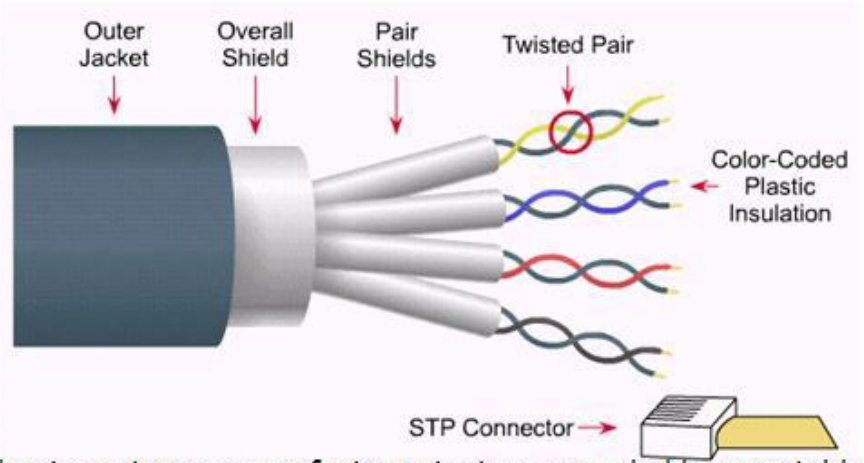
Lab-1- Types of cables used in networks:-

Twisted-Pair Cabling

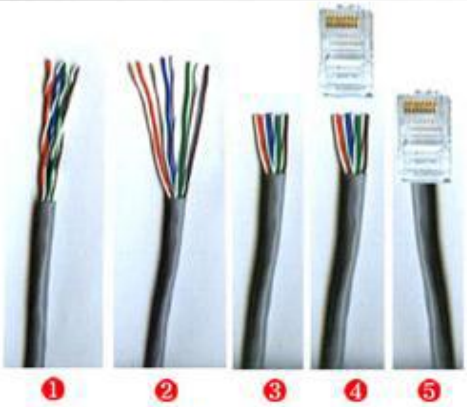
- Computer networks make extensive use of copy wire.
  - Easy to install
  - Inexpensive
  - Low resistance, so signals can travel father
  - Minimal interference
  - Wires come in pairs
  - The pairs of wire are twisted around each other (to reduce crosstalk, interference)

STP (Shielded Twisted Pair)



- Each wire pair or group of wire pairs is surrounded by a metal braid or foil.
- Acts as a barrier to any interfering signals.
- Increases the diameter and cost of the cable.
- Less common the Unshielded Twisted Pair (UTP)

UTP (Unshielded Twisted Pair)



Adding a connector

Advantages:

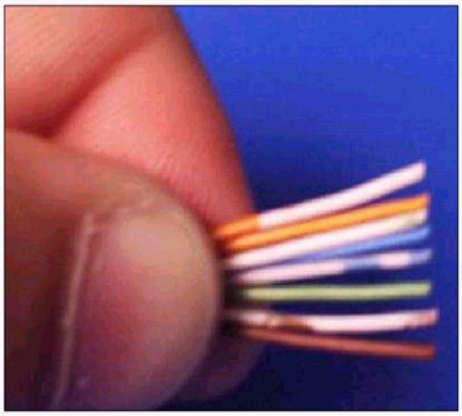
- Thin, flexible, easy to install
- Doesn't crowd wiring ducts as much as coax
- Cheap

Disadvantages:

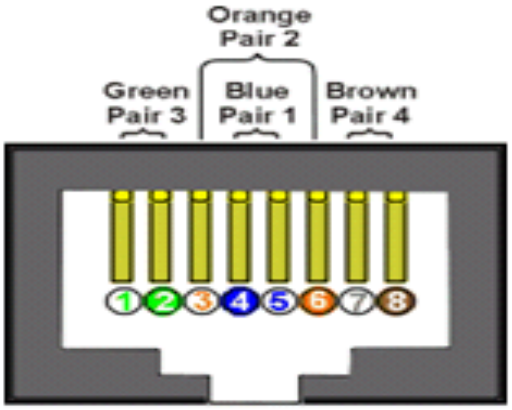
- More susceptible to interference than most other types of cabling
- Limited to segments of 100 meters.

