PHYSICAL LAYER

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Introduction

- How to connect two or more devices?
- **OSI Model**

  --> Open Systems Interconnect
- Set of protocols
- Introduced in first time in 1770s by **ISO (International Standards Organization)**
- Composed of 7 Layers

OSI Model Layers

7. Application Layer
6. Presentation Layer
5. Session Layer
4. Transport Layer
3. Network Layer
2. Data Link Layer
1. Physical Layer

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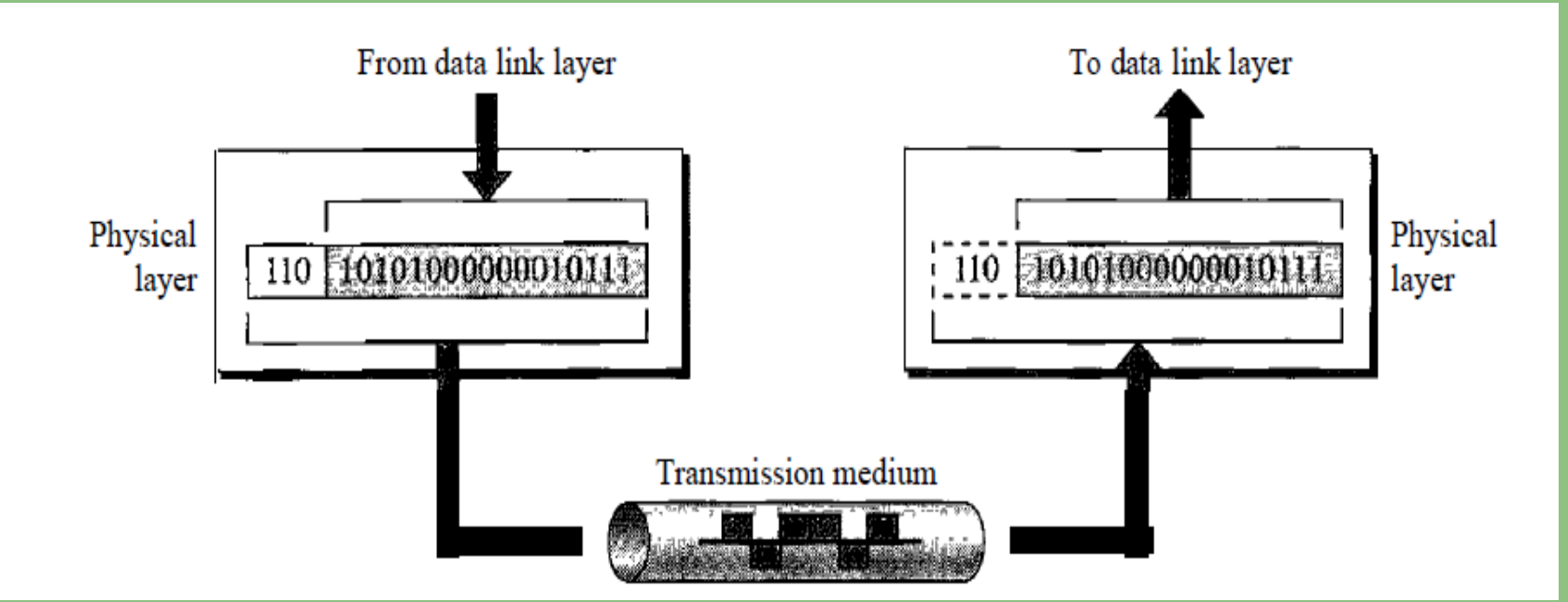
Not
Do
Please

PHYSICAL LAYER

- It deals with the mechanical and electrical specifications **(Devices)**
- Physical characteristics of interfaces and medium.
- To move data in the form of electromagnetic signals across a transmission medium
- The physical layer data consists of a stream of bits (sequence of Os or 1s)
- Bits are encoded into signals

