Bachelor Of Engineering
In
Information Technology

Semester Six, Third Year(Even semester)
21th March 2022
Offline 1st Lecture

Padre Conceicao College of Engineering

Verna Goa 403722 India

Web Technology

RC 2019-20

Unit 1

UNIT 1

Topic	Subtopics
Introduction to Web	Web Architecture, Web Applications¸ Web servers, Web Browsers, Overview of HTTP
HTML	Elements, Attributes, Tags, Forms, Frames, Tables, Overview and features of HTML5
Cascading Style Sheets	Need for CSS, basic syntax and structure of CSS, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, Overview and features of CSS3.
XML	Introduction to XML, uses of XML, XML key components, DTD and Schemas, Transforming XML using XSL and XSL

UNIT 1

Sr.No	Title
1	Web Architecture
2	Web Applications
3	Web servers
4	Web Browsers
5	Overview of HTTP

Web Architecture

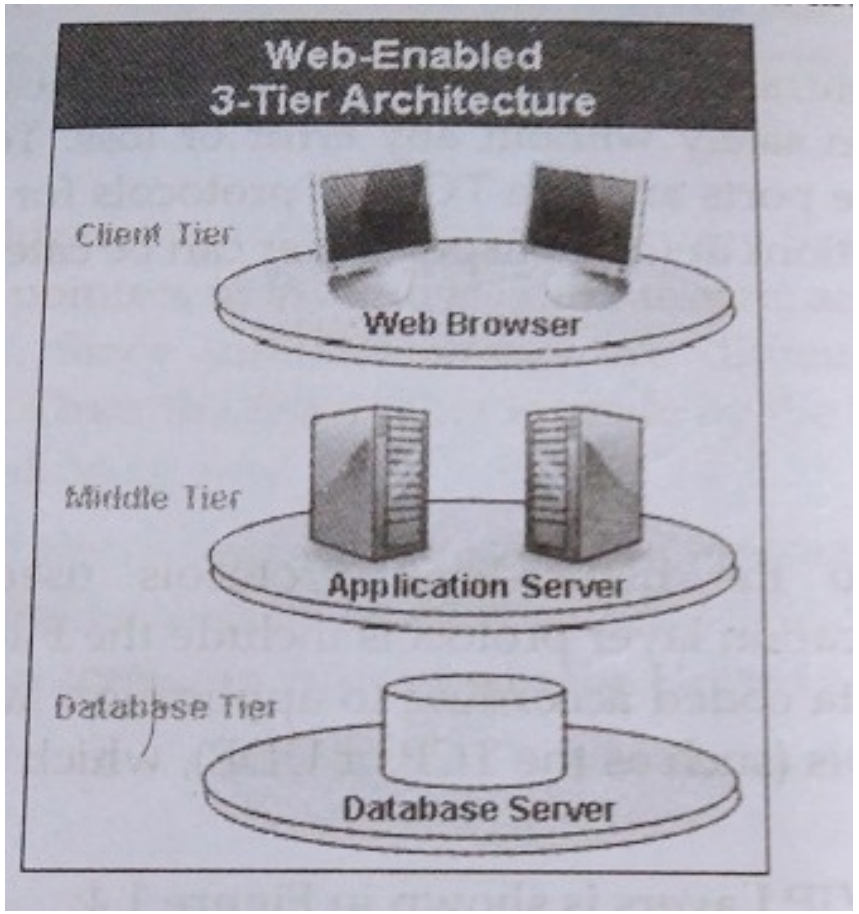
- The Internet is a worldwide network of computers all attached in a global networking scheme. This scheme known as TCP/IP ,assigns and uses unique address to communicate between computers on the Internet.
- The world Wide Web is a network of computers that, using the Internet ,are able to exchange text, graphics, and even multimedia content using standard protocols.
- Web clients-which are generally personal computers but can also be dedicated terminals, mobile devices, and many more-access the server’s content via a browser.

