COMMUNICATION AND NETWORKS

TRANSMISSION MEDIA

TRANSMISSION MEDIA

A TRANSMISSION MEDIA IS A MEDIUM OF DATA TRANSFER OVER A NETWORK

GUIDED MEDIA

WIRED CONNECTION

UNGUIDED MEDIA

WIRELESS CONNECTION

GUIDED MEDIA

-TWISTED PAIR CABLE

1.UNSHIELDED TWISTED PAIR(UTP)

2.SHIELDED TWISTED PAIR(STP)

-COAXIAL CABLE

-OPTICAL FIBERS

Twisted pair cable

-Most popular network cabling

-Basis for most internal office telephone wiring

-Consists of two identical wires twisted along each other

-Twisting of wires reduces network errors

-The no.of.pairs in the cable depends on the type

-There are two types of twisted pair cabling :

1.Unshielded twisted pair

2.Shielded twisted pair

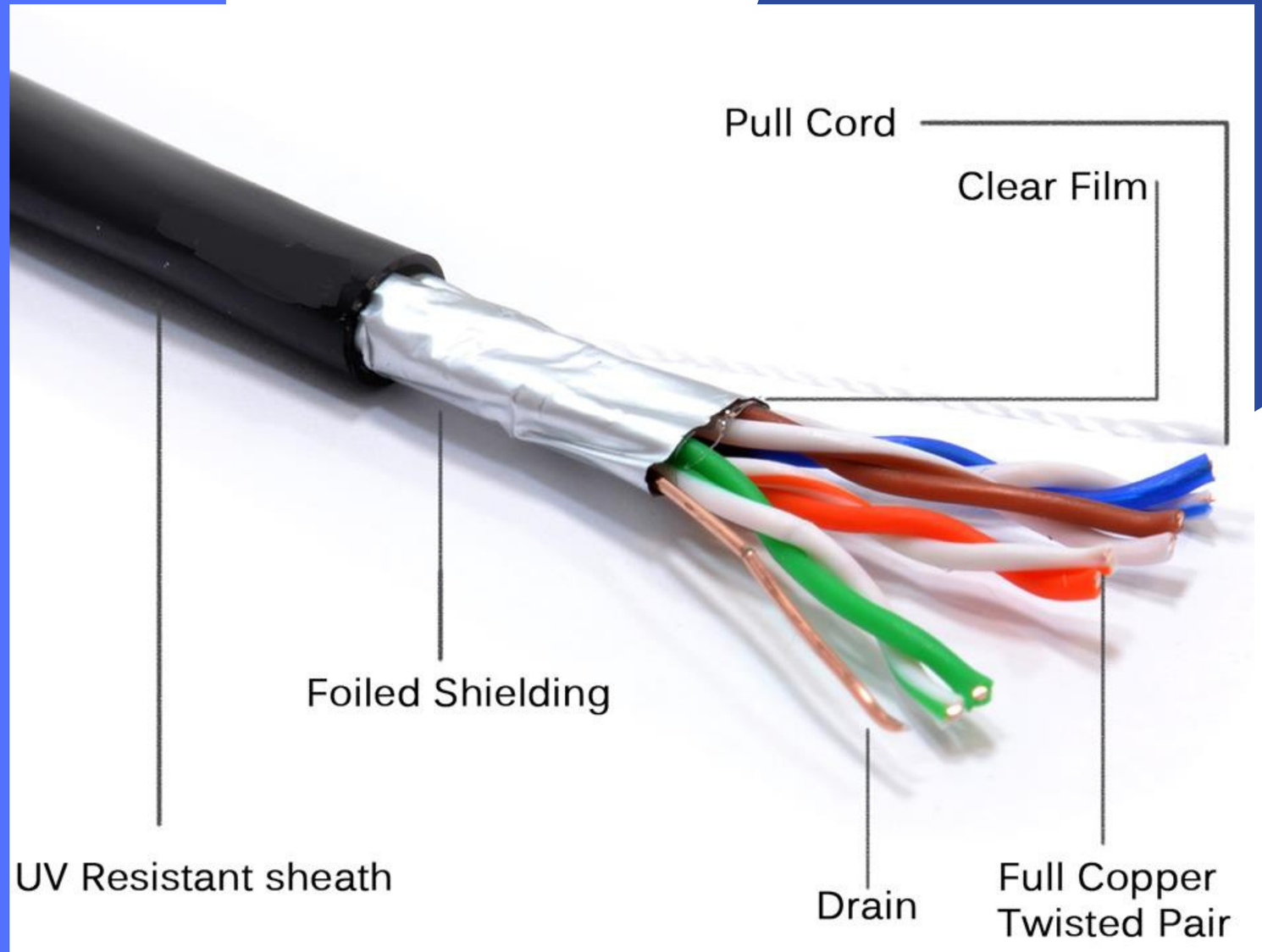
1.UNSHIELDED TWISTED PAIR

USED FOR VARIETY OF ELECTRONIC COMMUNICATIONS

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 Rink & 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)

