

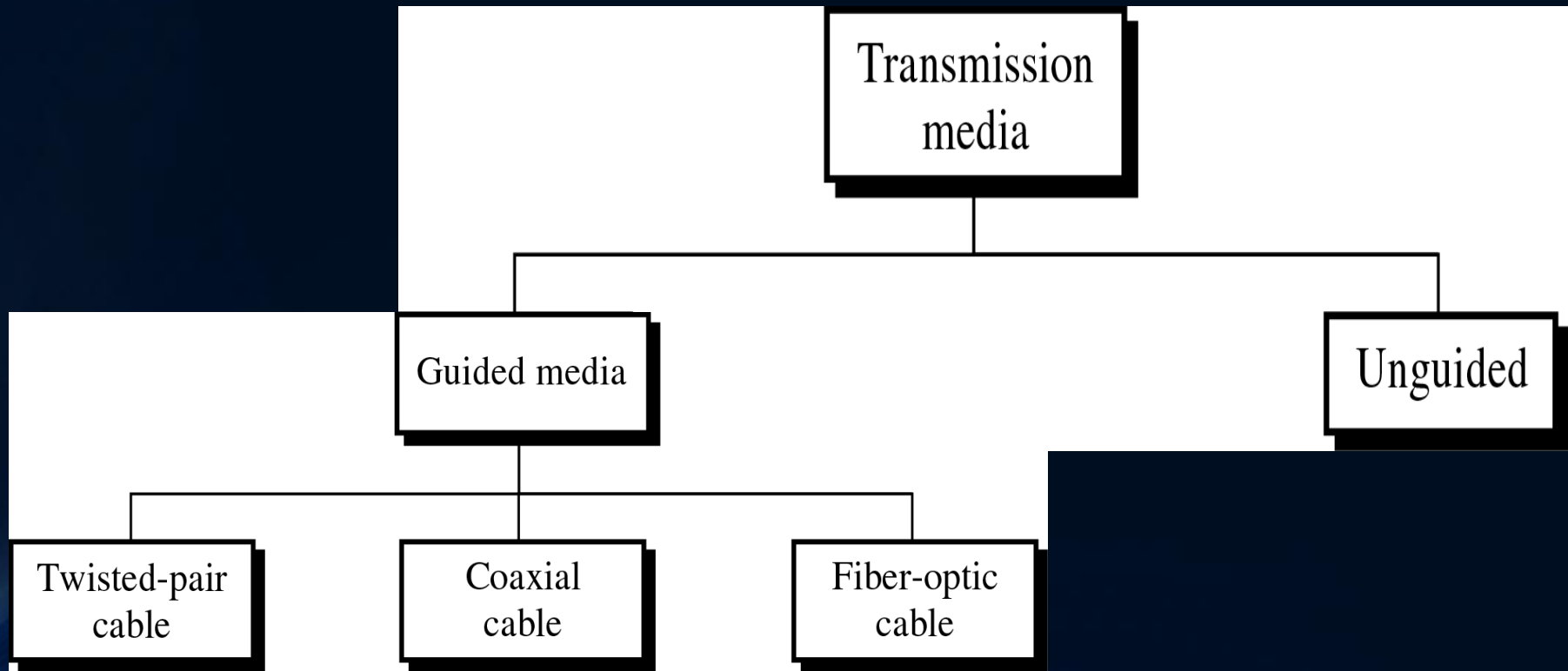
**Kardan University**  
**BCS Faculty**  
**Data Communication and**  
**Computer Networks**

# OUTLINE

- **Network Media or Transmission Media**
- **Guided and unguided media**
- **STP cables**
- **Coaxial cables**
- **Fiber**
- **Cable combinations**

# TRANSMISSION MEDIA

- Are the Links that connect nodes together.
- Media are what the message are transmitted over.



