22-07-18

CHAPTER – 7

TRANSMISSION MEDIA

Guided – cable

- Twisted pair
- coaxial
- Fiber optic

Unguided – wireless

- Radiowave
- Micro wave
- Infrared

Twisted pair – [RJ-45] – connector দিয়ে PC তে Connected.

- Data rate বেশী।
- পাতলা কপার।
- ইন্টারনেট connection এ use হবে।
- ৮ টা তে ক্যাবল থাকে, যার ১,২,৩,৬ port active.
- ইথারনেট connection এ use হয়।

Twisted pair

- Unsheild
- Sheild [Metalic coding]

Coaxial —

→ কপার তুলনামূলকভাবে মোটা।
→ Data rate, twisted থেকে ভালো।
→ BNC-T / BNC Connector.
→ ব্যাবল টেলিভিশনে used হয়।
→ Applicable for short distance.

Fiber optical —

→ long Distance communication.
→ coding ও দুটি থাকলে Data rate কমে।
→ Expensive.

→ 197 page.

Adv

1. Higher Bandwith;
2. Immunity to tap;
3. Less signal attenuation
4. Immunity to electromagnetic interference.
5. Less weight.

Dis

1. Need expertise to install and maintain.
2. Unidirectional light propagation.
3. High cost.

Radiowave	Microwave	Infrared
Freq- 3KHz to 1GHz	1GHz – 300GHz	300GHz – 400THz
Antena. Omnidirectional	Unidirectional	None
Appln: AM, FM	Cell phone, satellite, WLan.	keyboard, mouse

CHAPTER 7

Transmission Media

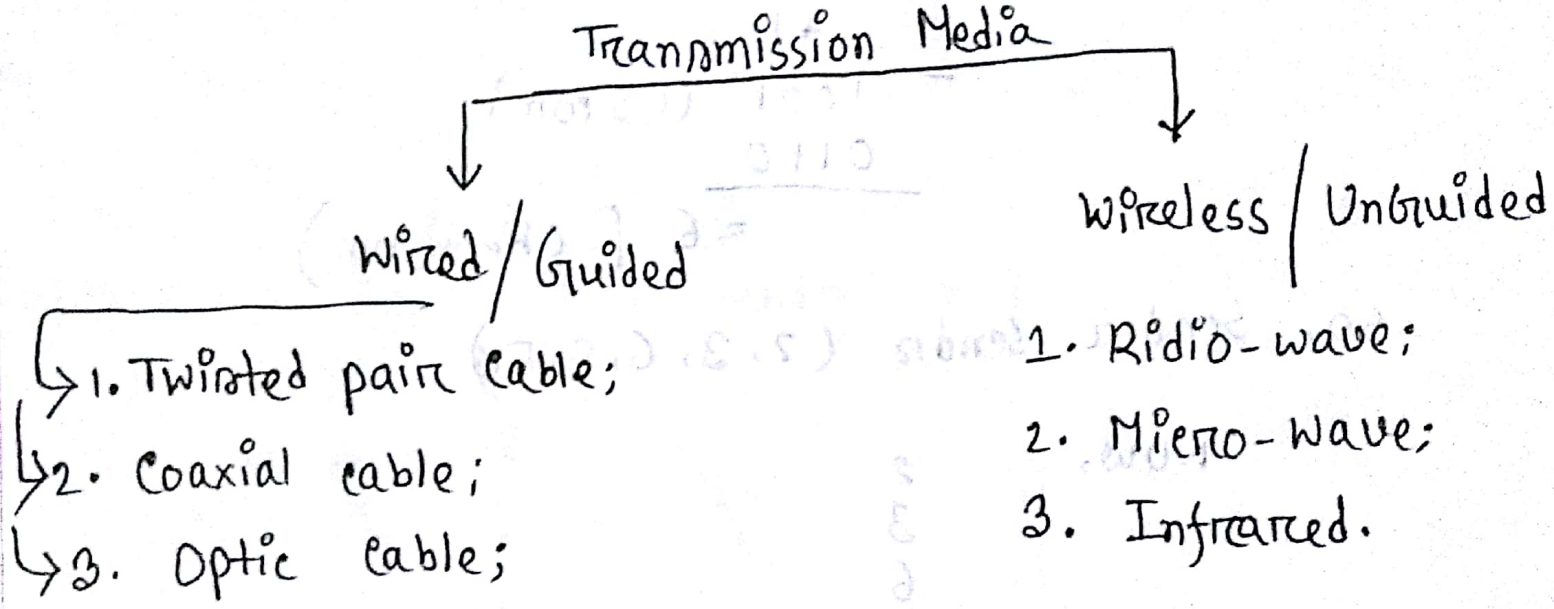
We discussed many issues related to the physical layer in Chapters 3 through 6. In this chapter, we discuss transmission media. We definitely need transmission media to conduct signals from the source to the destination. However, the media can be wired or wireless.