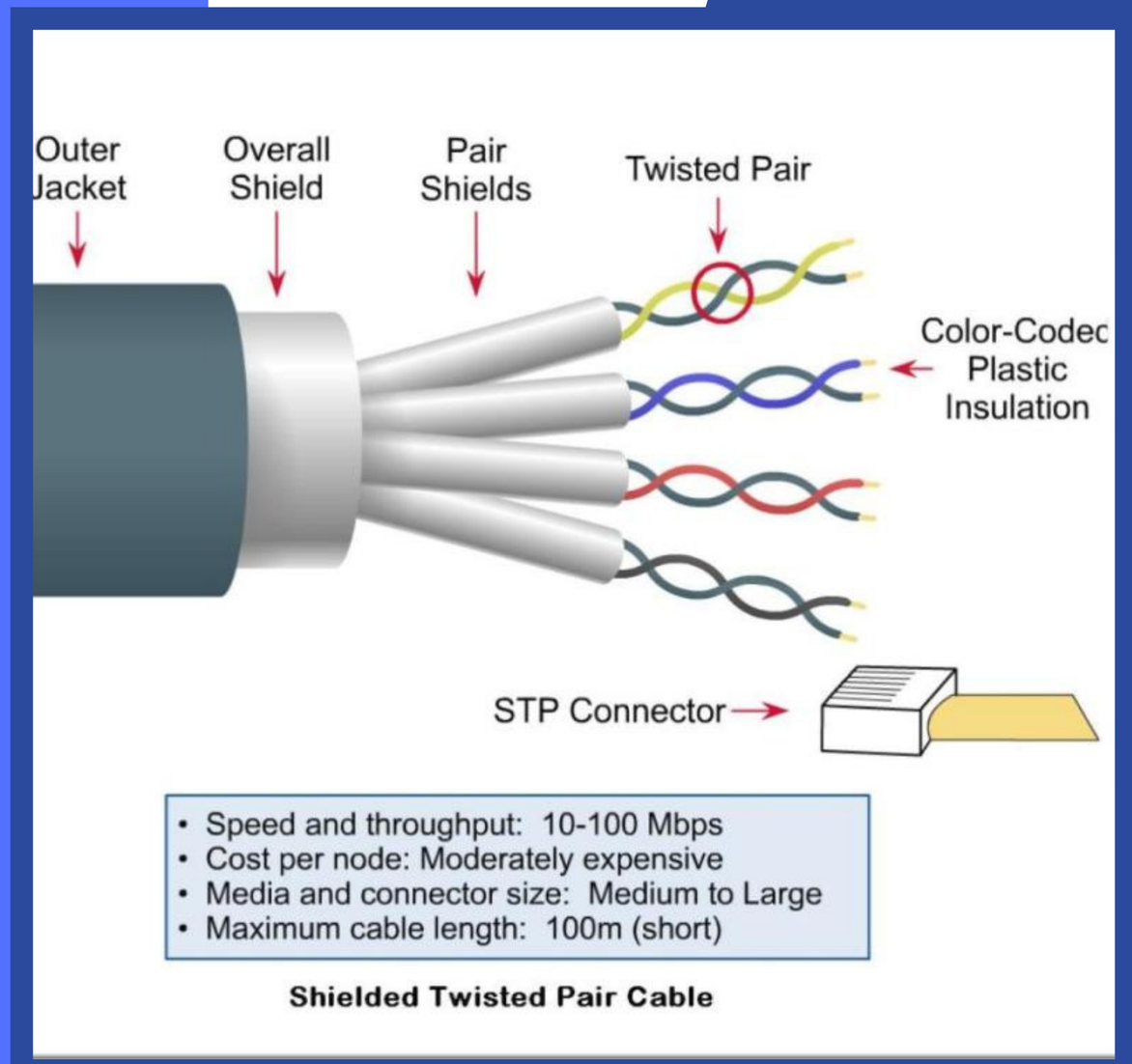
UTP

AS THE NAME WOULD IMPLY, THESE CABLES DO NOT HAVE INSULATION (SHIELDING) BETWEEN EACH OF THE PAIRED WIRES.



STP

STP PAIR CABLE IS A PAIR OF WIRES WOUND AROUND EACH OTHER AND EACH PAIR IS PLACED INSIDE A PROTECTIVE FOIL WRAP TO PROTECT IT FROM CROSSTALK.
HEAVIER AND COSTLIER THAN UTP,REQUIRES PROPER GROUNDING AT BOTH ENDS



ADVANTAGES AND DISADVANTAGES

ADVANTAGES

-Simple
-Flexible
-Low weight
-Inexpensive
-Connected easily
-Easy to install and maintain

DISADVANTAGES

-Incapable for long distance
-Unsuitable for long distance
-Supports maximum data rates 1mbps without conditioning and 10mbps with conditioning

COAXIAL CABLE

Coaxial cable consist the following layers in its construction:

1. The copper conductor
2. Insulation layer of plastic foam
3. Shield of wire mesh tube or metallic foil
4. Outer shield of tough plastic

- HAS HIGH ELECTRONIC PROPERTIES
- SUITABLE FOR HIGH COMMUNICATION
- TRANSPORT MULTI-CHANNEL TELEVISION SIGNALS AROUND METROPOLIAN AREAS