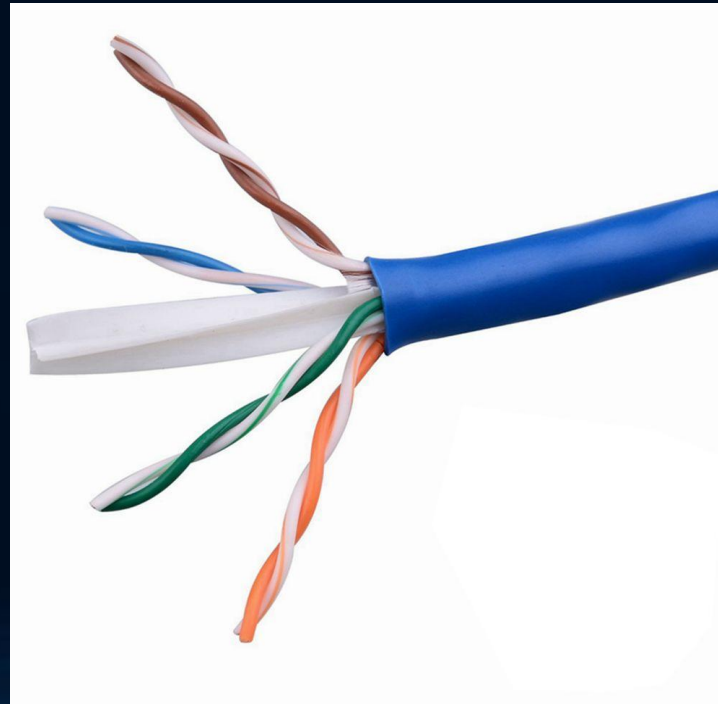
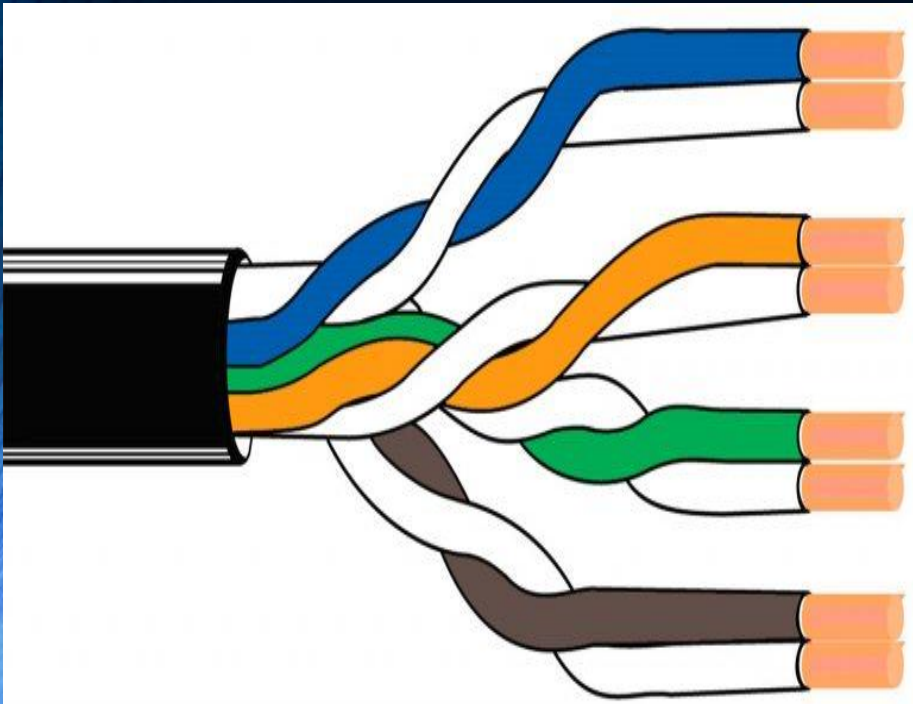
# GUIDED MEDIA

- Guided Media, are those media that provide a conduit from one device to another.



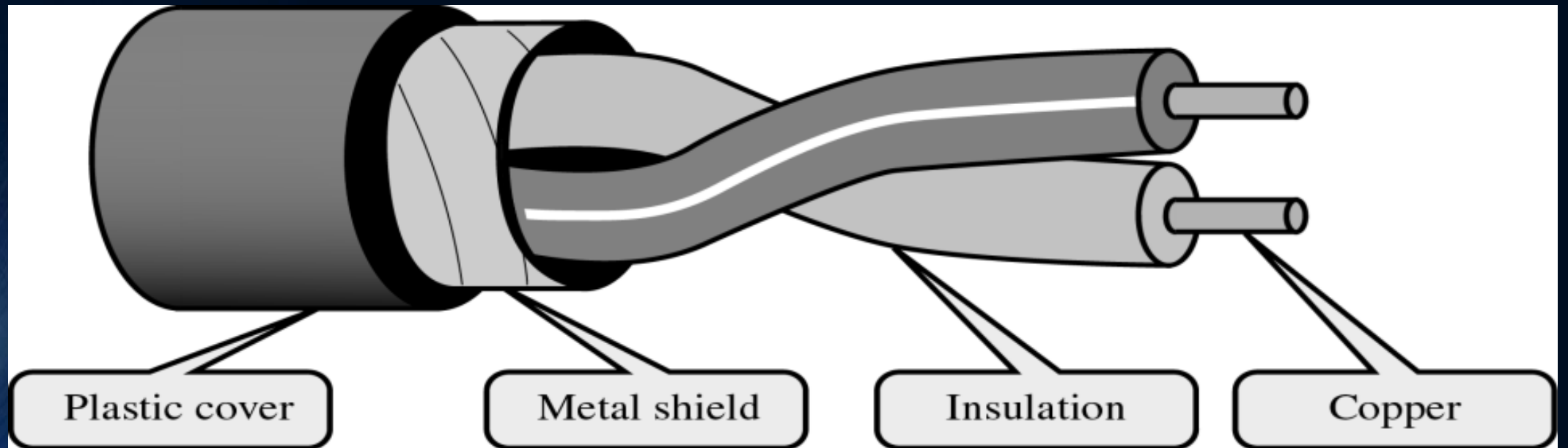
# TWISTED PAIR

- The twisted pair cable comes in two forms:
  - Unshielded Twisted Pair (UTP) cable
  - Shielded Twisted Pair (STP) cable



