

Transmission Media

Magnetic Media

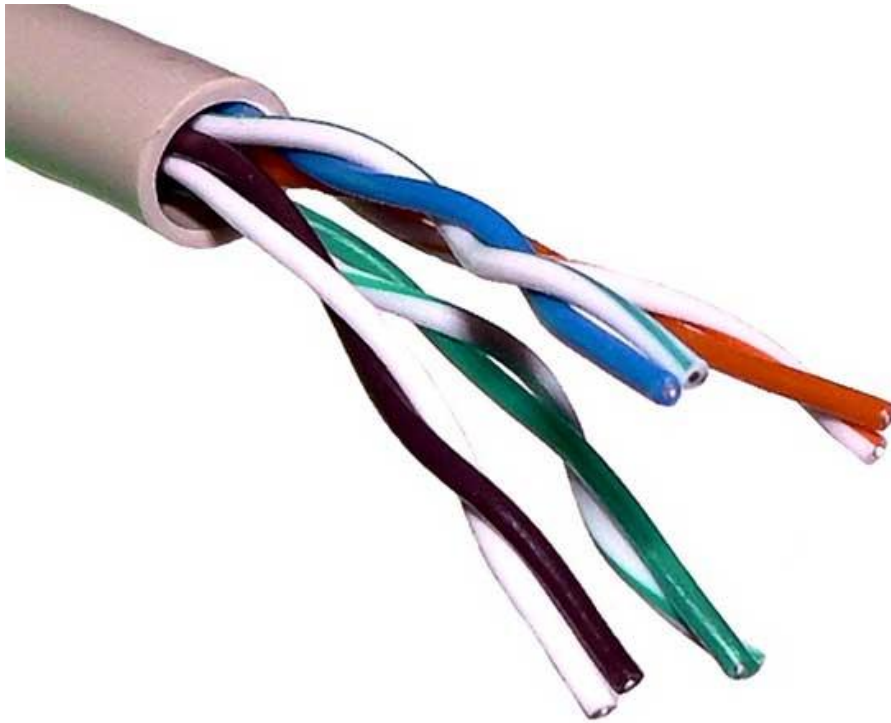
One of the most convenient way to transfer data from one computer to another, even before the birth of networking, was to save it on some storage media and transfer physical from one station to another. Though it may seem odd in today's world of high speed Internet, but when the size of data to transfer is huge, Magnetic media comes into play.

For an example, say a Bank has Gigs of bytes of their customers' data which stores a backup copy of it at some geographically far place for security and uncertain reasons like war or tsunami. If the Bank needs to store its copy of data which is Hundreds of GBs, transfer through Internet is not feasible way. Even WAN links may not support such high speed or if they do cost will be too high to afford.

In these kinds of cases, data backup is stored onto magnetic tapes or magnetic discs and then shifted physically at remote places.

Twisted Pair Cable

A twisted pair cable is made of two plastic insulated copper wires twisted together to form a single media. Out of these two wires only one carries actual signal and another is used for ground reference. The twists between wires is helpful in reducing noise (electro-magnetic interference) and crosstalk.



[Image: Twisted Pairs]

There are two types of twisted pair cables available:

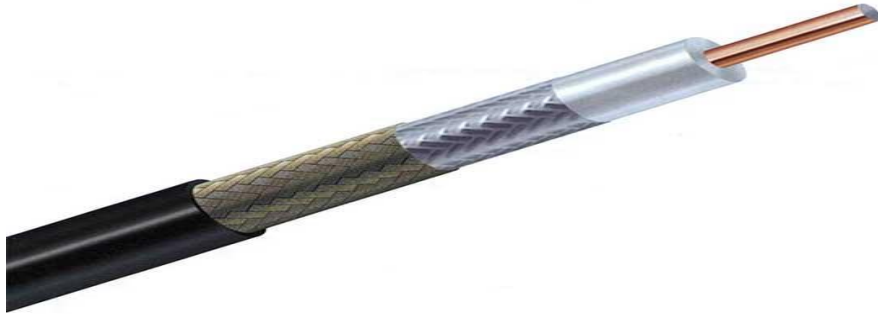
- Shielded Twisted Pair (STP) Cable
- Unshielded Twisted Pair (UTP) Cable

STP cables come with twisted wire pair covered in metal foil. This makes it more indifferent to noise and crosstalk.

