SNS College of Engineering Coimbatore - 641107

UNIT 1

INTRODUCTION AND PHYSICAL LAYER

Computer Networks and Internet – Network Types –

Performance – OSI Model – Transmission Media

NETWORK

- A network is a collection of two or multiple connected computer systems that may share resources, such as an internet connection, an app, a printer, etc.

TYPES

- There are four types:
  - PAN (Personal Area Network)
  - LAN (Local Area Network)
  - MAN (Metropolitan Area Network)
  - WAN (Wide Area Network)
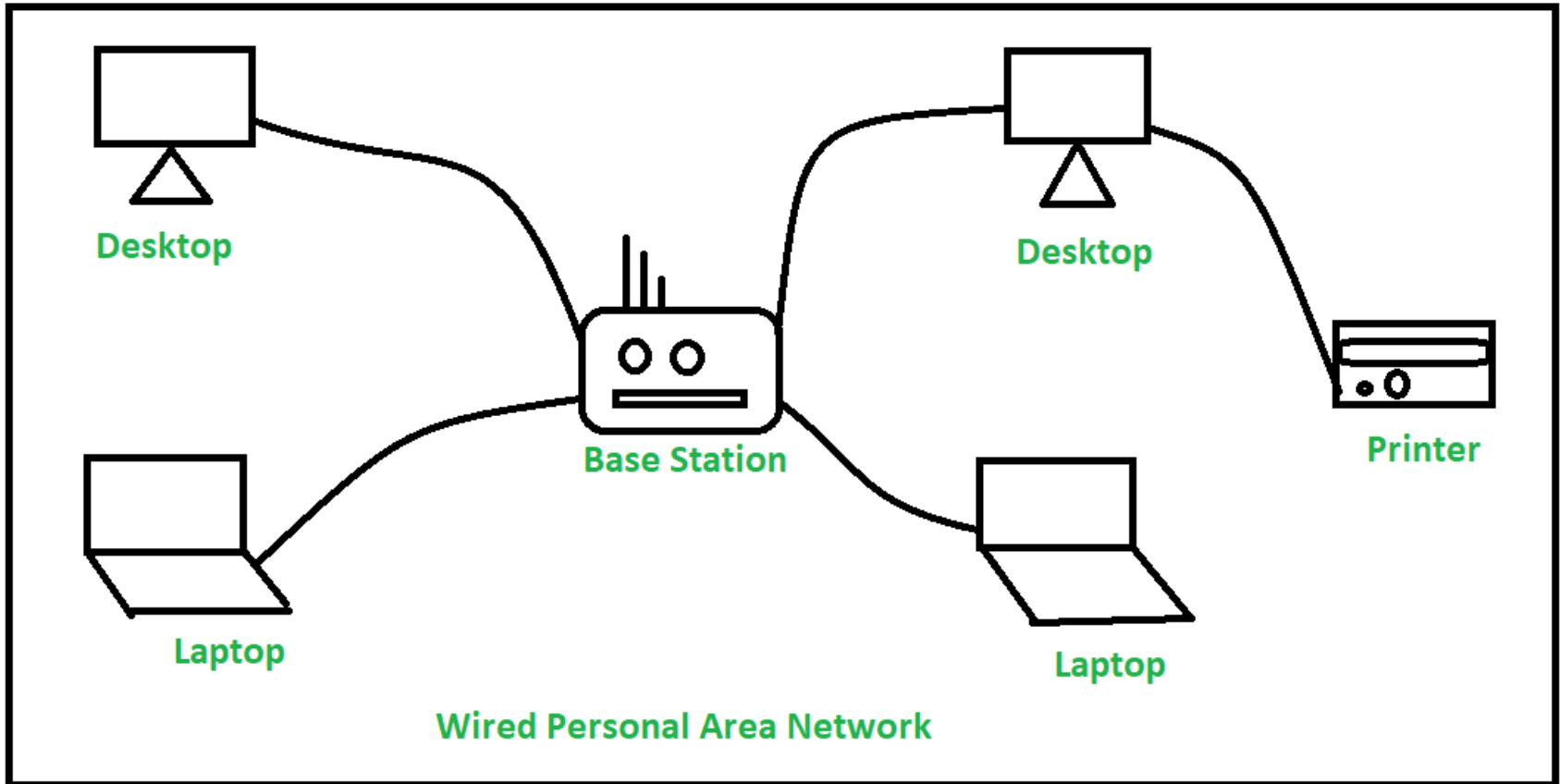
PAN (Personal Area Network)

- It is an interconnection between devices like smartphones, tablets, computers, and other digital devices.