PHYSICAL LAYER

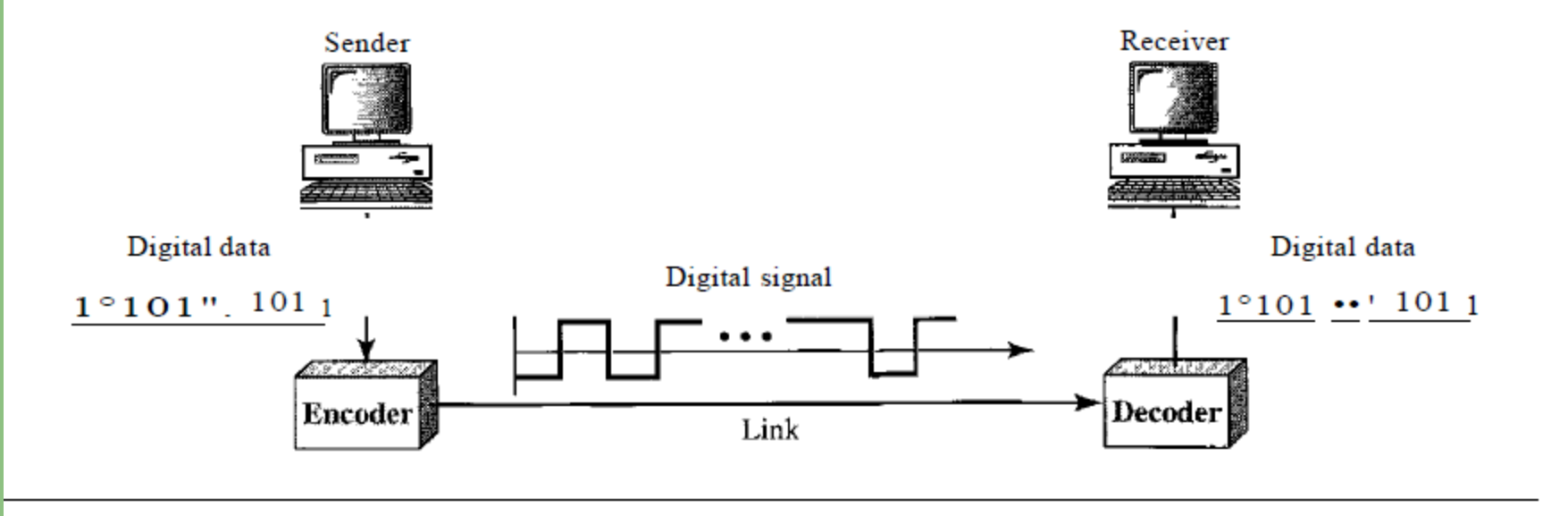


Signals

- A signal is an electric current or electromagnetic field used to convey data from one place to another.
- A ***Transmitter*** encodes a *message* into a signal, which is carried to a *receiver* by the communications *channel*.
- Signals can be interpreted as either *Analog* or *Digital*

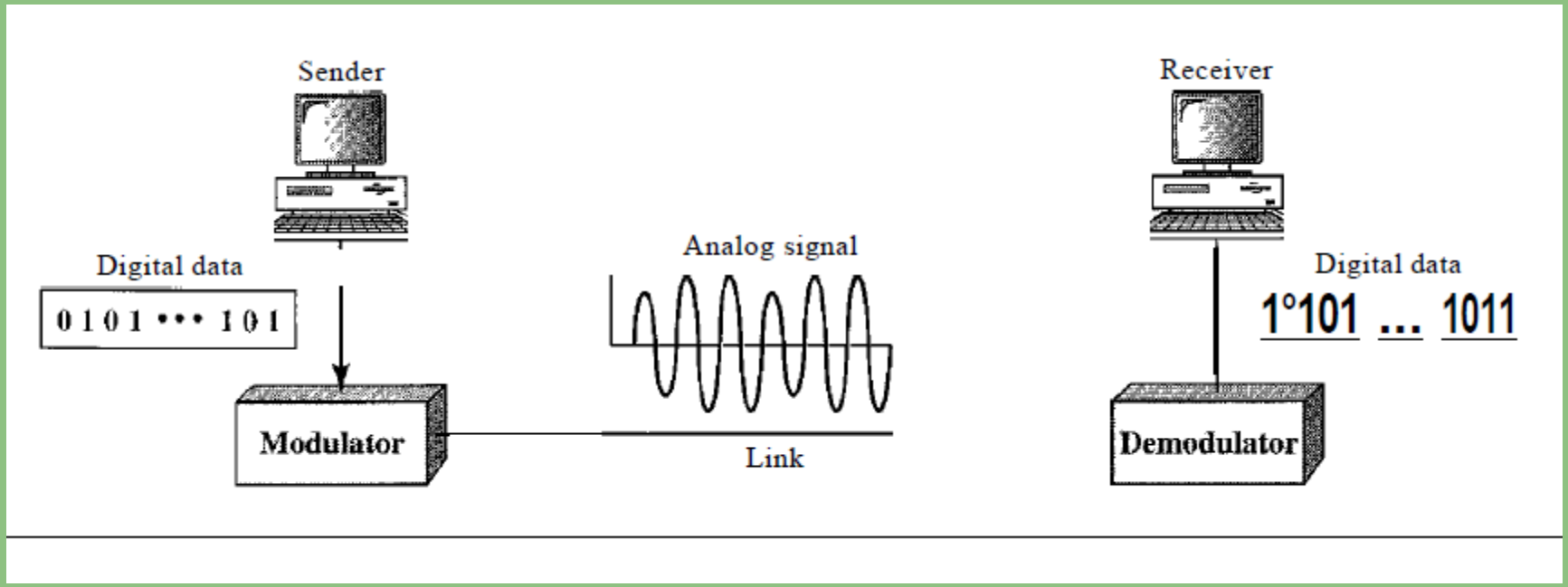
Digital Signals

- Digital signals are non-continuous, discrete



Analog Signals

- Analog signals are continuous, non-discrete



Devices

Some of the common devices are:

- Hub
- Switch
- Repeater
- Bridge
- Modem

PC, Mobile phone, Telephone or Cables etc are also devices use for data communication.

