

Types of Networking Cables

Networking cables are used to **connect devices** in a network — like computers, switches, and routers — to **transmit data**.

There are **three main categories**:

1. Twisted Pair Cables
2. Coaxial Cables
3. Fiber Optic Cables

1. Twisted Pair Cables

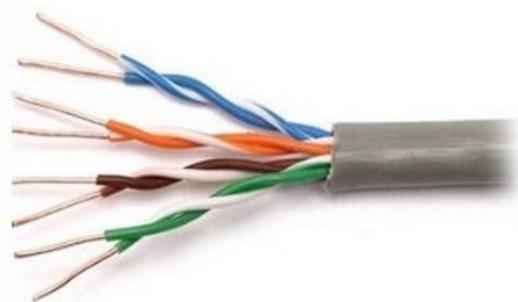
This is the most commonly used cable in LANs (Local Area Networks).

► Types:

Type	Description
UTP (Unshielded Twisted Pair)	Most common, no shielding, cheaper
STP (Shielded Twisted Pair)	Has shielding to reduce interference



Unshielded Ethernet Cable [UTP]



► Categories of UTP:

Category	Max Speed	Usage
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Cat5	100 Mbps	Basic LANs (older)
Cat5e	1 Gbps	Most common in LANs
Cat6	1–10 Gbps	Faster networks
Cat6a	Up to 10 Gbps (longer distance)	High-performance networks
Cat7/Cat8	10–40 Gbps	Data centers, modern enterprise LANs

 **Used For:** Ethernet connections, routers, switches, computers

 **Max Length:** 100 meters

2. Coaxial Cable

Has a **central conductor** with insulation and shielding, used in earlier computer networks and cable TV.

► **Types:**

- **Thicknet (10Base5)** – Older, used in long-distance Ethernet
- **Thinnet (10Base2)** – Flexible, used in early LANs

► **Features:**

- Better shielding than twisted pair
- Slower than modern Ethernet

 **Used For:** Cable TV, old broadband, CCTV

 **Max Length:** Around 500 meters (Thicknet)



3. Fiber Optic Cable

Uses **light signals** (not electricity) to transfer data, making it **extremely fast and secure**.

► Types:

Type	Description
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Single-Mode Fiber (SMF) Thin core, long-distance (up to 40+ km), laser light

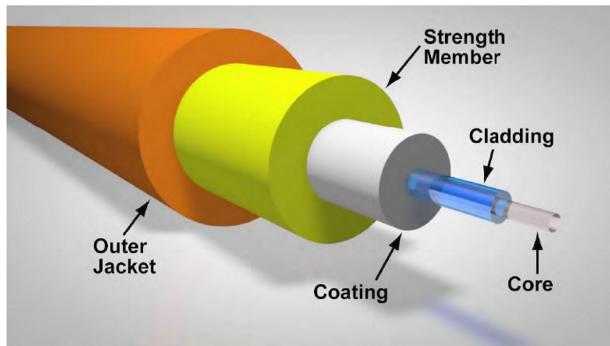
Multi-Mode Fiber (MMF) Thicker core, shorter distance (300–500 m), LED light

► Features:

- Immune to EMI (Electromagnetic Interference)
- Very high bandwidth (40+ Gbps)

 **Used For:** Backbone networks, ISPs, data centers

 **Max Length:** Several kilometers





Comparison Table

Cable Type	Speed	Distance	Cost	Interference	Use Case
Cat5e UTP	1 Gbps	100 m	Low	Medium	Home/Office LAN
Cat6 UTP	10 Gbps (short)	100 m (1 Gbps)	Medium	Low	Fast LAN
Coaxial	Up to 100 Mbps	500 m	Medium	Low	CCTV, Cable TV
Fiber Optic	10 Gbps–40 Gbps+	Up to 80 km	High	Very Low	Internet Backbone, WAN

Summary:

- **Twisted Pair (Cat5e, Cat6)** – Common in homes/offices
- **Coaxial Cable** – Used in older networks and CCTV
- **Fiber Optic Cable** – High-speed, long-distance communication