This chapter is divided into three sections:

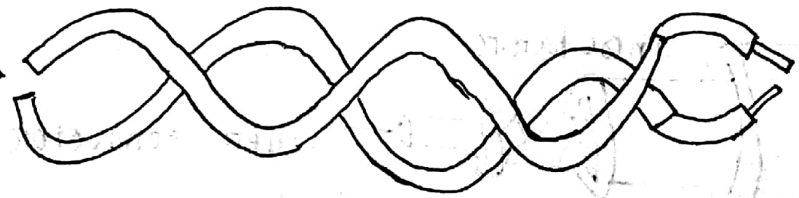
- The first section introduces the transmission media and defines its position in the Internet model. It shows that we can classify transmission media into two broad categories: guided and unguided media.
- The second section discusses guided media. The first part describes twisted-pair cables and their characteristics and applications. The second part describes coaxial cables and their characteristics and applications. Finally, the third part describes fiber-optic cables and their characteristics and applications.
- The third section discusses unguided media. The first part describes radio waves and their characteristics and applications. The second part describes microwaves and their characteristics and applications. Finally, the third part describes infrared waves and their characteristics and applications.

CHAPTER – 07

Transmission Media



1. Twisted pair cable: Twisted pair cable consists of two conductors (copper), each covered by its own plastic insulator, twisted together. One of the wire is used to carry signals to receivers, and other One is used for ground reference. In addition with the signal sent from One of them, noise and unwanted crosstalk may affect On both wires and can cause unwanted signals. To, get rid of this kind of problems wires are twisted parallaly. It causes, the diff On the sides of receivers.



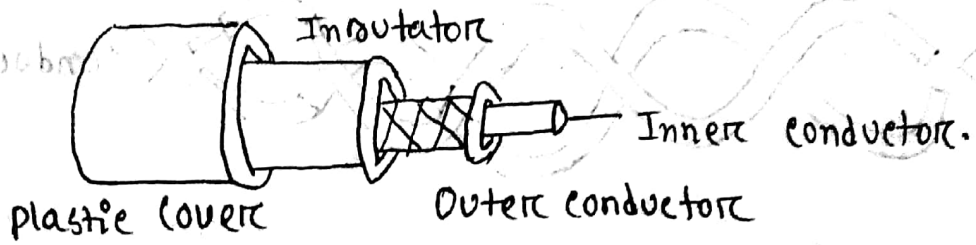
→ connectors:

→ RJ45 (~~Radio~~ Registered Jack)

Uses and Application:

1. DSL/ Telephone line.
2. Data rate high.
3. Thick copper.
4. Internet connection.

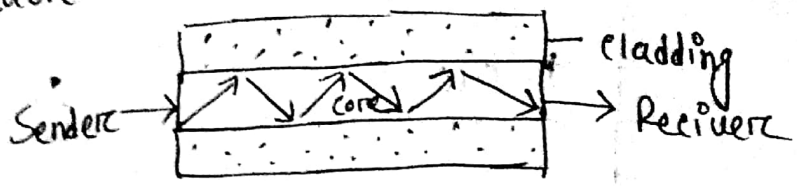
2. Coaxial cable: Coaxial cable carries signals of higher frequency ranges rather than twisted pair cable. Inspite of two wires coaxial cable has a central core conductor made of solid or copper enclosed in insulating sheild. which in in turn, encased in an outer conductor of foil, braid or combination of two. Outer wrapping works as sheild and at the same time second conductor and completes circuit. All this things are protected by plastic cover.



⇒ Connector ⟶ RF (Radio Government) → BNC / BNC-T (Bayonet Neill concelman)

Use & App:
1. Used in TV.
2. Higher bandwith.
3. Attinuation is high.
4. Short distance.

3. optic cable: signals are carried in the form of light by optic cable.



optic fibers use reflections to guide the light through a channel. Core is sheilded by cladding of less dense glass. The diff of the density of two should be at a range that the light of core isn't reflecting in.

Use-and applications:

1. Higher Bandwith;
2. Immunity to tap;
3. Attenuation is less;
4. Immunity to electromagnetic interferences;
5. Less weight;

Dis:

1. Costly;
2. Installation prob.
3. unidirectional light propagation.

Difference of Wireless mediums

Ridiowave	MicroWave	Infrared
1. 3kz to 1GHz	1. 1GHz to 300GHz	1. 300Gz - 400GHz
2. Used in AM, FM.	2. Telephone, Sattelite.	2. Keyboard, mous pe.
3. Omnidirectional.	3. Unidirectional	3. None.

Twisted pair Cable

2 types →

1. Unsheild twisted;
2. Sheilded twisted;