3-Tier Web Architecture

- Three-tiered application is a client-server architecture in which the user interface, functional process logic, computer data storage and data access are developed and maintained as independent modules on separate platforms. The 3-Tier Architecture has the following three tiers:

1. Presentation Tier-Displays information related to services, as browsing , and information on various products to the user for online shopping. It communicates with other tiers by outputting results to the browser/client tier and all other tiers in the network.
2. Application Tier-Controls an application’s functionality by performing detailed processing.
3. Data Tier-Consists of database servers. Here information is stored and retrieved.

The Three-Tier Architecture



Web Applications

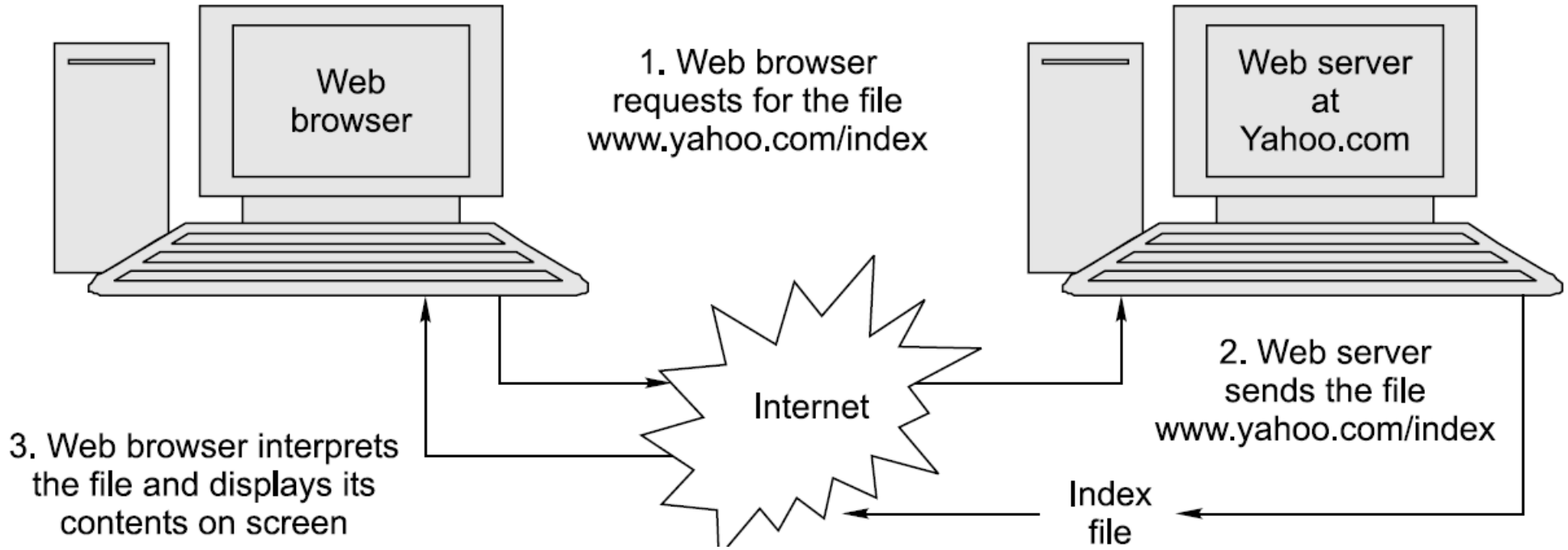
- A **web application** (or web app) is application software that runs on a web server.

Web servers

- A web Server is a program running on a server computer. It consists of the Website containing a number of Web pages. A web page is a special type of computer file written in a specially designed language called HTML.(Hyper Text Markup Language)Each web page can contain text, graphics, sound, video and animation that people want to see or hear.
- The web server constantly and passively waits for a request for a web page from a browser program running on the client and when any such request is received, it locates that corresponding page and sends it to the requesting client computer.

- To do this ,every Website has a server process(a running instance of a program) that listens to TCP connection requests coming from different clients all the time. After a TCP connection is established, the client sends one request and the server sends one response. Then the server releases the connection. This request-response model is governed by a protocol called HTTP. (Hyper Text Transfer Protocol)
- For instance , HTTP software on the client prepares the request for a web page , whereas the HTTP software on the server interprets such a request and prepares a response to be sent back to the client. Thus both client and server computers need to have HTTP software running on them.
- HTML is a special language in which the web pages are written and stored on the server.
- HTTP is a protocol, which governs the dialog between the client and server.