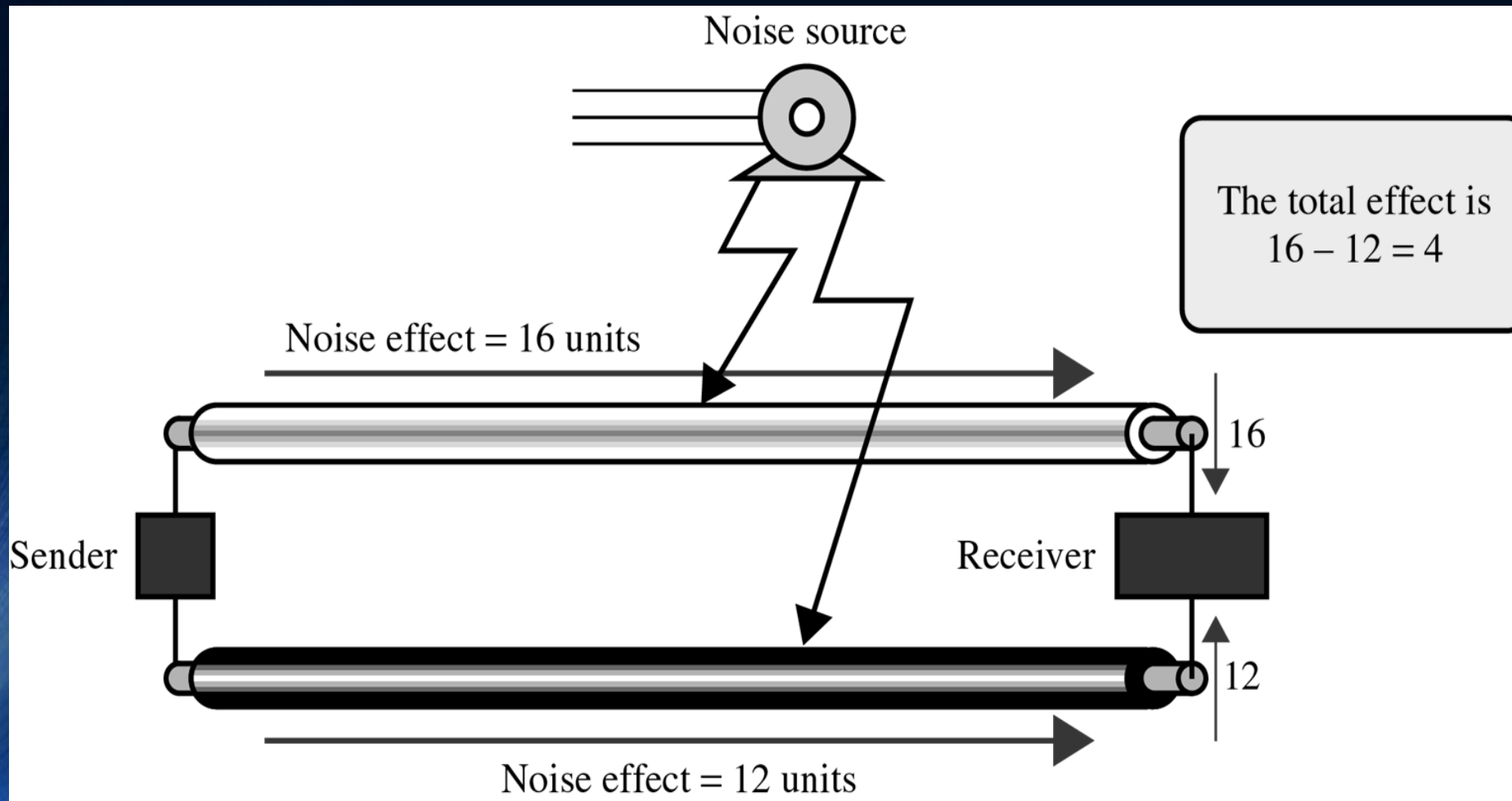
# TWISTED PAIR

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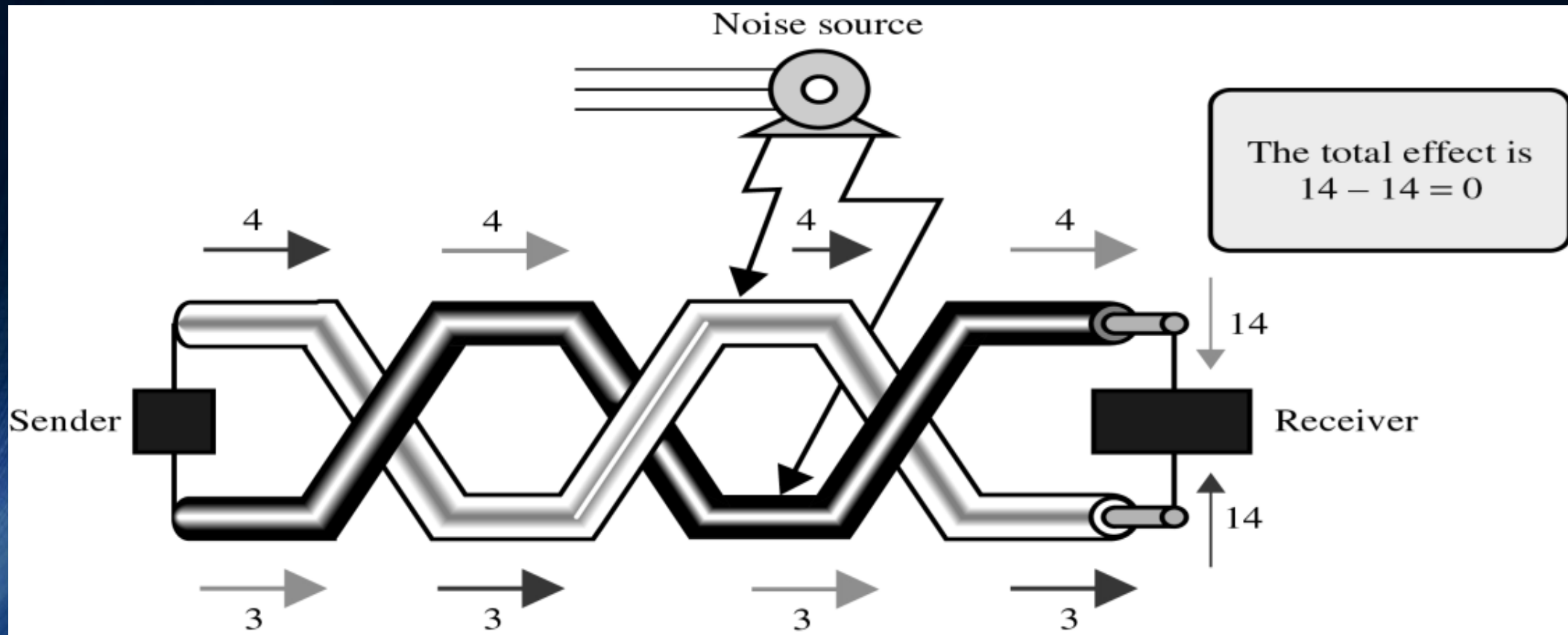
# WHY TWISTED PAIRS?

