What is Topology? explain types of topologies.

Topology refers to the physical arrangement of a device or any interconnected nodes. It outlines how various components, such as computers, devices, or nodes, are connected and communicate with each other. Topology defines the paths that data or signals take to travel within a network.

There are several common network topologies:

1. Bus Topology
2. Ring Topology
3. Star Topology
4. Mess Topology
5. Tree Topology
6. Hybrid Topology

Bus Topology: Devices are connected linearly on a single cable, called the "bus." Data travels along the cable, and each device receives and filters the data. If the cable breaks, the whole network can go down.

Star Topology: In this arrangement, all devices are connected to a central hub or switch. Communication occurs through the central hub, which makes adding or removing devices easy. However, if the hub fails, the entire network may be affected.

Ring Topology: In ring topology, all computers are connected via a cable that loops in a ring or circle. A ring topology is a circle that has no start and no end.

This topology has exactly two neighbors for each device. Passing data on this topology is token passing. The main advantage of ring topology is that if signals are getting weak, each node in the network regenerates the weak signal.

> ***Token passing***- *Token contains a piece of information which along with data is sent by the source computer. Then this token passes to next node, which checks this data is for this computer or not. If yes then the computer accepts it for processing otherwise passes token along with data to the next node. This process continues until the signal reaches its right destination*

Mesh Topology: In Mesh Topology, each node, other devices are interconnected with one another. In mesh topology, if any cable or node fails there are many other ways for two nodes to communicate.

Tree Topology: Tree topology, also known as hierarchical topology, is a network arrangement that resembles a tree structure. It's a combination of the star and bus. In a tree topology, devices are connected in a hierarchical manner, with at least three levels of connectivity.

Hybrid Topology: Hybrid topology uses a combination of any two of more topologies. A hybrid topology is produced when two different basic network topologies are connected.

Two common Examples for hybrid topology are: **Star Ring Topology and Star Bus topology**