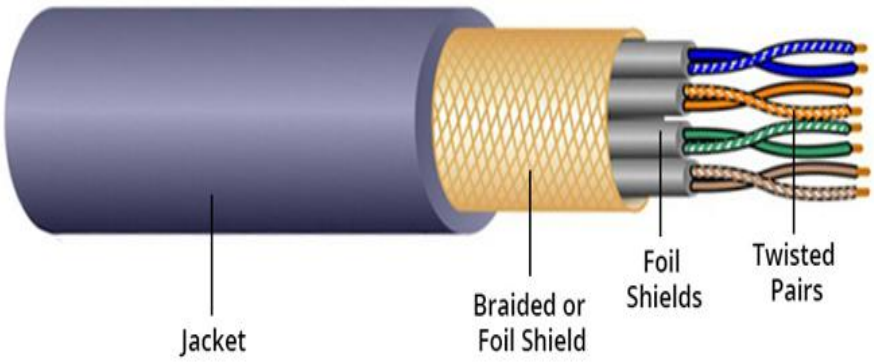
Twisted Pair Cable

Twisted pair cable is often used for telephone communications and most modern Ethernet networks. It is a kind of wiring in which two conductors of a single circuit are twisted together. A pair of wires forms a circuit that can transmit data. And the pairs are twisted together to provide protection against crosstalk, the noise generated by adjacent pairs.



There are two types of twisted pair Ethernet cable: unshielded twisted pair (UTP) and shielded twisted pair (STP). The commonly used UTP copper cable is Cat5, Cat5e, Cat6, Cat6a and Cat7. The STP copper cable has a foil-wrapped outside on each pair of wires. The four pairs of wires then are wrapped in an overall metallic braid or foil, usually 150-ohm cable. STP cable has a better capacity of resisting noise than UTP cable, even if both of them can be used in 10GBASE-T. Know the difference between UTP and STP cable in 10GBASE-T network: UTP or STP Cables for 10GBASE-T Network?

Advantages

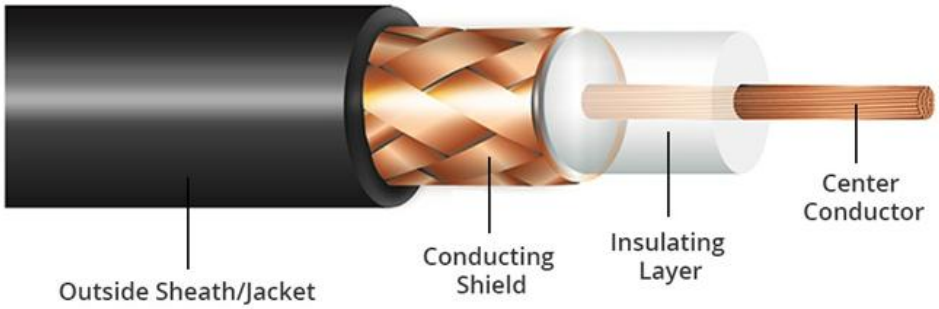
- Cost-effective
- Pliable and easy to install
- Performs best over short distance

Disadvantages

- Lower durability (must be routinely maintained)
- Susceptible to EMI
- Higher attenuation

Coaxial Cable

Coaxial cable, or coax cable, is designed to transmit high-frequency signals. It's comprised of a round copper conductor and three layers of insulation and shielding which prevents crosstalk from motors, lighting and other sources of EMI. With the shield construction, the coaxial cable can support longer cable lengths between two devices.



There are a number of different types of coax, but only two—RG59 and RG6—get the most use in residential applications. The name "RG" dates back to World War II and means "radio guide" which doesn't have really signify anything today.

Advantages

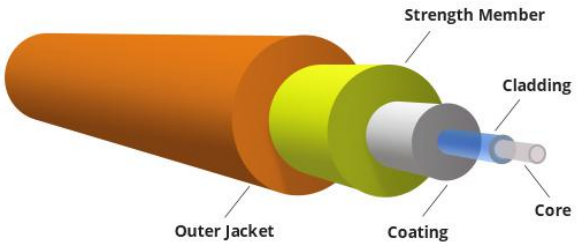
- Very durable
- Performs best over short distance

Disadvantages

- Signal loss over long distance
- Signal leak at points of egress
- Speed fluctuations under heavy usage

Fiber Optic Cable

Fiber optic cable, also called as optical fiber cable, is a type of Ethernet cable which consists of one or more optic fibers that are used to transmit data. Fiber optic cable transmits data as pulses of light go through tiny tubes of glass. The transmission capacity of optical fiber cable is 26,000 times higher than that of twisted pair cable.



Fiber optic cable can be divided into single mode fiber (SMF) and multimode fiber (MMF). Single mode optical fiber has a small core, and only allows one mode of light to propagate at a time. While multimode fiber cable comes with a larger core and is designed to carry multiple light rays or modes at the same time. The common single mode fiber cable is OS2 cable, and multimode fiber cable is OM1, OM2, OM3, OM4, and OM5. And the transmission distance of single mode fiber cable is up to several kilometers, while the multimode fiber is up to 550 meters over 10G network. To know more details about fiber optic cable types, working principle and installation tips, please read: Fiber Optic Cable Guide: Fiber Optic Cable Types and Installation

Advantages

- Can be bundled together
- EMI-resistant
- Performs well over long distances

Disadvantages

- More expensive
- Harder to install
- Susceptible to being cut or damaged