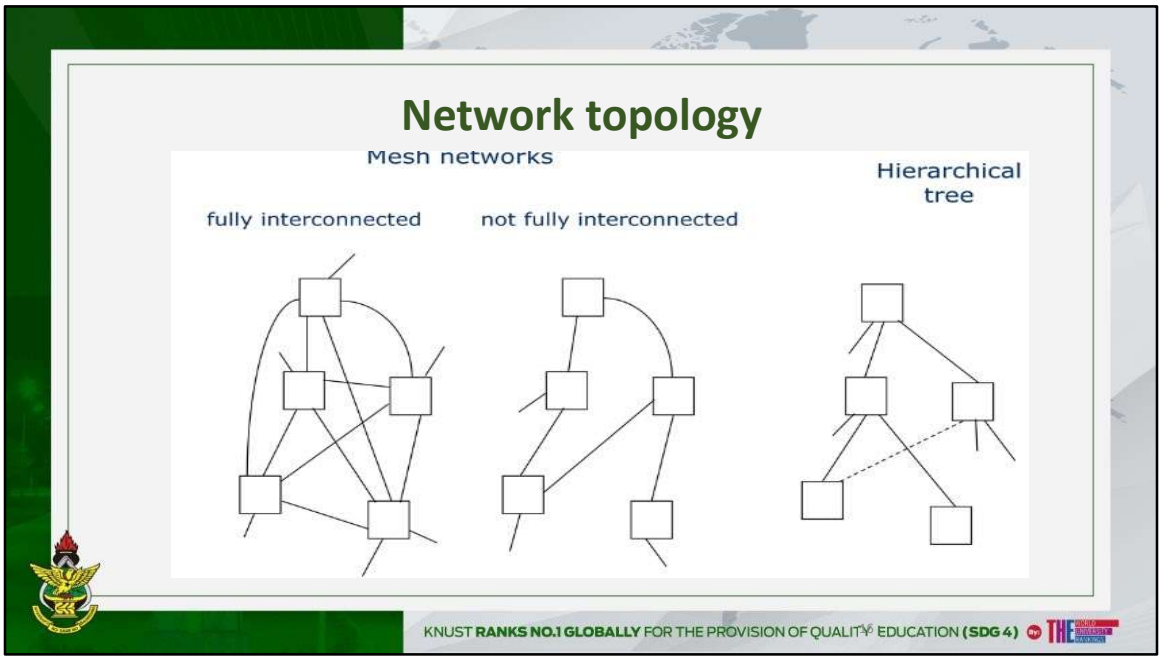
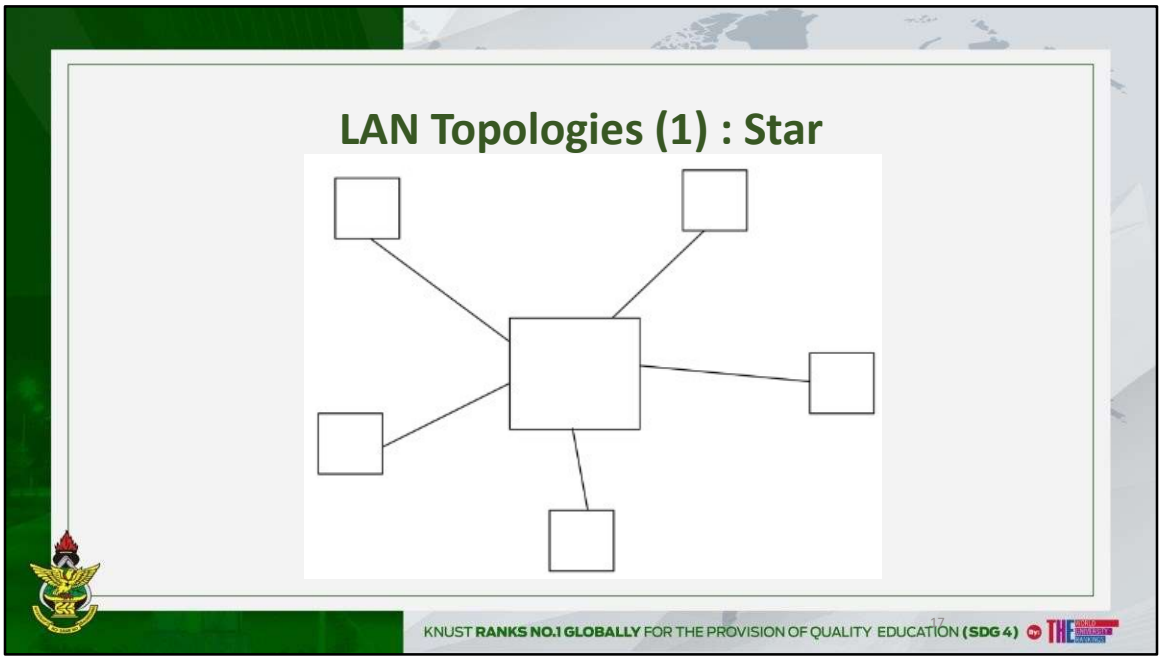


Mesh networks are typical of packet-switched WANs. They are not generally fully interconnected as the number of links would otherwise be excessive.

