



# **KIET Group Of Institutions**

## **TCP/IP Model (CN Unit 1)**

**Students will learn about the following:**

- ❖ TCP/IP model

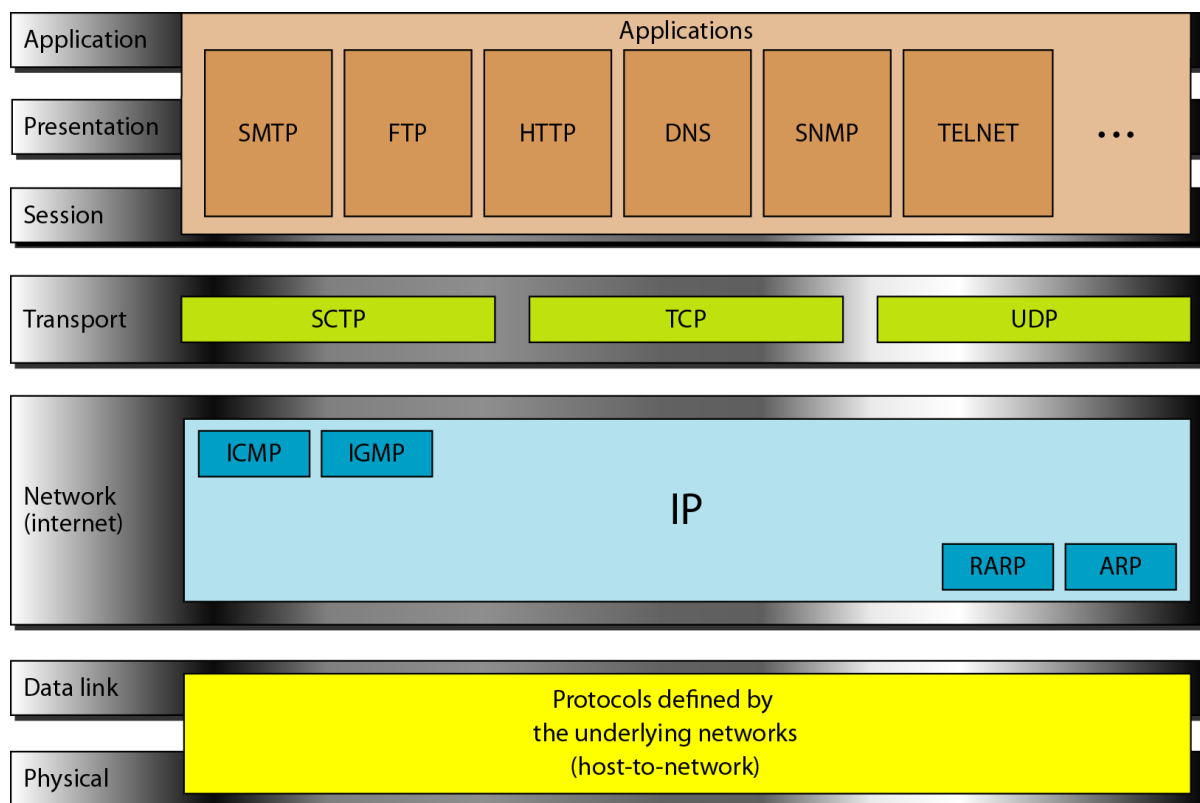
**Notes Compiled By:**

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## TCP/IP PROTOCOL SUITE

It is designed and developed by Department of Defense (DoD) on 1960s.

The layers in the TCP/IP protocol suite do not exactly match those in the OSI model. The original TCP/IP protocol suite was defined as having four layers: host-to-network, internet, transport, and application. However, when TCP/IP is compared to OSI, we can say that the TCP/IP protocol suite is made of five layers: physical, data link, network, transport, and application.



### Physical and Data Link Layer

- TCP/IP does not define any specific protocol. It supports all the standard and proprietary protocols.

### Network Layer

TCP/IP support the Internetworking Protocol. (Four supporting protocols: ARP, RARP, ICMP, and IGMP).

- *Internetworking Protocol (IP)*: It is an unreliable and connectionless protocol(a best-effort delivery service).
- *Address Resolution Protocol*: is used to associate a logical address with a physical address.
- *Reverse Address Resolution Protocol*: allows a host to discover its Internet address when it knows only its physical address
- *Internet Control Message Protocol*: sends query and error reporting messages.
- *Internet Group Message Protocol*: is used to facilitate the simultaneous transmission of a message to a group of recipients.

