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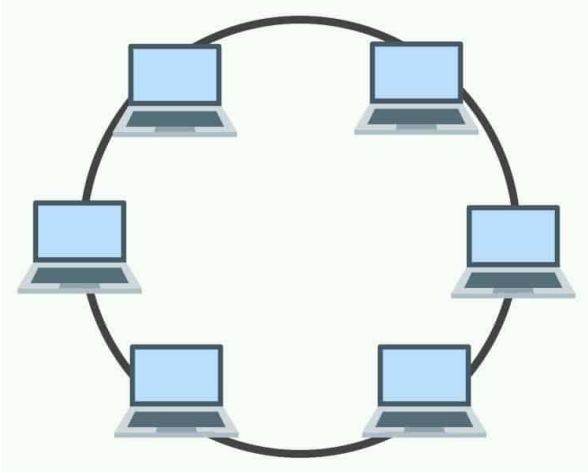
Course Name: O Level (2nd Sem) **Subject:** Introduction to ICT Resources
Topic: Computer Network - Types (Part 4) **Date:** 29-05-2020

Computer Network

Types of Computer Network

- **Ring Topology**

This layout is similar to the linear bus, except that the nodes are connected in a circle using cable segments , in this layout, each node is physically connected to only two other nodes. Each node passes information along to the next one, until it arrives at its intended destination. Since each computer re-transmits what it receives, a ring is an active network and is not subject to signal loss problems which a bus topology experiences. There is no termination because there is no end to the ring. In ring topology, computers are arranged in a circle. Data travels around the ring in one direction, with each device on the ring acting as a repeater. Ring networks typically use a token-passing protocol.



Computers connected in a ring or circular topology Performance on this type of topology is faster because each portion of the cabling system handles only the data flow between two machines. This type of topology can be found in peer-to-peer networks, in which each machine manages both information processing and the distribution of data files.

Note: ***Fiber Distributed Data Interface (FDDI) is a fast fiber optic network based on the ring topology.***

Advantages of Ring Topology

(a) Because every computer is given equal access to the token, no one computer can monopolize the network.
(b) The fair sharing of the network allows the network to degrade gracefully. It continues to function in a slower manner rather than fail entirely.

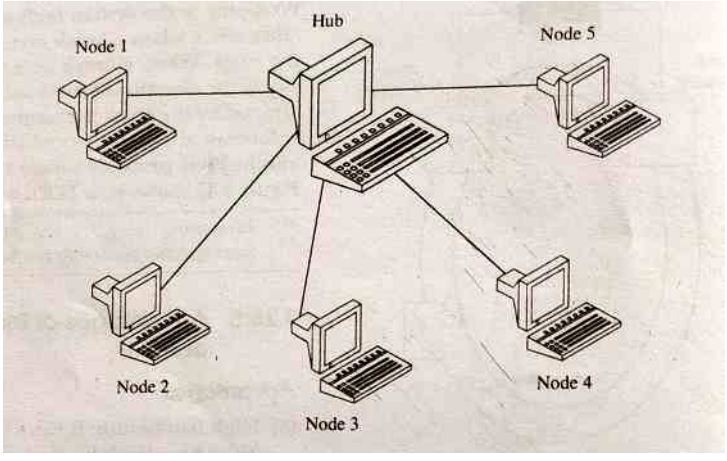
Disadvantages of Ring Topology

(a) Failure of one computer on the ring affects the whole network.
(b) It is difficult to troubleshoot a ring network.
(c) Adding or removing computers disrupt the network.

- **Star Topology**

Each computer on a star network communicates with a central hub that re-sends the message either to all the computers (in a broadcast star network) or only to the destination computer (in a switched star network.) The hub in a broadcast star network can be active or passive.

An active hub regenerates the electrical signal and sends it to all the computers connected to



it. This type of hub is called a multiport repeater. Active hubs and switches require electrical power to run. A passive hub merely acts as a connector point and does not amplify or regenerate the signals Passive hubs do not require electrical power to run.

Ethernet l0BaseT is a popular network based on the star topology. You can use several types of cables to implement a star network. Hybrid hub can accommodate several types of cable in the same star network. You can also expand a star network by placing another star hub where a computer might otherwise go, allowing several more computers or hubs to be connected to that hub. This creates a hybrid star network.

