Unit 1 Content

- **Introduction:**
  - Introduction to Web Technology
  - History of Web and Internet
  - Connecting to Internet
  - Introduction to Internet services and tools
  - Client-Server Computing, Protocols Governing Web
  - Basic principles involved in developing a web site
  - Planning process
  - Types of Websites
  - Web Standards and W3C recommendations,

Unit 1 Content(cont1..)

- Web Hosting Basics
- Types of Hosting Packages
- Introduction to web testing
- Functional Testing
- Usability & Visual Testing
- Performance & Load Testing

Unit Objective

Objective of Unit 1:

- To learn about web development strategies with protocols governing web and internet services and tools.
- To understand the basic concepts to develop the website as per web standards and W3C recommendations.
- To understand web hosting and web hosting packages.
- To understand to register a domain and maintain web servers.

Introduction to Web Technology

- Web Technology refers to the various tools and techniques that are utilized in the process of communication between different types of devices over the internet.
- A web browser is used to access web pages.
- Web browsers can be defined as programs that display text, data, pictures, animation, and video on the Internet.

Classification of Web technology

- World Wide Web (WWW)
- Web Browser
- Web Server
- Web Pages
- Web Development

History of Web development and Internet

World Wide Web

- The World Wide Web is a system of interlinked hypertext documents accessed via the Internet. Web is a huge collection of pages of information linked to each other around the globe.

History of WWW:

- WWW is created by Sir Tim Berners Lee in 1989 at CERN in Geneva.
- In 1990, the first text only browsers were setup and CERN scientist.
- To transfer HTML document to remote sites a new protocol was devised called HTTP (Hyper Text Transfer Protocol).

Contd….

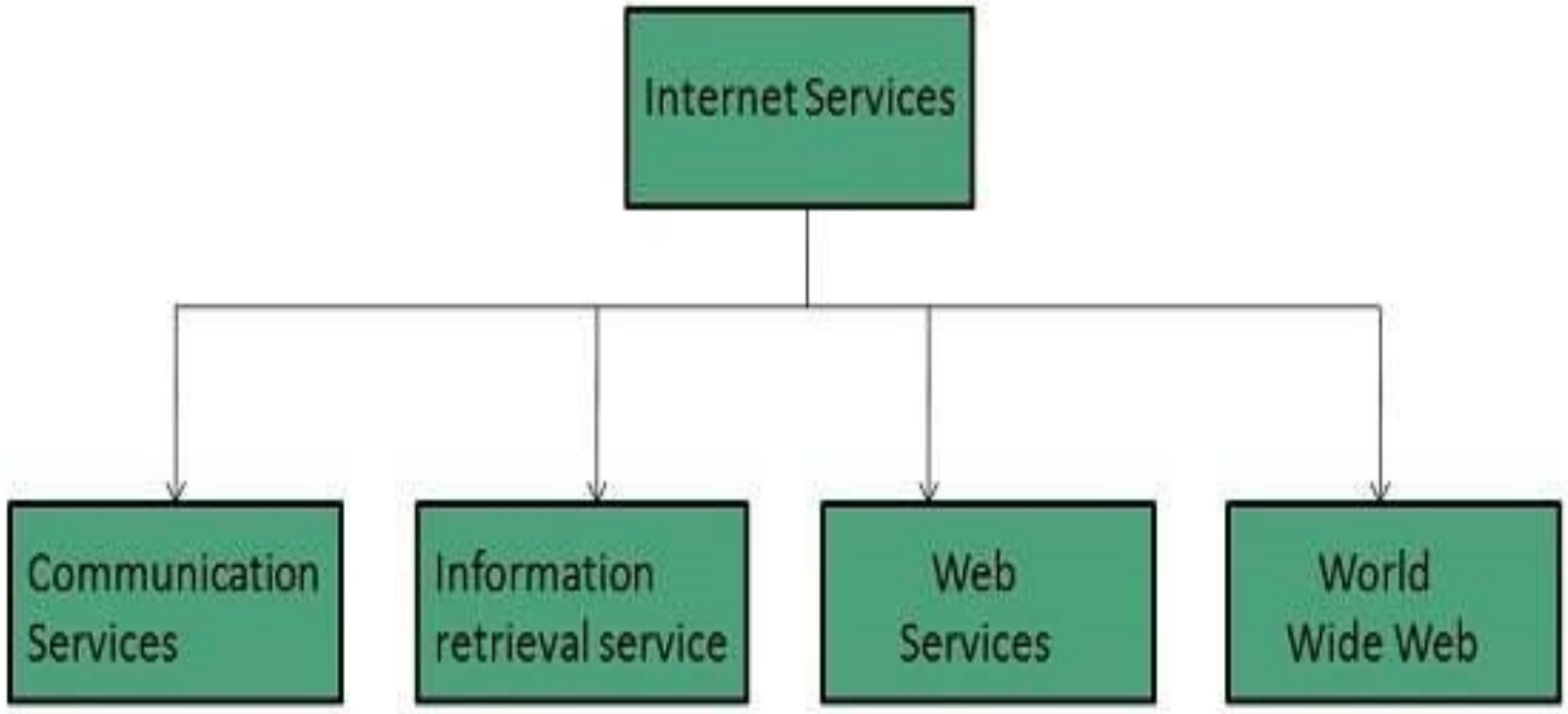
- In the fall of **1991**, conference goes around the world started hearing about the promise but sparks still were not flying.
- In 1993, there are only about 50 websites world wide.
- A browser that allowed user to take advantage of the web's graphical capabilities was developed at the National center for Super Computing application (NCSA).
- NCSA called the browser Mosaic.

Connecting to Internet

- When determining which type of Internet speed and Internet connection type is right for you or your family, it's important to understand the distinction between each connection.
- In today's age, there are numerous ways to connect laptops, desktops, mobile phones, gaming consoles, e-readers and tablets to the Internet.
  - MOBILE
  - WIFI HOTSPOTS
  - DIAL-UP
  - BROADBAND
  - DSL(DIGITAL SUBSCRIBER LINE)
  - CABLE
  - SATELLITE

Introduction to Internet services and tools

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



Introduction to Internet services and tools

1. Web Hosting Services: Web hosting services provide the infrastructure and resources needed to store and publish websites on the internet. They offer various hosting options, such as shared hosting, virtual private servers (VPS), dedicated hosting, and cloud hosting.

2. Domain Name Registrars: Domain name registrars allow users to register and manage domain names, which are essential for identifying websites on the internet (e.g., www.example.com). Popular registrars include GoDaddy, Namecheap, and Google Domains.

3. Content Management Systems (CMS): CMS platforms, such as WordPress, Joomla, and Drupal, simplify website creation and management by providing user-friendly interfaces to design, update, and publish content without extensive coding knowledge.

4. Web Browsers: Web browsers like Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari are essential tools that allow users to access and view websites on the internet.

Introduction to Internet services and tools

5. FTP Clients: File Transfer Protocol (FTP) clients like FileZilla enable users to upload, download, and manage files on web servers, making it easier to maintain websites.

6. Web Development Frameworks: Frameworks like React, Angular, and Vue.js facilitate web development by providing pre-built components and tools to build interactive and responsive web applications.

7. Version Control Systems: Version control systems like Git allow developers to track changes in their code, collaborate with others, and easily revert to previous versions if necessary.

8. Web Analytics Tools: Tools like Google Analytics provide valuable insights into website traffic, user behavior, and other essential metrics, helping website owners make data-driven decisions.

Introduction to Internet services and tools

9. Website Performance Tools: Performance optimization tools like GTmetrix and PageSpeed Insights help developers analyze and enhance website loading times and overall performance.

10. Cloud Services: Cloud computing platforms like Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform offer scalable infrastructure and services for hosting web applications and managing databases.

11. Search Engine Optimization (SEO) Tools: SEO tools like SEMrush and Moz help website owners improve their search engine rankings and analyze competitors' strategies.

12. Web Security Tools: Security tools like SSL certificates, firewalls, and vulnerability scanners help protect websites from malicious attacks and ensure data security.

13. API Development Tools: Tools like Postman and Swagger assist developers in designing, testing, and documenting APIs (Application Programming Interfaces) for web services.