UTP has seven categories, each suitable for specific use. In computer networks, Cat-5, Cat-5e and Cat-6 cables are mostly used. UTP cables are connected by RJ45 connectors.

Coaxial Cable

Coaxial cables have two wires of copper. The core wire lies in center and is made of solid conductor. Core is enclosed in an insulating sheath. Over the sheath the second wire is wrapped around and that too in turn encased by insulator sheath. This all is covered by plastic cover.



[Image: Coaxial Cable]

Because of its structure coax cables are capable of carrying high frequency signals than that of twisted pair cables. The wrapped structure provides it a good shield against noise and cross talk. Coaxial cables provide high bandwidth rates of up to 450 mbps.

There are three categories of Coax cables namely, RG-59 (Cable TV), RG-58 (Thin Ethernet) and RG-11 (Thick Ethernet). RG stands for Radio Government.

Cables are connected using BNC connector and BNC-T. BNC terminator is used to terminate the wire at the far ends.

Power Lines

Power Line communication is Layer-1 (Physical Layer) technology which uses power cables to transmit data signals. Send in PLC modulates data and sent over the cables. The receiver on the other end de-modulates the data and interprets.

Because power lines are widely deployed, PLC can make all powered devices controlled and monitored. PLC works in half-duplex.

Two types of PLC exist:

- Narrow band PLC
- Broad band PLC

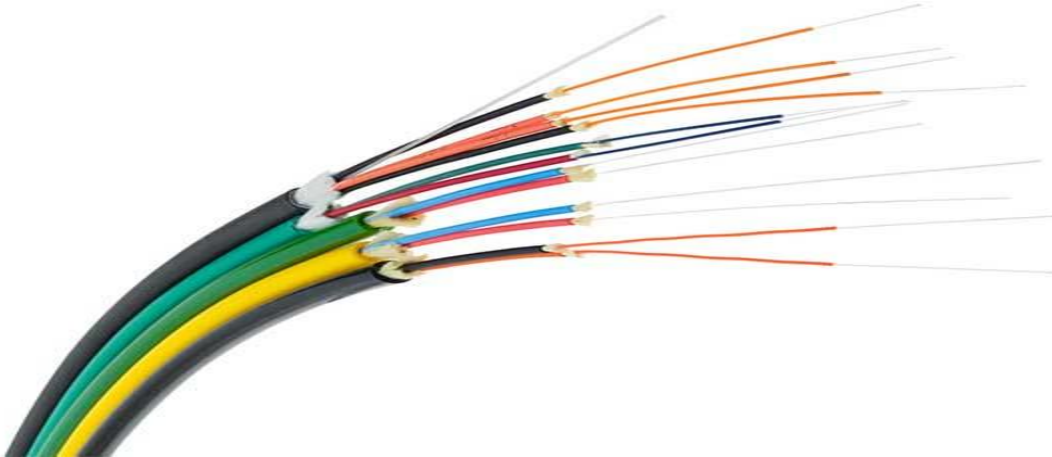
Narrow band PLC provides lower data rates up to 100s of kbps, as they work at lower frequencies (3-5000 kHz). But can be spread over several kilometers.

Broadband PLC provides higher data rates up to 100s of Mbps and works at higher frequencies (1.8 – 250 MHz). But cannot be much extended as Narrowband PLC

Fiber Optics

Fiber Optic works on the properties of light. When light ray hits at critical angle it tends to refracts at 90 degree. This property has been used in fiber optic. The core of fiber optic cable is made of high quality glass or plastic. From one end of it light is emitted, it travels through it and at the other end light detector detects light stream and converts it to electric data form.

Fiber Optic provides the highest mode of speed. It comes in two modes, one is single mode fiber and second is multimode fiber. Single mode fiber can carries single ray of light whereas multimode is capable of carrying multiple beams of light.



[Image: Fiber Optics]

Fiber Optic also comes in unidirectional and bidirectional capabilities. To connect and access Fiber Optic special type of connectors are used. These can be SC (Subscriber Channel), ST (Straight Tip) or MT-RJ.

Source:

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