SUBJECT: WEB TECHNOLOGY
Subject Code - 2160708
6th Semester Computer Engineering
Faculty: Chhaya Patel

Unit 1 : Introduction of Web Technology

References:

Book: Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
https://www.youtube.com/watch?v=JsbxB2l7QGY

- **Describe WWW or Web.**
  - The **World Wide Web** (abbreviated **WWW** or **the Web**) is collection of electronic resources.
  - **WWW contains huge amount of documents, images, and other resources which can be accessed using hyperlinks.**
  - Web resources are identified by Uniform Resource Locators (URLs).
  - English scientist Tim Berners-Lee invented the World Wide Web in 1989.
  - He is the father of web environment.
- **Describe W3C.**
  - **W3C stands for World Wide Web Consortium** which is an international consortium of companies involved with the Internet and the Web.

- The W3C was founded in 1994 by **Tim Berners-Lee**, the original architect of the World Wide Web.
- Nearby 400+ members available in W3C, a few well known members are Microsoft, Face book, IBM, Apple, Sun Microsoft, etc…
- Main duty of W3C is to mention web standards.

➢ **Describe Network.**

- Network is collection of computers interconnected together to exchange resources each other.
- First network in web environment is ARPANET.
- The **Advanced Research Projects Agency Network** (**ARPANET**) is first network developed between two computers.
- In this network FTP (File Transfer Protocol) protocol is used.

➢ **Describe Internet.**

- It is called international network.
- It was developed by **vint cerf** American computer scientist. He is the father of internet.
- Internet is collection of TCP by IT communication protocols.
- TCP (Transmission control protocol) representing connectivity between computers in N/W.
- IP (Internet Protocol) representing connectivity between N/W.
- **Collection of TCP by IP communications protocols is called INTERNET.**

➢ **Describe Emails.**

- Email means Electronic Mail services.
- **Email first time implemented by an American jack smith.**
- Then after first **web mail** developed by an Indian **sabeer Bhatia** called hotmail.com.
- It is completely working based on SMTP and MIME.

- SMTP (Simple Mail Transfer Protocol) is taking care of delivering mail between different domains.
- MIME (Multipurpose Internet Mail Extension) is taking care of transferring different kind of data through email services.

➢ **Describe FTP.**

- FTP means File Transfer Program/Protocol.
- Later Program is converted into Protocol because every protocol is type of program.
- It is kind of services to transfer files between intra/internet connected computers.

➢ **Describe Telnet.**

- Telnet means Telecommunication network or Telephone network.
- It is used to connect computers.
- It is client server communication.
- Client means local host and server means remote host.
- We are connecting to remote host with the help of local host, the helper is called Telnet.

➢ **Describe HTTP/HTTPS.**

- HTTP means Hyper Text Transfer Protocol.
- It is taking request and giving response.
- HTTPs: s means SSL – Secure Socket Layer.
- Both HTTP and HTTPs are doing same duty but HTTPs is converting every request into encrypted format or secured format or cipher text format.

