Others are POP3 and IMAP Server both of which handles incoming mail. POP stands for Post Office Protocol and IMAP Stands for Internet mail Access Protocol.

5.6. E-MAIL MANAGEMENT

Q.6. What is E-mail management ?

Ans. E-mail is basically a message sent to us. We receive a number of E-mail a day. When we decide to view a mail our mailer will provide some sort of index of message with the subject line displayed. Normally the messages are numbered in sequences. The mailer usually displays the first or current message.

Action Option :

- ▼ We can delete a message without reading if we come to know the e-mail is not our use from its subject line. This is a good way to deal with junk mails.
- ▼ If we do not want to read a message due to lack of time, we can simply skip over it save it to a file.
- ▼ If we have read a message we have two options after it is we can delete it or we can save it to disk also we can forward it to some one else.

Vacation Program : This is a software facility that automatically replies to your e-mail. Usually, the program sends a brief reply back to each message you receive. For business purposes it is mandatory to include the name and telephone no, or e-mail address of someone to contact in your absence. You should be aware that a large no. of users despise vacation programs.

5.7. MIME TYPES

Q.7. What do you mean by MIME types ?

Ans. MIME Types : Multipurpose Internet Mail Extensions (MIME) is an Internet standard that extends the format of E-mail to support:

- Text in character sets other than US-ASCII
- Non-Text Attachments
- Message bodies with multiple parts, and
- Header information in non-US-ASCII character sets.]

MIME is specified in six linked RFC memoranda : RFC 2045, RFC 2046, RFC 2047, RFC 4288, which together define the specifications. MIME defines mechanisms for sending other kinds of information in e-mail. These include text in languages other than English using character encoding other than ASCII and bit binary content such as files

ntaining images, sounds, movies and computer programs. MIME also a fundamental component of communication Protocol such as HTTP, which requires that data be transmitted in the context of e-mail like messages even though the data might not fit this context of e-mail like message even through the data might not fit this context. Mapping messages into and out of MIME format is typically done automatically by an e-mail client by mail server when sending or receiving Internet e-mail.

MIME defines a collection of e-mail header for specifying additional attributes of a message including content type and defines a set of transfer encoding which can be used to represent 8 bit binary data using character from the 7 bit ASCII character set. MIME also specifies rules for encoding Non ASCII characters in e-mail message headers such as "subject" allowing these header fields to contain non English 94 characters.

8. NEWS GROUP AND MAILING LISTS

Q.8. Explain the terms :

(i) News groups

Ans. Newsgroups are similar to e-mail except that instead of sending your message to someone's mail box, the message is posted on a bulletin board where anyone can read it and respond. This allows a discussion to take place among several people. A newsgroup may have several active discussions at one time.

- Working of Newsgroups :

- (a) Need a newsreader program. Both browsers i.e. Navigator and Internet explorer have built in newsreader software.
- (b) Determine in which newsgroup you are interested and then subscribe to them from the newsgroup button of your browser. You do not need to subscribe to a newsgroup to read or participate in it. Subscribing to a newsgroup is similar to saving a bookmark or favorite in your browser. It just makes it easier for you to find it again. Keep in mind that newsgroups were once the only way to have so called threaded discussions, where related messages are grouped together. Example : wholesome.net that wants to avoid controversy at all costs, so the only newsgroups it offers Soc. Couples and misc-kids.

(ii) Mailing lists

Ans. Mailing List are a very important extension of the communication services provided by e-mail. This directory lists thousands of interest groups that use mailing lists to carry out their discussions. A mailing list is just a group of e-mail addresses maintained either manually by some person who takes on the responsibility of forwarding mail to all the people on the list, or automatically, by a computer program. Such a computer program is called a mail reflector, mail reflector usually have two addresses the address to which all mail is sent that is to be distributed to everybody on the list, and the address to which changes to the mailing list are sent. Once you start using the internet, you will notice people talking about joining lists and participating in discussions on various subjects. While there are thousands of ongoing newsgroup discussions happening as well. Mailing lists have usually been divided into two classes.

5.9. SMTP

Q.9. Explain the simple mail transfer protocol (SMTP).

Ans. SMTP :

- (i) Simple Mail transfer protocols is a protocol used for sending e-mail efficiently and reliably over the internet.
- (ii) It is the application level protocol that handles exchanged of messages between e-mail server over TCP/IP network.
- (iii) It is a mail delivery protocol modeled on FTP Protocol that not only transfer mail messages between systems but also provides notification regarding the incoming mail.
- (iv) When you send e-mail server which further contacts the recipient mail server using SMTP commands.
- (v) These commands generally specify the server's and receiver's e-mail address along with the message to be send.
- (vi) The exchange and SMTP commands between two e-mail servers are carried out automatically without any user intervention.
- (vii) When the exact recipients mail server is contacted it stores the message into his mail box. If a message can not be delivered then error report is send to the sender, thus making it a reliable protocol.
- (viii) Some of the SMTP commands are :

HELLO	Used to identify sender to receiver
MAIL	Initiates a mail transaction
RCPT	Used to identify recipient of the message.
DATA	Message body.

5.10. PICO

Q.10. What do you mean by term PICO explain in detail?

Ans.

- (i) PICO is a plain text editing program that can be used for text editing as well as computer program development.
- (ii) It does not have text enhancement capabilities like many word processing programs.
- (iii) Main features are text entry, searching spelling checker, file browsing and paragraph justification.
- (iv) Pico is a text editor used to create text files.
- (v) Pico requires a video terminal emulation of VT-100, VT-200, VT-210 or VT-220. Editing commands can be split into several groups : Cursor movement, Cut and Paste, Save and Insert files and miscellaneous.

- (vi) Most editors, including Pico let you Insert text at the current cursor position simply by typing it in.
- (vii) Many of the commands are executed by depressing the Control Key and another key Simultaneously. Pico help allows you to obtain documentation about all of the editor's Commands on-line.
- (viii) Unix Pico editor is a full screen editor which is very easy to use. Beginners often find it nice and easier to use initially than either vi or Emacs. From the start or plan to switch to them later.

To use Pico on file, enter

Pico Filename

The following functions are available in Pico (where applicable, corresponding function key commands are in parentheses).

- ^G (F1) Display this help text.
- ^F moves forward a character
- ^B move backward a character
- ^P move to the previous line.
- ^N move to the next line.
- ^A move to the beginning of the current line.
- ^E move to the End of the current line.
- ^V move forward a page of text.
- ^Y move backward a page of text.
- ^W search for text, neglecting case.
- ^L refresh the display.
- ^D delete the character at the cursor position.
- ^K cut selected text.
- ^U uncut (Paste) lost cut text inserting it at the current cursor position.
- ^I Insert a Tab at the current Cursor Position.

5.11. PINE

Q.11. Explain the term PINE and its features.

Ans.

- (i) PINE is a easy way to learn electronic mail system.
- (ii) It is menu driven, which means the command choices will be presented at the bottom of each screen as well as online help.
- (iii) PINE is a text editor, which is automatically used when you compose a message.
- (iv) PINE is a mail user agent that provides tool for reading, sending and managing electronic messages.
- (v) PINE was developed by computing & communications at the University of Washington.

- (vi) PINE is available for Unix as well as the Personal Computer running a Micro Operating System.
- (vii) Electronic mail allows you to communicate quickly and easily with colleague campus and around the world. The use of e-mail is rapidly increasing, changing teaching, learning, research, health care and administration.

PINE Offers :

- 1. On Screen Menus and Messages : PINE displays your option in menus at bottom of each screen, so you do not need to memorize commands, on screen message appears on a line above the command menu to give you warning or information as make a choice.
- 2. Online Help : Help is instantly available to provide information about the task are performing.

Features :

- | | |
|-------------------------------|---------------------------------|
| 1. Starting and Quitting Pine | 2. Writing a message in Pine |
| 3. Listing messages | 4. Viewing a messages |
| 5. Replying to a message | 6. Saving a message |
| 7. Forwarding a message | 8. Deleting a message |
| 9. Using the Address Book | 10. Guidelines for using E-mail |

5.12. LIBRARY CARDS CATALOG AND ONLINE REF. WORKS

Q.9. What are chat rooms ?

Ans. (a) Chat room is an online form where people are moderated either by limit who is allowed to speak or by having moderation volunteers patrolling the net watching for disruptive or otherwise undesirable behaviour. Anyone who can access the internet and can type fast quickly. To enter rooms and participate it does not anything. The only cost associated is the cost of your internet connection.

