Get familiar with networking terms

Network :A network is just a collection of devices and end systems connected to each other and able to communicate with each other.There are two types of topologies in networking.

The physical topology is what the network looks like and how all the cables and devices are connected to each other.

The logical topology is the path our data signals take through the physical topology.

Protocols are rules that govern how devices communicate and share information across a network. Examples of protocols include:

• HTTP - Hyper Text Transfer Protocol

• SMTP – Simple Mail Transfer Protocol

Multiple protocols often work together to facilitate end-to-end network communication, forming **protocol suites or stacks.**

Network reference models were developed to allow products from different manufacturers to interoperate on a network. A network reference model serves as a blueprint, detailing standards for how protocol communication should occur.

Considerations in network

Speed –The biggest consideration

Delay – There must be specific delay for sending datas across the network.VOIP applications must follow time delay for proper communications

Availability – Network should be always available for applications accessing it

Local area networks (LANs) are used to connect networking devices that are in a very close geographic area, such as a floor of a building, a building itself, or a campus environment

Wide area networks (WANs) are used to connect LANs together. Typically, WANs are used when the LANs that must be connected are separated by a large distance.

A MAN (Metropolitan Area Network)is another category of network, though the term is not commonly used. A MAN is defined as a network that connects LAN's across a city-wide geographic area.

An **internetwork**is a general term describing multiple networks connected together. The Internet is the largest and most well-known inter network.

Some networks are categorized by their function, as opposed to their size. A**SAN (Storage Area Network)**provides systems with high-speed, lossless access to high-capacity storage devices.

A VPN (Virtual Private Network)allows for information to be securely sent across a public or unsecure network, such as the Internet. Common uses of a VPN are to connect branch offices or remote users to a main office.

Methods of Network Communication

Unicast : One to One Communication.used in both IPv4 and IPv6

Broadcast: One to all communication.Used in Ipv4 only

Multicast : One to a group communication.Used in both IPv4 and IPv6

Anycast : One to nearest Communication.Used in Ipv6

Broadcast Domain : A logical division of network where all devices can reach each othjer by broadcast

Collision Domain : It is a logical seperation of a network where data packets will collide each other.when collision occur every devices in collision domain will get effected by it.

CSMA/CD : CSMA/CD (carrier sense muli access/Collision detection) is a protocol used in wired network/LAN to detect collision and over come it.CSMA/CD is only used in half duplex communication

Half-Duplex – hosts can transmit or receive, but not simultaneously

Full-Duplex – hosts can both transmit and receive simultaneously

CSMA/CA : (carrier sense muli access/Collision avoidance) is a protocol used in wireless network to avoid collision.

Ethernet is a family of technologies that provides data-link and physical specifications for controlling access to a shared network medium. It has emerged as the dominant technology used in LAN networking

Power over Ethernet (PoE) allows both data and power to be sent acrossthe same twisted-pair cable, eliminating the need to provide separate powerconnections. This is especially useful in areas where installing separatepower might be expensive or difficult.

PoE can be used to power many devices, including:

· Voice over IP (VoIP) phones

· Security cameras

· Wireless access points

HUB : A hub is nothing more than a physical repeater, if it receives an electrical signal on one interface it will repeat it by sending it on all its interfaces except the one it originated from.There is no intelligence in a hub and it only operates

on the physical layer of the OSI model.Hub have one broadcast domain and one collision domain

Switches: Switches work in layer 2 and layer 3.Switches working in layer 3 have both routing and switching capacity.New switches work in full duplex mode.switches have one broadcast domain and mulitple collision domain.Collision domain is equal to number of active ports in that switch

there are three things that switches do that hubs do not:

- Hardware address learning
- Intelligent forwarding of frames

Three types of layer -2 forwarding methods

Cut-through switching: The switch will start forwarding the frame before the whole frame has entered the switch. The switch only needs to know the destination MAC address so as soon as it reads it it can start forwarding. This is fast but less reliable if you have corrupt frames.

Store-and-forward: The switch will receive the complete frame, check if it‟s errors free and then forward it. If it‟s corrupt it will be discarded.

Fragment-free: The switch will check if the first 64 bytes are OK, basically this is a trade-off between cut-through and store-and-forward switching.

Routers: Routers interconnect networks and choose the best path to each network

Destination.Routers work on layer 3 ie network layer.Routers dont forward broadcasts.Routers are capable for seperating broadcast domains

Routers build routing tables to perform forwarding decisions, which contain the following:

- The destination network and subnet mask
- The next hop router to get to the destination network
- Routing metrics and Administrative Distance

The routing table is concerned with two types of Layer-3 protocols:

Routed protocols - assigns logical addressing to devices, and routes packets between networks. Examples include IP and IPX.

Routing protocols - dynamically builds the information in routing tables. Examples include RIP, EIGRP, and OSPF

- What is Routing?
- What is Protocol?
- Explain difference between Router,Switch and Hub ?
- What is the difference between OSI and TCP/IP Model ?
- What is the size of IP Address?
- IEEE standard for wireless networking?
- What is the range of class A address?
- What is the range of class B address?
- What is the range of class C address?
- What is PoE (Power over Ethernet) ?
- What is a peer-peer process?
- What is the difference between broadcast domain and collision domain ?
- What is ping? Why you use ping?

- Explain difference between straight and cross over cable with examples ?
- What is the difference between tracert and traceroute
- What is Round Trip Time?
- Define the terms Unicasting, Multiccasting and Broadcasting and Anycasting?
- Where do we use cross and standard cable?
- How many pins do serial ports of routers have?
- What are the differences between static ip addressing and dynamic ip addressing?
- Difference between CSMA/CD and CSMA/CA ?
- What is DHCP scope?
- What is Checksum?
- What is Redundancy ?
- What are the criteria necessary for an effective and efficient network?
- What is the key advantage of using switches?
- When does network congestion occur?
- Does a bridge divide a network into smaller segments?
- What are the different memories used in a CISCO router?
- What are the different types of passwords used in securing a CISCO router?
- What is the use of "Service Password Encryption" ?

- Brielfly explain the conversion steps in data encapsulation.?
- In configuring a router, what command must be used if you want to delete the configuration data that is stored in the NVRAM?
- Differentiate Logical Topology from Physical Topology?
- what is AS (Autonomous System) ?
- What is the difference between Private IP and Public IP ?
- Explain different cable types ?
- How does RIP differ from EIGRP?
- Differentiate User Mode from Privileged Mode
- What is 100BaseFX?
- Differentiate full-duplex from half-duplex ?
- What does the show protocol display?