Protocols Governing Web

Protocol

- A protocol is a set of rules to communicate applications to each other.
- A protocol is the interface required for communicating the different applications

Classification of Protocols

- HTTP
- TCP/IP
- FTP
- SMTP
- TELNET

Transmission Control Protocol (TCP)

TCP is a connection oriented protocol and offers end-to-end packet delivery. It acts as back bone for connection. It exhibits the following key features:

Transmission Control Protocol (TCP) corresponds to the Transport Layer of OSI Model.

TCP is a reliable and connection oriented protocol.

TCP offers:

- Stream Data Transfer.
- Reliability.
- Efficient Flow Control
- Full-duplex operation.
- Multiplexing.

Cont…

TCP offers connection oriented end-to-end packet delivery.

TCP ensures reliability by sequencing bytes with a forwarding acknowledgement number that indicates to the destination the next byte the source expect to receive.

It retransmits the bytes not acknowledged with in specified time period.

TCP Services

TCP offers following services to the processes at the application layer:

- Stream Delivery Service
- Sending and Receiving Buffers
- Bytes and Segments
- Full Duplex Service
- Connection Oriented Service
- Reliable Service

Cont…

Stream Deliver Service

TCP protocol is stream oriented because it allows the sending process to send data as stream of bytes and the receiving process to obtain data as stream of bytes.

Sending and Receiving Buffers

It may not be possible for sending and receiving process to produce and obtain data at same speed, therefore, TCP needs buffers for storage at sending and receiving ends.

Bytes and Segments

The Transmission Control Protocol (TCP), at transport layer groups the bytes into a packet. This packet is called segment. Before transmission of these packets, these segments are encapsulated into an IP datagram.

Full Duplex Service

Transmitting the data in duplex mode means flow of data in both the directions at the same time.

Cont…

Connection Oriented Service

TCP offers connection oriented service in the following manner:

1. TCP of process-1 informs TCP of process – 2 and gets its approval.
2. TCP of process – 1 and TCP of process – 2 and exchange data in both the two directions.
3. After completing the data exchange, when buffers on both sides are empty, the two TCP's destroy their buffers.

Reliable Service

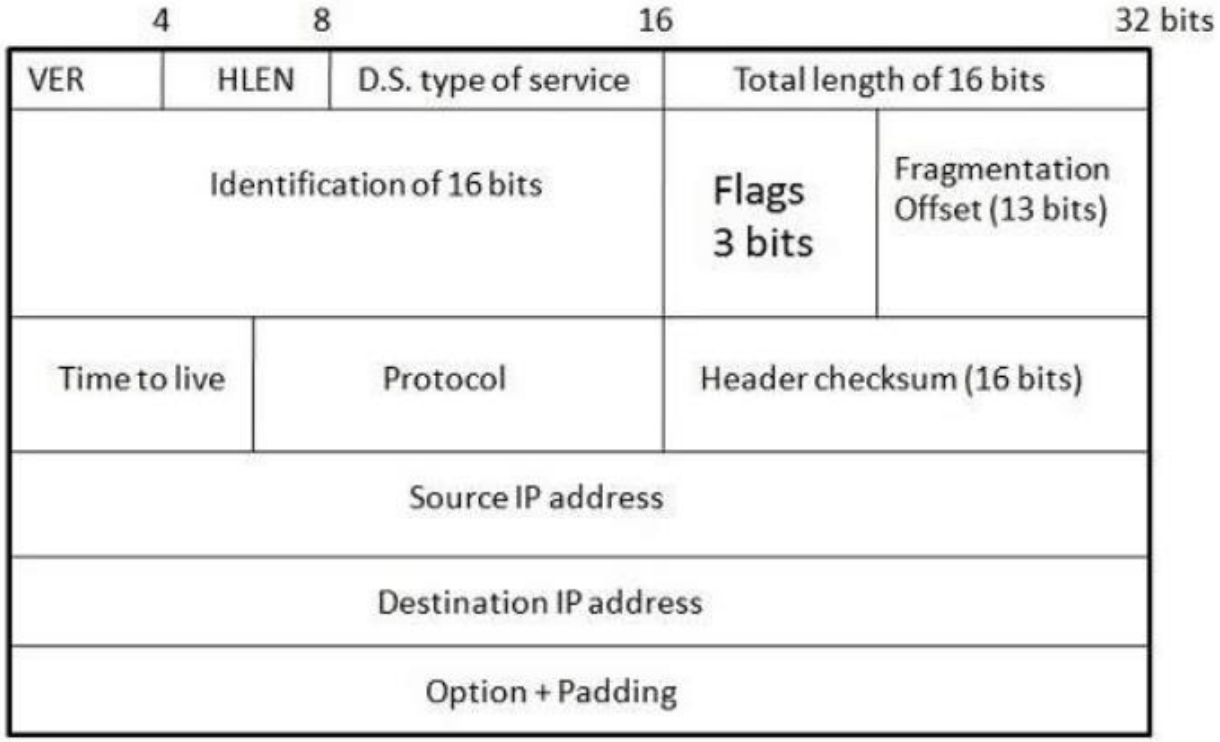
For sake of reliability, TCP uses acknowledgement mechanism.

Internet Protocol (IP)

Internet Protocol is connectionless and unreliable protocol. It ensures no guarantee of successfully transmission of data.

In order to make it reliable, it must be paired with reliable protocol such as TCP at the transport layer.

Internet protocol transmits the data in form of a datagram as shown in the following diagram:



Cont…

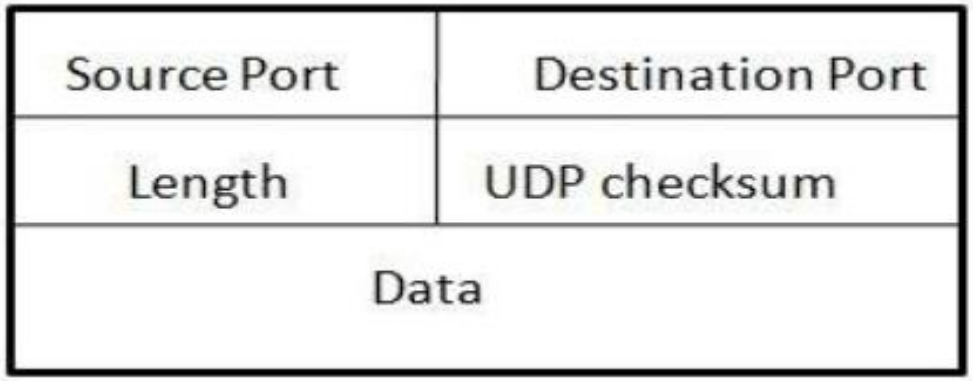
Points to remember:

- The length of datagram is variable.
- The Datagram is divided into two parts: header and data.
- The length of header is 20 to 60 bytes.
- The header contains information for routing and delivery of the packet.

User Datagram Protocol (UDP)

Like IP, UDP is connectionless and unreliable protocol. It doesn't require making a connection with the host to exchange data. Since UDP is unreliable protocol, there is no mechanism for ensuring that data sent is received.

UDP transmits the data in form of a datagram. The UDP datagram consists of five parts as shown in the following diagram:



Cont…

Points to remember:

UDP is used by the application that typically transmit small amount of data at one time.

UDP provides protocol port used i.e. UDP message contains both source and destination port number, that makes it possible for UDP software at the destination to deliver the message to correct application program.