Hub

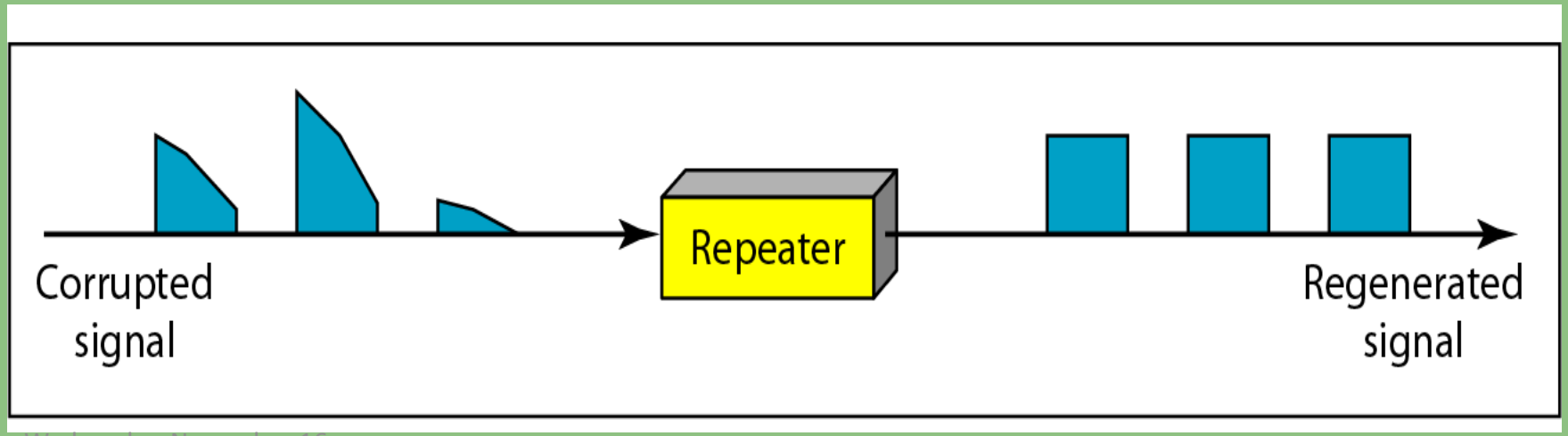
- Centralize device that connects many devices to share data
- Less secure

Switch

- Device that connects many other devices together to make a network
- More intelligent then Hub
- More secure