Note: ***Out of all the topologies, the Star topology is the most flexible and the easiest to diagnose when there is a network fault.***

Advantages of Star Topology

(a) It is easier to modify or add new computers to a star network without disturbing the rest of the network. You simply run a new line from the computer to the central location and plug it into I the hub. When the capacity of the central hub is exceeded, you can replace it with one that has a larger number of ports to plug lines into it.

(b) The center of a star network is a good place to diagnose network faults. Intelligent hubs (hubs with microprocessors that implement features in addition to repeating network signals) also provide for centralized monitoring and management of the network.

(c) Single computer failures do not necessarily: bring down the whole star network. The hub can detect a network fault, isolate the offending computer or network cable and allow the rest of the network to continue its operation.

(d) You can use several cable types in the same network with a hub that can accommodate multiple cable types.

Disadvantages of Star Topology

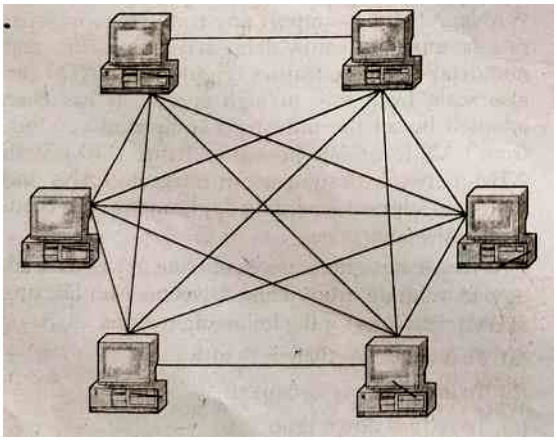
(a) If the central hub fails, the whole network fails to operate.

(b) Many star networks require a device at the central point to rebroadcast or switch the network traffic.

(c) It is costlier to cable a star network because all network cables must be pulled to one central point, requiring more cable, length.

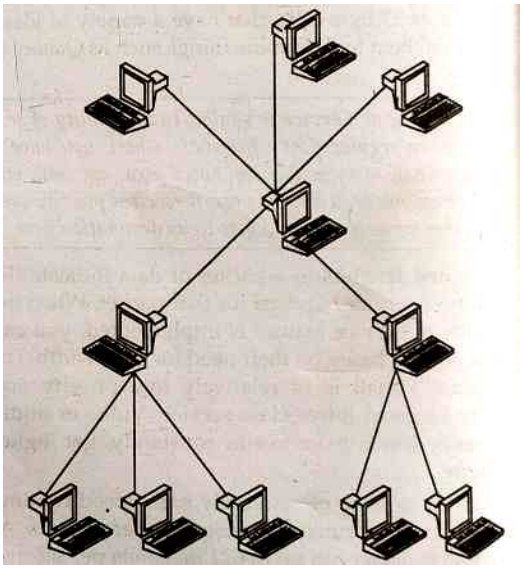
- **Mesh Topology**

It is a type of network setup where each of the computers and network devices are interconnected with one another, allowing for most transmissions to be distributed, even if one of the connections! Go down. A mesh topology is most often used in large back-bone networks in which failure of a single switch or router can result in a large portion of a network going down. This topology is expensive because it has redundant connection to every computer. This type of topology is commonly used for wireless networks. This figure is a visual example of a simple computer setup on a network using a mesh topology.



- **Tree Topology**

Tree is a network topology containing zero or more nodes that are linked together in a hierarchical fashion. The topmost node is called the root. The root may have zero or more child nodes; "Connected by edges (links); the" root is the parent node to its children. Each child node can, in turn, have zero or more children of its own.' Nodes sharing the same parents are called siblings. Every node in a tree has exactly one parent node (except for the root, which has none), and all nodes in the tree are descendants of the root node. These relationships ensure that there is always only one path from one node to another node in the tree.



Exercise:

1: What is Ring topology in computer network?
2: What is Star topology in computer network?
3: Compare bus, star and ring topology?
4: What are the advantages of Mash topology?