



Dr. SNS RAJALAKSHMI COLLEGE OF
ARTS AND SCIENCE
(AUTONOMOUS)

Accredited by NAAC (Cycle- III) with 'A+' Grade



DEPARTMENT OF GRAPHICS AND CREATIVE DESIGN & DATA ANALYTICS

COMPUTER NETWORKS AND DATA COMMUNICATION
TRANSMISSION MEDIA
UNIT- II

Transmission Media



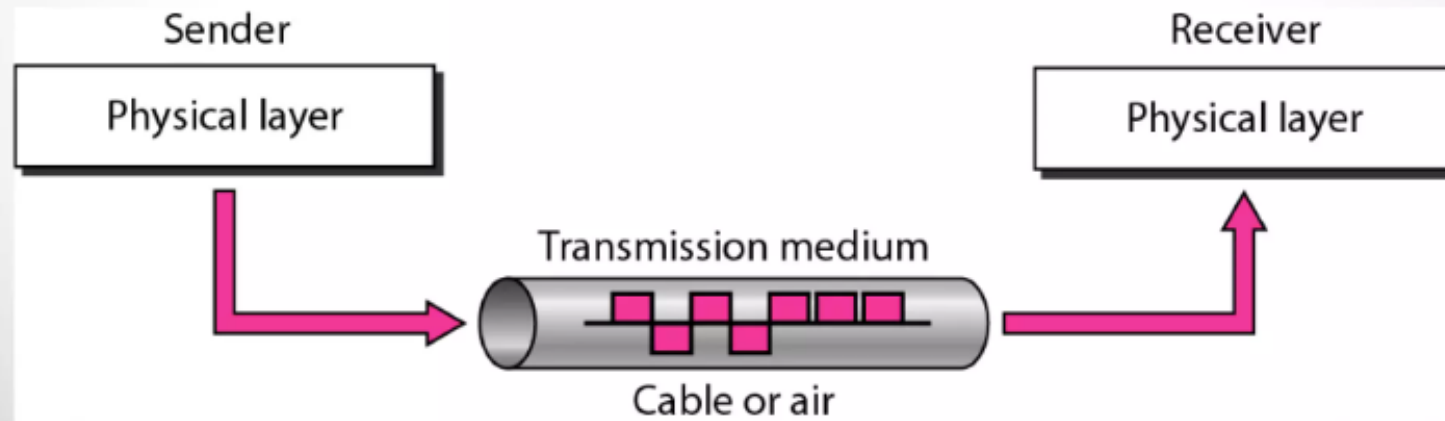
What is Transmission Media ?

In data communication,

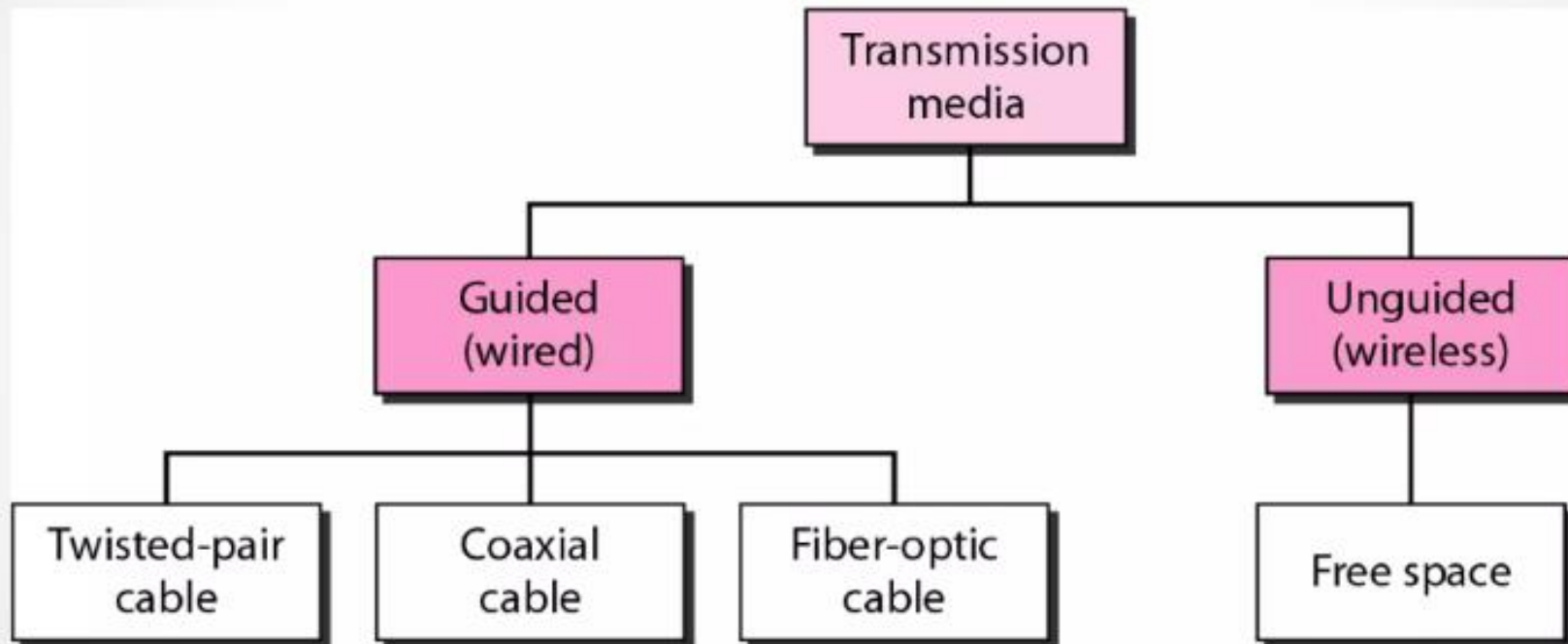
- **Transmission media** is a pathway that carries the information from sender to receiver.
- We use different types of cables or waves to transmit data.
- Data is transmitted normally through electrical or electromagnetic signals.