- Old parallel pairs:



# WHY TWISTED PAIRS?

- The new twisted pairs reduce the noise effect:



# CATEGORIES OF TWISTED PAIR

- **Category 1 (Cat1):**

- Basic Twisted pair cabling used in Telephone system
- Used for voice only
- Have two pairs of lines

- **Category 2 (Cat2):**

- Used for voice and data
- Have 4 pairs of lines
- Speed: 4Mbps.

# CATEGORIES OF TWISTED PAIR

- **Category 3 (Cat3):**
  - Required to have at least 3 twists per foot
  - Can be used for data transmission of up to 10Mbps
  - Used for both voice and data
  - 4 pairs of lines
- **Category 4 (Cat4):**
  - Must have at least 3 twists per foot
  - Possible transmission rate of 16 Mbps
  - 4 pairs of lines
  - Used for voice and data

# CATEGORIES OF TWISTED PAIR

- **Category 5 (Cat5):**

- Used for data transmission of up to 100 Mbps
- 4 pairs of lines
- Used for data and voice

- **Category 5e (Cat5e):**

- Used for data transmission of up to 1000 Mbps
- 4 pairs of lines
- Used for voice and data

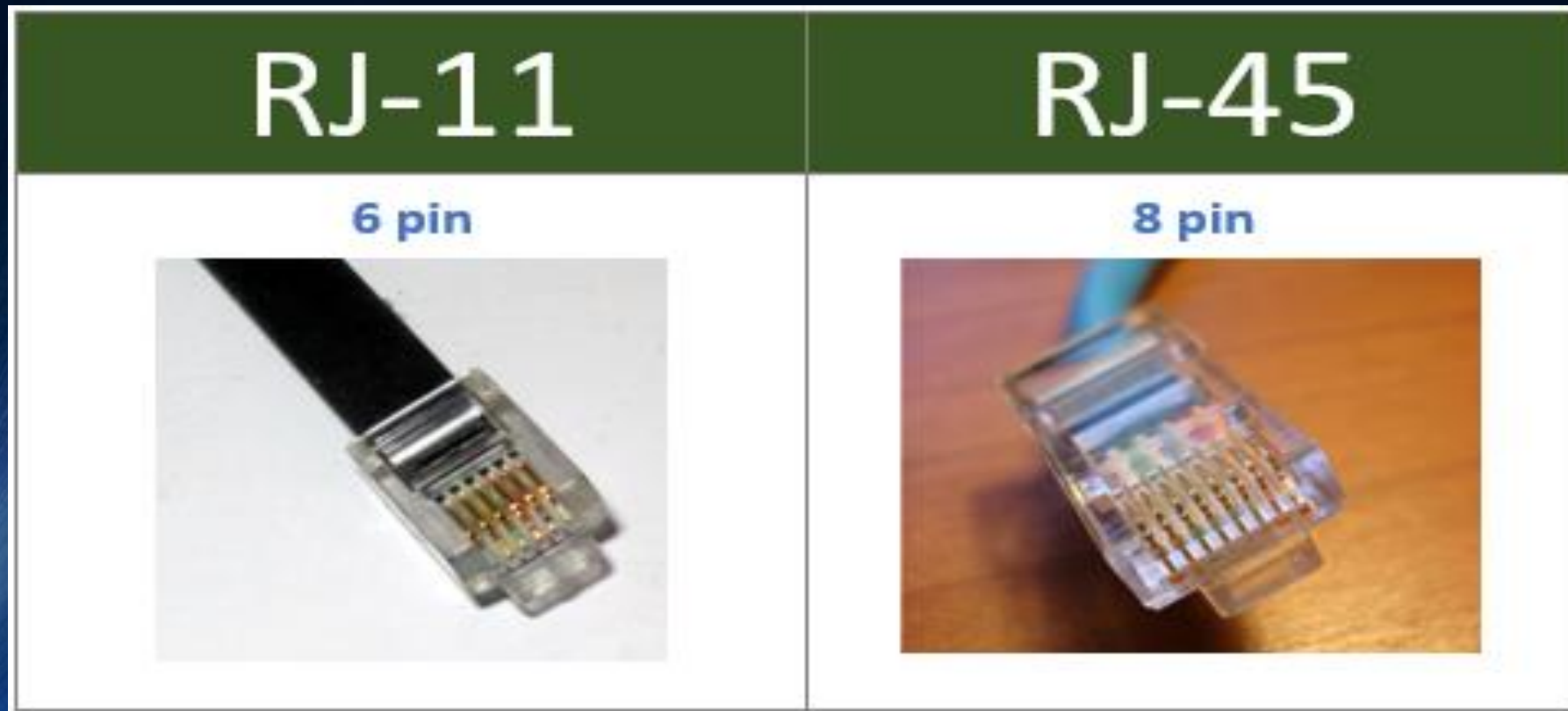
# CATEGORIES OF TWISTED PAIR

- **Category 6 (Cat6):**

- Used for data transmission of up to 10000 Mbps
- 4 pairs of lines
- Used for data and voice

# RJ CONNECTORS

- RJ45 (Registered Jack) $\Rightarrow$  8 pins  $\Rightarrow$  Data & voice
- RJ11 (Registered Jack) $\Rightarrow$  6 pins  $\Rightarrow$  Voice only



# STP/UTP CABLE CONFIGURATION

- Straight cable
  - Connects devices of different types.
  - SW/B/H-PC
  - SW/B/H-R
- Cross cable:
  - Is used to connect devices of same type.
  - PC/SW/R/H/B-PC/SW/R/H//B
  - PC-R

# STP/UTP CABLE CONFIGURATION

- Rolled cable
  - Is used to connect a PC to the console port of Router/Switch for the configuration purpose.
  - This type of cable is also called console cable,
  - One end of the cable is serial female and another end is RJ45.
  - The RJ45 end of the cable is connect to R/S.