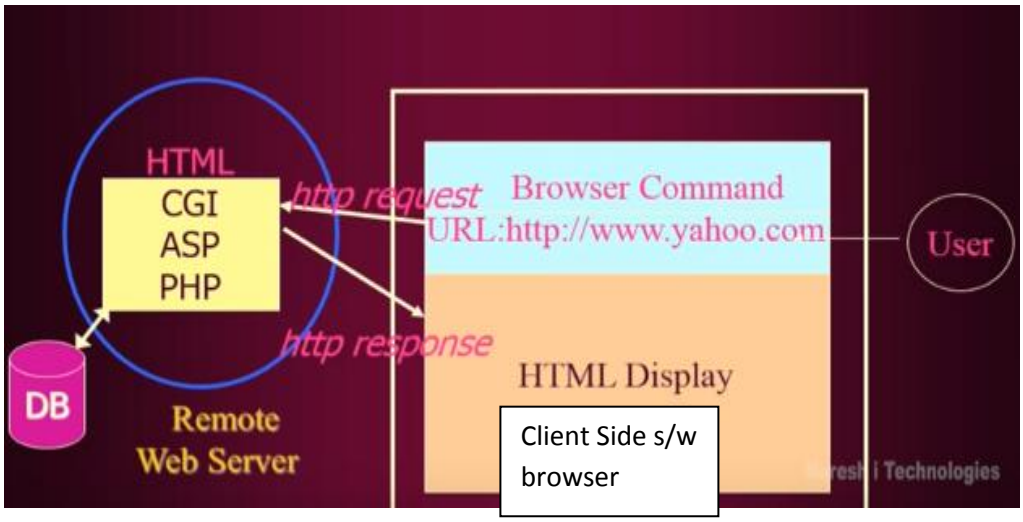
➢ **Describe Blog.**

- Blog is nothing but web page or web site with daily updates.
- Every updated information display first.

- It use reverse chronological order means latest update first display and first updated last display.

- **Describe Forum.**
  - Forum is online discussion website.
  - It is message board, group of people holding their messages and conversion.
- **Describe Add-ons.**
  - Add-ons are additional features to the web browsers.
  - Best example of add-ons is any toolbar like Google toolbar, eBay toolbar, games toolbar.
- **Describe Plug-in.**
  - It is kind of additional software to the web browser.
  - Best example of plug-in is flash player, adobe PDF reader.
- **Describe Web page.**
  - Web page is developed in HTML and open using web browser.
  - Web pages classified in two categories.
    1. Static page: Page where user not able to interact directly with web pages. It is developed using HTML and CSS.
    2. Page where user able to interact directly with web pages. It is developed using HTML, CSS and JAVASCRIPT.
- **Describe Website.**
  - Collection of web pages is called website.
  - Web pages classified in two categories.
    1. Static website: Website developed only on client side technology.
    2. Dynamic website: Website developed on client side technology as well as server side technology.
- **Describe Browser.**
  - It is client side light weight software. For example internet explorer, Firefox, Google Crome, Safari, Opera etc…

- It takes http request from client to server; it renders http response from server to client.



- Once you enter any URL in browser, immediately request is come from client to server is called http request.
- Server level technologies (like ASP, PHP, CGI, JSP etc...) taking care of request and checking request is really available or not with concern database.
- In both cases request available or not available we will get response.
- If request is available browser will get response in terms of HTML pages.
- If request is not available we will get appropriate error message.
- This is called three tier architecture with presentation layer, business logic layer and data access layer.
- All client level technologies like HTML, HTML5, CSS, CSS3, JAVASCRIPT, Bootstrap, J Query, and Angular JS are come under presentation layer.
- All server level technologies like .NET, JAVA, PHP, CGI and JSP are come under business layer.
- Storage technologies like MySQL, SQL Server, Oracle or DB2 are come under data access layer.
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➢ **Describe HTTP Protocol.**

- HTTP protocol used for communication between the Browser and the Web server.
- HTTP defines how messages are formatted and transmitted, and what action web servers and browsers should take in response to various commands.

- For example, when the user enters a URL in a browser, the browser actually sends and HTTP command to the web server directing it to fetch and transmit the requested web page.
- There are 4 major components of HTTP.
    1. **HTTP request message structure**
        - The format of HTTP request is :

          Start line/Request line
          Header field
          <CR><LF> or blank line
          Message body

          <u>Start line/Request line</u> (e.g., GET /images/logo.png HTTP/1.1, which requests a resource called /images/logo.png from the server).

          Start line consist of three parts separated by single space.

          1. Request method (GET method)

          GET method is used when you type URL in address bar, when you click on some hyperlink, when browser downloads images to display within HTML document.

          2. Request URI

          The Request-URI is a Uniform Resource Identifier that identifies the resource upon which to apply the request.

          The type of URI currently used on the Web is the Uniform Resource Locator (URL).

