

Types of Guided Transmission Media:

There are following types of guided transmission media:

Twisted-Pair Cables:

The most popular network cabling is twisted-pair cabling. It is light-weight, easy to install, inexpensive, and supports a variety of networks. Twisted-pair cabling is made of pairs of solid or stranded copper twisted along each other. The twists are to reduce vulnerability to EMI(electromagnetic induction) and crosstalk. The number of pairs in the cable depends on the type of cable.

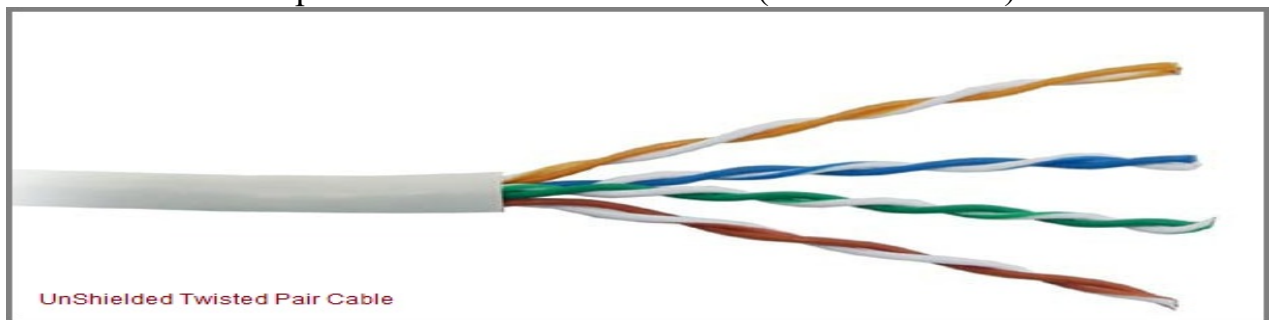
Twisted Pair is of two types:

1. **Unshielded Twisted Pair (UTP)**
2. **Shielded Twisted Pair (STP)**

1)Unshielded Twisted Pair Cable:

A popular type of cable that consists of two unshielded wires twisted around each other. Due to its low cost, UTP cabling is used extensively for local-area networks (LANs) and telephone connections but it is less expensive and easier to work with. It consists of color-coded copper wires, but does not include any foil or braiding as insulator to protect against interference. Wire pairs within each cable have varied amounts of twists per foot to produce cancellation.

UTP cables consist of 2 or 4 pairs of twisted cable. Cable with 2 pair use RJ-11 connector and 4 pair cable use RJ-45 connector(used in ethernet).



UTP Cable Color Coding:

There are 4 twisted pairs with four different colored wires. Each colored wire is twisted with white wire with a strip of same color on it.



There are 2 types of UTP cables:

- Straight
- Cross

Straight Cable:

- It is used to connect devices having different function. For Example,
- Connecting a router to a hub or switch.
- Connecting a server to a hub or switch.
- Connecting workstations to a hub or switch.

Cross Cable:

It is used to connect devices having same functions or roles. For example:

- Connecting hubs to switches.
- Connecting a hub to another hub.
- Connecting PC to PC

UTP Categories:

There are different categories of UTP based on their usages:

UTP Categories - Copper Cable				
UTP Category	Data Rate	Max. Length	Cable Type	Application
CAT1	Up to 1Mbps	-	Twisted Pair	Old Telephone Cable
CAT2	Up to 4Mbps	-	Twisted Pair	Token Ring Networks
CAT3	Up to 10Mbps	100m	Twisted Pair	Token Ring & 10BASE-T Ethernet
CAT4	Up to 16Mbps	100m	Twisted Pair	Token Ring Networks
CAT5	Up to 100Mbps	100m	Twisted Pair	Ethernet, FastEthernet, Token Ring
CAT5e	Up to 1 Gbps	100m	Twisted Pair	Ethernet, FastEthernet, Gigabit Ethernet
CAT6	Up to 10Gbps	100m	Twisted Pair	GigabitEthernet, 10G Ethernet (55 meters)
CAT6a	Up to 10Gbps	100m	Twisted Pair	GigabitEthernet, 10G Ethernet (55 meters)
CAT7	Up to 10Gbps	100m	Twisted Pair	GigabitEthernet, 10G Ethernet (100 meters)