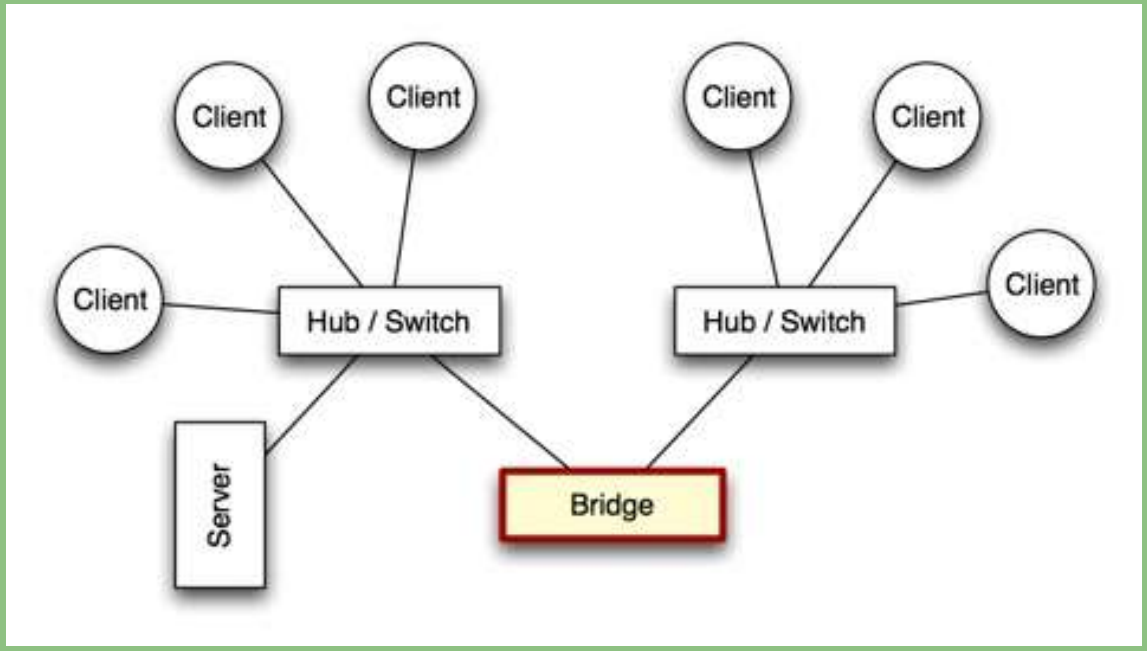
Repeater

- Regenerates the signal (Electrical, Wireless or Optical) which are corrupted due to long distance
- Overcome the distance limitations of the transmission media.



Bridge

- Creates a single aggregate **network** from multiple communication **networks**



Modem

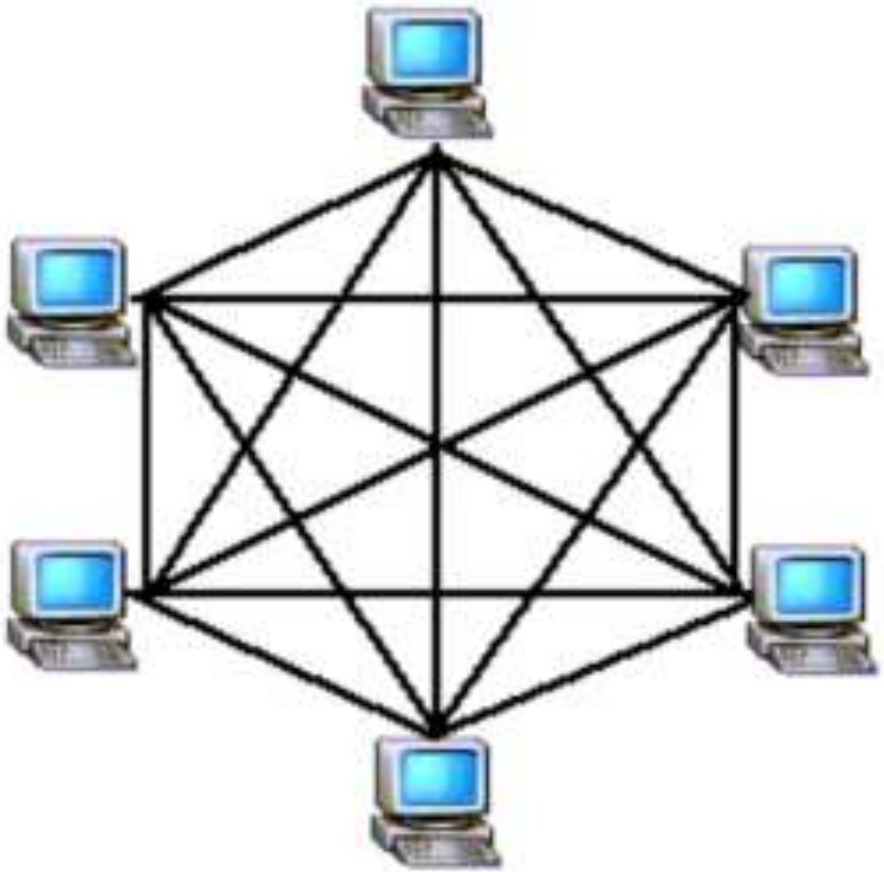
- The word Modem comes from Modulator-Demodulator
- Modulation: Digital signals to analog
- Demodulation: Analog signals back to Digital