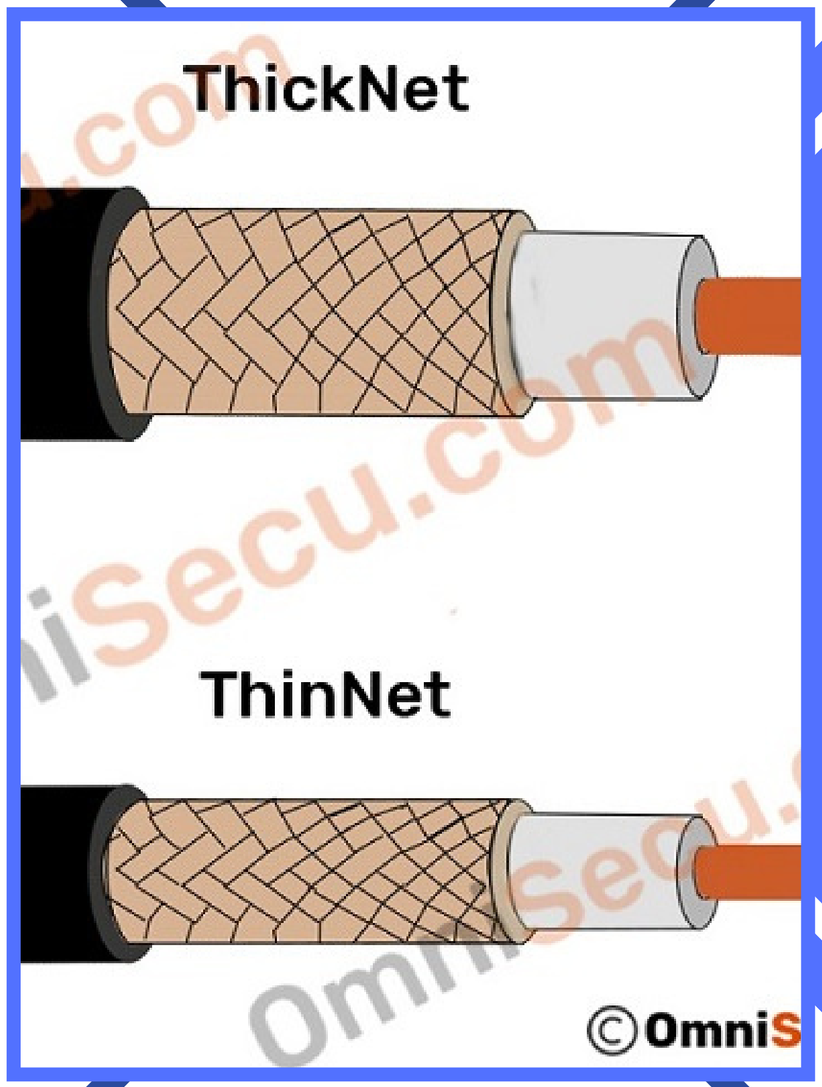
TWO TYPES OF COAXIAL CABLE

1.THICKNET:

MAXIMUM SEGMENT LENGTH IS UP TO **500MTS** AND BANDWITH UP TO 10MBPS

2.THINNET:

MAXIMUM SEGMENT LENGTH IS UP TO **185MTS** AND BANDWITH UP TO 10MBPS



ADVANTAGES AND DISADVANTAGES

Advantages:

-BETTER DATA TRANSMISSION THAN TWISTED-PAIR CABLES
-USED AS SOURCE FOR SHARED CABLE NETWORK
-USED FOR BROADBAND TRANSMISSION
-HIGHER BANDWITH UP TO 400MBPS

Disadvantages:

-SINGLE CABLE FAILURE CAN TAKE DOWN AN ENTIRE NETWORK

-EXPENSIVE

-NOT COMPATIBLE WITH TWISTED PAIR CABLES

OPTICAL FIBERS

-USES ELECTRICAL SIGNALS TO TANSMIT DATA

-IT USES LIGHT

-LIGHT ONLY MOVES IN ONE DIRECTION , FOR TWO WAY COMMUNICATION TO TAKE PLACE A SECOND CONNECTION MUST BE MADE BETWEEN THE TWO DEVICES