Description

- Transmission media are located below the physical layer
- Computers use signals to represent data.
- Signals are transmitted in form of electromagnetic energy.



Classification of Transmission media



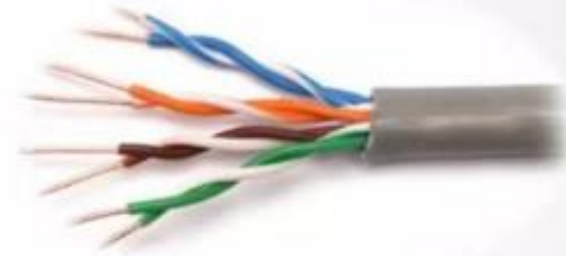
Twisted-pair cable

- A twisted pair consists of two conductors
- Basically copper based
- With its own plastic insulation, twisted together.



Twisted Pair Description

- Provide protection against cross talk or interference(noise)
- One wire use to carry signals to the receiver
- Second wire used as a ground reference
- For twisting, after receiving the signal remains same.
- Therefore number of twists per unit length, determines the quality of cable.



Twisted Pair

Advantages:

- Cheap
- Easy to work with

Disadvantages:

- Low data rate
- Short range

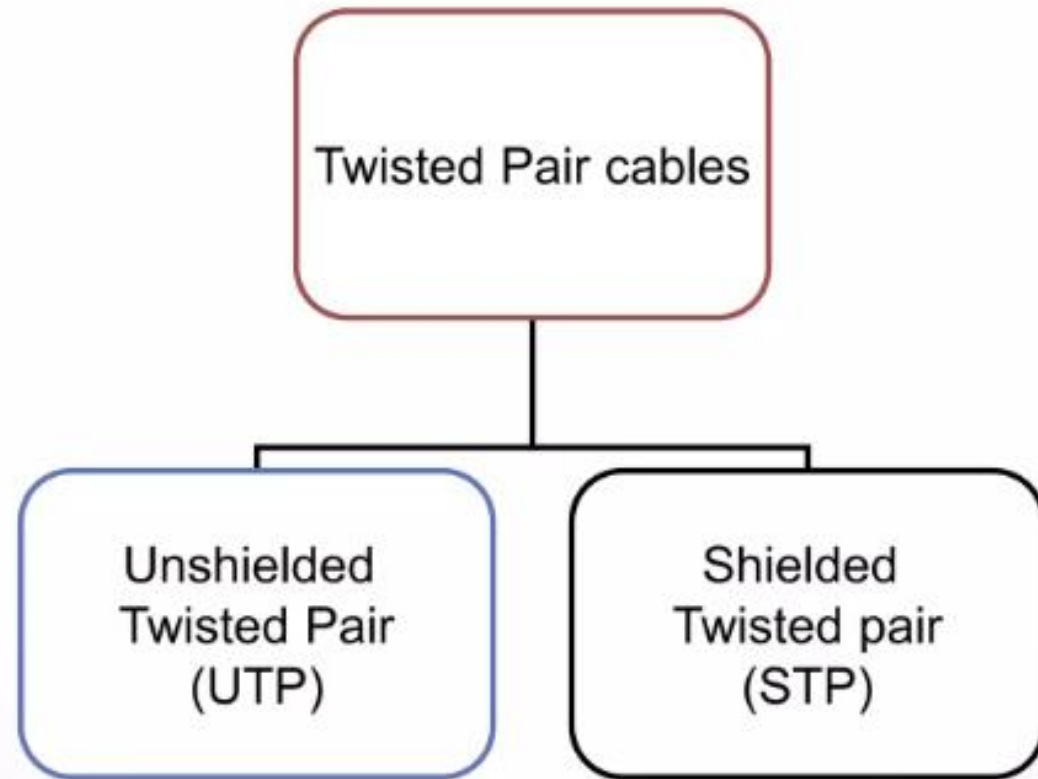


Twisted Pair - Applications

- Very common medium
- Can be use in telephone network
- Connection Within the buildings
- For local area networks (LAN)



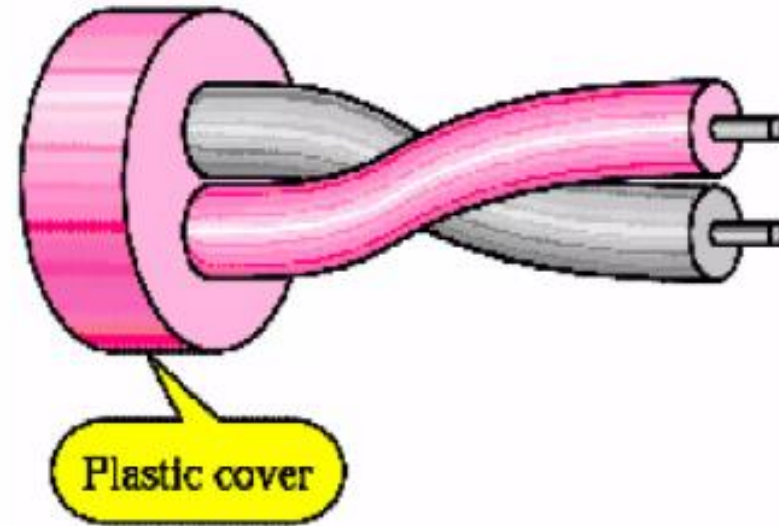
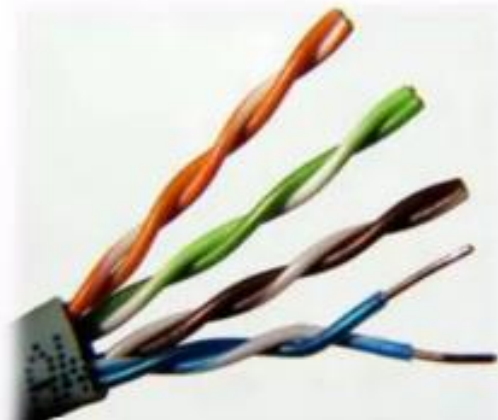
Twisted Pair Cables



Unshielded Twisted Pair (UTP):

Description

- Pair of unshielded wires wound around each other
- Easiest to install



a. UTP

Advantages of UTP:

- Affordable
- Most compatible cabling
- Major networking system

Disadvantages of UTP:

- Suffers from external Electromagnetic interference



Applications

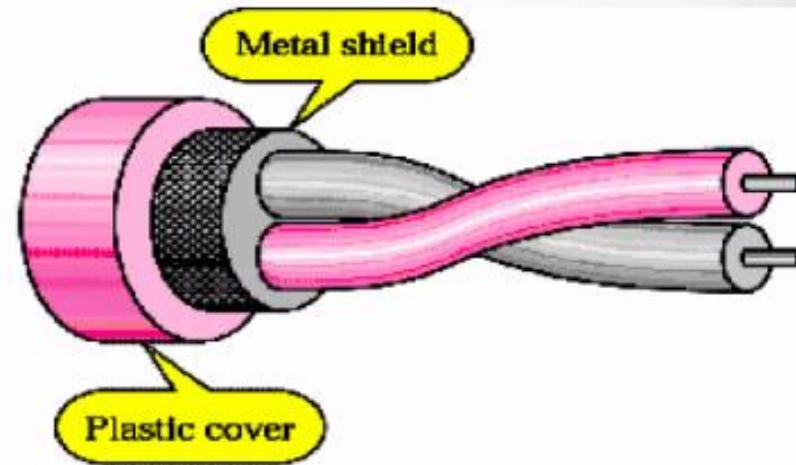
UTP :

