**Assignment ( Introduction )**

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**TCP/IP**

Definition: TCP/IP stands for Transmission Control Protocol/Internet Protocol and is a suite of communication protocols used to interconnect network devices on the internet.

TCP/IP specifies how data is exchanged over the internet by providing end-to-end communications that identify how it should be broken into packets, addressed, transmitted, routed and received at the destination.

TCP/IP requires little central management and is designed to make networks reliable with the ability to recover automatically from the failure of any device on the network.

The TCP/IP protocol consists of four layers such as link layer, network layer, transport layer, and application layer. Each layer adds addresses to the protocol stack as a physical address, logical address, port address, and application-specific address.

**TCP**

TCP defines how applications can create channels of communication across a network. It also manages how a message is assembled into smaller packets before they are then transmitted over the internet and reassembled in the right order at the destination address.

**UDP**

User Datagram Protocol (UDP) is a Transport Layer protocol. UDP is a part of the Internet Protocol suite, referred to as UDP/IP suite. Unlike TCP, it is an unreliable and connectionless protocol. So, there is no need to establish a connection prior to data transfer.

Though Transmission Control Protocol (TCP) is the dominant transport layer protocol used with most of the Internet services; provides assured delivery, reliability, and much more but all these services cost us additional overhead and latency. Here, UDP comes into the picture. For real-time services like computer gaming, voice or video communication, live conferences; we need UDP. Since high performance is needed, UDP permits packets to be dropped instead of processing delayed packets. There is no error checking in UDP, so it also saves bandwidth.

User Datagram Protocol (UDP) is more efficient in terms of both latency and bandwidth.

**HTTP**

Definition: HTTP stands for Hyper Text Transfer Protocol. For fetching resources such as HTML documents. This is a basis for data communication in the internet. The data communication starts with a request sent from a client and ends with the response received from a web server.

* A website URL starting with “http://” is entered in a web browser from a computer (client). The browser can be a Chrome, Firefox, Edge, Safari, Opera or anything else.
* Browser sends a request sent to the web server that hosts the website.
* The web server then returns a response as a HTML page or any other document format to the browser.
* Browser displays the response from the server to the user.

**The Components of HTTP or Structure of HTTP**

* **HTTP Request Structure from Client**
* A request line to get a required resource have a 3 VERB – URI – VERSION

VERB is a type of request like GET or POST – URI is a URL – VERSION is a version of request like V1.0 | V1.1.

* Request Header contain more information about the resource to be fetched, or about the client requesting the resource.
* Request Message |Request Body that contain the data that have been added by request
* **HTTP Response Structure from Web Server**
* Response Status Code like 404 or 200 or 500 or something status code else and HTTP VERSION.
* Response Header is an HTTP header that can be used in an HTTP response and that doesn't relate to the content of the message. Response headers, like Age, Location or Server are used to give a more detailed context of the response.
* Response Message | Response Body that contain the answer message from server In response to the sent from client