File Transfer Protocol (FTP)

FTP is used to copy files from one host to another. FTP offers the mechanism for the same in following manner:

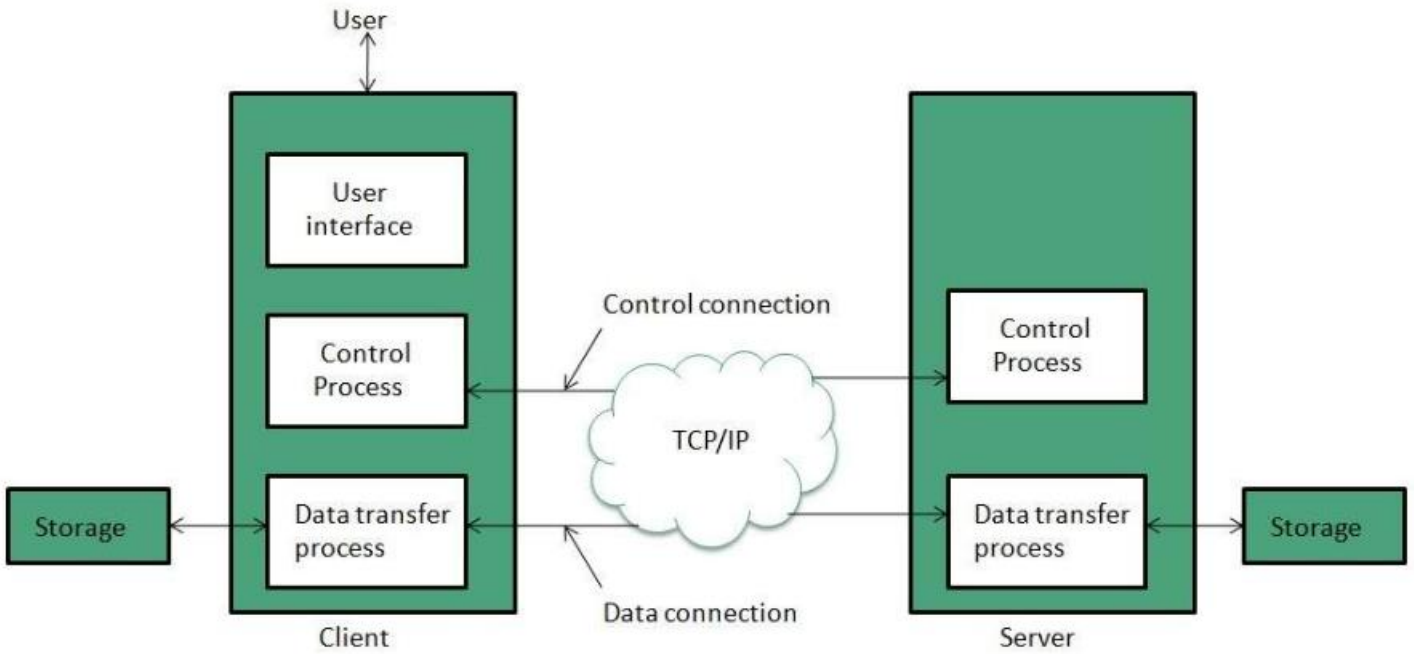
FTP creates two processes such as Control Process and Data Transfer Process at both ends i.e. at client as well as at server.

FTP establishes two different connections: one is for data transfer and other is for control information.

Control connection is made between control processes while Data Connection is made between

FTP uses port 21 for the control connection and Port 20 for the data connection.

Cont...


User
User interface
Control Process
Data transfer process
Storage
Client
Control connection
TCP/IP
Data connection
Control Process
Data transfer process
Storage
Server

Trivial File Transfer Protocol (TFTP)

Trivial File Transfer Protocol is also used to transfer the files but it transfers the files without authentication. Unlike FTP, TFTP does not separate control and data information. Since there is no authentication exists, TFTP lacks in security features therefore it is not recommended to use TFTP.

Key points

- TFTP makes use of UDP for data transport. Each TFTP message is carried in separate UDP datagram.
- The first two bytes of a TFTP message specify the type of message.
- The TFTP session is initiated when a TFTP client sends a request to upload or download a file.
- The request is sent from an ephemeral UDP port to the UDP port 69 of an TFTP server.

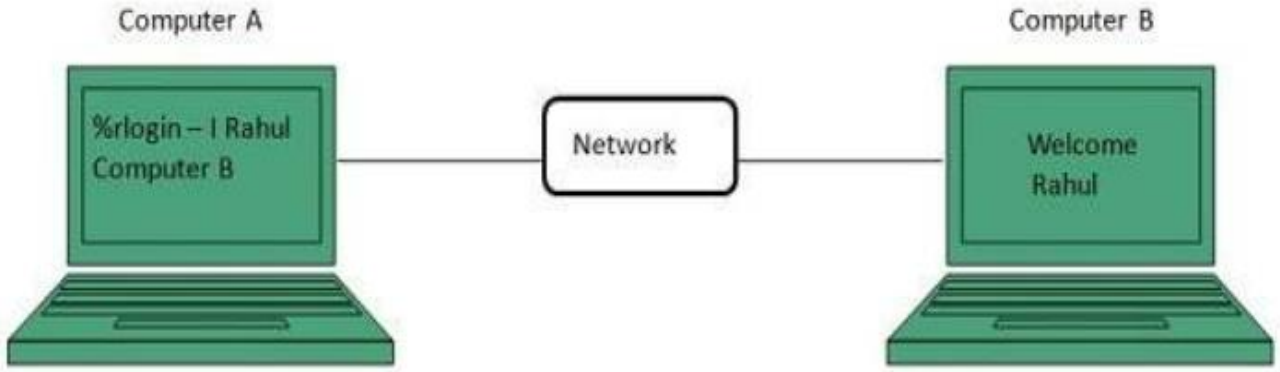
Difference between FTP and TFTP

S.N.	Parameter	FTP	TFTP
1	Operation	Transferring Files	Transferring Files
2	Authentication	Yes	No
3	Protocol	TCP	UDP
4	Ports	21 – Control, 20 – Data	Port 3214, 69, 4012
5	Control and Data	Separated	Separated
6	Data Transfer	Reliable	Unreliable

Telnet

Telnet is a protocol used to log in to remote computer on the internet. There are a number of Telnet clients having user friendly user interface.

The following diagram shows a person is logged in to computer A, and from there, he remote logged into computer B.



Hyper Text Transfer Protocol (HTTP)

HTTP is a communication protocol. It defines mechanism for communication between browser and the web server.
It is also called request and response protocol because the communication between browser and server takes place in request and response pairs.

HTTP Request
HTTP request comprises of lines which contains:

Request line

Header Fields

Message body

Cont…

Key Points

•The first line i.e. the **Request line** specifies the request method i.e. **Get** or **Post.**

•The second line specifies the header which indicates the domain name of the server from where index.htm is retrieved.

HTTP Response

Like HTTP request, HTTP response also has certain structure.

HTTP response contains:

Status line

Headers

Message body

Protocols Governing Web(cont1..)

HTTP Protocol

- HTTP is the primary protocol used to distribute information on the web
- Initial HTTP 0.9 does not allow for content typing and does not have provisions for supplying meta- information.
- Content Typing is to identify the type of data being transferred.
- Meta Information is supplemental data, such as environment variables that identify the client's computer

Protocols Governing Web(cont1..)

TCP/IP

- It is a set of rules that an application can use to package its information for sending across the networks of networks.

FTP

- FTP uses TCP to create a virtual connection for control information and then creates a separate TCP connection for data transfers.

- It is used to transfer the files over networks.

Protocols Governing Web(cont1..)

SMTP

- It is an Internet standard for electronic mail (e- mail) transmission across Internet Protocol (IP) networks.

Telnet

- This protocol used to remotely login into another system .

- This is used to browse file and directories on the remote system.

Daily Quiz

1.) The HTML and HTTP standard are defined by __

(A) Web client
(B) Internet association
(C) WWW consortium
(D) WWW

2.) The ____ passes the information given by the user to a specified program.

(A) User
(B) Programmer
(C) Web server
(D) Browser

3.) Which language is used for creating Web Pages?

(A) PASCAL
(B) C
(C) HTML
(D) BASIC

Daily Quiz

4.) What is the abbreviation of HTTP?

(A) Hypertext tag path

(B) Hyper Text Transfer Protocol

(C) Hypertext transfer path

(D) None

5.) The entire web document is contained within ____

(A) Comments

(B) Tags

(C) Web page

(D) HTML element

Types Of Websites

Website:

- A website is simply a collection of interlinked web pages.