          3. HTTP Version

          The HTTP-Version element tells the server what version the client is using so the server knows how to interpret the request.

          Example: GET /images/logo.png HTTP/1.1

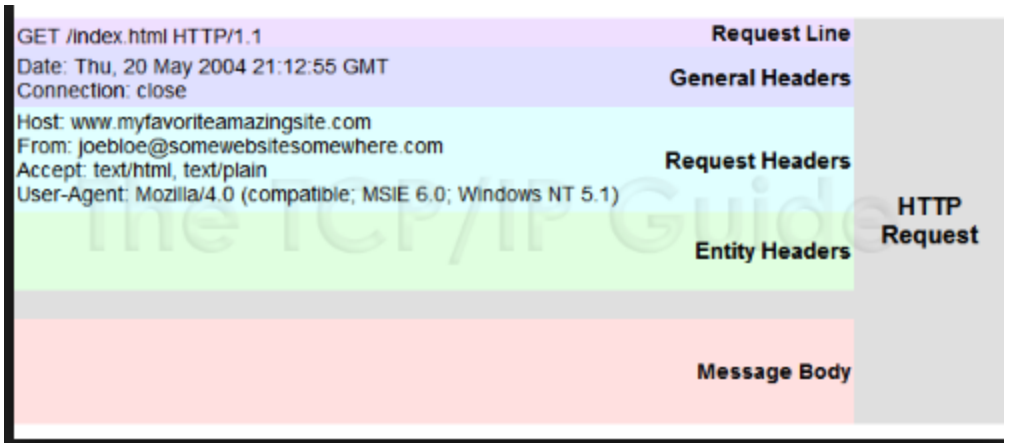
          <u>Header field</u>

In this request header details are provided to the server about the request.

<CR><LF> or Blank line (carriage return character followed by a line feed character) used to separate header and message body.

Message body (An optional)

Example



2. **HTTP response message structure**
   - The format of HTTP response is :

Status line/Response line
Header field
<CR><LF> or blank line
Message body

Status line/Response line

It consists of the HTTP protocol version followed by a numeric status code and its associated phrase.

Example

HTTP/1.1 200 OK

3. HTTP methods

- The method defines connection between web browser and server.
- It is always written in UPPER case letters.
- The primary method in HTTP is GET method.
- GET method is used when you type URL in address bar, when you click on some hyperlink, when browser downloads images to display within HTML document.
- Another method is POST method, POST method is used to send information collected from user form.

HTTP Method	Description
GET	The GET method is used to retrieve information from the given server using a given URI and it assumed to be safe, repeatable operation by browser.
POST	The POST method is used when you want to send some data to the server, for example, file update, form data, etc.
HEAD	The HEAD method is functionally similar to GET, except that the server replies with a response line and headers, but no entity-body.

4. HTTP status codes

- Status codes are issued by a server in response to a browser's request.

- The Internet Assigned Numbers Authority (IANA) maintains the official registry of HTTP status codes
- There is different status codes used for response.
    1. 1XX informational response
    2. 2XX Success
    3. 3XX Redirection
    4. 4XX client errors
    5. 5XX server errors etc…

Different status code and associated phrase.

Status Code	Phrase	Description
200	OK	Standard response for successful HTTP requests
201	Created	request has been fulfilled, resulting in the creation of a new resource
202	Accepted	The request has been accepted for processing, but the processing has not been completed.
400	Bad Request	The server cannot or will not process the request due to an apparent client error
403	Forbidden	The request was valid, but the server is refusing action.

- **Describe HTTP Headers.**

- **There are 4 types of header used in HTTP.**
- **General header:** Headers applying to both requests and responses but with no relation to the data eventually transmitted in the body.
- **Request header:** Headers containing more information about the resource to be fetched or about the client itself.
- **Response header:** Headers with additional information about the response, like its location or about the server itself (name and version etc.).
- **Entity header:** Headers containing more information about the body of the entity, like its content length or its MIME-type.

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