Cut a Length of Cable

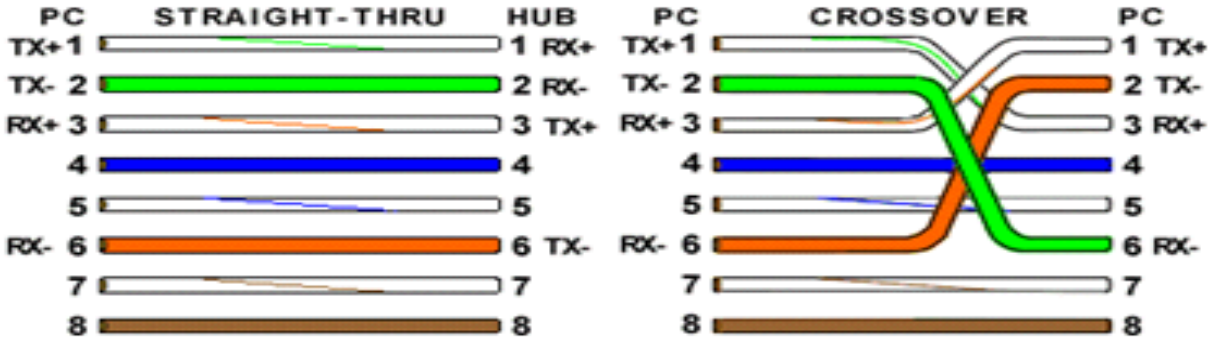
Organize and Flatten Wires

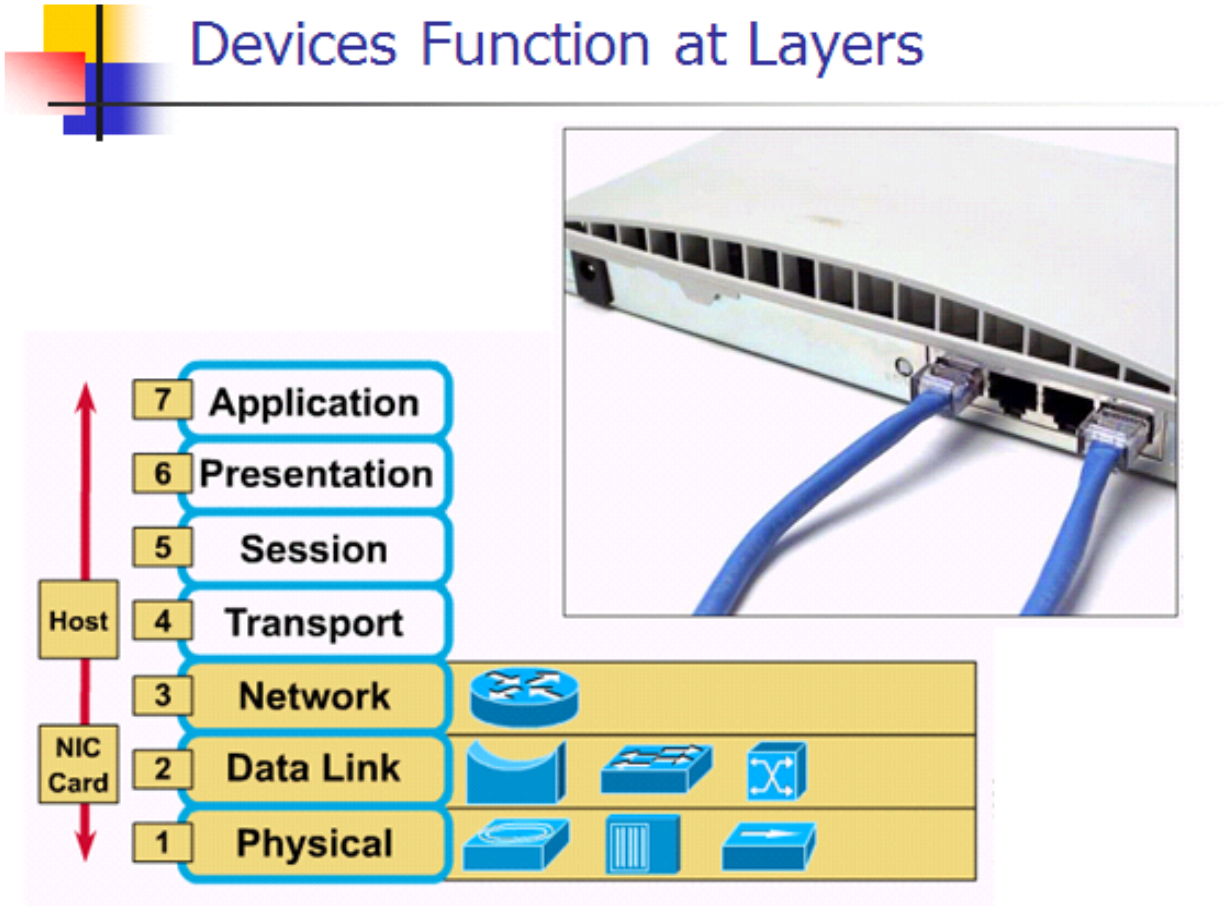


CAT5 Termination (568A)

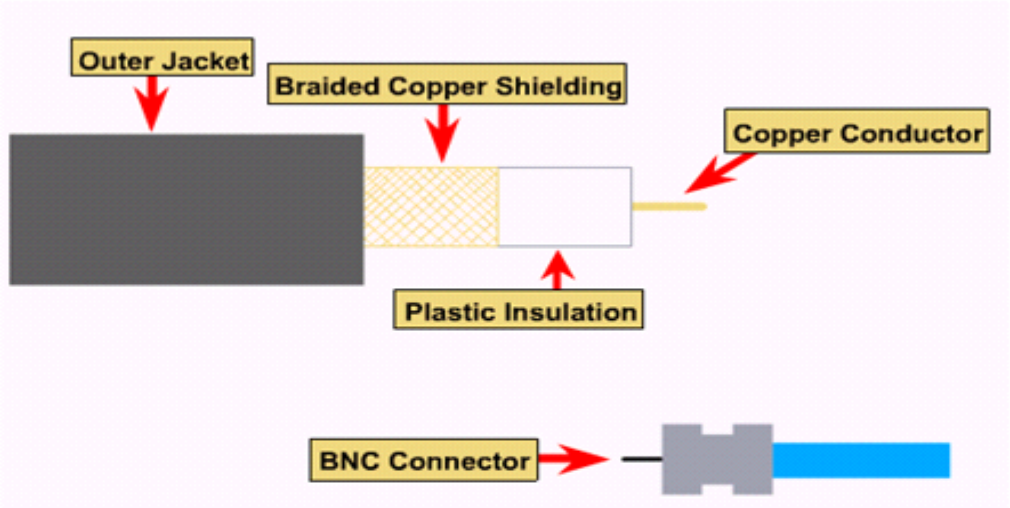


RJ-45 JACK




Devices Function at Layers
7 Application
6 Presentation
5 Session
4 Transport
3 Network
2 Data Link
1 Physical
Host
NIC Card

Coaxial Cable



- Consists of solid inner core, usually made of copper
- Uses a foil or copper braid shield
  - Thinnet (10Base2): 185 meters unboosted
  - Thicknet (10Base5): 500 meters unboosted