Classification of Website

- Corporate Website
- Individual website

Websites

Corporate Website:

- In this, there is certain no. of persons, who develop their website for a particular organization.
- The corporate website are formed when group of people have common interest and objective.
- The purpose of this website is to convey the information of organization to all over the world

Websites(cont1..)

Individual Website

- Personal web pages are world wide web pages created by an individual to contain content of a personal nature rather than content pertaining to a company, organization or institution.
- It is just like profile management system.
- In this type of website an individual wants to develop website for hi-projection, career growth etc.

Web Applications

- Web application is a kind of application that can be through the web browser over the internet.
- Web applications may include simple office software word processors, Google docs, project management, computer-aided design, online spreadsheets, and presentation tools.
- Some common scripting languages are used to create web applications such as JSP, ASP and PHP.
- Web applications interact with program variables ,spreadsheets and databases using user input for creating the dynamic web content.

Web Applications(cont1..)

Examples of Web Application

- Airline Reservation System.
- Message Boards.
- Shopping Cart.
- Net-banking.

Writing a Web Projects

Objective of above Topic:

To developed web project and understand the concepts of web project development differs from traditional web projects

Phases of writing the web projects

Write a project mission statement

- Write the specific mission statement that you want to do.

Identify Objectives

- Specific
- Measurable
- Attainable
- Realistic
- Time limited

Writing a Web Projects(cont1..)

Phases of writing the web projects(cont..)

❖Identify your target users

- The matter of a website will be determined by the users whom you want to visit the site. This is totally depend upon
  i. Market research
  ii. Focus group
  iii. Understanding the audiences

❖Determine the scope

- By supporting documents and client's approval.

Writing a Web Projects(cont1..)

Phases of writing the web projects(cont..)

- **Budget**
  - ❖ Assumption for budgets.
  - ❖ Budget categories.
  - ❖ Determine hidden costs and tools.

- **Planning issues:**

❖Discuss client's existing information system.
❖Project team and developing infrastructure.
❖Where the website will place.

Connecting To Internet

Telephone

- A Telephone is a device that converts voice communication into electrical signals that can be transferred to other telephones and heard.
- Telephones enable people to communicate with other people all over the world and is widely credited as being first invented by Alexandra Graham Bell in 1876.
- There are three basic phones in use today. The classic corded telephone, which could be rotary dial like or have buttons, the cordless or wireless phone, and the cell phone

Connecting To Internet(cont1..)

Cable

A **cable** is one or more wires covered in a plastic covering that connects a computer to a power source or other device.

Two Types of computer cables

- **A data cable** is a cable that provides communication between devices.
- For example, the data cable that connects your monitor to your computer and allows your computer to display a picture on the monitor such as SATA and USB etc.
- **A power cable** is any cable that powers the device.

Connecting To Internet(cont1..)

Types of Cables:

- **AT** - Used with early keyboard.
- **ATA -** Used with hard drives and disc drives.
- **CAT5** - Used with network cards.
- **Coaxial** -Used with TV and Projectors.
- **DVI** - Used with Monitors Projectors, and other display
- **E-SATA** - Used with external drives.

Connecting To Internet(cont1..)

Types of Cable

- **MDI -** Used with musical keyboards and other equipment.
- **Mini Plug -** Used with headphone, microphone and speakers.
- **Molex -** Power cable used inside your computer.

Connecting To Internet(cont1..)

Satellite Connection

- A satellite connection uses broadband but does not require cable or phone lines.
- It connects to the Internet through satellites orbiting the Earth.
- It can be used almost anywhere in the world, but the connection may be affected by weather patterns.

Connecting To Internet(cont1..)

Satellite Connection(cont..)

- A satellite connection also relays data on a delay, so it is not the best option for people who use real-time applications, like gaming or video conferencing.

- A satellite Internet connection is an arrangement in which the upstream (outgoing) and the downstream (incoming) data are sent from, and arrive at, a computer through a satellite.

Daily Quiz

1.) A program that is used to view websites is called a
- (A) Browser
- (B) Web viewer
- (C) Spreadsheet
- (D) Word processor

2.) Which of the following is not a type of broadband internet connection?
- (A) Satellite
- (B) DSL
- (C) Dial up
- (D) Cable

3.) Servers are computers that provide resources to other computers connected to a
- (A) Client
- (B) Mainframe
- (C) Supercomputer
- (D) Network

Daily Quiz

4.) Sending an E-mail is similar to
   (A) Sending a package
   (B) Talking on the phone
   (C) Writing a letter
   (D) Drawing a picture

5.) ARPANET stands for
   (A) Advanced Rehearse Projects Agency Network
   (B) Advanced Research Projects Agency Newark
   (C) Advanced Research Projects Agency Network
   (D) None of these

6.) The process of connecting to the internet account is
   (A) Sing in
   (B) Sing out
   (C) Login
   (D) Logout

Introduction To Internet Services

- **Common Protocol Used To Provide Internet Services**
  - The File Transfer Protocol (**FTP**) is a standard network protocol used to transfer computer files from one host to another host over a TCP-based network, such as the Internet
  - **Telnet** is a network protocol used on the Internet or local area networks to provide a bidirectional interactive text-oriented communication facility using a virtual terminal connection.

Introduction To Internet Services(cont..)

- **RSH** Remote Shell allows you to send single commands to the remote server.

- **RCP** Remote Copy provides the capability to copy files to and from the remote server without the need to resort to FTP or NFS (Network File System, the UNIX form of folder sharing

- **NNTP(Network News)-**(Reading and posting USENET news)

Introduction To Internet Services(cont..)

- **HTTP(Hypertext Transfer Protocol)-(**Transferring documents on the Web)
- **SMTP(Simple Mail Transfer Protocol)-** (Sending mail)
- **POP3(Post Office Protocol)-** (Reading Mail)
- **Post Office Protocol** (**POP**) protocol used by local e-mail clients to retrieve e-mail from a remote server over a TCP/IP connection.

Introduction to client-server computing

Client/Server Definition

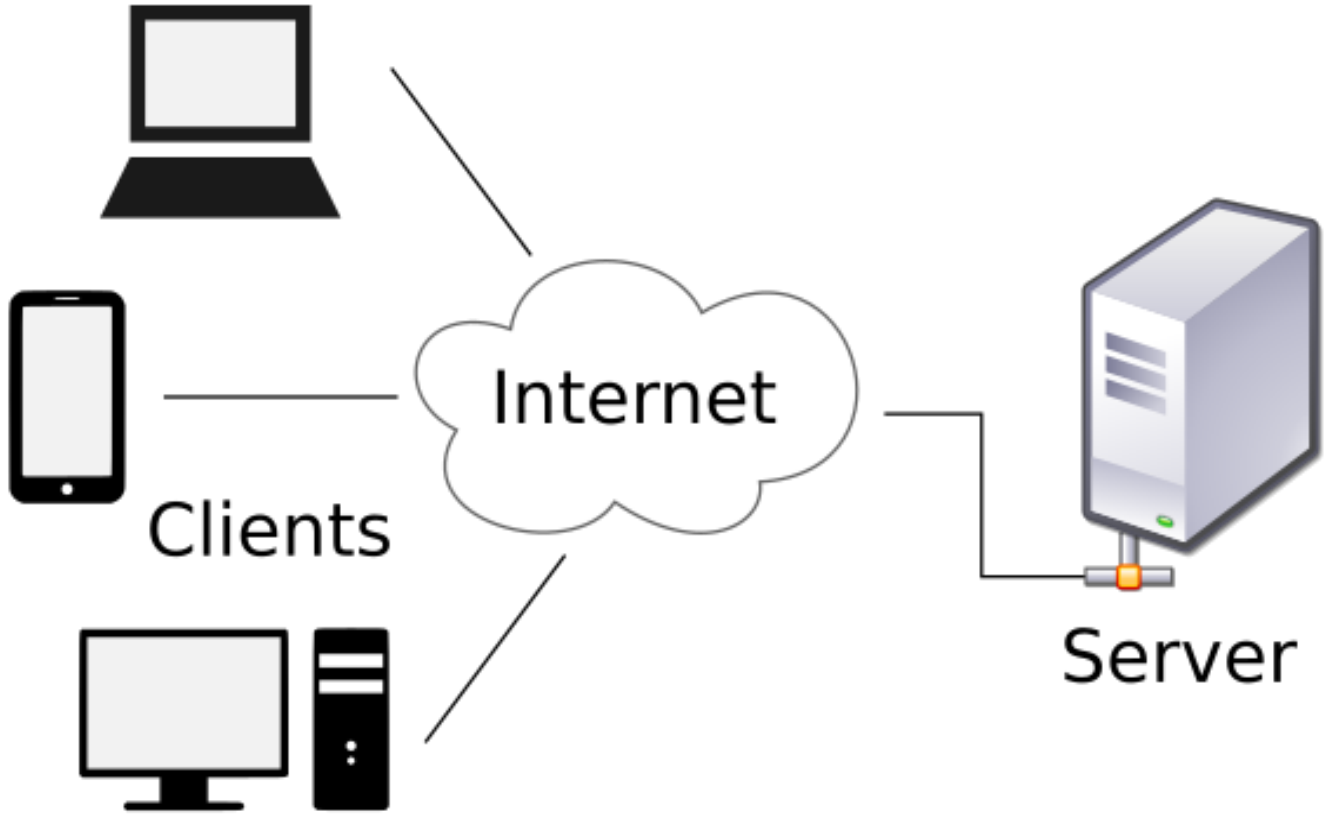
- In client/server computing "server software accepts requests for data from client software and returns the results to the client"