Optical fiber

core

- inner part where wave propagates

cladding

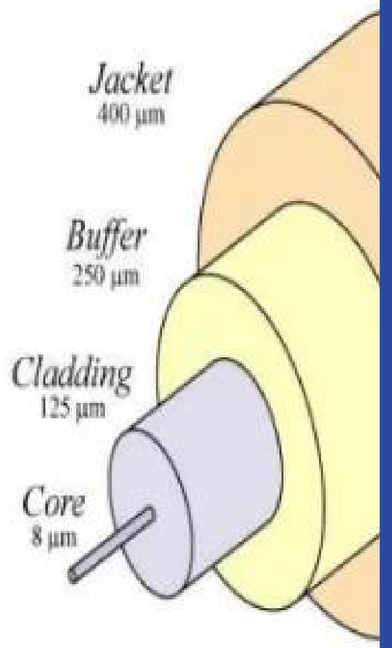
- outer part used to keep wave in core

buffer

- protective coating

jacket

- outer protective shield



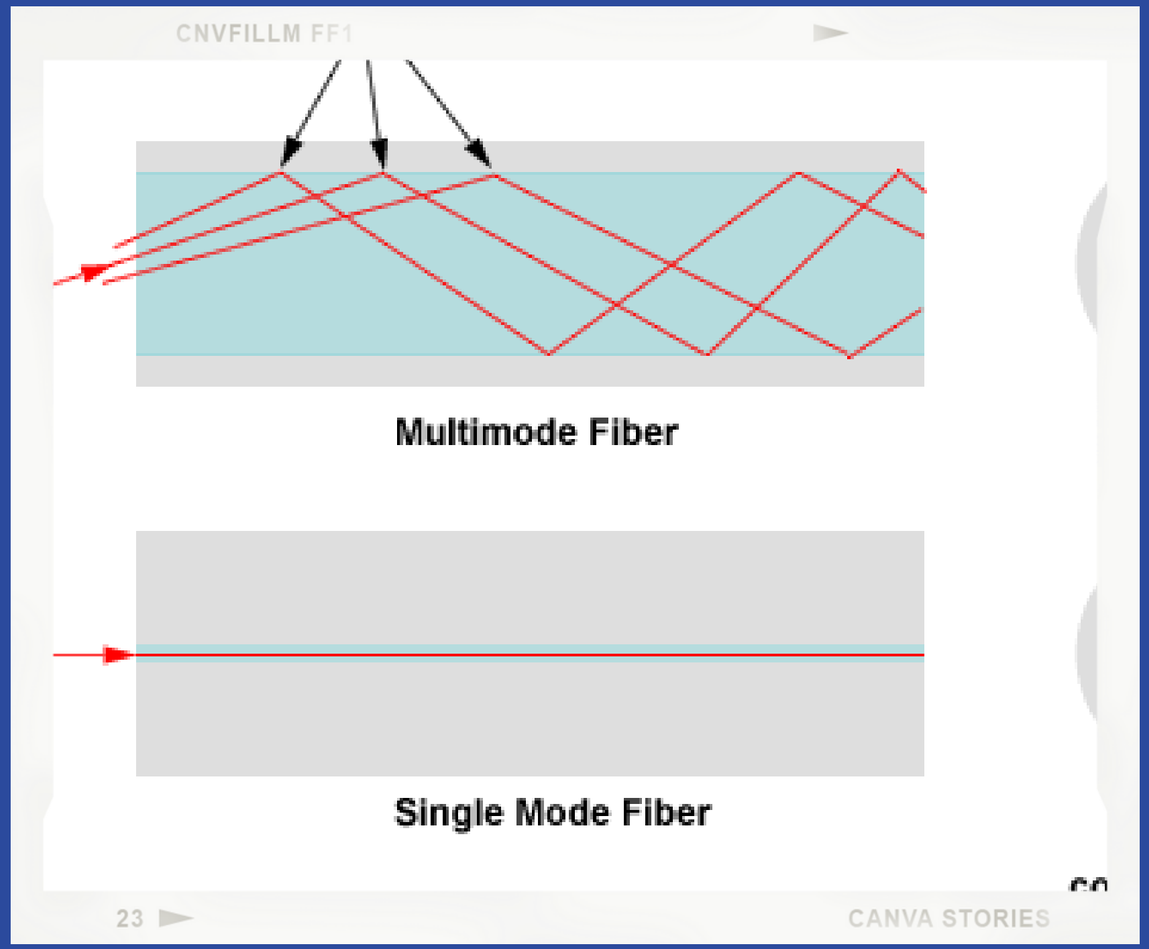
TWO TYPES OF FIBER OPTIC CABLE

1.Single node

MAXIMUM SEGMENT LENGTH UP TO 100KMS AND BANDWIDTH UP TO 2GBPS

2.Multi-Node

MAXIMUM SEGMENT LENGTH UP TO 2KMS AND BANDWIDTH UP TO 100MBPS



Advantages:

-Secure transmission
-Low attenuation
-No EMI interference
-Very high transmission capacity
-Used for broadband transmission and possible to mix data transmission channels with channels for telescope,TV etc....

Disadvantages:

-Expensive
-Hard to install
-Noise exception
-Connection loss
-Difficult to repair
-Difficult to connect to fibers