# STP/UTP CABLE CONFIGURATION

- Console cable



# STP/UTP CABLE CONFIGURATION

## ■ Straight cable configuration:

End A

Orange white

Orange

Green white

Blue

Blue white

Green

Brown white

Brown

End B

Orange White

Orange

Green White

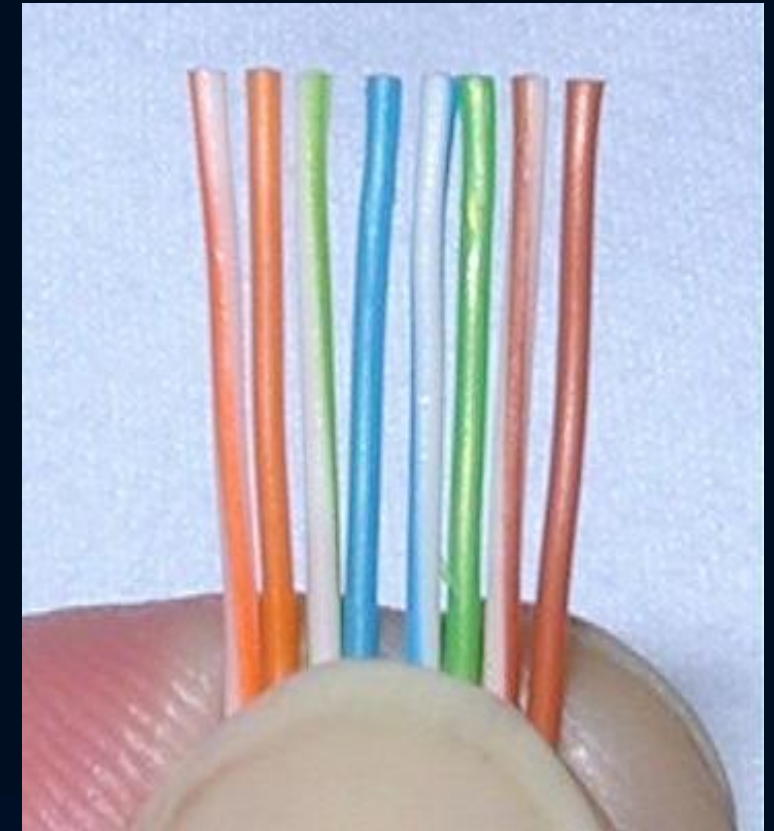
Blue

Blue White

Green

Brown White

Brown



# STP/UTP CABLE CONFIGURATION

## ■ Cross cable configuration:

### End A

Orange white