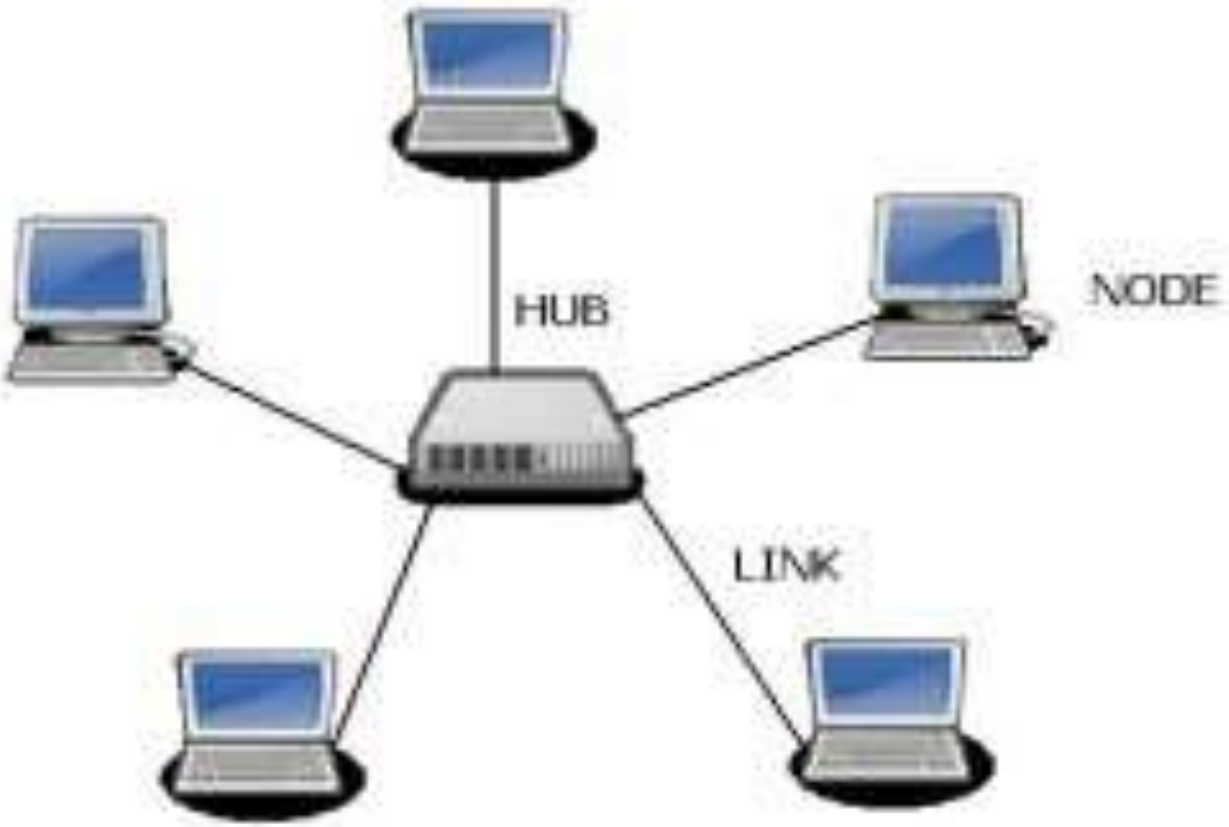
Physical Topologies.

How the devices are connected to make a network ?

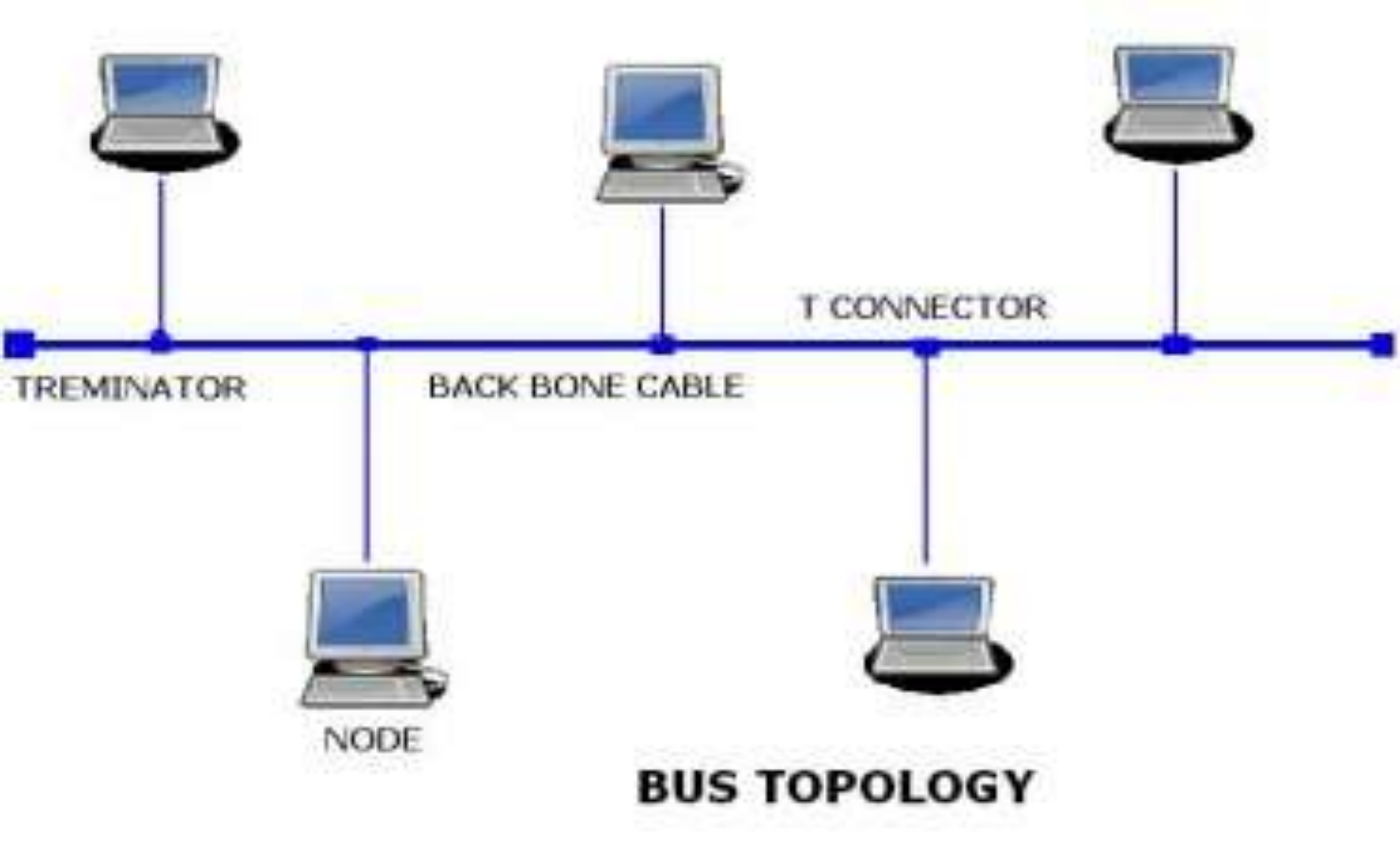
- *Mesh topology*
- *Star topology*
- *Bus topology*
- *Ring topology*
- Hybrid topology