Interaction between a Web browser and a Web Server



Web Browsers

Why are Web browsers needed?

- To access the World Wide Web, we must have a Web browsers.

What is a browser?

A browser is a software, which allows users to access and navigate the World Wide Web.

What are the different types of browsers?

1.Graphical 2.Text

Graphical browsers

- Graphical browsers are the browsers that contain text , images,audio, and video. These elements are retrievable through a graphical software program such as Internet Explorer, Firefox, Netscape and Opera. These browsers are available for Windows, Apple,Linux and other operating systems. Navigation is accomplished by pointing and clicking with a mouse on highlighted words and graphics. You can install a graphical browser on your computer. Also, these browsers get automatically installed at the time of operating system installation.
- For example, Internet Explorer is a part of the Windows operating system, and is also available on the Microsoft site. Firefox is available for downloading from the Mozilla site and Safari is available from the apple website.

Graphical browsers examples

Mozilla FireFox 96

Netscape Navigator

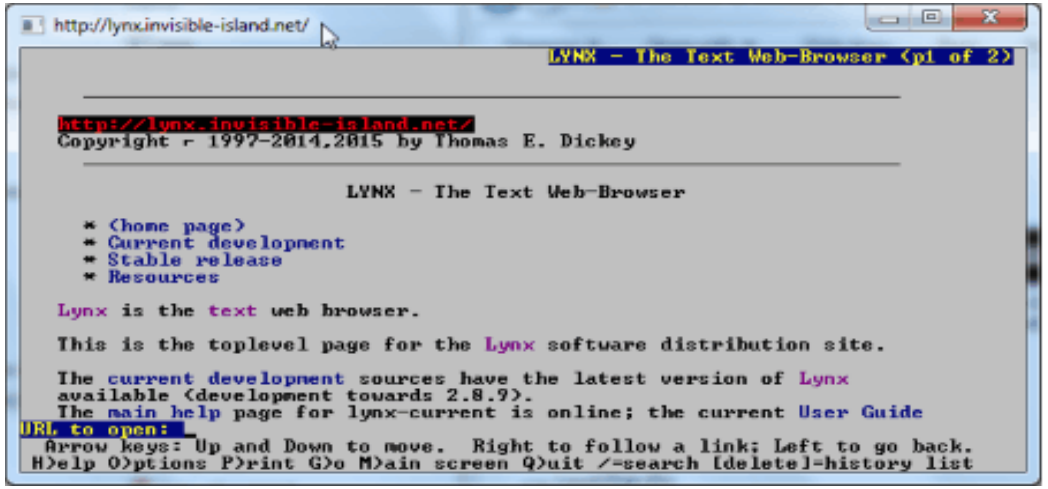
Opera

Text browsers

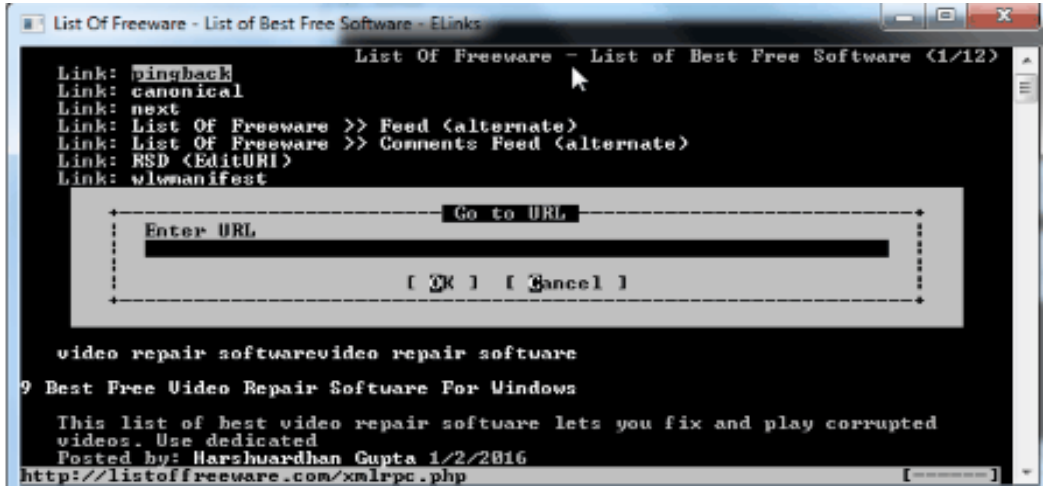
- Lynx is a browser that provides access to the Web in Text-only mode.
- Navigation is accomplished by highlighting emphasized words in the screen with the arrow up and down keys, and then pressing the forward arrow (or Enter) key to follow the link.