- Telephone subscribers connect to the central telephone office
- DSL lines
- LAN – 10Mbps or 100Mbps



Shielded Twisted Pair (STP)

- Pair of wires wound around each other placed inside a protective foil wrap
- Metal braid or sheath foil that reduces interference
- Harder to handle (thick, heavy)



b. STP



Advantages of STP:

- Shielded
- Faster than UTP

Disadvantages of STP:

- More expensive than UTP
- High attenuation rate



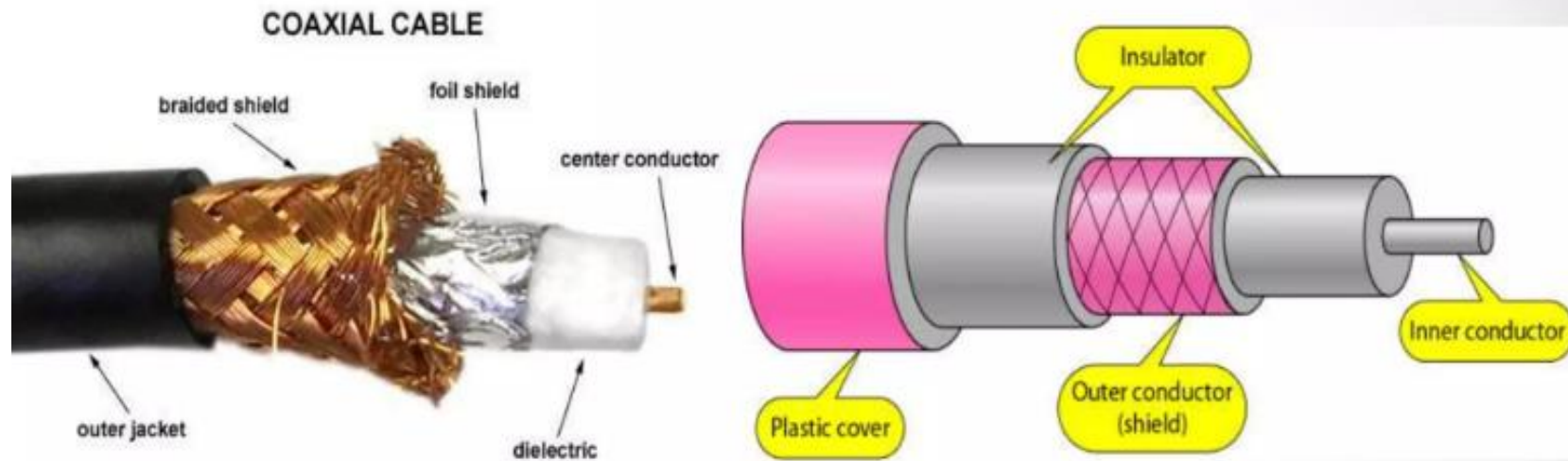
STP Application



- STP is used in IBM token ring networks.
- Higher transmission rates over longer distances.

Co-axial Cable

Co-axial cable carries signal of higher frequency ranges than twisted pair cable



- Inner conductor is a solid wire
- Outer conductor serves as a shield against noise and a second conductor

Coaxial Cable Applications

- Most versatile medium
- Television distribution
- Long distance telephone transmission
- Can carry 10,000 voice calls simultaneously
- Short distance computer systems links
- Local area networks



COAXIAL CABLE

ADVANTAGES

- Easy to wire
- Easy to expand
- Moderate level of Electro Magnetic Interference



DISADVANTAGE

- Single cable failure can take down an entire network
- Cost of installation of a coaxial cable is high due to its thickness and stiffness
- Cost of maintenance is also high

Fiber-Optic Cable

A fiber optic cable is made of glass or plastic and transmit signals in the form of light.

Nature of light:

- Light travels in a straight line
- If light goes from one substance to another then the ray of light changes direction
- Ray of light changes direction when goes from more dense to a less dence substance

