**N+\_Chapter-1: Introduction to Networks**

1. White is network topology?

Ans. Network topology is the arrangement of the various elements of a computer network. Essentially, it is the topological structure of a network and may be depicted physically or logically.

1. What do you mean physical topology and logical topology?

Ans. Physical topology is the placement of the various components of a network, including device location and cable installation, while logical topology illustrates how data flows within a network, regardless of its physical design.

1. Write the names of network topologies?

Ans. The names of network topologies are:

i. Bus ii. Star iii. Ring iv. Mesh v. Point-to-point

vi. Point-to-multipoint vii. Hybrid

1. Describe three main network topologies?

Ans. Bus topology: A bus topology is a network setup in which each computer and network device are connected to a single cable or backbone.

Star topology: Star topology is one of the most common computer network topology. In Star topology, all the nodes on the network are connected to a central device called Hub or Switch via cables. All traffic is controlled by the Hub. Devices transfer data to each other only through the Hub not directly.

Ring topology: A ring topology is a network topology in which each node connects to exactly two other nodes, forming a single continuous pathway for signals through each node - a ring. Data travel from node to node, with each node along the way handling every packet.

1. Write down advantage and disadvantage of star topology.

Ans. **Advantages of star topology:**

Very easy to install and maintain.

New nodes can be added or removed to and from central Hub easily and quickly.

Star networks are very reliable because if any node or cable fails, other nodes are not affected.

**Disadvantages of star topology:**

It requires more cables than other topologies. So it becomes more costly.

This type of network depends upon the central Hub. If the Hub fails, the whole network breaks down.

1. Write down advantage and disadvantage of bus topology.

**Advantages of bus topology**

* Easy to connect a computer or peripheral to a linear bus
* Requires less cable length than a star topology resulting in lower costs
* It works well for small networks.

**Disadvantages of bus topology**

* Entire network shuts down if there is a break in the main cable
* Difficult to identify the problems if the whole network goes down.
* It can be hard to troubleshoot individual device issues.
* Terminators are required for both ends of the main cable.

1. Write down advantage and disadvantage of ring topology.

## Ans. Advantages:

* All data flows in one direction, reducing the chance of packet collisions.
* Data can transfer between workstations at high speeds.
* Performs better than a bus topology under heavy network load
* Does not require a central node to manage the connectivity between the computers
* Point to point line configuration makes it easy to identify and isolate faults.

**Disadvantages:**

* The entire network will be impacted if one workstation shuts down.
* Moving, adding and changing the devices can affect the network
* Communication delay is directly proportional to number of nodes in the network
* Bandwidth is shared on all links between devices
* More difficult to configure than a Star.

1. What is Mesh Topology? Write advantages and disadvantages of mesh topology.

Ans. A mesh network is a network topology in which each node relays data for the network. All mesh nodes co-operate in the distribution of data in the network.

Advantages:

* Data can be transmitted from different devices simultaneously.
* Even if one of the components fails there is always an alternative present. So data transfer doesn’t get affected.
* Expansion and modification in topology can be done without disrupting other nodes.

Disadvantages:

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* Even if one of the components fails there is always an alternative present. So data transfer doesn’t get affected.
* Expansion and modification in topology can be done without disrupting other nodes.

1. What is Hybrid Topology? Write advantages and disadvantages of hybrid topology.

Ans. A hybrid topology is a type of network topology that uses two or more other network topologies, including bus topology, ring topology, star topology etc. That is, the combination of more topologies is known as hybrid topology.

**Advantages of Hybrid Network Topology:**

* + - Reliable
    - Flexible
    - Effective

**Disadvantages  of  Hybrid  Network  Topology:**

* + - Complexity  of  Design
    - Costly Hub
    - Costly  Infrastructure

1. What are LAN and WAN?

Or What is the difference between LAN and WAN?

Ans. A LAN is a local area network, which typically means a network in one centralized location. A WAN is a wide area network, which means several LANs in remote locations connected to each other.

1. What is the term for a device that shares its resources with other network devices?

Ans. Server is the term for a device that shares its resources with other network devices.

1. Describe common network components.

Ans. The most three common network components are:

* + 1. Workstations: Workstations are often seriously powerful computers that run more than one CPU and whose resources are available to other users on the network to access when needed.
    2. Servers: Servers are also powerful computers. They get their name because they truly are “at the service” of the network and run specialized software for the network’s maintenance and control known as the network operating system.
    3. Hosts: They really can be referring to almost any type of networking devices such as computers, printers etc- including workstations and servers.

1. What is MPLS?

Ans. MultiProtocol Label Switching (MPLS) is a switching mechanism that imposes labels (numbers) to data and then uses those labels to forward data when the data arrives at the MPLS network. IT has several advantages compare to other WAN technologies such as physical layout flexibility, one-to-many connection etc.

1. Write down the difference between peer to peer and client server- network.

Ans. There’s a huge difference between peer to peer and client server network. For instance, a peer-to-peer network has no central server. Each workstation on the network shares its files equally with the others. There’s no central storage or authentication of users. Conversely, there are separate dedicated servers and clients in a client server network. Through client workstations, users can access most files, which are generally stored on the server. The server will determine which users can access the files on the network.

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