

## Internet & WWW

### Network Topology and Protocol

#### Star Topology

In a star topology, each device has dedicated point-to-point link only to a central controller, usually called a hub. In other words, the devices in the network are not directly linked to one another but they all are linked with a central hub. If a device wants to send data to other device then the data always travel through the hub then reaches to the intended device.

At the present scenario hub is replaced by switch.

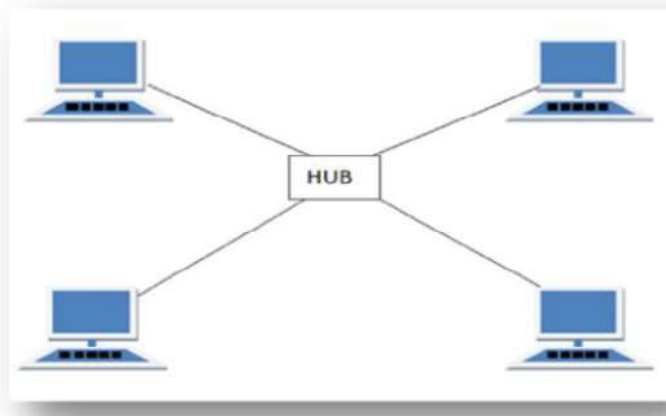


Fig. Star Topology

#### Add to the knowledge

**Hub vs Switch:** Hub sends a message to all devices in the network (broadcast) and the intended device receives it but switch sends to that intended device only.

#### Advantages:

1. Failure of a device, does not affect entire communication: Since all devices have separate connection with the hub, therefore if one link or device fails, only that link or device is affected but all other links and devices remain active.
2. Ease of installation and fault detection: If a new device needs to be connected to the network then it can be easily be attached with the hub (depending upon the capacity of hub). Also, if any device would not respond then it may be easy to detect that device only by checking separate connection with the hub. Therefore, it has an easy way of installation of new device, fault identification or isolation without affecting the other device.
3. Centralized management: Due to centralized management (central hub), it helps in monitoring the network.

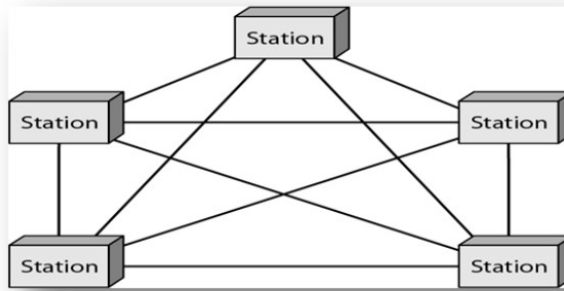
#### Disadvantages:

1. Failure of hub stops all communication: Since all devices in the network depend on the central hub, therefore, if the hub fails, the whole system is dead.
2. Dependency on central hub: Performance and number of devices which can be added in the network, depend on the capacity of central device (Hub).
3. Increases cost: The use of central device (hub or switch) and connection of each device with the central device increases the overall cost of the network.

**Use:** In high speed LANs. It is the most preferred topology in organisations like university/ college, business firms etc.

## Mesh Topology

In a mesh topology, every device has a dedicated point-to-point link to every other device. In other words, each device is connected to other device with separate path or link.



**Fig. Mesh Topology**

### Advantages:

1. Less traffic: Use of dedicated or separate wires (links) ensures that each connection can carry its own
2. data load, thus reducing the traffic problems.
3. Failure of any device, does not affect entire system: It is robust. If one link or device becomes fail, it does not affect the entire system.
4. Increase privacy or security: Due to use of separate link the data travels only between the intended sender and receiver, therefore, it enhances privacy or security.

### Disadvantages:

1. Huge amount of cabling and ports: Due to separate connections from one device to another, huge
2. amount of cabling and the number of I/O ports required which makes a complex structure.
3. Difficult to install new device: If a new device may be attached in the network, we have to link it to every device in the network by using separate cables and ports, therefore installation and reconnection are difficult.
4. Expensive: It is expensive due to huge amount of cables and ports.

**Use:** Connection of telephone regional offices in which each regional office needs to be connected to every other regional office.