Entering a chat room

- ▼ Just GO IN : You can enter into the chat room at anytime.
- ▼ Accept An invitation to Join : If somebody found any person is online than person will invite you to join him.
- ▼ Request an invitation to join a private chat : If any person found request ! any other person than that person will accept this request and start communicating with each other.
- ▼ Create a New room : You can create a private or public, temporary or permanent chat room based upon the needs of your group.

(b) Chatting : Real time communication between two users via computers. Once chat has been initiated, either users can enter text by typing on the keyboard and entered text will appear on the other user's monitor. Most networks and online services offer a chat feature.

Various chat programs :

1. **Adium** : Is a popular instant messaging client for Mac OSX that supports multiple IM networks, including window live messenger yahoo/message google Talk, AIM, ICQ and XMPP. It supports many protocols through the libaries libezu MGT wither engine and libe purple.
2. **Digsby** : Is a proprietary multi protocol instant messaging application developed by dot syntax, 4C. Display is written in WXPYthon and uses webkit for rendering. It supports most mainstream IM service such as AOL instant messenger microsoft NET messenger service, yahoo messenger.
3. **Google Talk** : Is a free charge windows web based application for instant messaging and voice over internet protocol (VOIP) offered by google inc instant messaging between the google talk servers and its client uses an open protocol XMPP, allowing users of other XMPP, jabber clients to communicate with google talk users.
4. **IMVU** : Is a 3D graphical instant messaging client developed by IMVU inc. It hosts over 100 million registered users. Six million unique montly visitors and \$ 25 million revenue run rate as of October 4,2009.
5. **Kopete** : Is a multi protocol, free software instant messaging client. Although it can run in numerous environments. It was designed for and integrates with KDE desktop environment. This name comes from the Chilean word "copete" a word referring to alcoholic drink.

Q.10. What are the different phases of SMTP and why do we need POP3 for electronic mail.

Ans. (i) Connection set-up : An SMTP will attempt to Setup a TCP connection with target host when it has one or more mail message deliver to that host. The following sequence occurs during connection setup :

- ▼ The sender opens a TCP connection with the receiver.
- ▼ Once the connection is established the receiver identifies itself with 220 service ready.
- ▼ The sender identifies itself with the HELO command.
- ▼ The receiver accepts the sender's identification with "250' OK".
- ▼ If the mail service on the destination is not available the destination host returns a "421" service not available" reply in step 2 and the process is terminated.

2. Mail Transfer

- ▼ Once the connection has been established, the SMTP sender may send one or more message to the SMTP receiver.
- ▼ There are three logical phases to the transfer of a message.

- ▼ One or more RCPT commands identify the recipients of this message.
- ▼ A DATA command transfer the message text.

3. Connection termination : The SMTP sender closes the connection in the following manner :

- ▼ The sender sends a QUIT command and waits for a reply.
- ▼ Sender initiates TCP close operation for the TCP connection.
- ▼ The receiver initiates its TCP close after sending its reply to the QUIT command.

Need of POP3 for electronic mail

- ▼ POP supports simple download and delete requirements for access to remote mailboxes.
- ▼ E-mail clients using POP 3 generally connect, retrieve all messages store them on the user's PC as a new message, delete them from the server, and then disconnect.
- ▼ E-mail clients supported POP3 then over time popular mail client software added IMAP support.
- ▼ A POP3 server listens on well-known port 110.
- ▼ Encrypted communication for POP3 is either requested after protocol initiation using the STLS command if supported or by POP 3S, which connects to the server using transport layer security or secure sockets layer on well-known TCP port 995.

Q.11. Write a detailed note on e-mail security and define newsgroup with advantage and disadvantage.

Ans. E-mail security is a priority for all business with the growing threat of hackers, viruses, spam, phishing and identity theft as well as the need to secure business information.

Ways to secure your e-mail and e-mail users :

- ▼ E-mail security is a multi-layered discipline which can involve using several types of security software and security technology.

Make sure you use a spam filter and scan your E-mail attachments research has shown that nine out of every ten viruses that infect a computer reach it through an e-mail attachment.

- ▼ As well as implementing security packages, good security practices and policies for your staff are also essential to security your E-mail communications.

Newsgroup : News group are similar to e-mail except that instead of sending your message to some one's mail box, the message is posted on a bulletin board where anyone can read it and respond.

News group provide away to quickly meet and communicate with people from all over the world who share your interests, without ever having to leave your computer. You can communicate with them anytime you like.

Today, news groups resemble virtual coffee hours, where people get together to discuss subjects of mutual interest.

Advantages

The newsgroup is probably the easiest way to find quick answers about a topic. By going to a newsgroup you can :

- Find people who have expertise in a field.
- Network with people in your field of interest. Great for developing contacts.
- Ask one time questions about technical matters.
- Get references to other sources of related information.
- Monitor discussions on hobbies e.g., cooking, pets, travel.
- Have an opportunity to contribute your knowledge.
- Find a job, Find a new employee.
- Buy something, Sell something.
- Get computer hardware or software support from a group of product users.

Disadvantages

- Your e-mail address might be collected by a junk mailer. Hide it.
- You might be exposed to language and topics that are distasteful to you and not suitable for children.
- Be careful of the type of personal information you give out in a newsgroup posting. Use common sense. Never give out your address or phone number, for example.
- If a newsgroup contains an attachment, always scan for viruses before opening.
- Finding the right group can be difficult. Fortunately there are ways around this problem.

Q.12. Write short notes on :

- (i) Library card catalog
- (ii) Online reference works

Ans. (i) Library Card Catalog : is a register of all bibliographic items found in a particular library or group of libraries, such as those belonging to a university system spread out over several geographic locations. A bibliographic item can be any information entity, e.g. Books, computer files, graphics, cartographic materials etc. that is considered library materials e.g. A single novel in an anthology or a group of library material or linked from the catalog as far as it is relevant to the catalog and to the user of the library.

Main goal of Library Card Catalog :

- (a) To enable a person to find a book of which either :
 - The Author
 - The Title
 - The Subject

- (b) To show what the library has
 - By a given author
 - On a given Subject
 - In a given Kind of Literature
- (c) To assist in the choice of a book
 - As its Edition
 - As to its Character

(ii) **Online Reference Works :** References used as a relation between objects in which one object designates by linking to another object. Such relations as these may occur in a variety of domains including logic, computer science, art and scholarship. Talking about the World Wide Web or the Internet. Online reference means jumping from one webpage to another for the desired purpose i.e. if on a webpage there are many links and suppose we want to search about hard disk then that topic will be under domain of computer.

- All learn Academic directories offers a collection of Academic Websites in various fields that have been Catalogued and reviewed by Scholars from Oxford, Stanford, Yale Universities.
- Encyclopedia Britannica Online
- Know play has lots of searches for various reference materials, including dictionaries, encyclopedia and other reference books.
- Ask Oxford : is a very comprehensive site produced by the editors of the Oxford English Dictionary that has answer to questions on English Grammar.

Q.13. How to enter in a chat room?

Ans. Entering a chat room : There are four ways in which you can enter a chat room.

(i) *Just go in*

You may enter a public chat room at any time. You will notice before you join if others are present. For scheduled chats, your facilitator will indicate which chat room to meet in so you will know where to be for the event.

(ii) *Accept an invitation to join* : If members notice that you are online and would like for you to participate in their conversation, they will invite you to join them in a chat room. The chat may be either public or private. By accepting the invitation you will enter the chat room.

(iii) *Request an invitation to join a private chat*

You may notice that a private chat is happening and wish to take part. Click on the request a key button and the moderator of the chat room will be notified of your request. If the members would like you to join them, you will receive the key and may enter the room.

(iv) *Create a new room* :

You might schedule a time for colleagues to chat online about a specific topic. You can create a private or public, temporary or permanent chat room based upon

the needs of your group. As the creator of the room, you will automatically enter the room as soon as it is added.

Q.14. What are the popular chat programs available on the internet?

Ans. Popular chat programs available on the Internet :

(i) **Web based chat** : This is the easiest form of chat because all you basically need is web support which can be found in the current versions of browsers like netscape and internet explorer. If you have one of these browsers, you just need to find a chat room that's java based and jump into one that suits you.

(ii) **Internet relay chat** : IRC has been around the longest and is a little more tricky than other forms of chat. It can be classified as : multi user, multi channel chatting system. The most famous and popular chat program that has been implemented on a range of platforms such as windows, mac and Unix machines. Mirc, pirc, vire, ircle and Macirc are just a few of the different version of IRC available. IRC is a complex system that allows hundreds of people to chat online in a wide variety of topics. IRC is based on a client server model. You run a client program on your own computer such as MIRC which connects you to a server computer on the Internet. These servers then link to many other servers to make up an IRC network. This allows messages from one user (client) to be transported to another. This means that people from all over the world can talk to each other live and simultaneously. IRC offers the widest variety of chat rooms. To use it, you need :

- connection to the internet

- IRC client program such as

- mIRC < <http://www.mirc.com/> > for the windows operating system

- ircII <<http://www.eterna.com.au/ircii/>> for UNIX

- Jrcle < <http://www.ircle.com/> > for macintosh

(iii) **Instant messaging** : This works by maintaining a list of people who use the internet via an instant message program. The program tells you which of the people are online at any given time, allowing you to exchange message with them instantly.

