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1.

A network is a group of interconnected devices that can communicate with each other. The structure of a network can vary depending on its purpose and size, but it typically includes the following components:

Network devices: These include routers, switches, hubs, and modems that are responsible for directing and managing network traffic.

Network media: This includes the physical cables and wireless signals that are used to transmit data between devices. Common types of network media include twisted-pair cable, coaxial cable, and fiber-optic cable.

Hosts: These are the devices that connect to the network and can include computers, smartphones, and servers.

Protocols: These are the rules and standards that govern how data is transmitted over the network. Common network protocols include TCP/IP and Ethernet.

Services: These are the applications and services that run on the network and make it possible for users to share resources and communicate. Examples of network services include email, file sharing, and the World Wide Web.

For successful communications all the above components need to be configured and maintained properly to ensure smooth and efficient communication.

2.

The function of protocols in network communication is that it is allowing the connected devices to communicate with each other, despite having any differences in their internal processes. Protocols in network communication is one of the reasons why you can communicate easily with other people over the internet or world. The importance of having a protocol works in network communication is that it also helps the user to transmit any kind of data packets to one another.

3.

A layered model, also known as a protocol stack, is a way to organize and describe the functionality of a network. It divides the complex task of networking into smaller and more manageable layers, each with a specific function. The advantages of using a layered model to describe network functionality include:

- Modularity: Each layer is designed to perform a specific function, which makes it easier to understand, design, and implement. This modularity also allows for changes or updates to be made at one layer without affecting the others.

-Interoperability: A layered model allows different types of devices and technologies to work together because they all adhere to the same set of standards and protocols. This is particularly useful in large and complex networks that consist of a variety of different devices and technologies.

-Scalability: A layered model makes it easier to expand or modify a network as needed. Because each layer is designed to perform a specific function, new devices or services can be added without affecting the existing network infrastructure.

The most widely used layered model for describing network functionality is the OSI (Open Systems Interconnection) model, which defines seven layers: Physical, Data Link, Network, Transport, Session, Presentation, and Application. Each layer has a specific role and communicates with the layers above and below it to facilitate the communication between different devices over the network.

4.

The TCP/IP (Transmission Control Protocol/Internet Protocol) model and the OSI (Open Systems Interconnection) model are both widely recognized network models that describe the different layers of a network and their respective roles.

The TCP/IP model has four layers:

1.The Network Interface Layer: This layer corresponds to the OSI Physical and Data Link layers. It provides the interface between the computer and the physical media (e.g. cables, wireless signals) used for data transmission.

2.The Internet Layer: This layer corresponds to the OSI Network layer. It provides the means for routing data packets between different networks, using the IP protocol.

3.The Transport Layer: This layer corresponds to the OSI Transport layer. It provides the means for establishing and maintaining a reliable, end-to-end communication between devices, using the TCP or UDP protocol.

4. The Application Layer: This layer corresponds to the OSI Session, Presentation, and Application layers. It provides the interface between the network and the applications that run on the devices, such as HTTP, FTP, SMTP, and DNS.

The OSI model has seven layers:

1.The Physical Layer

2. The Data Link Layer

3. The Network Layer

4. The Transport Layer

5. The Session Layer

6. The Presentation Layer

7. The Application Layer

5.

Addressing and naming schemes are important in network communications because they provide a way to identify and locate devices on a network.

Addressing:

Each device on a network, such as a computer or a router, is identified by a unique address called an IP address (Internet Protocol address). IP addresses are numerical labels assigned to each device connected to a computer network that uses the Internet Protocol for communication. It serves two principal functions: identifying the host or network interface and providing the location of the host in the network. This way, when data is sent across the network, it can be directed to the correct device by using its IP address.

Naming Schemes:

While IP addresses are unique and can be used to identify and locate devices, they are not easy for humans to remember. To make it easier for people to remember, naming schemes can be used in addition to IP addresses. The most common naming scheme is the Domain Name System (DNS), which associates domain names with IP addresses. For example, www.example.com is a domain name that is associated with an IP address, such as 192.0.2.1.

This way, users can use domain names instead of IP addresses to access network resources, making it easier to remember and type. DNS also allows for easy management and scalability, as names can be changed without having to update all the devices on the network.

In summary, addressing and naming schemes are important in network communications because they provide a way to identify and locate devices on a network, allowing devices to communicate with each other. They also make it easier for users to remember and access network resources.