Elements of C-S Computing

- A Client
- A Server
- And a network
- In client-server computing major focus is on SOFTWARE

Introduction to client-server computing

A Client/Server Computing



Introduction to client-server computing

1. Web Server

A web server powers the site you're looking at right now. This genre of server focuses on serving web content to clients.

Web servers simply take "GET" and "POST" requests from clients (among other verbs).

A "GET" request is when a client simply wants to retrieve information and doesn't have any information to submit to the server.

A "POST" request on the other hand is when a client does have information to share with the server and expects a response back. For example, filling up a form on a web server and clicking the submit button is a "POST" request from the client to the server.

Web servers are typically "headless" in nature. This is to preserve the memory on the server and ensure that there's enough to power the operating system and applications on the server.

Introduction to client-server computing

"Headless" means that it doesn't run like a traditional home computer, but rather just serves content. The administrators of these servers can only connect to them through command line terminals.

Remember that these types of servers can run any type of application just like your home computer can.

They can also run on any operating system, as long as they obey the general "rules" of the web.

Modern web applications usually run on a series of layers, starting with server-side scripts and programs that process data (e.g PHP, ASP.NET etc), and ending with client-side scripting (e.g Javascript) that programs how the data should be displayed.

Some Ports used for Webservers: Port 80 for HTTP (not encrypted) and Port 443 for HTTPs (encrypted).

Introduction to client-server computing

2. Database Server

A database server typically operates in together with another type of server. This kind of server simply exists to store data in groups.

There are countless methods of keeping data that operate on different theories. One of the more common types is known as “SQL” or “Structured Query Language”.

Database programmers can create databases on these servers using scripting in the language of the database.

Web applications usually have their server-side components connect to a Database server to grab data as users request it.

Introduction to client-server computing

A good practice is to have webservers and database servers on different machines. The reason that database servers should exist on their own is for security.

If a hacker gains access to the main webserver but not the database server, they will be able easily to retrieve or modify the data stored in the database server.

Some popular Database servers include MySQL, MariaDB, Microsoft SQL, Oracle Database etc.

Some Ports used for Database Servers: Port 3306 (MySQL, MariaDB), Port 1433 (MS-SQL), Port 1521 (Oracle DB).

Introduction to client-server computing

3. eMail Server

An email server typically runs on “SMTP” or “Simple Mail Transfer Protocol”. There are other possible protocols that newer mail servers operate on, but SMTP remains the dominant protocol.

An email server powers mail services. These servers in themselves simply take in emails from one client to another and forward the data to the other server.

Data is simplified when sent through SMTP, so some information, like web formatting, is usually lost in email transactions.

The modern approach to email servers typically pairs them with web servers. This allows for users to have a “web client” that graphically shows the data on a web page. Some newer web applications can even mimic a home computer email client without installing anything.

Some Ports used for eMail Servers: Port 25 (SMTP), Port 587 (Secure SMTP), Port 110 (POP3)

Introduction to client-server computing

4. Web Proxy Server

A web proxy server can run on one of many protocols, but they all do one thing in common.

They take in user requests, filter them, and then act on the user's behalf. The most popular type of web proxy server is designed to get around school and organizational web filters.

Because web traffic is all through one IP address and website that isn't yet blocked, users can gain access to sites that are forbidden through these filters.

The less popular type is an organizational proxy server. This has the same effect, but it's typically authorized by an organization.

Introduction to client-server computing

It takes users' web traffic, usually logs it for evaluation later, and sends it to the Internet.

This puts users' traffic all together so that one computer cannot be differentiated publicly from another.

This is done intentionally by an organization to prevent users from being targeted and usually to be able to inspect, cache and analyze packets sent and received.

Some Ports used for Web Proxy Servers: Port 8080, 8888 etc

Introduction to client-server computing

5. DNS Server

A DNS server, or “Domain Name Service” server, is used to translate domain names to their corresponding IP addresses.

This server is what your browser references when you type in a domain name and press Enter. The idea is that users don’t have to memorize IP addresses and organizations can have a fitting name

Typically, Internet Service Providers (ISPs) provide DNS servers to their users. However, there are many organizations that provide this lookup service for free, as well (such as the popular Google DNS server with IP 8.8.8.8).

Introduction to client-server computing

Some users who are more concerned about their privacy on the web often use these alternate DNS servers.

DNS servers are also tapped when users create a new domain name. DNS servers operate on a hierarchical basis, so there are some more “authoritative” servers than others.

The domain name is registered with one higher-up DNS server that other, lower-level DNS servers reference. Usually through a process taking anywhere from 24 to 48 hours, this registration propagates across the world.

Ports used for DNS Servers: Port 53 (both TCP and UDP).

Introduction to client-server computing

6. FTP Server

FTP servers, or “File Transfer Protocol” servers, have a single purpose: to host a file exchange among users.

These servers do not provide any type of encryption by default, so there are a number of secured versions of the protocol that are often used in its place (such as sFTP which is FTP over secure SSH protocol).

This type of server allows users to upload files to it or download files after authenticating through an FTP client. Users can also browse the server’s files and download individual files as they wish.

Some Ports used for FTP Servers: Ports 20,21 for FTP or Port 22 for sFTP.

Introduction to client-server computing

7. File Server

A File Server is different from an FTP server. This type of server is more modern and is typically capable of “mapping” networked files onto drives. This means that users can use their home computer’s file browser to look into folders.

The main advantage of this form of server is that users can upload and download shared files. Permissions to files are controlled by the administrator.

Usually File Servers exist in corporate networks in a Windows Active Directory environment or in Linux environments.

Introduction to client-server computing

8. DHCP Server

A DHCP Server uses the Dynamic Host Communication Protocol (DHCP) to configure the network settings of client computers.

Different Server Platforms

1. Physical Server

A Physical Server is what truly serves data in the end. Operating on metal and electricity, modern physical servers are often capable of serving far more than one user could ever want.

These are typically housed in data centers by hosting companies to serve a variety of clients. The only exception would be larger organizations who rely on these; in these cases, the organizations usually own the network of physical servers.

In the past, each server in a network (e.g Webserver, Database Server etc) was hosted on its own dedicated physical server. This concept is now being replaced with Virtualization technologies whereby each server can be a virtual machine inside a bigger physical machine.

Different Server Platforms

2. Virtual Server

A virtual server is a partitioned part of a physical server. Most “servers” online are virtual servers. They often are given a dedicated amount of physical server resources to utilize (such as RAM, CPU, Storage space).

Users can rent virtual servers for a fraction of the cost of a physical server. This is because hosting companies typically own or rent the physical server for a wholesale price, then profit off of selling parts of the physical machine at a time to users with smaller audiences.

