



4.9.2.1 Network Topology

Network Topology

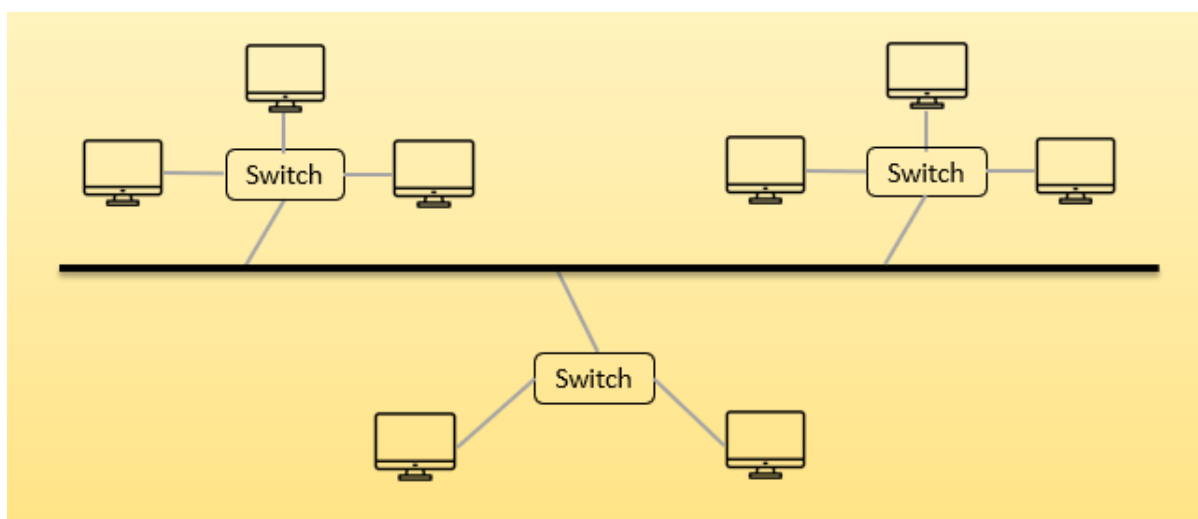
Topology refers to the structure of a network.

Physical Topology

Physical Topology refers to **the physical layout of the connections between the devices on the network.**

Logical Topology

Logic topology refers to **how the packets of data flow through a network.**





Physical Star Topology

In a physical star topology, every device is directly connected to a central node (a switch or hub).

When a device needs to send data, it sends it via the central node which forwards it on to its' intended recipient.

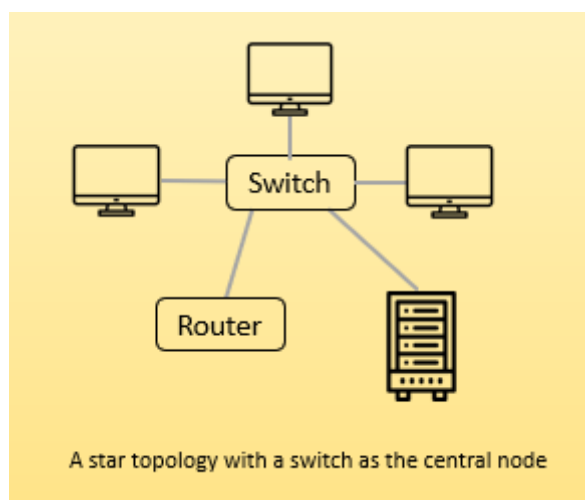
A switch will send the data to only the intended recipient while a hub will broadcast the data to every connected device.

Advantages:

- It is reliable. If one link fails the other links are not affected.
- Fast communication because each device has a dedicated connection to the central switch. Reducing data collisions.
- Improved security because a switch forwards data only to the intended device rather than broadcasting it to every device.

Disadvantages:

- If the central node fails, all communication on the network stops.
- Expensive due to each device needing its own cable.





Logical Bus Topology

In a logical bus topology, devices share a single logical communication channel. Data sent by one device is available to all devices on the network, but only the intended recipient processes the data.

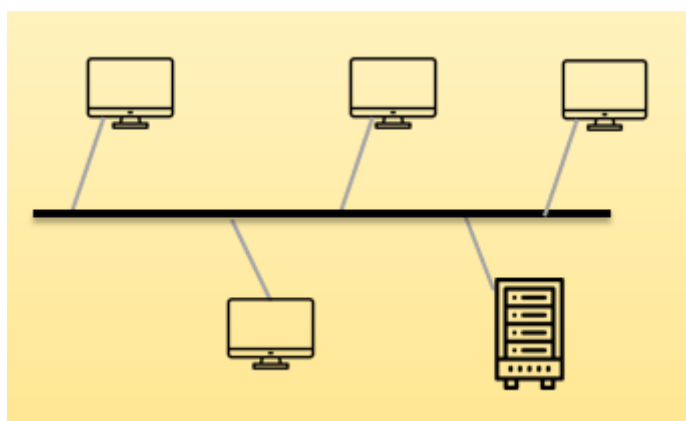
A network can be physically wired as a star but behave logically as a bus by using appropriate switching and a bus protocol.

Advantages:

- Less cabling may be required compared with some other physical arrangements.
- No dedicated logical connection is required between every pair of devices.

Disadvantages:

- Devices share the same logical communication channel, so collisions can occur if multiple devices transmit at the same time.
- Data may be visible to other devices on the logical network, creating security concerns.
- Performance can decrease as more devices compete to transmit data.



A physical bus topology