Text browsers examples

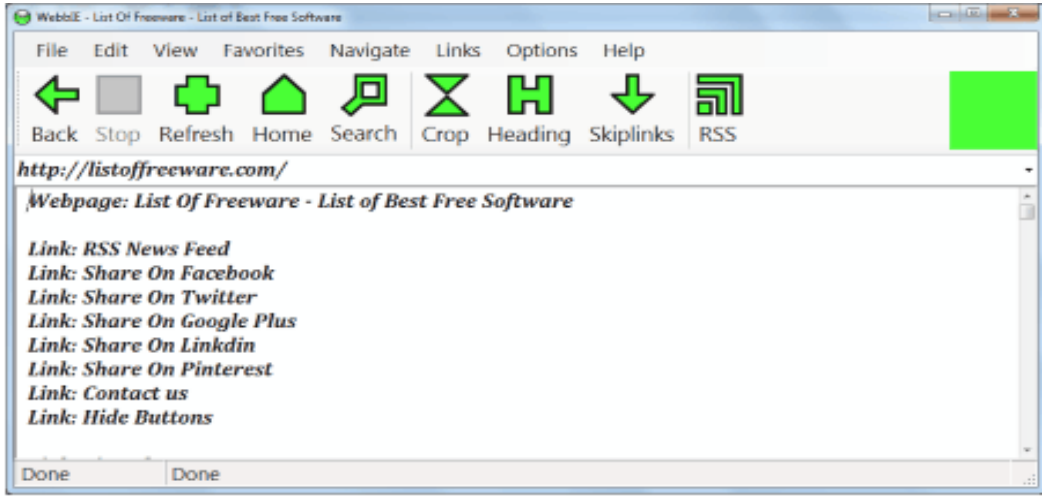
lynx



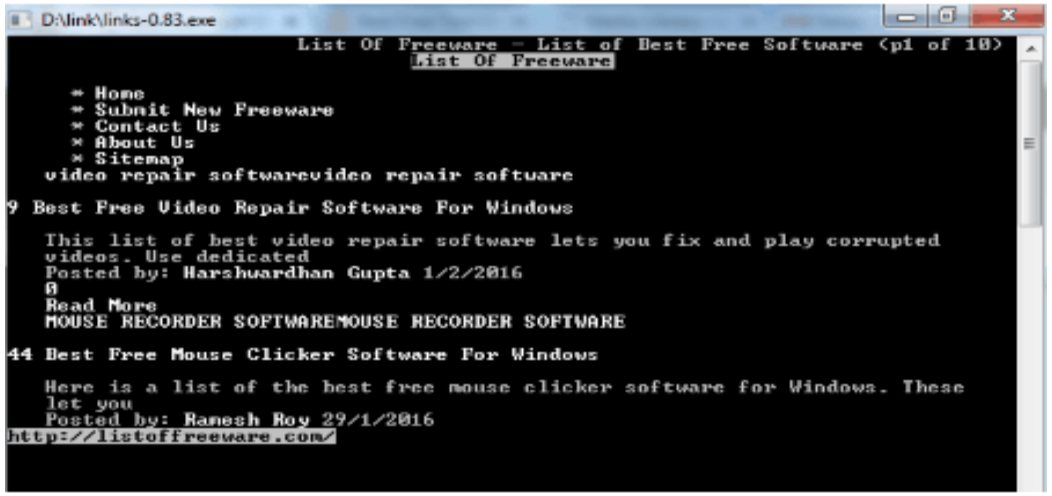
Elinks



WebIE



links

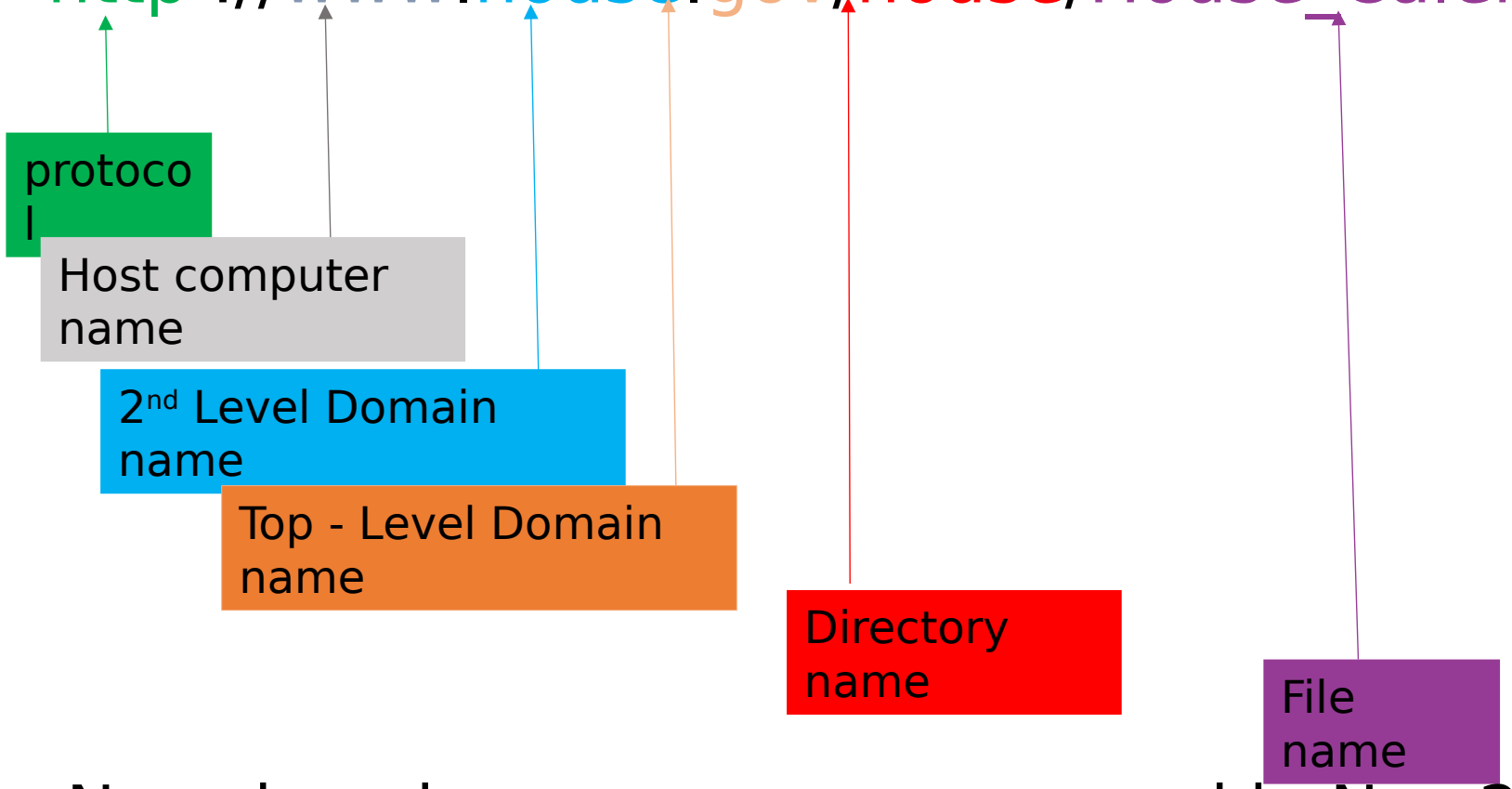


Retrieving Documents on the Web : The URL and Domain Name System

- URL=Uniform Resource Locator
- The URL specifies the Internet address of a stored file on a host computer connected through the Internet. Every file on the internet has a unique URL, no matter what is its access procedure. Web browsers use the URL to retrieve the file from the host computer and the specific directory in which it resides. This file is downloaded to the user’s client computer and displayed on the monitor connected to the machine.
- URLs are translated into numeric addresses using the Domain Name System(DNS). The DNS is a worldwide system of servers that stores location pointers to Wed sites. The numeric address, called the IP(Internet Protocol) address , is actually the “real” URL. Since numeric strings are difficult for humans to use, alphanumeric