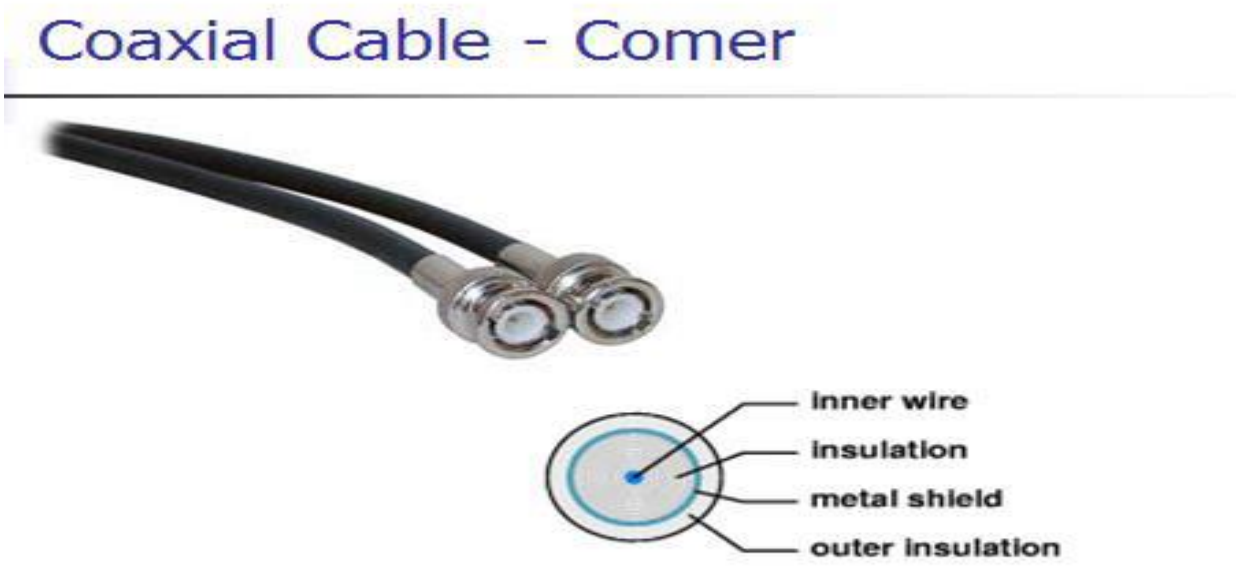
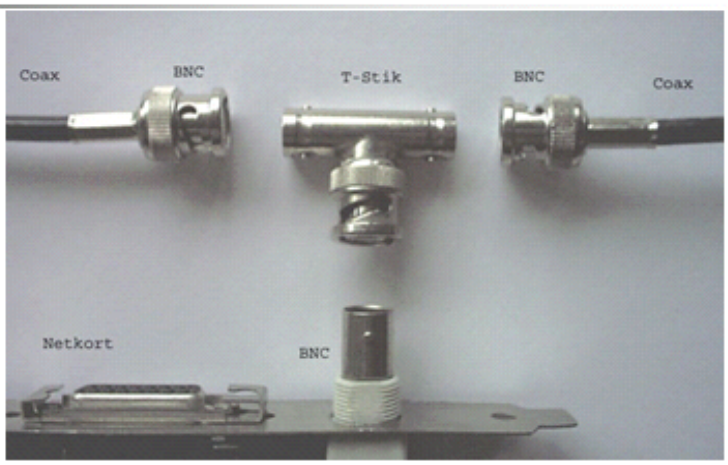


Figure 4.2 Enlarged cross-section of a coaxial cable with major parts identified. Although a coaxial cable is stiffer than a single wire, it can be bent.

