

# Wiring topology

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Network topology is the physical media setup of a network. Topologies can vary and often interact with each other. There are four main topologies, the Bus, Ring, Star, and Tree Bus Topology A bus network has a single line arrangement which computers attach to via the use of network cards.

Computers on the network transmit data in the form of packets and data will not collide with data sent by other nodes. If a collision happens then the computer sending the information simply tries again. One good point about the bus topology setup is that " Nodes can be attached to or detached from the network without affecting the network. Furthermore, if one node fails, it does not affect the rest of the network" (Capron, page 189).

Token Ring Topology The ring network topology connects all computers/nodes in a circular chain and allows data to pass in only one direction. Data which is sent from one computer to another on the network is assigned an address which is the destination address of the data. Due to the fact that data is sent in a circular fashion, each computer will check the address of the data packet to see if it is meant for that machine. If the data isn't meant for one computer, it is simply passed along the chain until it reaches its desired destination. There is no chance of data collision in this topology due to the fact that data goes in one direction. There is one drastic problem with this topology, this is "... if one node fails, the entire network fails."(Capron, page 189). This is the main reason I will not use this type of topology.

Star Topology The Star network topology relies on a main computer which is called a hub computer to manage the network. All messages go through the main computer which prevents collisions of data. There is one main problem

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with this system, "... if the hub computer fails, the network fails". (Capron, page 189) This is the reason why I won't be using this network topology.

**Cabling** In every topology there is cabling, there are four types of cabling which are; Coaxial cable is a single conductor wire within a shielded enclosure and can send a strong signal even if the cable is underground/undersea. " These cables can transmit data much faster, wire pairs and are less prone to noise." (<http://www.hub-tech.net/terms.html> , 01/05/02). Coaxial cable networks have several T- connectors to allow the computers network cards to connect to the network. A T-Connector (also called a BNC, British Navel Connector) is a junction where the computer connects to a 10Base2 (thinnet) cable.

At each end of the cable a terminator must be applied. If the cable is not terminated, data passing over the cable will bounce back and forth in an endless loop. A fifty ohm terminator must be applied at each time to stop this signal bounce. If the terminators aren't put on the signal bounce will cause the network to halt on its backbone. " The backbone is a segment of a network that handles much of the data passed over the network" (<http://www.hub-tech.net/terms.html> , 01/05/02). To add more computers to the network, one or both of these connectors can be removed and a cabling segment added. This is an advantage to using a bus network, one of the disadvantages is the fact that if there is a break in the network then the segment involved will shutdown due to a lack of termination.

**Wire Pairs** The Wire pairs/twisted pair is one of the most common media communications available. The cable is created by twisting wire together to

form a cable, which is then insulated. One of the reasons why wire pairs are inexpensive is because they are already in use in telephone systems. One of the bad points of coaxial cable is that it is susceptible to electrical interference or noise. Noise is anything that causes distortion in the signal when it is received. Sources of noise could be the sun or high voltage equipment.

**Fibre Optics** Fibre optics technology uses light and not electricity to send data. The fibre optic cable is made of glass fibres. Each fibre optic cable is thinner than a human hair and can guide beams of light for miles. Fibre optics cable is less expensive than wire cable and can transmit data faster than some technologies. It can also send and receive a wider assortment of data frequencies at one time. Fibre optics can also offer a very high bandwidth and low noise susceptibility.

**Common Topology Traits** With all network topologies, data is sent in the form of " packets". Packets are broken down pieces of computer data. Rather than sending a file in a huge lump, the computer breaks down the data into smaller chunks that the receiving machine can then reassemble. This means that all computers can use the network without letting one computer clog up the network. I have decided to use a bus topology. This is one of the most common topologies in networking systems. With a bus topology, each computer is connected in a linear fashion to one long cable, which either terminates or continues at the end. The cabling involved in this network is coaxial cable. Coaxial cabling is most common in two forms, 10Base2 (thinnet) and 10Base5 (thicknet). My network will use 10Base2 (thinnet).

Disk storage organisation. The main computer/server would have a 40gig hard drive allowing users to store information via the network. The computers would also have a floppy disk drive allowing the user to copy small files to take home too work on.