QUICK REVIEW

Q.1. What is electronic mail ?

Ans. *Electronic mail*, most commonly referred to as e-mail is a method of exchanging digital message from an author to one or more recipients. E-mail operates across the internet or other computer networks.

Q.2. Explain the term user ID.

Ans. User IDs : The synonyms for it are user name and account name. User ID is merely the combination of the word "user" and the abbreviation "id" standing for identification. The user id identifies you to the computer and it is unique, user id consists of user name and domain name.

Q.3. Explain the term password.

Ans. Password : Password is a secret code that authenticates to the computer and other people. Passwords should be of five characteristics long, that contains a number posses a lower case and upper case letter.

Q.4. What do you mean by e-mail address ?

Ans. E-mail address contains two part :

- (i) User name
- (ii) Domain name

These two parts are separated by @ symbol

General form : User name @ hostname. subdomain.domain

<mail to : username @ host name.sub domain.domain

Q.5. Explain the term chatting.

Ans. Real time communication between two users via computer. Once a chat has been initiated, either user can enter text by typing on the keyboard and the enter text will appear on the user's monitor.



6

CHAPTER

LANGUAGES

Topics Covered/Syllabus

- 6 Basic and advance HTML.
- 6 Basics of scripting languages

6.1. BASIC AND ADVANCE HTML

Q.1. What do you mean by HTML and its characteristics ?

Ans: HTML :

- (i) HTML stands for hyper text markup language.
- (ii) It is designed to specify the logical organization of a document, with important hypertext extensions.
- (iii) It is not designed to the language of WYSIWYG word processor such as word or word perfect.
- (iv) This choice was made because the same HTML document may be viewed by many different "browsers" of very difficult abilities.
- (v) It is an complete web pages. It includes text and graphics. Initially it was known by the name GMLC general markup language.
- (vi) It is a powerful toolaimed at creating a documentation language in which one could mark the little, heading etc.

Hypertext : Text used to link a webpage.

Markup : It means highlighting text either by underlining or displaying it in different colors or both.

Language : It refers to the way of communication between web pages which has its own syntax and rules.

Creating a HTML program :

To create a HTML document, you can type text in any word processor like notepad, wordpad and then create the page. The following are the steps through which we can create a HTML document using notepad.

1. Open notepad by clicking on start->Programs->Accessories->Notepad.
2. The notepad window will appear. Type the HTML code in the Notepad.

3. Click on File->Save menu option. The save as dialog box will appear. Select the folder to save the file. Select all files in the save as type option. Give the name in the file name text box with extension html or .htm.
 4. Click on the save button.

Viewing a HTML program: To view any HTML file, we need only the Web browser. To view the Web page, follow these steps :

1. Click start->Programs menu and choose Internet Explorer option. The internet explorer window will appear.
 2. Click on File->open menu option. The open dialog box will appear. Click on Browse button and dialog box will appear.
 3. Choose the path where you have stored the HTML document and after selecting your file. Click on open button and click OK on open dialog box.
 4. Your web page will be displayed on the web browser.

Alternative way of viewing a HTML program : Choose the path where you have stored the HTML document and after selecting your file, double click on your HTML document. Your web page will be displayed on the web browser.

Characteristics of HTML languages :

- (i) It is easy to understand and can be easily modified.
 - (ii) It provides a flexible way to design the web pages along with the text.
 - (iii) Graphics, video, sound can also be used and imported to give attractive look to the web pages.
 - (iv) Effective presentation can be made with all formatting effects.
 - (v) HTML documents can be displayed on any platform such as : Macintosh, windows and unix.

Mainly HTML is divided into the types of tags :

- (a) Empty tag (b) Container tag

(a) Empty tag : Empty tags are the tags which do not need closing after their usage.
e.g.
 → used to break the line.

(b) Container tag : Container tags are the tags which need closing after their usage.
e.g. <p> → used to start a paragraph.

Structure of HTML

```
<html>
<head>
<title>
</title>
</head>
<body>
</body>
</html>
```

BASICS OF SCRIPTING LANGUAGES

Q.2. What do you mean by term XML ?

Ane.

- (i) XML stands for extensible markup language.
- (ii) It is a language which relies on the concept of rule specifying tags and the use of a tag processing application that knows have to deal with the tags. XML is a simple very flexible text format derived from SGML.
- (iii) Originally, it was designed to meet the challenges of large scale electronic publishing.
- (iv) XML is also playing an increasingly important role in the exchange of a wide variety of data on the wide.
- (v) XML is a cross platform extensible and text based standard for representing data.
- (vi) It is also a key technology in the development of web services.
- (vii) XML is a meta markup language which allows you to define an infinite no. of markup language based up on the standards defined by XML.

Features of XML:-

- (i) XML is free and extensible XML tags are not predefined : You must invent your own tags, the tags used in the structure of HTML documents are predefined i.e., HTML documents can only use tags that are defined in the HTML standard (like <p>). But XML allows the one to define his own tags and his own document structures.
- (ii) XML is going to be everywhere in future web development : The belief is that XML will be as important to the future of the web as HTML has been to the foundation of the web and that XML will be the most common tool for all data manipulation and data transmission.
- (iii) XML is a compliment to HTML XML is not a replacement for HTML : In future web development is most likely that XML will be used to describe that data, while HTML will be used to format and display the same data. XML is a cross platform, software and hardware independent tool for transmitting information.
- (iv) XML can separate data from HTML, with XML your data is stored outside your HTML: When HTML is used to display data, the data is stored inside HTML files, with XML, data can be stored in separate XML files. This way you can concentrate on using HTML for data layout and display and be sure that changes to your HTML.
- (v) XML can be used to share data : Since XML data is stored in plain text format XML provides a software independent and hardware independent and hardware independent way of sharing data. This makes it much easier to create data that different applications can work with. It also makes it easier to expand or upgrade a system to new operating systems, servers applications and new browsers.

- (vi) XML can make your data more useful, with XML your data is available to more users : Since XML is independent of hardware, software and application you can make your data available to other than only standard HTML browsers, other clients and applications can access your XML files as data sources like they are accessing database.
- (vii) XML is used to exchange data between incompatible systems : In the real world computer systems and databases contain data in compatible formats. One of the most time consuming challenges for developers has been to exchange data between such systems over the internet. Converting the data to XML can greatly reduce this complexity and create data that can be read by many different types of applications.
- (viii) XML can be used to store data i.e., plain text files can be used to store data : XML can also be used to store data in file or in databases. Application can be written to store and retrieve information from the store and generic applications can be used to display the data.
- (ix) XML can be used to create new languages and is regarded as the mother of WAP and WML : The wireless markup language (WML) used to markup internet application for handheld devices like mobile phones, is written in XML.

Q.3. (i) XML Parsing, (ii) XML validators, (iii) XML element tags

Ans. (i) XML Parsing : Parsing is splitting up information into its component parts. In computing a parser is a program (or a piece of code or API that you can reference inside your own programs) which analyses files to identify the component parts.

XML applications are just the same : They contain a parser which reads XML and identifies the function of each the pieces of the document, and it then makes that information available in memory to the rest of the program.

While reading an XML file, a parser checks the syntax pointy brackets, matching quotes etc for well formedness, and reports any violations (reportable errors). The XML specification lists what these are.

e.g.

```
<person xml:id="abc 123" birth="1960-02-31"
       gender="female">
    <forename> Deepika </forename>
    <surname> Khatkar </surname>
    </name>
</person>
```

The example above parses as :

Element `<person>` identified with attribute XML:id (predefined type 'ID') containing "abc 123" and attribute birth containing "1960-02-31" and attribute gender containing "female" element `<name>` containing Element `<forename>` containing text 'Deepika' followed by element `<surname>` containing text Khatkar.

(ii) XML Validators : Validators for XML documents allows you to check your XML documents on conformance to W3C specifications for XML 1.0. The validator provides document check, including grammar your document points to.

With respect to personalized (but still XML conform) grammar, we check the document against the grammar (DTD or schema) you pointed to within document please specify n available URL to your XML DTD or schema so validate can process validation.

This service provides XML-validation only. In order to validate other document use appropriate services.