Orange

Green white

Blue

Blue white

Green

Brown white

Brown

### End B

Green White

Green

Orange White

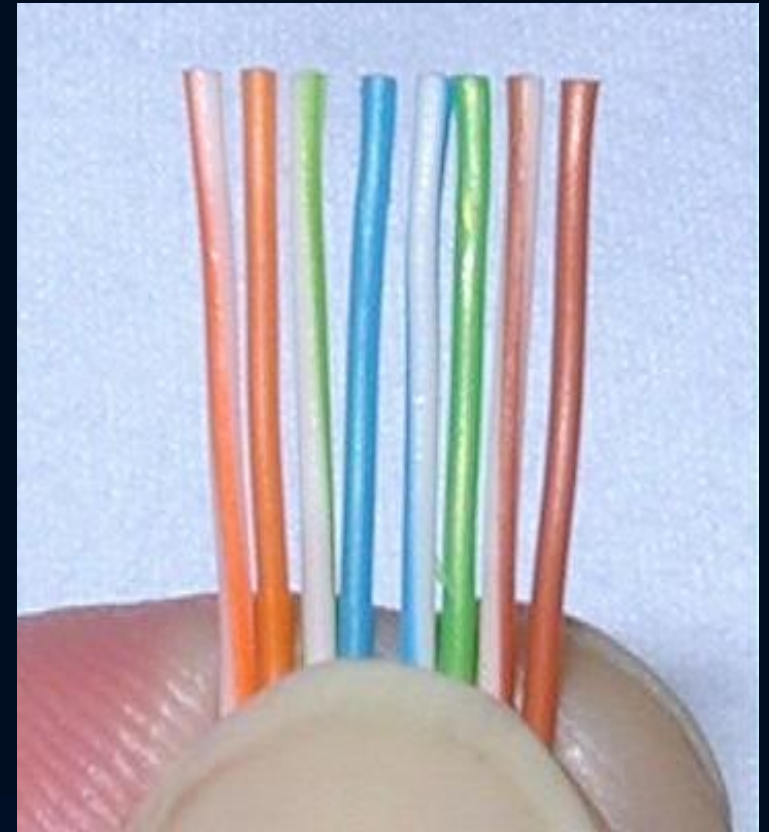
Blue

Blue White

Orange

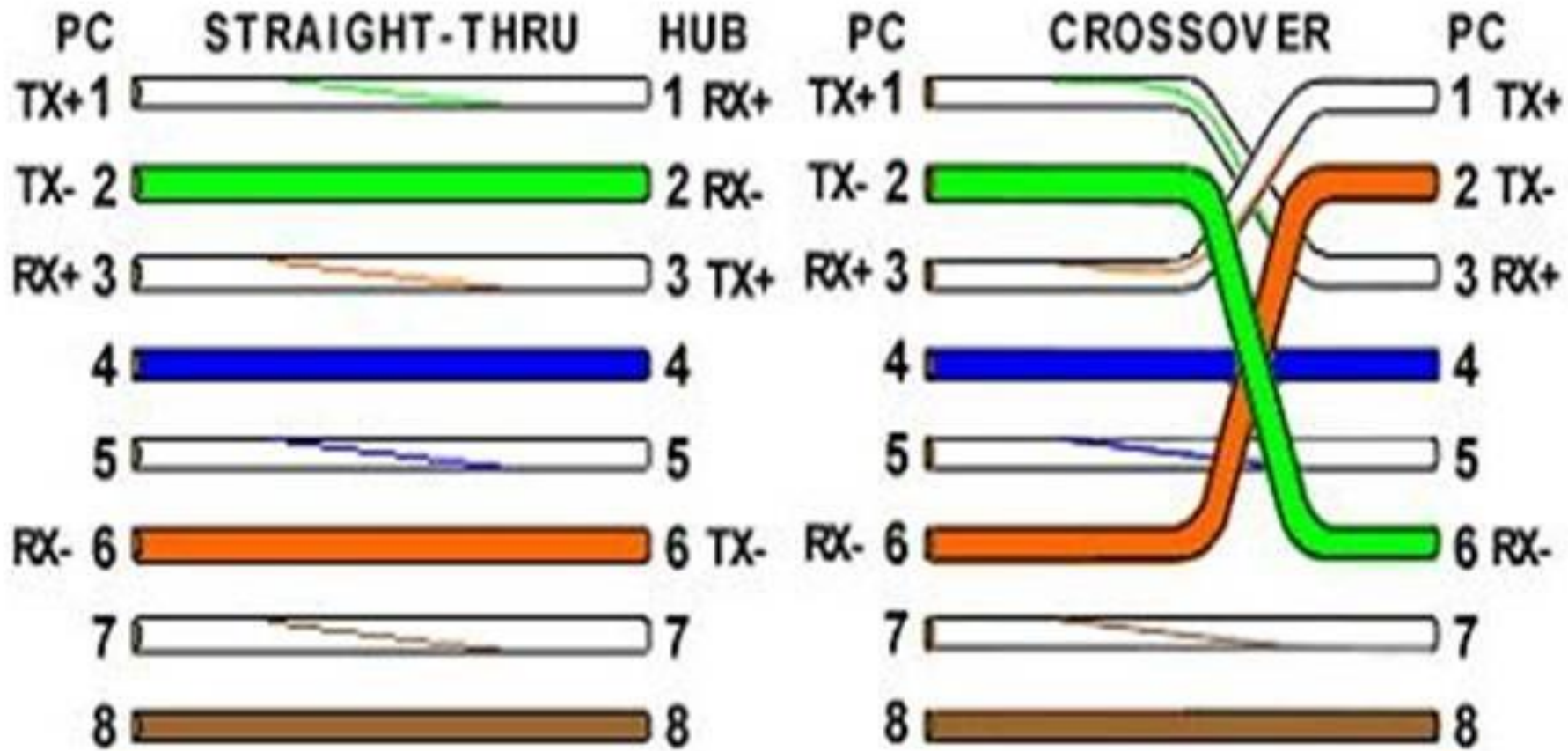
White Brown

Brown



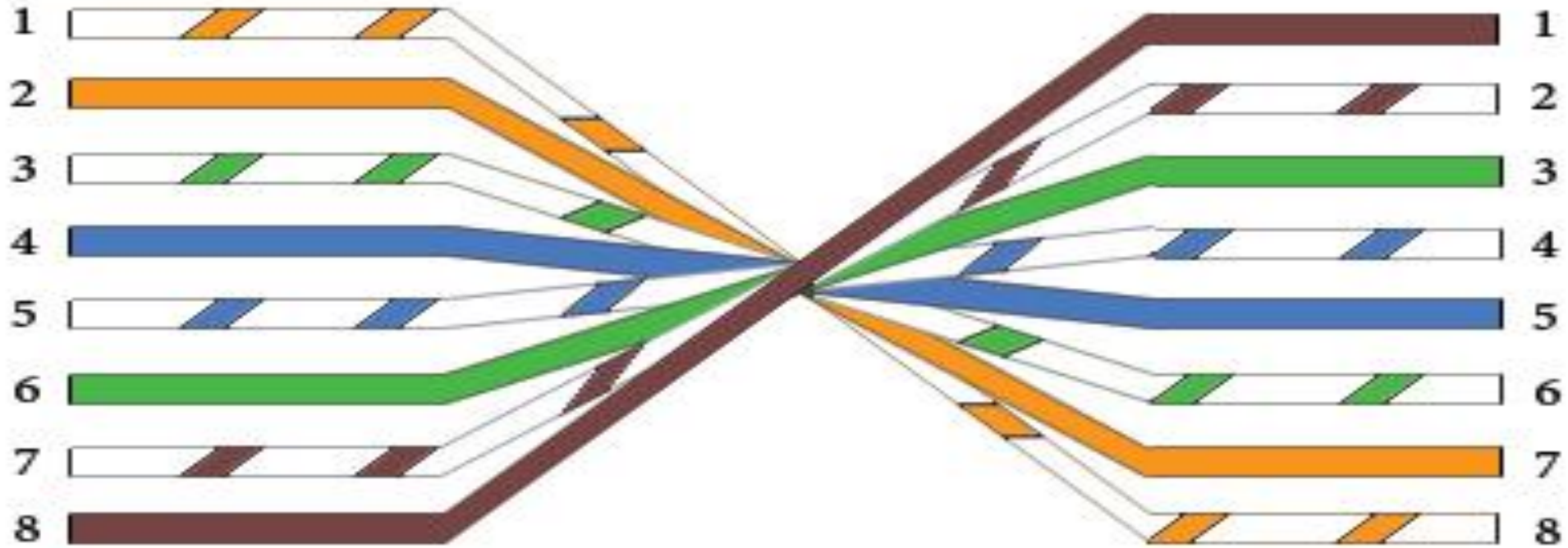
# STP/UTP CABLE CONFIGURATION

## Basic Theory:



# ROLLOVER CABLE CONFIG

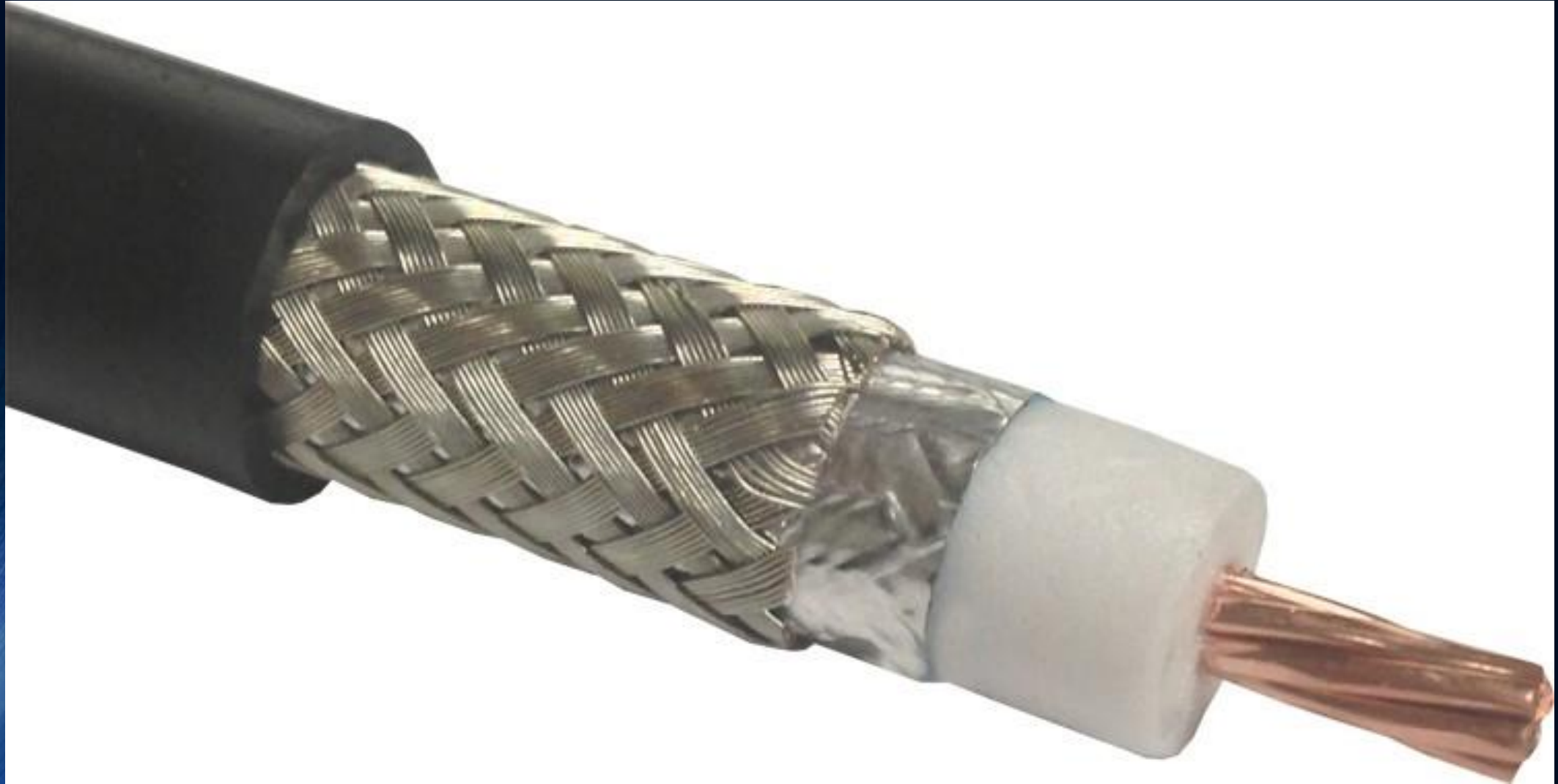