addresses are employed by end users. Once the translation is made by the DNS , the browser can contact the Web server and ask for a specific file located on its site.

- For example, this is a URL on the Web site of the U.S . House of Representatives

http ://www.house.gov/house/House_Calendar.shtml



- New domain names were approved in Nov 2000 by Internet Corporation for Assigned Names and Numbers (ICANN)

TLDs(Top-level Domains)

TLD	use
.com	Used for commercial entities. It is most popular top-level domain
.edu	Four-year , accredited colleges and universities.
.net	used for networking organizations such as Internet Service Providers & backbone providers.
.org	Designed for miscellaneous organizations ,including non-profit groups.
.biz	for registration of domains to be used by businesses
.museum	used exclusively by musems, museum associations &individual members of museum profession
.info	Is a generic TLD
.pro	For professionals
.name	For individuals
.aero	For aerospace industry
.mobi	For sites designed for mobile devices
.jobs	For human resources community
.gov	Government
.int	International organization

Country Domain List

2 letter Internet country code	Country
in	India
ch	China
de	Germany
jp	Japan
uk	United Kingdom
ca	Canada
br	Brazil
eg	Egypt
il	israel
it	italy
kw	kuwait

Overview of HTTP

- HTTP=Hypertext Transfer Protocol
- The web operates by sending data using specific protocols. The main protocol used for the Web is HTTP.HTTP defines how the computers on the Web, specially the server and client, exchange data.
- Consider a situation ,when you browse the web you actually sit at your computer and want to see a document commonly known as Web page on the Web. For browsing the web you use URLs . Since the document you are browsing resides somewhere else in the world, probably very far away from you. The browser cannot read the document directly from the disk where it is stored, if that disk is on another continent. To be able to read the document from such a long distance you need a web server.