- ▼ Validates HTML, XHTML, WML documents WWL/XHTML/HTML validator
- ▼ Checks XML grammar only >> DTD/Schema validator
- ▼ Check your feeds with >> RSS and atom validator

In addition extended tools are available such as OASIS CAM standard specification that provide contextual validation of content and structure that is more flexible than basic schema validations.

(iii) XML Element tags : XML elements can be defined as building blocks of an XML. Element can behave as containers to hold text, elements attributes media objects or all of these. Each XML document contains one or more elements the scope of which are either delimited by start and end tags or for empty elements by an empty element tag.

An opening tag looks like `<element>` while a closing tag has a slash that is placed before the element's name : `</element>`. All information that belongs to an element must be contained between the opening and closing tags of an element.

- ▼ Tags are case Sensitive : All tags must be written using the correct case.
- ▼ Element must be nested properly : You can place elements inside other elements but you need to ensure each element's closing tag doesn't overlap with any other tags.
- ▼ Element Names : Element names can contain any character (including letters and numbers). Element's names must not contain spaces. Element names must not begin with a number or punctuation character (for example a common or semi-colon etc)

Tags make the start and end of an element

`<foo>` - start tag
`</foo>` - end tag
`<foo></foo>` - element

Each XML document contains one or more elements the boundaries of which are either delimited by start tags and end tags or for empty elements by an empty element tag.

DHTML

Q.4. Explain the term DHTML.

Ans. DHTML : Dynamic HTML or DHTML is an umbrella term for a collection of technologies used together to create interactive and animated web sites by using a

combination of a static markup language (such as HTML) a client side scripting language (such as javascript), a presentation definition language (such as CSS) and the document object model. The application of DHTML was introduced by microsoft with the release of internet explorer 4 in 1997.

DHTML allows scripting languages to change variables in a web page's definition language, which in turn affects the look and function of otherwise "static" HTML page content after the page has been fully loaded and during the viewing process. Thus the dynamic characteristic of DHTML is the way it functions while a page is viewed not in ability to generate a unique page with each page load.

Use :

- ▼ DHTML allows authors to add effects to their pages that are otherwise difficult to achieve. In short words scripting language is changing the DOM and page styles.
- ▼ Simply put DHTML is the combination of HTML, CSS and javascript.
- ▼ Animate text and images in their document, independently moving each element from any starting point to any ending point, following a predetermined path chosen by the user.
- ▼ Embed a ticker that automatically refreshes its content with the latest news, stock quotes or other data.
- ▼ Use a form to capture user input, and then process, verify and respond to the data without having to send data back to the server.
- ▼ Include roll over buttons or drop-down menu.

The term DHTML has fallen out of use in recent years as it was associated with practices and conventions that tended to not work well between various web browsers. DHTML may now be referred to as unobtrusive javascript coding (DOM scripting) is an effort to place an emphasis on agreed upon best practices while allowing similar effects in a standards compliant way.

Java Script

Q.5. What is Javascript and its applications ?

Ans. Javascript :

- (i) Java script is the client side scripting language on the web.
- (ii) The syntax of javascript is fairly similar to C or java.
- (iii) Java script is an easy to use object based scripting language designed for creating live online application that link together objects and resources on both client and server.
- (iv) Javascript is a set of programming commands and instructions that can be used to enhance the way the web page operates. Using java script we can create dynamic HTML pages that process the users input and maintain persistent data using special object files and relation database.
- (v) Javascript is netscape's cross platform, object based scripting language for client and server application.

adigm : Multi paradigm : Scripting, object-oriented, imperative, functional

signed by : Brendan Eich

veloper : Netscape communication corporation mozilla foundation, Ecma
ational.

st appeared : 1995

ble release : Ecma script/june 17,2015

ring discipline : Dynamic duck

ajor implementations : KJS, rhino spider monkey V8, Carackan chakra

luenced by : Lua, scheme, pere, sulf, java, C, python, AWK hypertalk

fluenced : Action script, atscript coffee script dart, JScript, Net, objective-J QML,
cript live script

ename extension : .js

ernet media type : Application /javascript text/javascript (obsolete)

iform type identifier : Com.netscape. javascript source

pe of format : Scripting language.

6. Explain following javascript features :

• Javascript programming conventions

• Forms and data in javascript

• How it is implemented

ns. Conventions of Programming in Java Script :

• Java Script is Case Sensitive : A function named "myfunction" is not the same as "function". Therefore, watch your capitalization when you create or call variables. is and function.

• Symbols : Open symbols like [["Must have a matching closing symbol, like ' "]]

• White Space : Java Script ignores extra spaces. You can add white space to your script to make it more readable. These two lines mean exactly the same.

Name = "rahul"

Name =

"Rahul"

Break up a Code Line - You can breakup a code line within a text with a backslash. example below will be displayed properly.

```
document. Write("Hello\  
World!")
```

Note : You may not breakup a code line like this :

```
document. Write \  
("Hello World!")
```

The example above will cause an error.

- **Insert Special Characters :** You can insert special characters (like " ' ; &) with the backslash :

document. Write ("you \ & Ising \ " Happy Birthday \ ".)

The example above will produce this output.

You & I sing "Happy Birthday".

- (ii) **Forms and data in Java Script :** In a website, forms are generally used to collect information from the users. By adding Java Script to form. We can make it Interactive. The forms data in Java Script is entered through the forms object. Various forms objects are :

1. **Button :** It represent a graphics control of objects by specifying event or function on it.
2. **Check Box :** are square boxes used to checked or unchecked state of a data like male or female for sex.
3. **Radio Button :** It is used to opt one decision from many options like to tick on male or female.
4. **Drop Down List :** It is used for multiple choice selection like selection of colour either Red, Green.
5. **Text Area :** It is used to enter information in more than one line by specifying rows and

- (iii) **Implementation of Java Script :** Java Script is implemented with the help of HTML document and HTML tags (1) to embeds a Java Script in an HTM document. We use the <Script> tag. Then in Script we mention language = Java Script. All statements they should be included in the <Script> tag. There is another method to implement is by specifying a file as the Java Script source.

Q.7. Give description of Java script and Java script is navigator

Ans. Java Script : It is an easy to use object based scripting language designed for creating live online applications that link together objects and resource on both client and server.

- (i) Java Script is a set of programming commands and instructions that can be used to enhance the way the web page operates.
- (ii) Using Java Script, we can create dynamic HTML pages that process the user input and maintain persistant data using special object files and rational database.
- (iii) Therefore, Java Script is Netscape's Cross platform object based scripting languages for client and server applications. There are two types of Java :
 - Navigator Java Script, also known as client side Java Script.
 - Live Wire Java Script, also known as server side Java Script.

Java Script in Navigator : Netscape Navigator 2.0 and later versions can interpret Java Script statements embedded in an HTML page. When navigator requests such a page, the server sends the full content of the document, including HTML and Java Script

statements over the network to the client. The Navigator then displays the HTML and executes the Java Script producing the results that the user sees.

Client Side Java Script statements embedded in an HTML page can respond to user events such as mouse-clicks from input and page navigation.

Java Script Language : Client and server Java Script differ in many ways, but they also have many things in common, they are as follow :

- Keywords, statement syntax and grammar
- Rules for expressions, variables and literals
- Underlying object model (although navigator and live wire have different object frame works)
- Built in objects and functions. If you have live wire, you will often be able to write functions that work on either the client or the server.

HTML : (Hyper Text Markup Language) is designed to specify the logical organisation of a document, with important hypertext extensions.

- (i) It is not designed to be the language of a WYSIWYG Word Processor such as word or word perfect.
- (ii) This choice was made because the same HTML document may be viewed by many different "browsers" of very difficult abilities.
- (iii) It is a complete code that allows the user to create web pages. It includes text and graphics. Initially, it was known by the name GML (General Markup Language).
- (iv) It is a powerful tool aimed at creating a documentation language in which one could mark the title, heading etc.

Hyper text : Text used to link a web page.

Markup : It means highlighting text either by underlining or displaying it in different colors or both.

Language : It refers to the way of communication between web pages, which has its own syntax and rules.

Characteristics of HTML Languages :

1. It is easy to understand and can be easily modified.
2. It provides a flexible way to design the web pages along with the text.
3. Graphics, video, sound can also 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 any platform such as : Macintosh, Windows and Unix.

Dynamic HTML : DHTML is a term that encompasses a lot of ground or very little depending on whom you are talking to. DHTML does not follow the traditional dictionary definition of the word. In the real world, dynamic means "continual changes" in the context of HTML it means "subject to change at any time".

Q.8. List the graphic format supported by HTML. Explain features of these formats.