Rollover Wiring Guide  
568-B



# COAXIAL CABLE

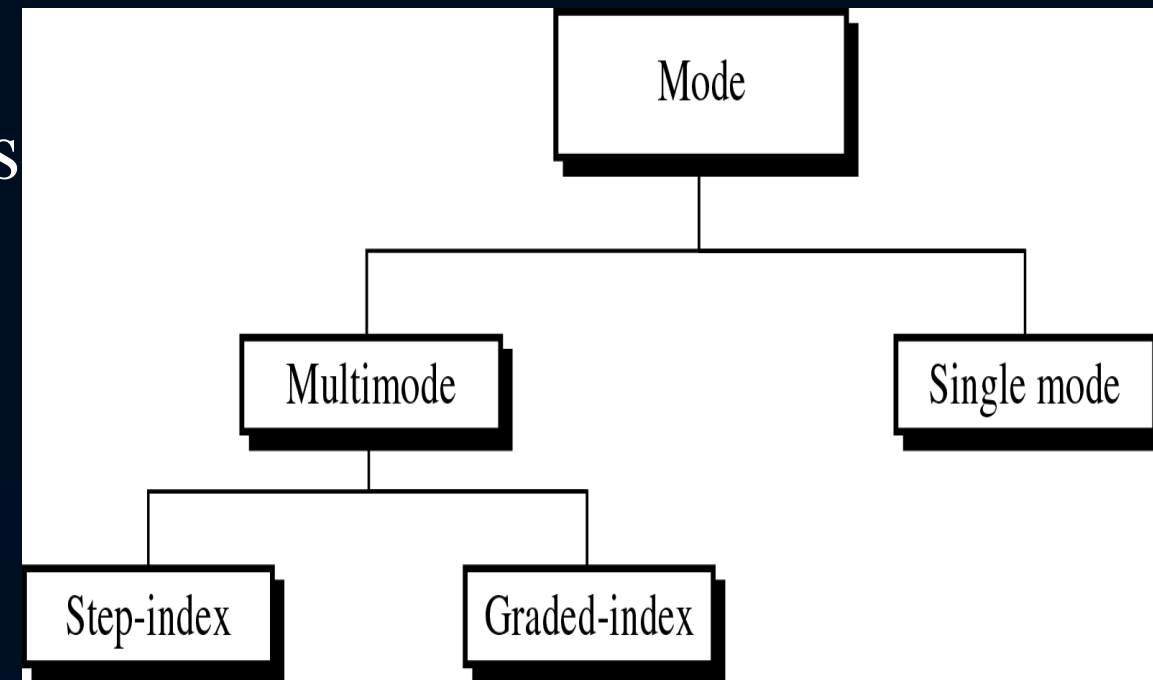
- Coaxial cable
  - Also called coax
  - Similar to cable TV wire
  - One wire runs through cable
  - Shielded from interference
  - Speeds up to 10 Mbps
  - Expensive than Twisted pair

# COAXIAL CABLE



# OPTICAL FIBER

- Optical fiber is made of glass or plastic
- It transmits signals in the form of light
- High speed but very expensive
- Fiber has the following categories
- 



# OPTICAL FIBER



# UNGUIDED MEDIA

- There no specific guided path for data transfer.
- Air is used as a physical path for the data transfer in the unguided media.
- The technologies using unguided media are:
  - Wi-fi (Wireless Fidelity)
  - Bluetooth
  - Infrared
  - Microwave
  - Li-fi (light fidelity)

THANK YOU