What are the comparative advantages and disadvantages of physical ring, bus, and star networks?

While the bus topology is very easy to implement by simply linking all computer to the same transmission line and requires less cable than the star topology, if any of the connections along this single transmission line fail, the entire network is impacted (FCIT, 2009). Adding devices to such a network "can turn out to be a major job" as they must be physically linked to the existing backbone (helpwithpcs, 2008).

Star topology networks are much less vulnerable, as connections can be removed from the hub without impacting the rest of the network; however, the hub becomes the critical point in this topology, as its failure can brings down the rest of the network (FCIT, 2009).

The physical ring topology connects a series of nodes in a closed loop, where they send transmission in one direction around the loop. The advantage to this topology is that there is little loss of signal strength over long distances, as each node along the network retransmits messages (Burd, 2006). The disadvantages to this topology is a low fault tolerance, where one node going down takes down the whole network, and the complexity of adding new devices in between existing devices on the network (helpwithpcs, 2008).

In a balancing act of cost and reliability, a tree network, where star topologies are used for collections of nodes in close proximity and a linear bus topology is used to connect the star topologies over long distances is best (FCIT, 2009).

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