Ans. Following are the graphic format supported by HTML :

- (i) **Raster** : Raster image formats (RIF's) should be the most familiar to internet users. A Raster format breaks the image into a series of colored dots called pixels. The numbers of ones and zeros (bits) used to create each pixel denotes the depth of color you can put into your images raster image formats can also save at 16, and 32 bits per pixel. At the two highest levels the pixels themselves can carry up to 16,777, 216 different colors.
- (ii) **Pixel and the web** : It allows some leeway to increase or decrease the size of the image and not mess it up too much. It is also the one that offers a more detailed look. The more pixels, the more detailed the image.
- (iii) **Meta/Vector image formats** : This formatting falls into a lot of proprietary formats made from specific programs. Corel draw (CDR), Hewlett packard graph language (HGL) and windows metafiles (EMF) are a few examples where the meta/vector formats have it over raster is that they are more than a simple grid of colored dots.
- (iv) **Bitmap** : Bitmap images are created by the server rather than as an inline image. Bitmaps are perfect for this process because they are simple series of colored dots. Bitmaps are good images but they are not great. Bitmap format is not very efficient at storing data.
- (v) **GIF image formats** : It was standardized in 1987 by compu serve, although the patent for the algorithm used to create GIF. Compression actually belongs to unisys. Compu serve updated the GIF formats in 1989 to include animation, transparency and interlacing.
- (vi) **PNG** : Portable network graphics is a format invented specifically for the web response to licensing scheme. Introduced which meant the creators of any software that supported the GIF format had to pay five thousand dollars for the privilege.

(b) Write the HTML program to change the color of the webpage.

Ans.

```
<html>
<head>
<title>
</title>
</head>
<body bgcolor = "#E6EFFA">
<h1> Hell World! </h1>
<p> <a href = "http:// www.xyz.com">
```

```

visit xyz.com </a><p>
</body>
</html>
syntax
<body bg color= "color name/hex number/ RGB number">

```

Q.9 (i) Explain the difference between XML and HTML

Ans.

- HTML is about displaying information, while XML is about describing information.
- XML was designed to describe data and to focus on what data is :
- XML was designed to carry data and is not a replacement for HTML.
- HTML was designed to display data and to focus on how data looks.

(ii) What are the designed goals for XML?

The design goals for XML are :

- (i) XML shall be straightforwardly usable over the internet
- (ii) XML shall support a wide variety of applications.
- (iii) XML shall be compatible with SGML.
- (iv) It shall be easy to write programs which process XML documents.
- (v) The number of optional features in XML is to be kept to the absolute minimum, ideally zero.
- (vi) XML documents should be human legible and reasonably clear.
- (vii) The XML design should be prepared quickly.
- (viii) The design of XML shall be formal and concise
- (ix) XML documents shall be easy to create.
- (x) Terseness in XML markup is of minimal importance.

Q.10. What is the difference between java script and Java?

Ans.

Java script	Java
<ol style="list-style-type: none"> 1. Interpreted (not compiled) by client. 2. Object based. Uses built in, extensible objects, but no classes or inheritance. 3. Code integrated with, and embedded in HTML. 4. Variable data types not declared (loose typing). 5. Dynamic binding. Object references checked at runtime. 6. Cannot automatically write to hard disk. 	<ol style="list-style-type: none"> 1. Compiled bytecodes downloaded from server, executed on client. 2. Object oriented. Applets consist of object classes with inheritance. 3. Applets distinct from HTML (accessed from HTML pages) 4. Variable data types must be declared (strong typing). 5. Static binding. Object references must exist at compile time. 6. Cannot automatically write to hard disk.

Q.11. Explain the advantages and disadvantages of Java script.

Ans. Advantages of Java script

- **Speed :** Being client-side, Java script is very fast because any code functions can be run immediately instead of having to contact the server and wait for an answer.
- **Simplicity :** Java script is relatively simple to learn and implement.
- **Versatility :** Java script plays nicely with other languages and can be used in a huge variety of applications. Unlike PHP or SSI scripts, Java script can be inserted into any web page regardless of the file extension. Java script can also be used inside scripts written in other languages such as perl and PHP.
- **Server load :** Being client side reduces the demand on the website server.
- **Easy debugging and testing.**
- **No special editor is required for it.**

Disadvantages of Java script

- **Security :** Because the code executes on the user's computer, in some cases it can be exploited for malicious purposes. This is one reason some people choose to disable Java script.
- **Relaying on End User :** Java script is sometimes interpreted differently by different browsers. Whereas server side scripts will always produce the same output, client-side scripts can be a little unpredictable. Don't be overly concerned by this though as long as you test your script in all the major browsers you should be safe.

QUICK REVIEW

Q.1. Explain the term HTML.

Ans. HTML stands for hyper text markup language. It is designed to specify the logical organization of a document, with important hypertext extension. It is not designed to be the language of wysiwyg word processor such as word or word perfect.

Hypertext : Used to link a web page

Markup : It means highlighting text

Language : Way of communication

Q.2. What is mean of term XML ?

Ans. XML stands for extensible markup language. It is a language which Relies on the concept of rule specifying tags and use of a tag processing application that knows have to deal with the tags.

Q.3. Define the term DHTML.

Ans. DHTML : Dynamic HTML or DHTML is an umbrella term for a collection of technology used together to create interactive and animated web sites by using a combination of a static markup language, a client side scripting language a presentation definition language and the document object model.

The application of DHTML was introduced by microsoft with the release of Internet explorer 4 in 1997.

Q.4. Explain the term Java script.

Ans. Javascript is the client side scripting language on the web. The syntax of java script is fairly similar to C or java. Java script is an easy to use object based scripting language.

Topics Covered/Syllabus

- ↳ Introduction to web servers
- ↳ Personal web server (PWS)
- ↳ Internet information services (IIS)
- ↳ Accessing and using these servers
- ↳ Apache web server.
- ↳ Software complexity
- ↳ Attacks
- ↳ Security policies and security private levels
- ↳ Encryption schemes
- ↳ Digital signature
- ↳ Firewalls
- ↳ Intrusion detection systems

7

CHAPTER

SERVERS

7.1. INTRODUCTION TO WEB SERVERS

Q.1. Write short notes on various web servers.

Ans. Apache Web Server :

- (i) Apache a Server for Unix Computer is the most popular and is considered one of the most robust implementations. It does not do any Log file analysis.
- (ii) There is no vendor so there is no formal technical support.
- (iii) There is no real way to administrate the computer through a web interface. Apache's modular approach allows for a great deal of customization. It includes strong links for database applications, It allows you to save your logfiles in formats you define.
- (iv) Most importantly, it runs on any Unix Computer and Unix is an operating System designed for client / Server and TCP/IP applications, Server.
- (v) A Server is said to be standalone when it starts automatically and runs continuously these system uses the V-Init procedure to start the server automatically when the system boots.

Personal Web Server :

- (i) It is a Microsoft Version of a web server program for individual PC users who want to share web pages and other files from their hard drive.
- (ii) PWS is a scaled down version of Microsoft's more robust web server. Internet information server.
- (iii) PWS can be used with a full time Internet connection to serve web pages for a web site with limited traffic.

- (iv) It can also be used for testing a web site offline or from a "Staging" site by putting it on a main website that is exposed to larger traffic.
- (v) PWS can be used together with Microsoft Front Page, a website design product upload web pages from a remote location or to the local hard drive, to check dead links, to create directories and to set permissions.
- (vi) PWS is frequently used as part of the trend toward peer-to-peer exchange publishing.
- (vii) The equivalent program for the Macintosh is called *personal web sharing*.
- (viii) PWS supports Front Page extensions so you can make use of all the fancy that Front Page offers. It can run Active Server Pages (.asp) as well as HTML.
- (ix) For the more advanced web page designer, ASP is a way of life and PWS provides an excellent environment to learn.
- (x) You can also use Java Script and VB Script as well as Active X Components.

Internet Information Service (IIS) :

- (i) It is a powerful web server that provides a highly reliable manageable and scalable web application infrastructure for all versions of Windows Server.
- (ii) IIS helps organizations increase web site and application availability while lowering system administration costs.
- (iii) IIS supports The Microsoft Dynamic Systems Initiative (DSI) with automated health monitoring, process isolation, and improved management capabilities.
- (iv) This Web Server that comes built in with Windows NT Server 4 and Windows 2000 Server. Software Services from Microsoft supports web site creation, configuration and management along with other Internet functions.
- (v) Internet information service includes Network News Transfer Protocol (NNTP), File Transfer Protocol (FTP) and Simple Mail Transfer Protocol (SMTP).