Daily Quiz

1.)----- is whatever you're using to interact with the internet

(A) client
(B) HTTP
(C) server
(D) navigation

2.) The-------is about communication between web clients and web servers.

(A) client
(B) HTTP
(C) server
(D) navigation

3.) Communication between client computers and web servers is done by sending ---
and receiving-------

(A)client server
(B) HTTP request HTTP responses
(C) server client
(D) navigation browser

Daily Quiz

4.) A client (a browser) sends an---------to the web
- (A) client
- (B) HTTP Request
- (C) server
- (D) navigation

5.) The-------request to the server for any information
- (A) client
- (B) HTTP
- (C) server
- (D) navigation

6.) The--------provide the information to the client
- (A)client server
- (B) HTTP request HTTP responses
- (C) server
- (D) navigation browser

Previous Topics: Recap

•Protocols governing web, and internet services and tools that connect to the internet.

• It was also discussed about the history of web.

•We had also discuss Cyber Laws and Website and its classification

Previous Topics: Recap(Cont..)

• The above topic was focused on the Web Application with its examples and phases.

• It was also discussed about the connection of Internet through:-
  - Telephone
  - Cables and its types
  - Satellite Connection.

• We have also discussed about the client server computing and Categories of Server.

•How to write the web project in the previous topic

Topic Objective/Outcome

Topics: **Web Hosting Basics, Types of Hosting Packages, Introduction to Web testing, Functional Testing, Usability & Visual Testing, Performance & Load Testing. (CO1)**

Objective of the above topics:

- To know the basics of web hosting and hosting packages.
- To get the knowledge about Web Testing.
- To learn how testing is used in a web server and how to test a website?

Web Hosting Basics

- When a hosting provider allocates space on a web server for a website to store its files, they are hosting a website.
- Web hosting makes the files that comprise a website (code, images, etc.) available for viewing online.
- web hosting is the process of renting or buying space to house a website on the World Wide Web.
- Website content such as HTML, CSS, and images has to be housed on a server to be viewable online.
- Web hosting service providers have the servers, connectivity, and associated services to host websites.
- Choosing the right hosting plan will mean having access to the right allocation of resources to keep your website loading quickly and reliably for your visitors.

Types of Hosting Packages

There are the six types of web hosting:

- Shared hosting
- Virtual private server (VPS) hosting
- Dedicated server hosting
- Cloud hosting
- Managed hosting
- Co-location

Shared hosting

- Shared hosting allows multiple websites to utilize a single server. Usually, you'll have no idea who or what websites you're sharing the resources of a server with. Each customer will usually have a limit on the total amount of server resources they can use, but this will be defined by your hosting package.

- Shared hosting is easily the cheapest and most economical option for your needs. However, the cheap price comes with limitations, which we'll get to below. Since most hosting companies will offer the same amount of space and storage it's important to choose a company you can trust.

Types of Hosting Packages

Virtual private server (VPS) hosting

- A VPS hosting plan is the ultimate middle ground between a shared server and a dedicated server.
- It's ideal for website owners that need more control, but don't necessarily need a dedicated server.
- VPS hosting provides website owners with more customization and storage space, but still they are not able to handle incredibly high traffic levels or spikes in usage meaning that the site performance can still be affected by other sites on the server.
- VPS hosting is used by website owners who want dedicated hosting but don't have the technical knowledge needed.
- VPS hosting offers the cost benefits of shared hosting with the control of dedicated hosting.

Types of Hosting Packages

Dedicated server hosting

- Dedicated hosting gives website owners the most control over the server that their website is stored on.
- Customer has full root and admin access, so he can control everything from security to operating system that you run.
- Dedicated servers cost are one of the most expensive web hosting options.
- Used by website owners with high levels of website traffic, and those who are in need of complete control of their servers.
- A high level of technical expertise is required for the installation and ongoing management of the server.

Cloud hosting

- It's a hosting solution that works via a network and enables companies to consume the computing resource like a utility.
- This allows users to employ as many resources as they need without having to build and maintain their own computing infrastructure.
- Cloud-based hosting is scalable, meaning your site can grow over time, using as many resources as it requires and while the website owner only pays for what they need.

Types of Hosting Packages

Managed hosting

- Hosting companies provide technical services such as hardware and software setup and configuration, maintenance, hardware replacement, technical support, updating and monitoring.
- With managed hosting, the provider looks after the day-to-day management of the hardware, operating systems and standardized applications.

Colocation

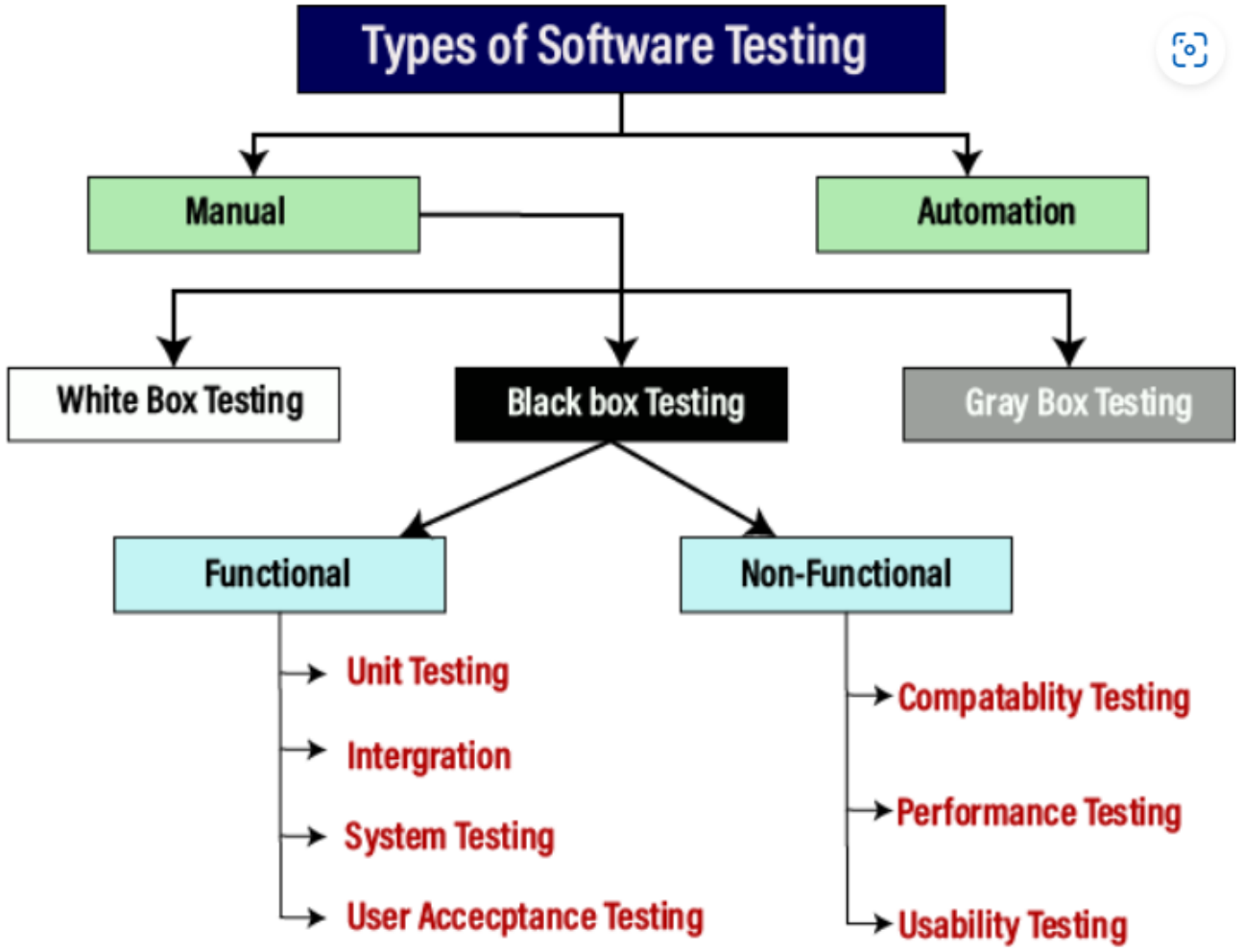
- Instead of keeping servers in-house or at a private data center, you may choose to "'co-locate" your equipment by renting space in a colocation center.
- The center will provide the power, bandwidth, IP address and cooling systems that your server requires. Space is rented out in racks and cabinets.
- Colocation gives access to higher levels of bandwidth than a normal office server room at a much lower cost.
- You're left to your own devices (literally) and will be expected to take care of everything including the hardware, software and services.

