



TCP-IP

Application Layer Protocol:

1. Application layer protocols provide services to the application software running on a user's computer.
2. The application layer does not define the application itself, but it defines the services that applications need.
3. Basically, the application layer provides an interface between software running on a computer and the network itself. It also provides services to end-users for working over the network.

Here are some examples of application layer protocols:

1. HTTP (Hyper Text Transfer Protocol)
2. SMTP (Simple Mail Transfer Protocol)
3. POP3 (Post Office Protocol 3)
4. FTP (File Transfer Protocol) **Transport Layer Protocol:**

1. Transport layer protocols provide services to the application layer protocols that reside one layer higher in the TCP/IP model.
2. Basically, the transport layer is responsible for transporting data, managing connections between hosts, and terminating connections after all data has been sent. It also provides end-to-end communication and error-recovery facilities.



3. The transport layer consists of two protocols: TCP (Transmission Control Protocol) and UDP (User Datagram Protocol).

To understand how transport layer protocols work, it is important to consider the application layer protocols since each layer provides services to the layer above it. TCP, for example, provides error recovery services to application layer protocols.

Network Layer Protocol:

1. Network layer protocols help the application layer and transport layer.
2. Network layer protocols provide a service to decide the routing (forwarding) process to deliver data to the correct destination.
3. There are two major network layer protocols: IPv4 and IPv6.
4. The network layer is defined by IP (Internet Protocol), and each computer in the world has a unique IP address to identify it.
5. IP defines the routing process with the help of routers, which are networking devices used to route (forward) packets to their correct destinations.

6. There are three major working types in IP:

1. IP routing protocol: This process involves routers asking their neighboring routers to add paths to their routing tables.



2. IP addressing: This process involves assigning IP addresses to specific subnetworks using four periods. IP addresses within the same subnet have the same first three values, which define the subnet.
3. IP routing: This process involves delivering IP packets from hosts to hosts using routers to ensure they reach their correct destination addresses.

Data Link Layer and Physical Layer:

1. The data link layer and physical layer work closely together. The physical layer specifies the energy consumption requirements, while the data link layer establishes rules.
2. The data link layer converts data streams into bits and adds data link headers and trailers.
3. The data link layer provides a service to the network layer. When a router or host needs to send an IP packet to another nearby router, they use data link details.
4. The physical layer defines the medium and mode in the network. The medium can be wired or wireless, and the mode can be full duplex or half-duplex. It also specifies the speed and frequency of data transmission on the wire.