Versions of IIS :

- IIS 1.0, Windows NT 3.51 available as a free add-on
- IIS 2.0, Windows NT 4.0
- IIS 3.0, Windows NT 4.0 Service Pack 3
- IIS 4.0, Windows NT 4.0 Option Pack
- IIS 5.0, Windows 2000
- IIS 5.1, Windows MCE

7.2. PERSONAL WEB SERVER (PWS)

Q.2. Explain PWS.

Ans.

- (i) Personal web server is Microsoft's version of a web server program for individual PC users who want to share web pages and other files from their hard drive.

-) PWS is a scaled down version of microsoft more robot web server IIS PWS can be used with a full time internet connection to serve web pages for a web site with limited traffic.
-) It can be used for testing a website off-line from a staging site before putting it on a main web site that is exposed to larger traffic PWS is frequently used as part of the trend toward peer to peer exchange and publishing.
-) PWS supports front page extension are you can make use of all the fancy lists that front page offers, additionally it can run active server page as well as HTML.
-) PWS provides excellent environment to learn.
 - i) Once the personal web manager is running you will see a screen until five icons down the side called main, published website, tour and advanced.
 - ii) If you select main you will see a button marked start click on the about PWS.
 - iii) At this point you won't see much happening. If you have a website see by to host or publish you can upload it now to the location shown here as your home directory if you want really quick test, click on the website icon on the left.
 - iv) This lets you use a wizard to produce a very basic website but to be honest it is not worth bothering with.

-INTERNET INFORMATION SERVICES (IIS)

Q.3. Explain IIS and its working.

Ans.

- (i) Internet information services (IIS) is a powerful web server that provides a highly reliable manageable and scalable web application infrastructure for all versions of Windows server.
- (ii) IIS helps organization increase web sites and application availability lowering system administration costs.
- (iii) IIS supports the Microsoft Dynamic System Initiative (DSI).
- (iv) These are responsible for storing and exchanging information with other machine. Two participants are required for each exchange of information a client which stores it.
- (v) Each side also requires a piece of software to negotiate the exchange of data in the case of client a browser like netscape or internet explorer is used.
- (vi) On the server side, things are not simple. There is a number of software options available they all have a similar task : To negotiate data transfer between clients and server via HTTP protocol.
 1. The Client's browser dissects the URL into a no. of separate part including address path name and protocol.
 2. A domain name server translates the domain name the user has entered into its IP address a numeric combination that represents the site's true address on the

3. The browser now determine which protocol should be used.
4. The server sends a GET request to the web server to retrieve the address it has been given.
5. The browser translates the date it has been given into HTML and display the result the user.

7.4. ACCESSING AND USING THESE SERVERS

Q.5. What are servers ? How start and stop Apache web server ? Explain the certain directories used for Apache configuration.

Ans. A server is a program, located on a computer with Internet access, that responds to a browser's request for a URL. That is a web server meets the demands of users by supplying or serving them the web pages requested. The server should have an uninterrupted Internet connection, so that the pages it handles are always available. Web Servers host Web Sites, Serving Pages to viewers upon request. Every Web Server has a unique address so that other computers connected to the Internet know where to find it on the vast network.

Starting and Stopping Apache Web Server : Apache is installed as stand alone server. Apache server is said to be stand alone when it starts automatically and runs continuously. These system uses the V-Init procedure to start the server automatically when the system boots. These procedures uses the special script which is included in/etc/rc.d/init.d. The Chkonfig command specifies the service at which you want to start and the run level at which you want to start it at.

Example :- Chkconfig – level 3 httpd on

This command will setup the web server to start at run level 3, In the same way, we can stop and restart the web server. On mandrake and Red Hat, we can use a service command to start, stop and restart the httpd server manually by using the following commands.

- Service httpd Start
- Service httpd Restart
- Service httpd Stop

Directories - Directories are grouped into three basic sections :

1. Directories that control the operation of the Apache Server Process as a whole global environment.
2. Directories that define the parameters of 'main' or 'default' server, which responds to requests that are not handled by a virtual host. These directives also provide default values for the setting of all virtual hosts.
3. Setting for 'virtual hosts' which allows web requests to be sent to different IP addresses or host names and have them handled by the same Apache Server Process.

APACHE WEB SERVER

Q.6. Explain Apache web server and its features in detail.

Ans. Apache web server : In the last few years, open source has been getting a lot of popularity because of Linux, Perl, and Apache. In 1998, IBM decided to abandon development of its own web server engine to go into web sphere and application server for the web and use Apache instead. In June of 1999, The apache software foundation was officially incorporated in the state of Delaware. The apache HTTP server project is an effort to develop and maintain an open source HTTP server for modern operating systems including UNIX, Linux, and Windows NT. The goal of this is to provide a secure efficient and extensible server that provides HTTP services in sync with the current HTTP standards. Apache has been the most popular web server on the Internet.

Features of apache web server : The following factors contribute to the success of the web server.

1. **The apache license :** It is an open source, BSD-like license that allows for both commercial and non-commercial uses of apache.
2. **The architecture of an apache has a modular design :** The core of the server is very light weight, and all other functions are implemented as modules that plug into the core. This means that you can keep the size of the executable down by leaving out functionality that you don't need. It also means that if there is some functionality missing that you do need, you can write your own custom module to plug into the core.
3. **Talented community of developers with a variety of backgrounds and an open development process based on technical merits.**
4. **Portable :** Apache runs on nearly all flavors of Unix (and Linux), windows, Beos, mainframes i.e., apache runs on anything. It can run on a 386 with 4 MB of RAM, and even it can run on a 4-processor machine with 1 GB of RAM.
5. **Robustness and security :** Apache provides several security related modules for securing and restricting access to the server.
 - **Authentication :** Authentication modules allow you to determine the identity of a client usually by verifying an username and password against a backend database. Apache includes modules to authenticate against plain text and database files. Additional authentication modules exist that connect Apache to existing security frameworks of databases, including : NT domain controller, Oracle, mySQL, Postgres SQL and so on. The LDAP modules are specially interesting as they allow integration with company and enterprise wide existing directory services. These modules can be viewed at <http://modules.apache.org>.

i. SOFTWARE COMPLEXITY

Q.7. Write short note on software complexity.

Ans. Software complexity is the all embracing notation referring to the factors that decide the level of difficulty in developing software projects.

1. Contributing Factors : Due to the Inherent complexity of large software system, such as those used for the Internet, it is difficult to make them completely secure. They are also very difficult to make error free. Other difficulties are :

- Program Size
- Market Forces
- Software Interfaces
- Team Development.

2. Browser, Network, Operating Systems and Servers : Browser is very complex piece of software. However it is only one part of the over all system that must be considered when assessing the security of the web. Other software areas of concern include: Networks, Your Server and Operating System.

Q.4. Differentiate between personal web server and proxy server.

Ans. Personal web server : In short allow user to allow selectively share, or publish information on the web or on a home network. Unlike other types of web server a phenate web server is owned controlled by an individual and operated for the individual needs instead of by company. It can be implemented different ways :

- ▼ As an appliance
- ▼ As general purpose server
- ▼ In shared hosting model
- ▼ As one feature of a computer that is otherwise also used for other purpose.

Proxy Server : A proxy server is a computer that offers a computer network service to allow clients to make in direct network connection to other network services. A client connects to the proxy server then re-equal a connection file on other resource available on a different server.

7.7. ATTACKS

Q.9. What are the different attacks ? Explain the various security and privacy levels.

Ans. Attacks : Information is an important asset that is the other business assets which should have to be protected appropriately. The purpose of information security management is to protect information from wide range of threat in order to ensure business continuity and minimum damage.

Types of Attacks :

- (a) **Active and passive attack :** An active attack is one in which the intruder may transmit message replay old message, modify message in transmit or delete selected message from the wire, typical active attack is one in which an intruder impersonates or acts as a man in the middle. A passive attack is one in which the intruder drops but does not modify the message stream in anyone.
- (b) **Denial of service :** Refer to a form of attacking computer system over network. DOS is normally a malicious attempt to render a network system unusable. In the DOS attack, the attacker sends a stream of requests to service on the sender machine in the hope of exhausting all resource like "memory" or consuming all processor capacity.

Distributed DOS : In DOS attack a hacker install an agent as daemon on numerous hosts. The hacker sends a command to the master which sides in any of the many hosts. The master communicate with the agents residing in other servers to commence the attack. DDOS are harder to combat because not stop them. The traffic can derive from hundred or even thousand of individual systems and sometimes the user are not even aware that their computers are part of the attack DDOS.

