

Thursday

7/10/24

Web Engineering

⇒ Socket (port): Sockets are ports or very low level software constructs that allow computers to communicate with each other. When we send information from one computer system to another, we send it to a port on receiving computer. If that port is available on the receiving computer, it will receive the information, otherwise it can not identify that information.

For example; ~~some common ports~~

Common Ports	Application
80	Web Pages
25 & 110	Email services
23	Tel-net
above 1024	other types that aren't defined

On order to make sense of the information, the receiving computer must know what protocol is being used.

⇒ Protocols:- Protocols are a set of rules used by computer systems to communicate each other. In order to communicate with each other, the computer systems must agree on a set of rules for
(i) who says what
(ii) when they say it
(iii) in which format they say it

These rules are called protocols. Some common protocols are (i) HTTP: used for web pages
(ii) FTP: used for file transfer

MONDAY
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WEB ENGINEERING

- Nature of Web Applications
- Building Web Applications
 - Hardware platforms
 - Software platforms (Schema, Business rule logic & interactive logic)

Lecture #7

- Front-End Development
- Back-End Development
- Full Stack Developer

- HTML (Hyper-Text Markup language) (Basic overview)
- CSS (Cascading Style Sheets) (II II)
- JavaScript
- PHP
- MySQL

29TH OCT

GRAPH THEORY

LECTURE READ

Monday

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Web Engineering

→ HTTP (Hyper Text Transfer Protocol) :-

(Hyper Text Transfer Protocol) is a network protocol used to access web pages on the internet. It is an application level protocol for distributed, collaborative & hyper media information system. There are two versions of HTTP;

- 1) HTTP/1.0
- 2) HTTP/1.1

→ HTTP/1.0 :-

It is ~~connectionless~~ message passing protocol. For each request, we require a new connection.

→ HTTP/1.1 :-

It is connection-oriented message passing mechanism in which once a client & server are connected, there will remain connected until told to close it or timed out.

Tuesday

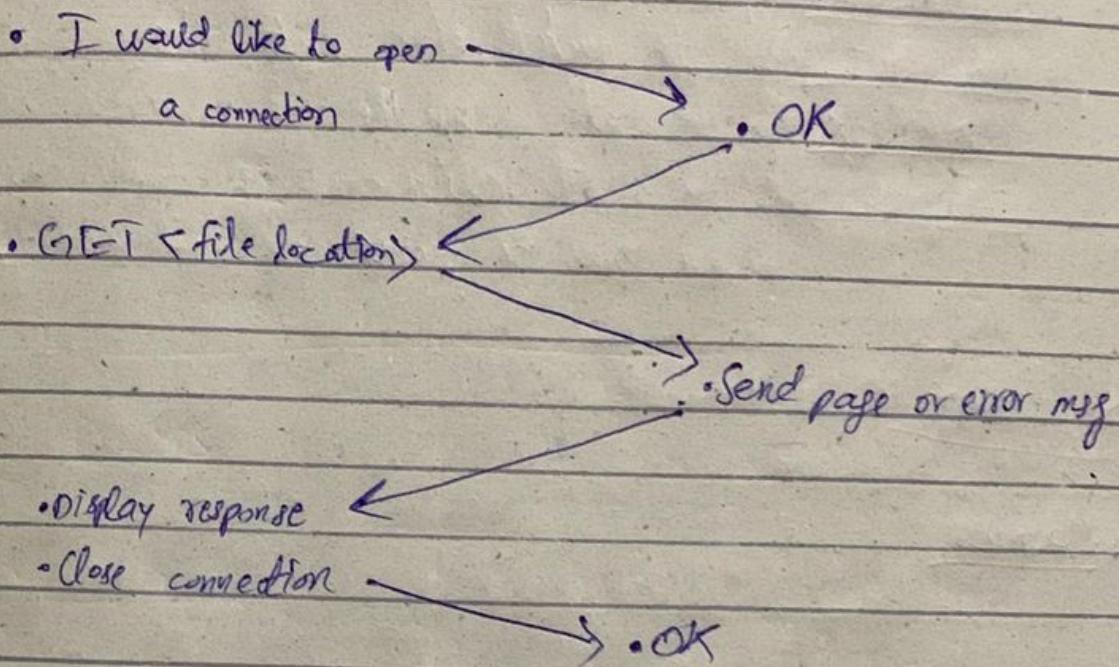
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WEB ENGINEERING

→ An HTTP Conversation

Client

Server



→ An HTTP Example

Network Protocols

→ HTTP is an application layer protocol.

Web browsers are used as front end. Web technology is used for communication and HTTP protocol is used as the communication protocol

(ii) Data Mining: Set of activities used to find new, hidden or unexpected patterns in data within a data warehouse.

(c) Web Applications:

Client/server applications accessed with a web browser over a network is called web applications. Web applications are considered better than desktop applications based on the following points:

- (i) web applications are platform independent applications.
- (ii) Web applications have the ability to update and maintain without disturbing client computers.