Mesh Topology

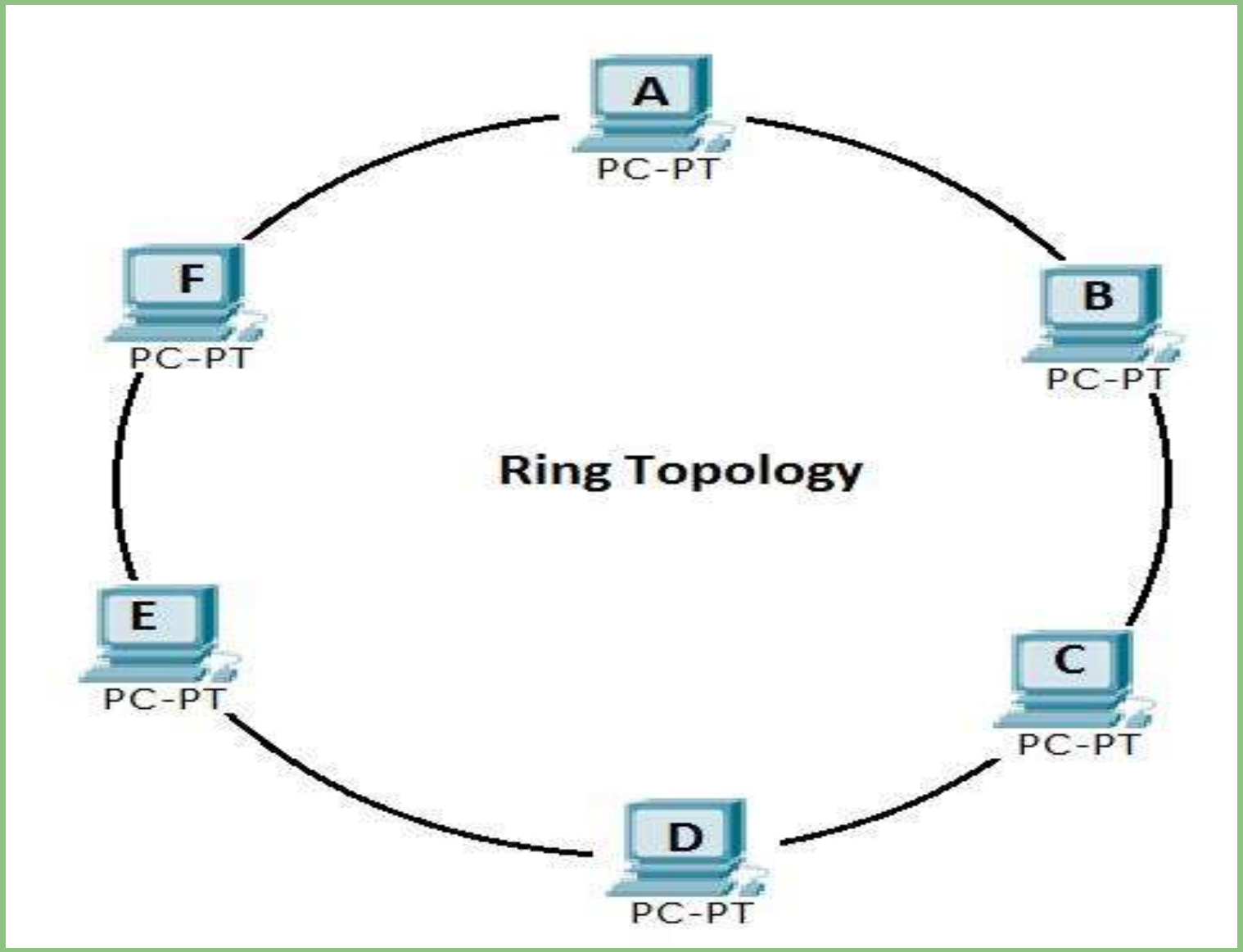


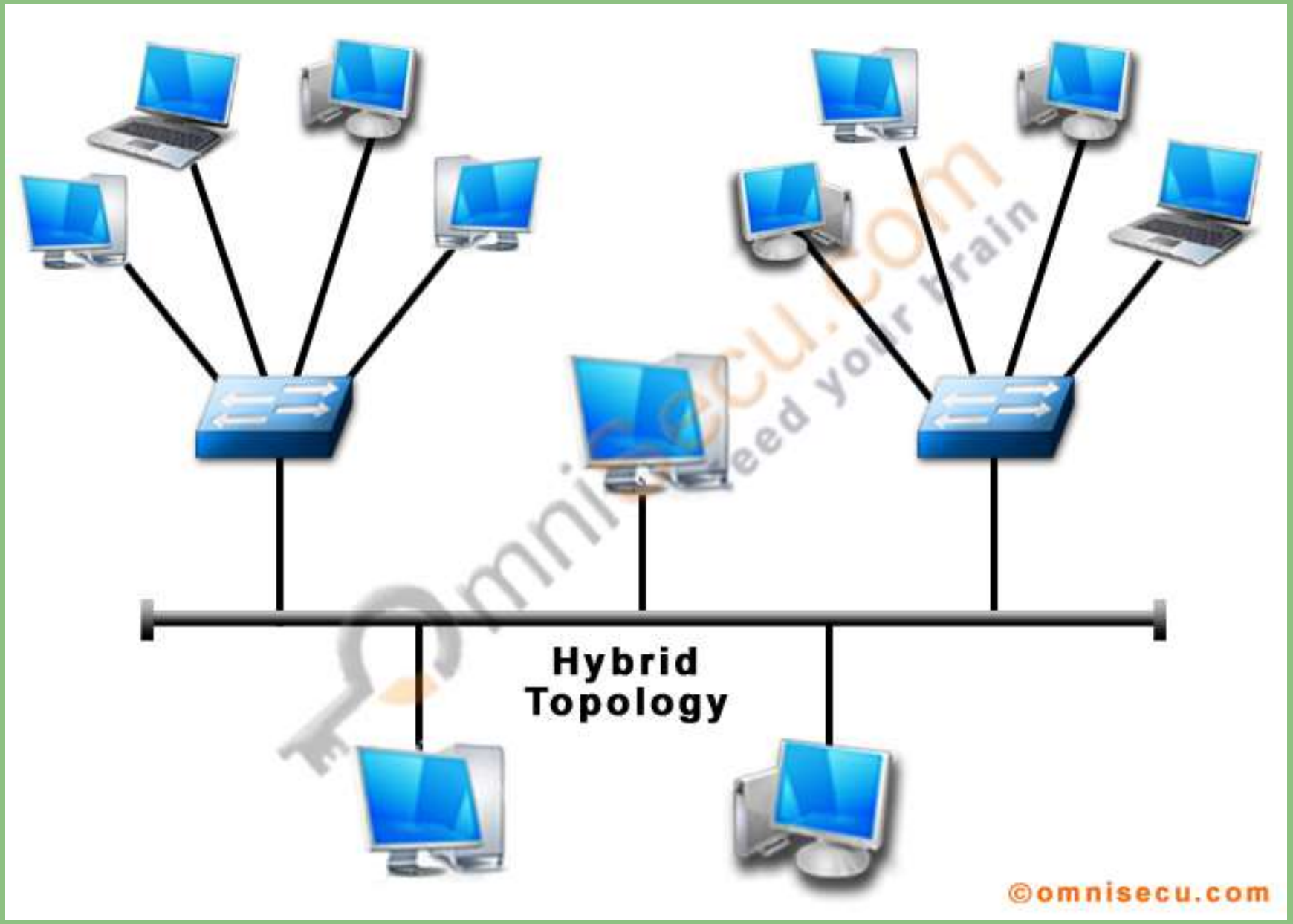


STAR TOPOLOGY



BUS TOPOLOGY


A
PC-PT
B
PC-PT
C
PC-PT
D
PC-PT
E
PC-PT
F
PC-PT
Ring Topology


Hybrid
Topology
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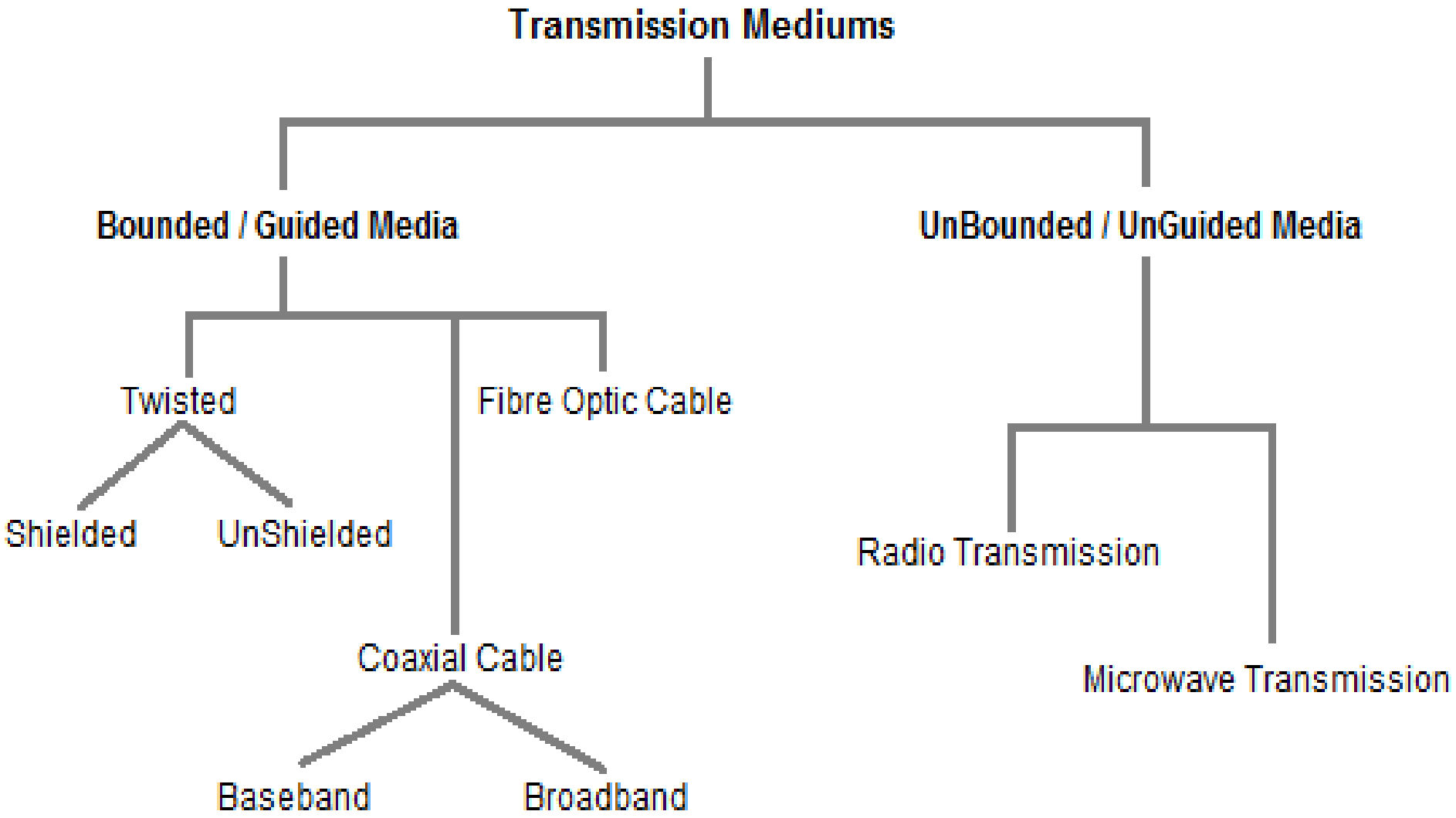
Transmission **Medium**

- Anything that can carry information from a source to a destination.
- Uses cables or electromagnetic signals to **transmit** data.

Types of Transmission Media

- 1. Wired or Guided Media or Bound Transmission Media
- 2. Wireless or Unguided Media or Unbound Transmission Media


Transmission Mediums
Bounded / Guided Media
UnBounded / UnGuided Media
Twisted
Fibre Optic Cable
Shielded
UnShielded
Radio Transmission
Coaxial Cable
Microwave Transmission
Baseband
Broadband

THANKS