Overview of HTTP

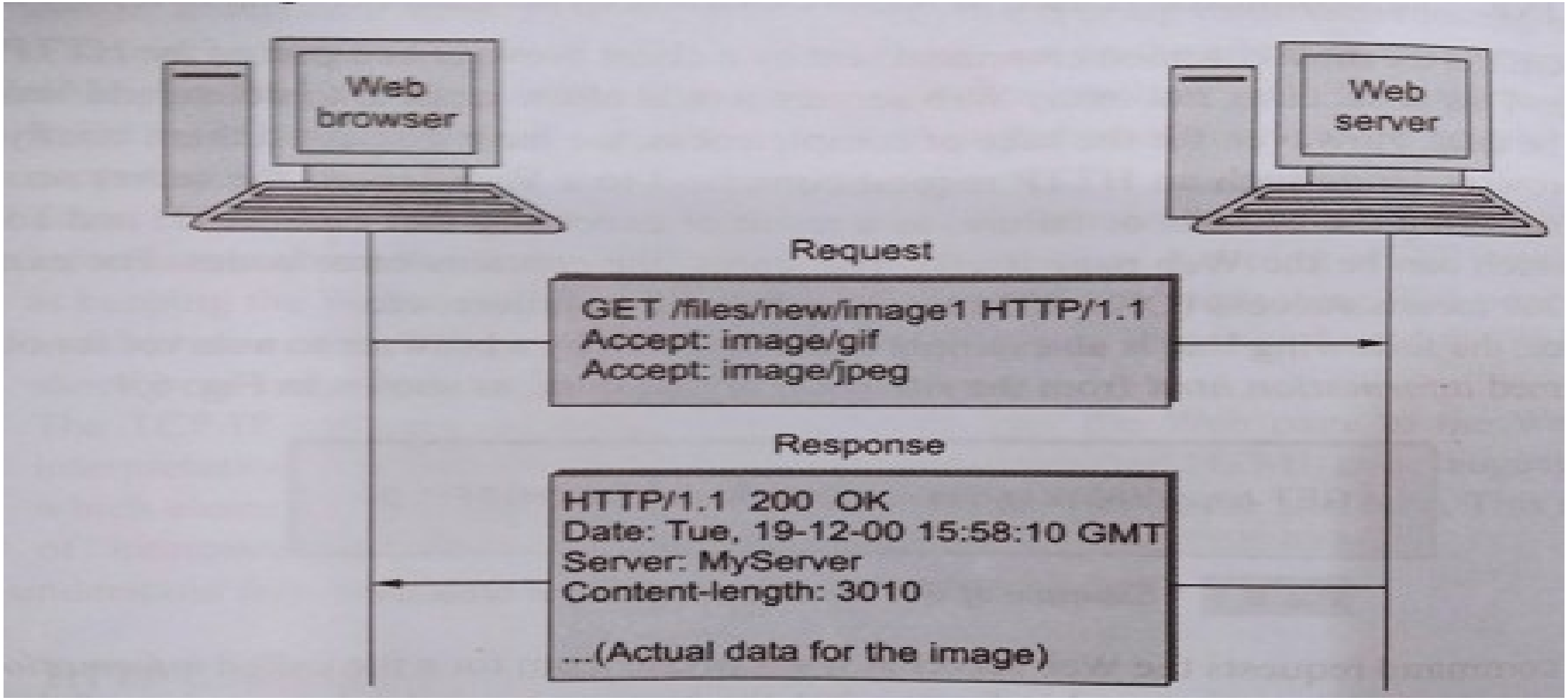
- A web server is a kind of computer program running on a server computer that listens for the request from Web browsers and then executes them accordingly.
- Next, the browser then contacts the server and requests the server to deliver the document to it. The delivery contains the server response in the form of document and the Web browser at the user’s end displays the document happily. The server also tells the browser about the kind of document ,whether this is HTML file, PDF file, ZIP file etc. The browser then shows the document with the program it was configured. These request and response procedure are issued in a special language called HTTP. The HTTP defines how the browser and the web server can communicate to each other. The actual working of moving bits and bytes back and forth across the network is done through TCP and IP. Much like other protocols, an HTTP conversation consists of a handful of commands from the client and a stream of data from the server.

HTTP request and Response

- Example of HTTP request and Response. The browser(client) retrieves a HTML document from the Web server . We shall assume that the TCP connection between the client and server is already established.
- As shown in the figure, the client sends a GET command to retrieve an image with the path /files/new/image1
- The name of the file is image1,and it is stored in the files/new directory of the Web Server.
- In response ,the Web server sends an appropriate return code of 200, which means that the request was successfully processed , and also the image data, as requested.

- The browser sends a request with the GET command. It also sends two more parameters by using two Accept commands.
- These parameters specify that the browser is capable of handling images in the GIF and JPEG format. Therefore ,the server should send the image file only if it is in one of these formats.
- In response, the server sends a return code of 200 (OK).It also sends the information about the date and time when this response was sent back to the browser.
- The server’s name is the same as the domain name. The server indicates that it is sending 3010 bytes of data (i.e., the image file is made up of bits equivalent to 3010 bytes. This is followed by the actual data of the image file)

Sample HTTP request and response interaction between a Web Browser and a Web Server



Assignment 1

- Q1a) Draw a neat diagram and Elaborate on Three-Tier Architecture (5 marks)

- *Assignment Announced to students : AA :21st March 2022*
- *Assignment to be Submitted by students : AS: 30th March 2022*