Attack involve :

- FTP bounce attacks
- Ping flooding attacks
- SYN flooding attack
- Port scanning attack
- Smart attacks

SECURITY POLICIES AND SECURITY PRIVATE LEVELS

Q.10. What are the different security policies, security privacy levels used on a secure networks ?

Ans. The different security policies and privacy levels used for making a secure network are :

1. Configurable Security Policies : Mozilla's configurable security policies allow us to set up security for the browser, and also have different security policies for different websites. The ideas for configurable security policies come from a number of sources. This famous bug 858 serves as a wish list for this sort of functionality. The code for this effect CAPS (Capabilities). Finally, IE's Zones employ some to this idea.

2. Setting Global Policies : Suppose you are annoyed by Pop-up advertisements and want to prevent all web pages from opening new browser windows. You can do this by adding the following line to your Mozilla user preferences file.

User_Pref ("Capability, Policy, default, Window, Open," "No Access");
Setting window. Open to no Access means that web pages cannot access the open property of any object of type window. If a web site tries to open to new window using window.open() the attempt will fail. The security manager will throw a Java Script exception. Preventing the function from being called. Unless the web page catches the exception. Preventing the function from being called. Unless the webpage catches the exception, the script will stop and error message will appear on the Java Script and console (File - Tools - Java Script Console)

3. Zone Policies : The default policy is special, it applies to all sites, you can also set policies that apply to specific sites or group of sites, overriding the default for example, if you wanted to restrict www.evil.org and www.annoying.com from creating dialog windows, you could use the code.

```
User_Pref ("capability, Policy, Policy, Policy names," Strict");
User_Pref ("capability, Policy, Strict, Sites,"http://www.evil.org");
User_Pref ("capability, Policy, Strict, Window, alert," No Access");
User_Pref ("capability, Policy, Strict, Window, Confirm," "No Access");
User_Pref ("capability, Policy, Strict, Window, Prompt," "No Access");
```

The first defines the name of the policy or policies you want to create, in this case "Strict". If you define more than one policy, list them all on the same line.

User-Pref ("capability, Policy, PolicyNames," "Strict, Shopping sites")

The preference "Capability, Policy, Strict, Sites" defines the web sites to which the strict policy is applied.

4. Security Levels : There are three security levels.

(a) **No Access :** Web Sites can never have this property or call this function.

(b) **Same Origin (default) :** Web Sites can access this property but only for pages on the same site, see this document for an explanation of how Mozilla determines whether two pages have the same origin.

(c) **All Access :** A Web-Site can access this property within the same site and on any other site. If the security level is not one of the three script can access it only if the script is signed and the user grants the privilege to the script through a dialog.

5. Get and Set : You can specify a policy that applies only to reading property, or only to changing its value, by adding get or set after the property name. This allows you to one policy for reading a property and another for changing its value.

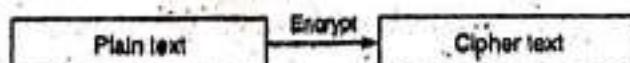
6. Figuring out Object Name : Figuring out the correct object name to use is sometimes tricky for example, Suppose for you, but you do not know the class name for a form element. The easiest way is to find out is to write a script converts the object into a string. If you goto a page with a form and type Java Script : alert into the location bar, you will see that document. Form [0] is an.

7.9. ENCRYPTION SCHEMES

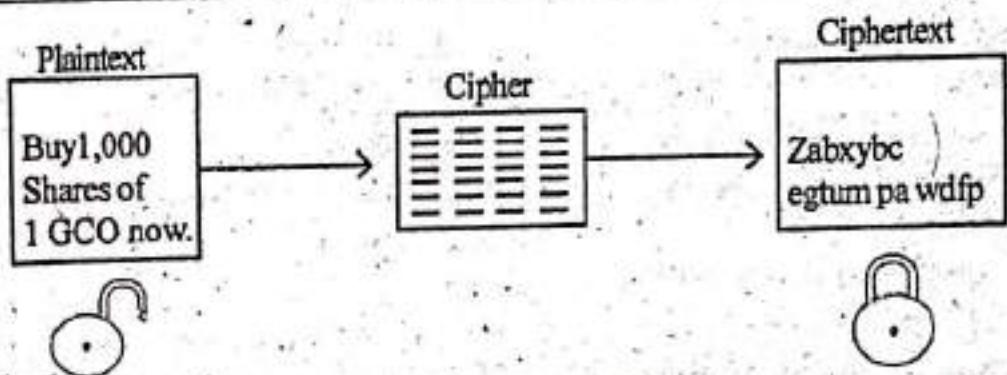
Q.11. What do you mean by encryption ? What are the different encryption scheme used for making the system more secure ?

Ans. Encryption : It is the conversion of electronic data into another form called cipher that which cannot be easily understand by anyone except the authorized parties.

To read an unencrypted file, you must have access to a secret key or password that enables you to decrypt it unencrypted data is called plain but encrypted data is called cipher. different encryption schemes used for making the system more secure



An encryption scheme is a method of encoding information. Encryption is a process by which we convert a data into the secure code, by the use of encryption algorithm, for transmission over a public network. In this encryption process the mathematical key to the encryption algorithm is encoded and transmitted with the data, and that encrypted data is decrypted again at the receiver's end and the required original data is achieved without any loss.



There are two categories in which most of the computer encryption systems belong they are:

- Public Key Encryption
- Symmetric Key Encryption

(i) **Public Key Encryption :** Uses a combination of a private key and a public key. private key is known only to your computer, while the public key is given by your iputer to any computer that wants to communicate securely with it. To decode an rypted message a computer must use the Public Key provided by the originating iputer and its own private key. A very popular Public Key encryption utility is called ity Good Privacy, which allows you to encrypt almost anything.

(ii) **Symmetric-Key Encryption :** In Symmetric Key encryption, each Computer has secret Key that it can use to encrypt a packet of information before it is sent over the work to another computer. Symmetric Key requires that you know which computers I be talking to each other so you can install the key on each one. Symmetric Key ryption is essentially the same as a secret code that each of the two computers must w in order to decode the information. The code provides the key to decoding the ssage. If you create a coded message to send to a friend in which each letter is substituted h the letter that is two down from it in the alphabet. So "A" becomes "C" and "B" omes "D".

O. DIGITAL SIGNATURE

Q.12. Explain Digital Signature

Ans. A digital signature is a mechanism that can be used to sign an electronic document officially.

- (i) Because digital signatures are difficult to forge, documents that contain such signatures can be considered authentic.
- (ii) The details concerning how digital signatures are actually implemented are complex. Digital Signatures provide a way of verifying both the sender of the information and the content of the message, ensuring that it has not been modified.
- (iii) Digital Signature is like an official seal on both a document and the envelope that protects the document from being altered.

- (iv) Digital Signature may be defined as the sequence of bits, that are calculated mathematically while signing a given document or message. This number depends on the contents of the message.
- (v) The algorithm used for signing and the private key used to perform the signing. The digital signature allows the recipient to check the actual origin of the information and integrity. Suppose that you wish to transmit an electronic file.
- (vi) A natural question is how can put a piece of information at the end of the file that serves the same role as a hand written signature on a document. It turns out that the digital signature is one of the main application of Public Key Cryptography.
- (vii) How do we realize a signature digitally? It is easy to copy, alter or move a file on computers without leaving any trail, one needs to be very careful in designing a signature scheme.
- (viii) A digital signature should be a number that depends on some known only to the signer and on the content of the message being signed.
- (ix) It must also be verifiable i.e. the recipient of the message should be able to distinguish between a forgery and a valid signature without requiring the signer to reveal any secret information this consist of three algorithms.

1. Key Generation Algorithm
2. Signing Algorithm
3. Verification Algorithm

The signing process is a form of Public Key encryption. In the Public Key Encryption data can be encrypted with a private key and can decrypted with a public key because the decrypting key is public, it is assumed that anybody can be decrypted the data. The purpose of public key encryption is not to hide data, but to prevent it from being altered. This is a slow process. A hash of the data is made and only this hash is encrypted. Hashing is a Mathematical Process that transforms data of any length in to a block of data with a set size called hash.

Generate Signed Data : Signed data consist of data, in its original format and a digital signature. To generate this signature, a hashing algorithm is applied to the data to obtain a hash value. The hash value is encrypted with a private key by the signature Algorithm to generate a digital signature.

Verify Signed Data : A digital signature is associated with a X.509 Certificate which contains the sender's public key. This key is used to decrypt the digital signature into the original hash value on the recipient's computer. To verify the signature, the same hashing algorithm is used to generate a hash value based on the original data. The decrypted hash value is compared to the generated hash value. If the values match, the digital signature is valid otherwise not.

