CA1 Presentation

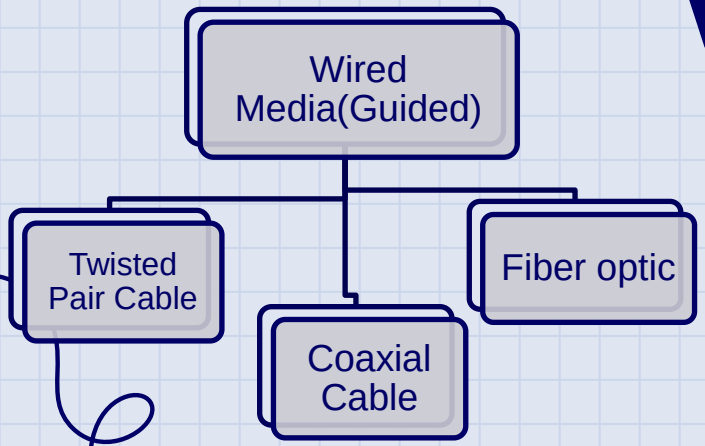
Wired Media

Wired Communication Media (Also known as Guided Media)

Name : Anirban Manna
Roll:34200121045
Year :3rd
Semester : 6th
Topic :Wired Media
Subject : Computer Networks
Code : PCC-CS602

Introduction

Step into the core of computer networks, where wired connections play a pivotal role. These physical cables offer a reliable and secure pathway for data transmission. From the roots of Ethernet to the cutting-edge technology of fiber optics today, let's unfold the simplicity and significance of wired media in shaping our digital landscape. Throughout this presentation, we will explore the various types of wired media used in computer networks, their characteristics, advantages, and applications



What is Wired Media?

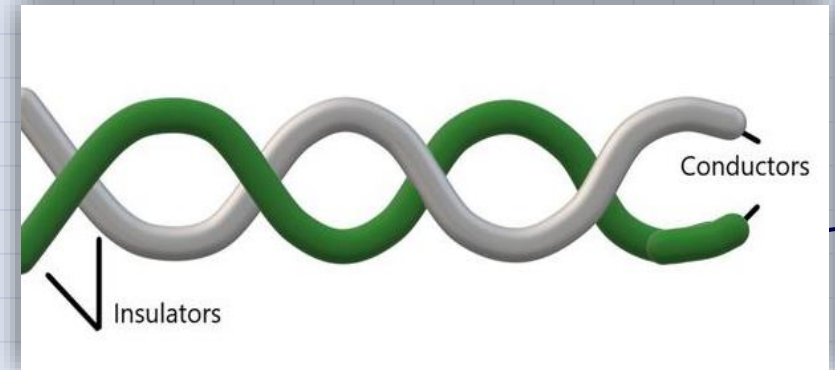
Wired media, often called guided media, comprises physical cables transmitting data through electrical or optical signals. Serving as the unsung heroes of our digital infrastructure, these cables literally form the backbone of the internet, linking devices across homes, offices, and continents.

Twisted-pair Cable

- It Consists of two Identical Wires wrapped Together in double helix.
- Twisting of wire reduces crosstalk , which is the disadvantage of any signal carrying wire

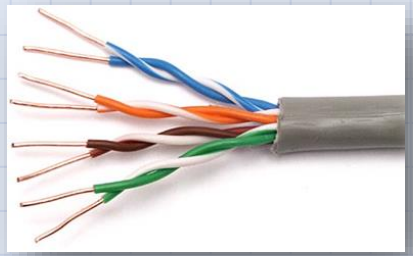
- **Working of twisted-pair cables:**

The twisted-pair cable has an outer jacket that keeps the wires together, a shield for the protection of the cable, color-coded plastic insulation to uniquely identify each conductor,. When current flows through a cable, it generates a small magnetic field around the wire. Connectors, like RJ45 for computer connections, are essential at both ends for linking two devices.



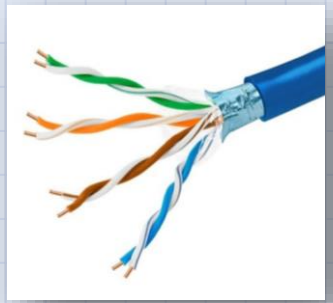
Types of Twisted-Pair Cable :

UTP Cable
Unshielded Twisted Pair Cables



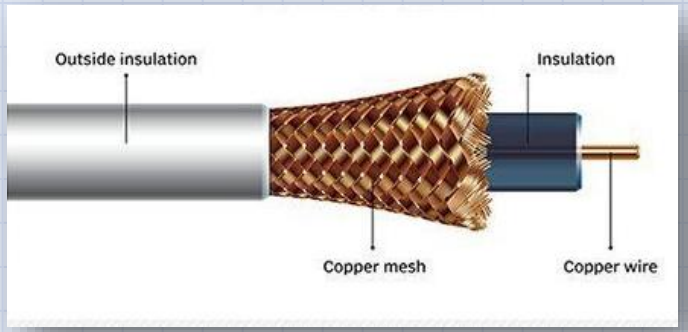
- Consists of twisted pairs of copper wires without additional shielding.
- Highly flexible and easy to install.
- UTP cables offer budget-friendly networking solutions.
- Widely used in homes, offices, and data centers.
- Ideal for low-interference environments without additional shielding needs.