Introduction to Web Testing

- Web testing, at its core, is simply checking your web application or your website for problems before you make that web application or website live. Web testing is designed to check all aspects of the web application's functionality, including looking for bugs with usability, compatibility, security, and general performance.

- Web testing is a crucial part of assembling any web application or website, as you don't want to invest the many resources in time and money you've spent developing this web application and then have it run into immediate problems upon release. We have seen that happen before, and it isn't pretty.

Introduction to Web Testing



Functional Testing

- Functional testing is a stage in the software delivery lifecycle (also referred to as a ‘process’) in which quality engineers verify whether the application under test’s features behaves as per their requirements.

  Here are some typical examples of functional testing:

- Do appropriate error messages appear when users input the incorrect information (e.g. invalid email address, card number)?
- Can users request to change their credentials (e.g. user name, passwords, etc.,...)?
- Can users log in with the new credentials?

Functional Testing Vs Non Functional Testing

	Functional Testing	**Non-functional testing**
Method	Normally performed under the black-box method. In which the testers only validate with inputs and outputs instead of the internal structure of the system.	Normally performed under the white-box method. In which the tester is made aware of the system's internal design to generate test cases accordingly.
Areas of concern	Whether or not the system's outputs satisfy the specification or requirements given	The system's performance, stability, security, usability, etc.
Inputs	Business requirements, client's specifications	Speed, throughput, scalability, etc.
Examples	Unit testing API testing Regression testing (can be both functional and non-functional)	Security testing Performance testing Load testing Stress testing

Usability & Visual Testing

- Usability testing refers to evaluating a product or service by testing it with representative users.
- Typically, during a test, participants will try to complete typical tasks while observers watch, listen and takes notes.
- The goal is to identify any usability problems, collect qualitative and quantitative data and determine the participant's satisfaction with the product.
- To run an effective usability test, you need to develop a solid test plan, recruit participants, and then analyze and report your findings.

Visual Testing

- Visual testing is a software testing technique that evaluates the visual appearance and behavior of a software application's user interface (UI) or graphical user interface (GUI). Visual testing aims to verify that the application's visual elements like colors, images, fonts, and layouts, are displayed correctly and consistently across different devices, operating systems, and browsers.
- Visual testing ensures that the user interface (UI) of the developed product appears as intended for users. It accomplishes this through several key benefits, including:
- Identifying defects or issues in the UI interface.
- Detecting variations in the UI that do not match the baseline snapshots.
- Creating specialized visual test cases that cover functional points.
- Identify visual bugs on different browsers.

Performance & Load Testing

Performance testing is a type of testing that is performed for verifying the performance of a system and to monitor the behavior of the system under stress. It tells about the reliability, stability, response time, and scalability of a system. On the other hand, load testing is primarily aimed for identifying the behavior of a system under the expected load.

What is Performance Testing?

Performance testing is performed over the software to test its performance under a particular workload for its sensitivity, reaction time and its stability. Performance testing is basically a superset of stress testing.

The primary goal of performing performance testing is to set the standards and benchmarks for the product. Performance testing indicates how the product behaves under regular parameters. Checking for concurrent users and response time is an example of performance testing.

Performance & Load Testing

- Load testing checks the performance of a software to check its performance under real life-based loads. In other words, load testing is a type of testing that checks the behavior of a system under the expected load. To perform the load testing of a system, we first need to know the expected load on the application in real life.

- Load testing collects all the data about response time, reliability, and stability of the system, and then analyzes the data to find the inconsistencies. Basically, the load test is performed to ensure the stable operation of a system under an expected load.

- The greatest advantage of load testing is that it helps in understanding the expected load that a system can handle so that we can reduce the risk of a failure.

Performance & Load Testing

The following are some of the important differences between Performance Testing and Load Testing –

Key	Performance Testing	Load Testing
Purpose	Performance testing tests the system performance under varying loads.	Load testing tests the system performance for multiple users using the application at the same time.
Threshold	Performance testing is conducted at below and above threshold limits.	Load testing is conducted at threshold limits.
Result	Performance testing ensures that the system is performing perfectly under varying loads.	Load testing ensures that the system can handle how many users at a time without performance degradation.
Result	Performance testing checks the performance of the system.	Load testing checks the operational capacity of the system.
Cost	Performance testing tools are not much costly.	Load testing tools are very costly.
Targets	Performance testing checks the reliability, scalability, and speed of the system.	Load testing checks the sustainability of the system.

Daily Quiz

- **What are shared on the Internet and are called as Web pages?**

a) Programs

b) Cables

c) Hypertext documents

d) None

- **What is the name of the location address of the hypertext documents?**

a) Uniform Resource Locator

b) Web server

c) File

d) Web address

Daily Quiz(cont..)

- **Which of the following is true about public access modifier?**

a) Variables, methods and constructors which are declared public can be accessed by any class.

b) Variables, methods and constructors which are declared public can be accessed by any class lying in same package.

c) Variables, methods and constructors which are declared public in the superclass can be accessed only by its child class.

d) None of the above.

- **Which program is used by web clients to view the web pages?**

a) Web browser

b) Protocol

c) Web server

d) Search Engine

Daily Quiz(Cont..)

(a) The following “Things to consider” while planning a website:

(i) Purpose of website
(ii) Target audience
(iii) Website contents
(iv) All of these

(b) The initial stage of planning your website is to:

(i) Identify the target audience
(ii) Identity the Purpose of the Site
(iii) Budgeting
(iv) Prepare Blue Print

(c) Which of following are the are web site design consideration and principles?

(i) Easy to read
(ii)Easy to navigate
(iii) Quick download
(iv) All of these

Weekly Assignment

1. Explain the following: **[CO1]**
    1. URL
    2. domain name space
    3. Domain name server
2. Explain the term protocol. List all the commonly used web protocols. **[CO1]**
3. Explain the role of web server on the internet. **[CO1]**
4. Explain the working of web with proper diagram. **[CO1]**
5. Give **examples** of each: static and dynamic website.**[CO1]**
6. Describe domain name space and domain name server. **[CO1]**
7. Describe all the steps of web site hosting. **[CO1]**
8. Explain Hypertext and Hypermedia. **[CO1]**
9. What do you understand by a markup language? List all the types of markup languages. **[CO1]**
10. Explain HTML with basic structure of an HTML document. **[CO1]**

MCQ s

- Who is making web standards
  a. Netscape
  b. Microsoft
  c. WWWC
- Range of Heading tags in HTML
  a. <h1> to <h3>
  b. <h1> to <h8>
  c. <h1> to <h6>
  d. <h1> to <h9>
- What does HTML stand for ?
  a. Hyperlinks and Text Markup Language
  b. Home Tool Markup Language
  c. Hyper Text Markup Language
  d. Home Text Markup Language

MCQ s(Cont..)

- Web is a huge collection of …….of information linked to each other around the globe.

a. Pages

b. Website

c. HTML

- Father of WWW

a. J.T. Thomson

b. Dennis Ritchie

c. Tim Berners-Lee

- Who is responsible for creating the look and feel of a site?

a. Creative Lead

b. Programmer

c. Analyst

d. Designer

MCQ s(Cont..)

Which of the following are information retrieval services on the internet?
i) World Wide Web ii) File Transfer Protocol iii) Telnet iv) Email
A) i, ii and iv only
B) ii, iii and iv only
C) i, ii and iii only
D) All i, ii, iii and iv

. …….. allows remote accessing to the files which contain programs, technical handouts, reports etc.
A) Remote Desktop
B) FTP
C) Telnet
D) Chat

Glossary Questions

..... allows remote accessing to the files which contain programs, technical handouts, reports etc.