## Transport Layer

Transport layer is represented by two protocols: TCP and UDP

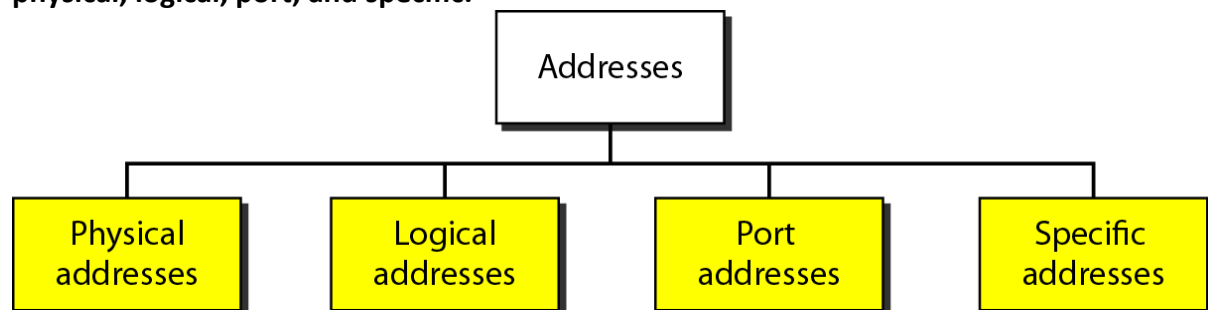
- *User Datagram Protocol*: It is a process-to-process protocol that adds only port addresses, checksum, error control, and length information to the data from the upper layer.
- *Transmission Control Protocol*: It is a reliable stream transport protocol; connection oriented. At the sending end of each transmission, TCP divides a stream of data into smaller units called *segments*. Each segment includes a sequence number for reordering after receipt, together with an acknowledgment number for the segments received. Segments are carried across the internet inside of IP datagrams. At the receiving end, TCP collects each datagram as it comes in and reorders the transmission based on sequence numbers.
- *Stream Control Transmission Protocol*: provides support for newer applications such as voice over the Internet. It is a transport layer protocol that combines the best features of UDP and TCP

## Application Layer

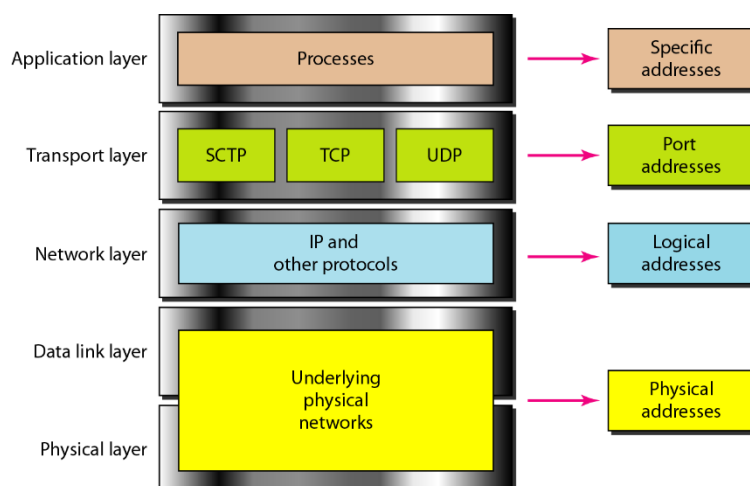
The *application layer* in TCP/IP is equivalent to the combined session, presentation, and application layers in the OSI model.

## ADDRESSING

Four levels of addresses are used in an internet employing the TCP/IP protocols: **physical, logical, port, and specific.**



## Relationship of layers and addresses in TCP/IP



### **Physical addresses**

The physical address, also known as the link address, is the address of a node as defined by its LAN or WAN. It is included in the frame used by the data link layer. It is the lowest-level address.

The physical addresses have authority over the network (LAN or WAN). The size and format of these addresses vary depending on the network.

### **Logical addresses**

Logical addresses are necessary for universal communications that are independent of underlying physical networks.

A universal addressing system is needed in which each host can be identified uniquely, regardless of the underlying physical network.

A logical address in the Internet is currently a 32-bit address that can uniquely define a host connected to the Internet. No two publicly addressed and visible hosts on the Internet can have the same IP address.

### **Port addresses**

The label assigned to a process is called a port address. A port address in TCP/IP is 16 bits in length.

Example:

- FTP: 20
- Telnet: 23
- HTTP: 80
- DNS: 53
- HTTPs: 443

### **Specific addresses**

Some applications have user-friendly addresses that are designed for that specific address.

Examples:

- 1) E-mail address (for example, [Studentname@kiet.edu](mailto:Studentname@kiet.edu))
- 2) Universal Resource Locator (URL) (for example, [www.kiet.edu](http://www.kiet.edu)).