Coaxial Cable

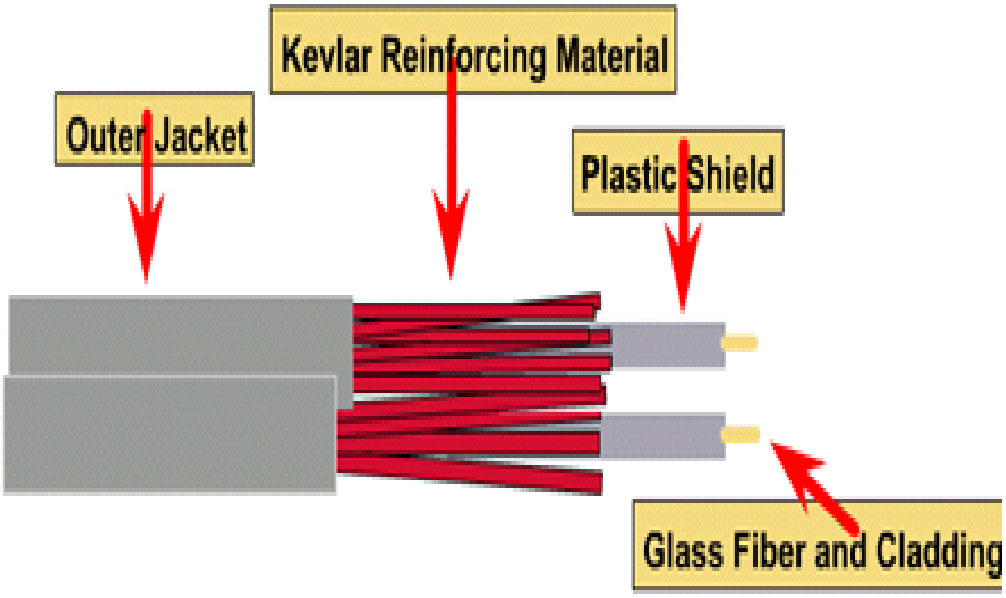


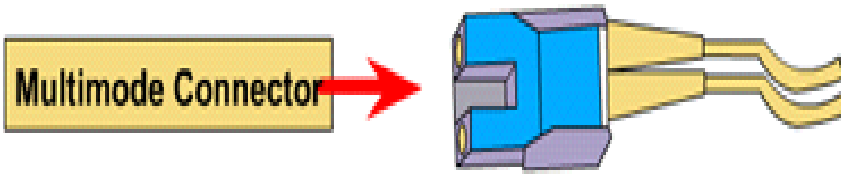
- **Advantages:**
  - Segment lengths are longer than twisted pair
  - Shielding built in
  - Hubs between stations are not required
  - Use to handle more bandwidth than UTP, but that is no longer true.
- **Disadvantages:**
  - Not as easy to run as UTP
  - More expensive than UTP
  - Needs more room in wiring ducts than UTP

10BASE2 50 Ohm Coax

10BASE5 Thicknet Cable

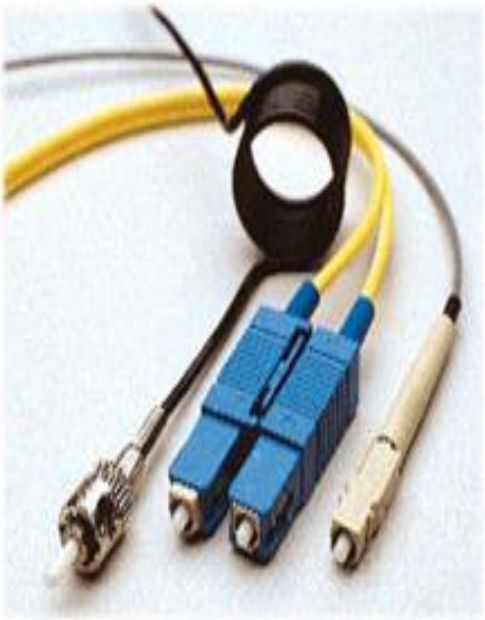
Fiber Optic Cable





- Speed and throughput: 100+ Mbps
- Average $ per node: Most Expensive
- Media and connector size: Small
- Single mode, maximum cable length: Up to 3000m
- Multimode mode, maximum cable length: Up to 2000m
- Single mode: One stream of laser-generated light
- Multimode: Multiple streams of LED-generated light

Fiber-Optic Cable



Advantages

- Not susceptible to electromagnetic interference
- Capable of higher data rates at further distances
- Capable of unboosted long runs

Disadvantages

- Expensive
- Most difficult to install