A) Remote Desktop
B) FTP
C) Telnet
D) Chat

……. is a global hypertext system that was initially developed in 1989 by Tim Berners Lee.

A) FTP
B) Telnet
C) www
D) email

The ……. application is built with a protocol interpreter, a data transfer, process and user interface.

A) TCP
B) FTP
C) Telnet
D) Chat

Glossary Questions

ARPANET used the concept of packet switching network consisting of subnet and …… computers.
A) local
B) remote
C) **host**
D) network

Internet was possible because of the use of the TCP/IP reference model and …… protocol stack.
A) FTP
B) **TCP/IP**
C) DHCP
D) UDP

……. was created for organizing machines into domains and map hostname onto IP address.
A) Domain Addressing System
B) **Domain Naming System**
C) Host Naming System
D) Domain Mapping System

Sessional Papers

Printed page: 1 **Subject Code: KIT 501**

Roll No: | | | | | | | | | | | | | |

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: 5 (A+B) SESSIONAL EXAMINATION –I) (2021-2022)

Subject Name: Web Technologies

Time: 1.15Hours **Max. Marks: 30**

General Instructions:

- All questions are compulsory. Answers should be briefand to the point.
- This Question paper consists of 2 pages & 5 questions.
- It comprises of three Sections, A, B, and C. You have toattempt all the sections.
- **Section A** -Question No- 1 is objective type questions carrying 1 mark each, Question No- 2 is very short answer type carrying 2 mark each. You are expected to answer them as directed.
- **Section B** - Question No-3 is Short answer type questions carrying 5 marks each. You need to attempt any two out of three questions given.
- **Section C** -Question No. 4&5are Long answer type (within unit choice) questions carrying 6marks each. You need to attempt any one part a or b.
- Students are instructed to cross the blank sheets before handing over the answer sheet to the invigilator.
- No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.
- **Blooms Level:** *K1: Remember, K2: Understand, K3: Apply, K4: Analyze, K5: Evaluate, K6: Create*

Sessional Papers

	SECTION – A		**[8]**	**CO**	**Blooms level**
1.	**Attempt all parts**		**[4×1=4]**	**CO**	
	a.	Methods shows _____ a. Behaviour of Class b. Entity of Class c. Behaviour of an Object d. Behaviour of any Programs	**(1)**	**1**	**K1**
	b.	The variable is also known as class variable ————- a. Local b. Instance c. Static d. All of the above	**(1)**	**1**	**K1**
	c.	Which of the following is the main advantage of object-oriented programming? a. Higher level of abstraction b. Modularity c. Promoting reusability d. All of the above	**(1)**	**1**	**K1**
	d.	Which of the following describes the state of an object? a. Methods b. Data	**(1)**	**1**	**K1**

Sessional Papers

		c. Attributes d. None of the above			
2.	**Attempt all parts**		**[2×2=4]**	**CO**	
	a.	Why Java is called platform independent language.	**(2)**	**1**	**K1**
	b.	List various protocols that are governing web.	**(2)**	**1**	**K1**
		SECTION – B			
3.	**Answer any two of the following-**		**[2×5=10]**	**CO**	
	a.	Discuss the Method Overriding concept in JAVA. Give suitable example	**(5)**	**1**	**K2**
	b.	Write a program to implement interface that calculate the area of rectangle using abstract method declaration within interface	**(5)**	**1**	**K5**
	c.	Explain the process to create a package in JAVA? Give suitable example	**(5)**	**1**	**K4**
		SECTION – C			
4.	**Answer any one of the following-**		**[2×6=12]**	**CO**	
	a.	Explain the various types of Exception hierarchy in Java. Write a program to implement ArrayIndexOutOfBoundsException in Java.	**(6)**	**1**	**K5**

	b.	Write a program to implement interface that calculate the area of rectangle using abstract method declaration within interface	**(5)**	**1**	**K5**
	c.	Explain the process to create a package in JAVA? Give suitable example	**(5)**	**1**	**K4**
		SECTION – C			
4.	**Answer any one of the following-**		**[2×6=12]**	**CO**	
	a.	Explain the various types of Exception hierarchy in Java. Write a program to implement ArrayIndexOutOfBoundsException in Java.	**(6)**	**1**	**K5**
	b.	List various ways to create thread in Java? Write a program to generate even and odd thread by using these ways.	**(6)**	**2**	**K5**
5.	**Answer any one of the following-**		**[2×6=12]**	**CO**	
	a.	Design an interface inside the class and interface with suitable example	**(6)**	**2**	**K6**
	b.	Differentiate abstract class and interface with example.	**(6)**	**1**	**K4**

Old Question Paper

B.TECH.
(SEM VI) THEORY EXAMINATION 2018-19
WEB TECHNOLOGIES

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

(a) Explain the difference between Portal and Website. (Unit-1)
(b) Packages and Interfaces both acts as a container, How? (Unit-1)
(c) How XML is different from HTML? (Unit-2)
(d) What is the difference between and tag in HTML? (Unit-2)
(e) We want to submit the data on page itself, what can be done? (Unit- 4)
(f) What is the role of CGIs in web design? (Unit-3)
(g) Differentiate the terms SendRquest() from Hyperlink. (Unit-5)

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

(a) Why early planning is useful to develop an effective website? Give proper example in favor of your reason. (Unit-1)
(b) Describe the role and importance of CSS in web designing. Also Differentiate Class and Id in CSS. (Unit-2)

Old Question Paper(cont..)

example in favor of your reason. (Unit-1)

(b) Describe the role and importance of CSS in web designing. Also Differentiate Class and Id in CSS. (Unit-2)

(c) What do you mean by Session Bean? Explain its types using suitable example. (Unit- 4)

(d) Explain Request Dispatcher. Also Describe different ways to get the object of request dispatcher. (Unit-5)

(e) Explain the role of Java Script to develop a web page. Write a java script function to check a textbox is either empty or not. (Unit-3)

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) Describe the objective of any Website. Which type of essential skills required being a member of web project team? (Unit-1)

(b) Explain the difference between JSP includes directive elements & JSP includes action elements. (Unit-5)

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) What is Java Bean exactly? Write down the steps to create Java Bean. What is the role of introspection in Java Bean? (Unit-4)

(b) What do you mean by Database Drivers, explain each type? Also explain the steps to get any value into database. (Unit-4)

Old Question Paper(cont..)

Printed Pages: 02 **Sub Code: RIT601**

5. Attempt any *one* part of the following: **7 x 1 = 7**

(a) "Document Type Definition (DTD) in XML is necessary", justify the statement with suitable example. Under which conditions which DTD is more preferable? (Unit-2)

(b) Using a frameset, create an HTML document like following:-

Header.html	
Menu.html	**Output.html**

Also host it as a web page on any server. (Unit-2)

6. Attempt any *one* part of the following: **7 x 1 = 7**

(a) JSP is an extension of Servlets not replacement, Justify? What problems of Servlets technology can JSP is suppose to solve? (Unit-5)

(b) How we deploy the Servlets on Tomcat Web Container? Also explain how we change the default port number of Tomcat Container? (Unit-5)

7. Attempt any *one* part of the following: **7 x 1 = 7**

(a) Can we do session handling in HTML Page with the help of JavaScript? If yes then how or If not then why? (Unit-3)

(b) Explain the following terms in Brief:-
- (i) Scoket Programming
- (ii) TCP/IP Server

Expected Questions for University Exam

- Discuss the various protocols in details that are governing web
- Explain various types of tools available to design a website
- Discuss the process involve in web hosting with help of example
- Explain the various types server involve in client/server model
- Elaborate the complete process for creating Emails in Cpanel.
- Discuss various types of hosting packages for registering domains

References

- Burdman, Jessica, “Collaborative Web Development” Addison Wesley
- Xavier, C, “ Web Technology and Design” , New Age International
- Ivan Bayross,” HTML, DHTML, Java Script, Perl & CGI”, BPB Publication

Recap of Unit 1

- Discussed about the history of web development strategies and protocols governing web with various types of internet services and tools.
- Discussed about various types server with the help of client server computing concepts.
- Discussed the various type of hosting packages
- Discussed about various protocols governing web

Thank You

Recap of Unit 1