STP Cable
Shielded Twisted Pair Cables



- Features twisted pairs of copper wires with additional shielding for protection against external signal interferences
- Commonly used in industrial settings and areas with substantial interference.
- Typically more expensive due to added shielding.

Co-Axial Cable



- It Consists of solid ire core (Concentric Conductors).
- Surrounded by one or more foil / wire shields ,each separated by plastic insulator
- Suitable for high speed communication and widely used in television Signals .
- Transfers Electrical Signal

Types of Co-Axial Cable:

Thicknet

- Thicker wire
- Maximum length 500 meter

Thinnet

- Thin Wire
- Max length 185 meter

Application:

- Digital telephone networks
- Analog telephone networks
- Cable TV networks
- Ethernet LANs

Advantage and Disadvantage of Co-axial Cable

Advantage

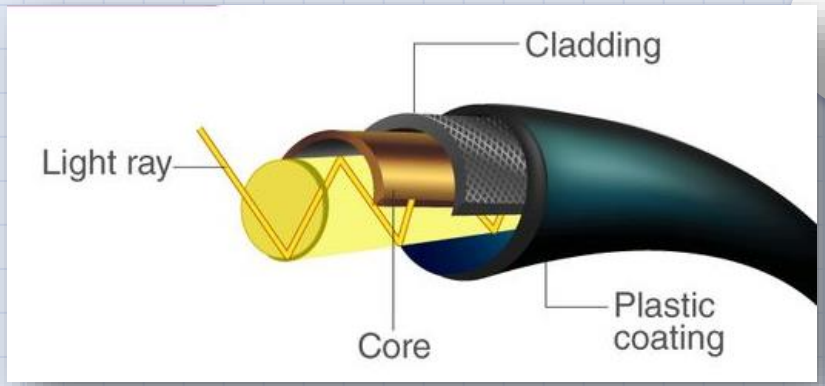
1. Transmission characteristics are much better than twisted pair.
2. It can be used on shared cable network
3. Mainly Used for Broadband Transmission
4. High bandwidth up to 400mbps

Disadvantages

1. Expensive compare to twisted Pair
2. Not compatible with twisted pair

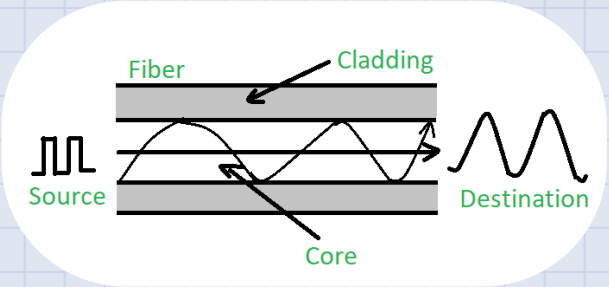
Fiber Optic Cable

Consists of an inner glass core surrounded by a glass like material which has lower refractive index.



Parts of Fiber cable:

CORE : It is Glass / plastic through which light travels.
CLADDING : It reflect light back to the CORE.
Plastic Coating: It Prevents the cable from hostile environment



Types of Optical Fiber Cable

Types	Maximum Length	Maximum Speed
Sigle Node	2kms	100mbps
Multi Node	100kms	2gbps

Advantage and Disadvantage of Co-axial Cable

Advantage

1. It is immune to electrical and magnetic interface
2. It is highly suitable for harsh environment
3. Secure Transmission
4. Broadband transmission

Disadvantages

1. Installation Problem
2. Connection less
3. Most expensive
4. Light out of phase

References

Notes of ClassRoom:
https://classroom.google.com/u/2/c/NjI3OTM1MjEyNDY3/m/NjUNjg2OTc4MjE3/details

Geek For Geeks :
https://www.geeksforgeeks.org/wired-communication-media/

Book : **Network Programmability and Automation by** Jason Edelman

Conclusion

- Wired media remains a vital part of modern communication infrastructure
- Offers advantages in security, reliability, and speed
- Future advancements in fiber optic technology promise even higher potential
- Understanding wired media is crucial for navigating the digital world