Hierarchical networks are typical of public telephone networks. Generally there are some connections out of the hierarchy, which gives some mesh-like structure. Similarly mesh networks often have some hierarchy built into them.

The important aspect of these network topologies is that intermediate nodes need to perform routing and switching.

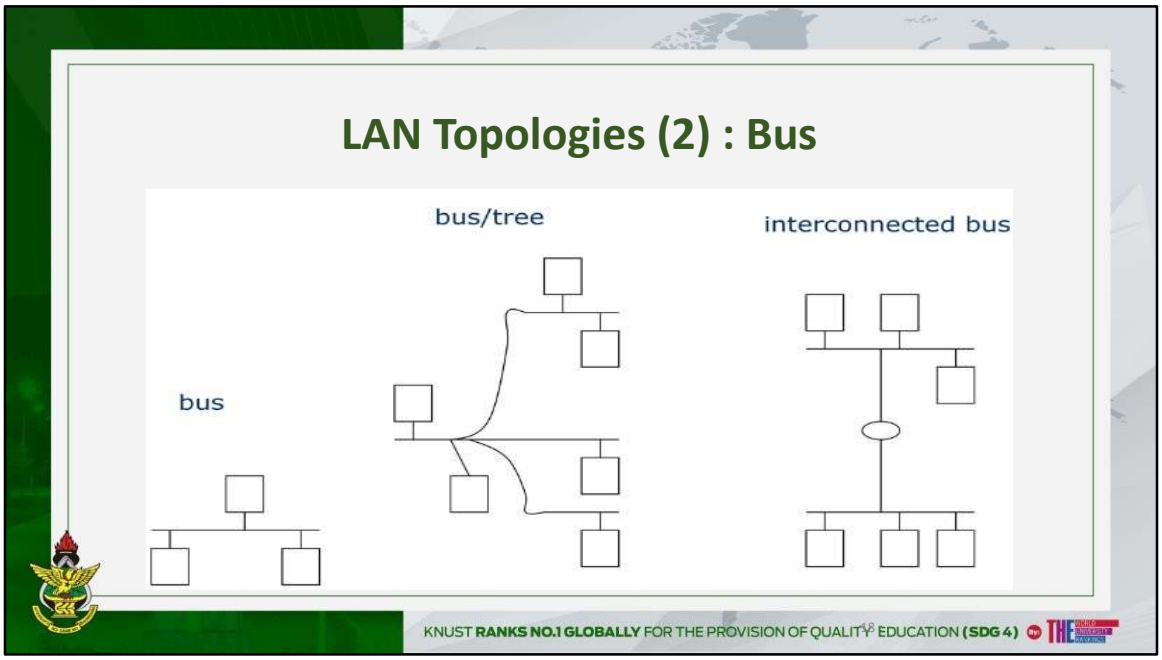


In LANs, specific topologies have been developed as *short point-to-point or multipoint links are* made.

In the STAR configuration each device is connected via a point-to-point link to a central node.
The attached devices can be relatively unintelligent - they are only concerned with simple point-to point links. Large demands are placed on the central node, however, in terms of its processing power and the high concentration of traffic that occurs here. Reliability is also dependent on this single node.

An advantage is that it is the configuration used for PABX exchanges, so it could lead to easy integration of voice and data traffic.

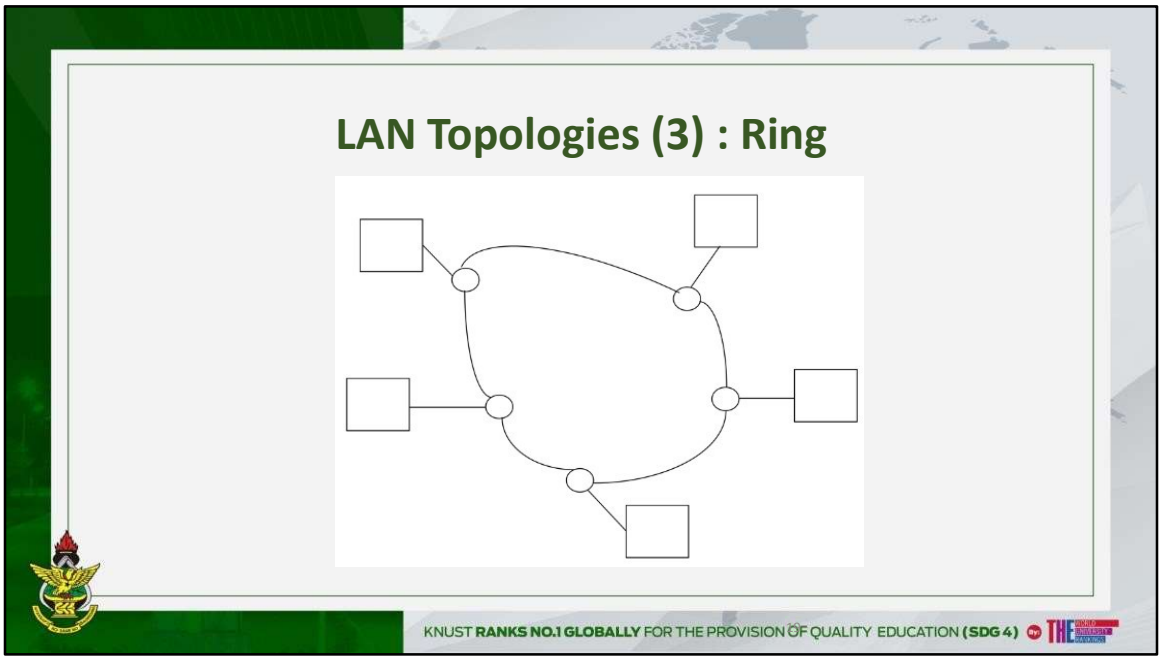
Depending on the complexity and speed of the central node, the links can be very high speed, and operate with simple access protocols (in fact, largely the absence of an access protocol).