→ Web Application Architecture

The architecture for web application is composed of the following layers:

- (i) Web Browser Layer: It allows users to navigate through web pages on the internet.
- (ii) Web Server Layer: It responds to requests submitted by the web browser.
- (iii) Application Server (Layer): It is used for data processing.
- (iv) Business logic layer: It is used to implement business rules.
- (v) Database Server Layer: It is used to store and manage data.

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→ Commonly Used Web Application Architectures

- (a) Client/Server Applications: It provides a flexible and scalable structure that uses the advantage of personal computer processing power & utilize the capacity & power of dedicated server.

The typical client/server architecture is made up of:

~~server, client~~

- (i) servers : Providing services to clients
- (ii) Client : Requesting services from server
- (iii) Business Logic : Implementing business rules

(b) Data Warehouse Applications

These applications are used to support decision-making in executive management. The data warehouse is accessed by software application called "online analytical processing (OLAP)".

The OLAP applications retrieve data and generate reports with the capabilities of "data mining". These applications are further divided into two sub-components.

- (i) Data Warehouse : A collection of many types of data taken from a number of different databases that support various corporate departments.

N-Tier Architecture

Significance of tier

- Three components
- 2 types of layers
- Client

N-Tier (Multi-tier) Architecture

- 1-Tier Architecture
- 2-Tier Architecture
- Client/Server 2-Tier Architecture

↳ Pros & Cons

- 3-Tier Architecture

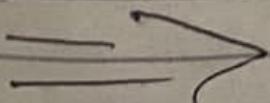
- Presentation Layer
- Logic Layer
- Data Layer

- 3-Tier client/server Architecture

↳ Pros & Cons

Q) Which tier to use in a real-life scenario?

→ Middleware



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WEB ENGINEERING

What is HTML

↳ HTML Tags

↳ <!DOCTYPE> Declaration

↳ Headings `<h1>...<h6>`

↳ Paragraph `<p>`

↳ Link `...`

↳ Image ``

↳ src, alt, height, width

↳ Button `<button></button>`

↳ Lists

↳ ``

↳ ``

↳ `...`

```
<!DOCTYPE html>
<html>
  <head>
    <title>Task</title>
  </head>
```

• <body>

 <button>Home</button>

 <h1>Hazara University</h1>

Simple Mail
Transfer Protocol

(iii) SMTP; used for email

A network protocol is a set of rules used for conversation b/w a client & a server.

=> TCP/IP is a common protocol used for network communication. TCP/IP stands for transfer control protocol/internet protocol. TCP/IP is a combination of two sub-protocols i.e. TCP and IP. The internet & most of the computer networks are connected through TCP/IP networks.

(i) IP: IP is used to move data in the form of packets or chunks from one place to another. The places on the network are specified by IP addresses.

IP Address is four single byte-number separated by dots.

For example, 172.67.222.204 is the IP address of server with hostname www.hrc.edu.pk

(ii) TCP, TCP ensures that all packets are present at receiving node and are present in proper order.

TCP/IP forms a wrapper around any kind of data. The data uses its own protocol for identification.

Domain Name
server

⇒ Hostname \rightarrow DNS server The real name of computer system on the Internet is its four byte IP address. However, it is difficult to remember numbers so we use hostnames.

→ A hostname is a descriptive name of ~~the~~ computer system connected to the internet.

For example, www.hv-edu-pk is the hostname of computer system with IP address 172.67.222.204

→ At DNS (Domain name server) is a computer system that translates hostnames into IP addresses. It is a machine that keeps a record in the form of table of hostnames and their corresponding IP addresses.

⇒ DHCP (Dynamic Host Configuration Protocol) → DHCP is a way of assigning temporary IP addresses as needed. If we have a website, it must be hosted on a computer system that permanently resides on the Internet. This computer must have a permanent IP address. There are not enough IP addresses for the 10s of devices connected to the internet. Therefore, if we do not have a permanent website, we can be assigned a temporary IP address (dynamically allocated) each time ~~we connect~~ we connect to the internet.

Similarly, if we have a network, only one computer gets a permanent IP address, the rest of the computers can be assigned internal IP addresses which are not visible from the outside. This mechanism is called ~~DHCP~~.

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~~HTTP - SD~~

URL (Uniform Resource Locator):

A

The URL (Uniform Resource Locator) defines a location on the web. It is up to five parts. For example "http://www.xyz.com:80/ad/index.html #specials".

Protocol \Rightarrow HTTP (used for web pages)

Hostname \Rightarrow www.xyz.com

Port \Rightarrow 80 (default for http requests)

Path to specific webpage \Rightarrow index.html

Anchor \Rightarrow #specials (a location within a webpage)

World Wide Web (WWW):

The world wide web (WWW) is the world's largest client-server platform. In WWW, communication occurs through message passing with following steps:

(i) Within web browser, we select a URL of the desired web page.

(ii) Web browser sends request for web pages to server.

(iii) Server responds with two types of information ~~that~~ i.e. page type and content of the page.

(iv) A browser uses type information to correctly display the content of web page.