Q.9. Write short note on :

- (a) Non-Repudiation
- (b) SQL-Injection
- (c) Denial of service attack

Ans. (a) Non-repudiation : The sender of a message cannot deny sending the message. It is a way to guarantee that the sender of a message cannot later deny and the recipient cannot deny having received the message.

Non repudiation is the assurance that someone cannot deny something. Typically, in reduction refer to the ability to ensure that a party to a contract or a communication cannot deny the authenticity of their signature on a document or the sending of a message at they originated.

(b) SQL Injection : It is a type of security exploit in which the attacker adds structured query language (SQL) code to a web form input box to gain access to resource or make changes to date.

An SQL query is a request for some action to be performed on a database.

(c) Denial of service attack : It is a type of attack on a network that is designed to bring the network to its knees by flooding it with useless traffic.

Many DOS attacks such as ping of death and tear drop attack exploit limitation in the TCP/IP protocols.

For all the known DOS attacks, there are software fixes the system administrator can install to limit the damage caused by the attacks. But like viruses new DOS attacks are constantly being dreamed up by hackers.

11. FIREWALLS

Q.13. What are the benefits of using firewalls ? What are different types of firewalls available explain any one ?

Ans. Benefits of Firewall : When implemented correctly, firewalls can control access both to and from a network. They can be configured to keep unauthorized or outside users from gaining access to internal or private networks and services. They can also be configured to prevent internal or private networks and services. They can also be configured to prevent internal users from gaining access to outside or unauthorized networks and services. The main benefits of using Firewall are as follows :

1. User Authentication : Firewalls can be configured to require user authentication. This allows network users to specific services and resources. Authentication also allows network administrators to track specific user activity and unauthorized attempts to gain access to protected networks or services.

2. Auditing and Logging : Firewalls can provide auditing and Logging capabilities. By configuring a firewall to log and audit activity, information may be kept and analyzed at a later date. Firewalls can generate statistics based on.

A Firewall's Security design logic is enforced using some type of packet Screening method. Each uses information from different layers of the open systems interconnection (OSI) model. These methods are based on how Firewalls use both pre-configured rules and filters and information gathered from packets and sessions to determine whether to allow or deny traffic. The three well known methods are Packet Filtering, Stateful packet

inspection and application gateways/proxies. Hybrid packet screening methods often combine two or more of these to provide added functionality and security.

Types of Firewalls :

1. Network Level
2. Application Level
3. Stateful Packet Inspection

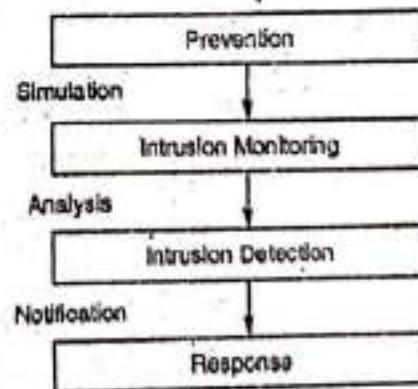
Stateful Packet Inspection : Stateful Packet Inspection Combines the best aspects of the packet filter and Proxy Methods, without their attendant problems. A stateful device performs fundamentally as a packet filter, yet it tracks the state of connections made through it such tracking enables the device to reject packets that are not associated with existing connections initiated from the protected network. Rejected Packets are dropped and a Security Log message is generated. Stateful devices offer the sophisticated decision making capabilities of proxy servers, yet operate much faster because they use a minimal implementation with no OS processing overhead. Because stateful packet inspection is transparent, special proxy applications are not required. This reduces the load on the firewall and improves performance when the connection is destined for an internal host, since the firewall will not be involved. This is not the case when an application is configured to use a Proxy Server. One good technique of implementing a Firewall is to use a combination of a pair of on a network between the two routers. This setup allows the external router to block off any attempts to use the underlying IP Layer to break Security, While allowing the proxy server to handle potential security holes in the higher Layer Protocols. The internal router's purpose is to block all traffic except to the proxy server.

7.12. INTRUSION DETECTION SYSTEMS

Q.14. What do you mean by IDS ? Explain why IDS is preferred over firewalls.

Ans. Instrusion detection system : Are software or hardware system that automate the process of monitoring the events occurring in a computer system a network analyzing them for signs of security problem.

Intrusions are caused by attacks causing the system from the internet unauthorized uses of the systems who attempt to gain additional privileges given them. As these network attack have increased in number and security over the past few year, Instrusion detection system have become a necessary infrastructure of most organization. Its may also respond to anomalous a malicious traffic by taking action such as blocking the user or source IP address from accessing the between. IDS is an element of the security policy. The main task to IDS is to act as a defence of a computer system by detecting an attack repelling it once an intrustional has been detected IDS issues atleast administrators of this fact.



IDS are preferred over firewalls because firewalls looks out for intrusion in order to stop them from happening. The firewall limits the access between network in order to prevent intrusion and does not signal an attack from inside the network. An IDS evaluate a suspected intrusion once it has taken place and signal an alarm.

Q.15. Define pine discuss its features and limitations ?

Ans. PINE is a easy way to learn electronic mail system. It is menu driven, which means the command choices will be presented at the bottom of each screen as well as online help. PINE is a text editor, which is automatically used when you compose a message. PINE is a mail user agent that provides tool for reading, sending and managing electronic messages. PINE was developed by computing & communications at the University of Washington. PINE is available for Unix as well as the Personal Computer running a Microsoft Operating System.

Electronic mail allows you to communicate quickly and easily with colleagues in campus and around the world. The use of e-mail is rapidly increasing, changing, teaching, learning, research, health care and administration.

PINE Offers :

1. On Screen Menus and Messages : PINE displays your option in menus at the bottom of each screen, so you do not need to memorize commands, on screen messages appears on a line above the command menu to give you warning or information as you make a choice.

2. Online Help : Help is instantly available to provide information about the task you are performing.

Features :

1. Starting and Quitting Pine
2. Writing a message in Pine
3. Listing messages
4. Viewing a messages
5. Replying to a message
6. Saving a message
7. Forwarding a message
8. Deleting a message
9. Using the Address Book
10. Guidelines for using E-mail.

Q.16. What are the benefits of Internet Information server?

Ans. Cost to acquire : One of the best things about internet information server is that it is free. You can easily download it using your web browser from the microsoft web page at <http://www.microsoft.com/info/serv/>.

Compatibility with microsoft and other products : Internet information server runs only on microsoft windows NT server. However, it is part of an integrated growing product family known as microsoft back office. This group includes microsoft SQL server, Microsoft exchange server, systems management server, and SNA server. IIS works with all client PC browsers on any platform.

Rapid installation and configuration : A graphical setup program installs and runs web, file transfer protocol (FTP), and Gopher services on your NT server in about ten minutes. You can immediately publish existing files from your server or other servers and in no time, you can have your own web site up and running.

Easy service management : An IIS feature known as the internet service manager graphically displays all management options in a graphical menu. Using ISM, you can manage any IIS servers on your network. You can remotely manage your IIS servers over the internet as well. ISM also makes it possible for you to host multiple web sites from a single server.

Effortless performance monitoring : You can use the performance monitor feature to measure system performance. IIS also logs site management and performance information for you for further analysis. Should you outgrow your server's processor, IIS runs under windows NT server which is scalable to a host of single processor and multiprocessor computers.

IIS uses windows NT server directory services to establish secure areas of your website. That means you have the ability to require user identification and passwords before a user can access a specified area of your server. You can control access by anonymous users, set document permissions, and audit document access easily with IIS. Additionally, a secure socket layer encrypts conversations between IIS and client browsers that support SSL.

QUICK REVIEW

Q.1. Define web server.

Ans. A server is a program located on computer with internet access, that responds to browser's request for a URL. That is a web server meets the demands of users by supplying them the web pages requested.

Q.2. Explain the term PWS.

Ans. PWS : Personal web server is microsoft version of a web server program for individual PC users who want to share web pages and other files from their harddrive. PWS is a scaled down version of microsoft more robust web server, IIS. PWS can be used with a full time internet connection to serve web pages for a web-site with limited traffic.

Q.3. What are the software complexities?

Ans. Software complexity is the all embracing notation referring to the factors that decide the level of difficulty in developing software projects.

Q4. Define the term fire walls.

Ans. Firewalls provide a barrier between networks that prevents or denies unwanted or authorized traffic. A fire wall is a system or a group of system used to control access between network a trusted network and an unfrosten networking using pre-configured rules of filters.

Q6. Define the term digital signature.

Ans. A digital signature is a mechanism that can be used to sign and electronic document usually because digital signatures are difficult to forge, documents that contain such signature be considered authentic.