With a BUS topology, no switches or repeaters (except for amplification) are *required. The* network is simply the shared transmission medium. The medium is referred to as broadcast or multipoint as transmissions can be heard by all attached devices.

Processing, packetisation and access control is now required of all attached devices. The network is, however, flexible - further devices can be added with little or no disruption –and reliable - single device failures do not affect the whole network.

However, the cable taps and cable lengths can lead to bandwidth restrictions through signal attenuation. The transmission medium bandwidth is shared amongst attached devices by the access protocol.

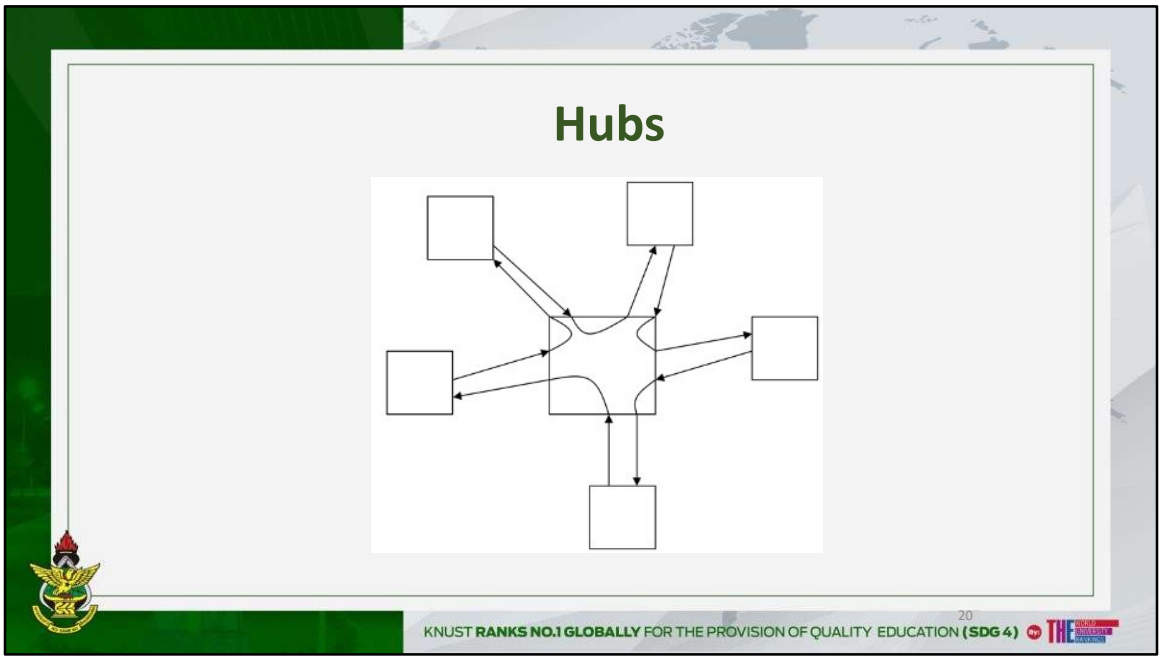


In a RING topology, repeaters are joined by a series of point-to-point links to form a closed loop.

The connections are chosen to keep “unrepeatered” distances short. Communicating devices attach at repeaters - no real switching is required as information may be copied as it goes past. The repeaters are relatively simple, but the attached devices must provide for packetisation/access control.

There are some flexibility/reliability problems - bypass circuitry must be switched in if a node fails or a new node is to be attached. However, fault location is easy. High data rates can be achieved because of the short (“unrepeatered”) distances, and because unidirectional transmission is particularly suitable for optical fibre technology.

For a simple access protocol (no switching) information revolves around the whole ring, removed by the sender. The bandwidth of every link is therefore shared by the access protocol.



In this configuration the central node (HUB) is “passive”.

Logically, hub networks can be of bus or ring topologies.

- With passive power splitting the hub is equivalent to a bus.
- With collapsed wiring, as above, it is equivalent to a ring.

In reality, it is usually the case that the hub will contain repeater electronics, enabling longer link distances to the attached devices, and more of them.