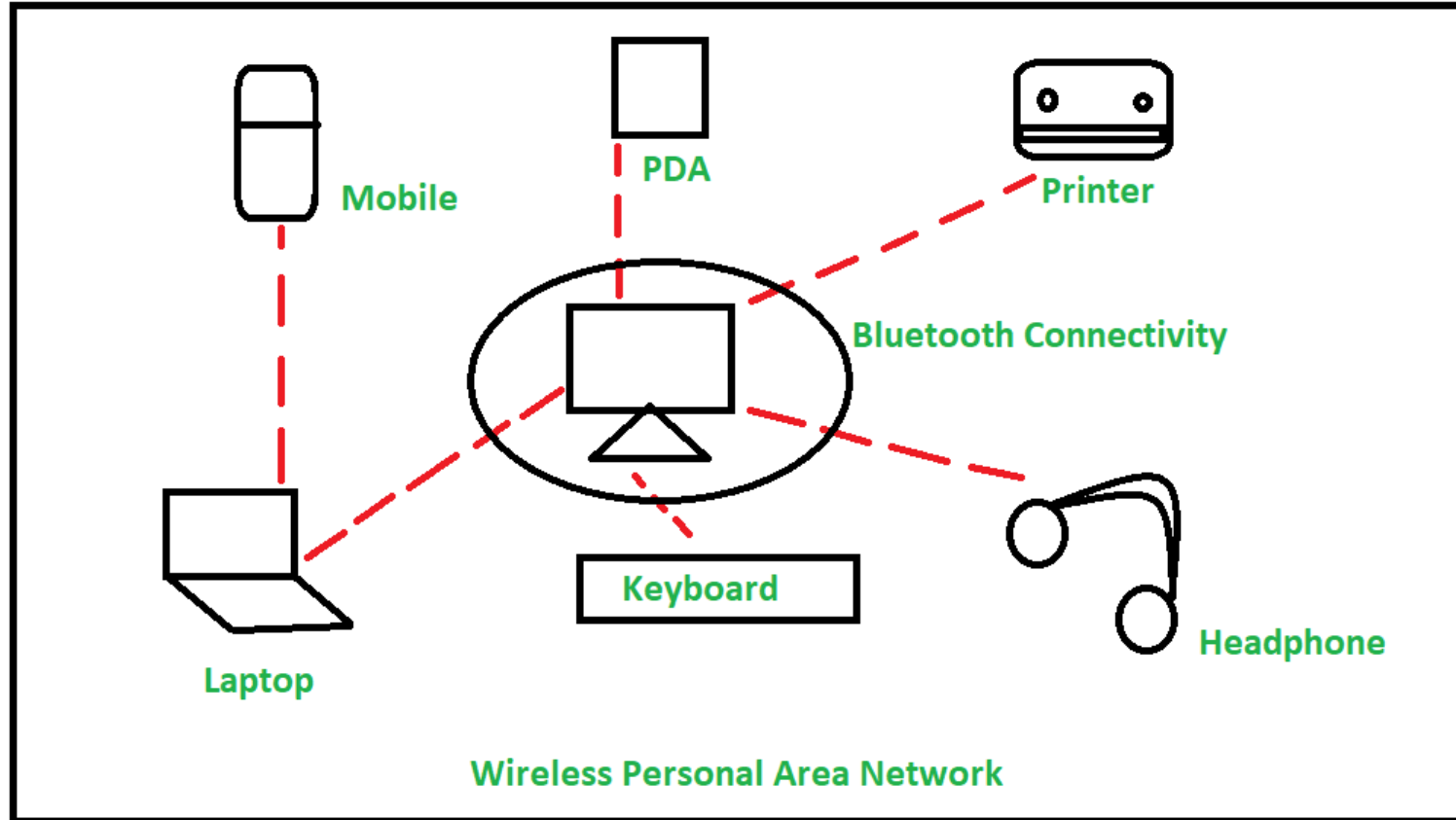- PAN has a range of 10 meters.

Types:

- Wired PAN

- Wireless PAN

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Wired PAN

Wired Personal Area Network

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Wireless PAN

Wireless Personal Area Network

Advantages

- No extra space requires

- Connect to many devices at a time

- Cost effective

- Easy to use

- Reliable

- Secure

- Portable

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Disadvantage

- Less distance range

- Slow data transfer

- Interfere with radio signal

- Infrared signal travel in a straight line

- Costly in terms of communication devices

- Health problem

LAN (Local Area Network)

- It is a computer network that interconnects computers within a limited area such as a residence, school, laboratory, university campus, or office building.

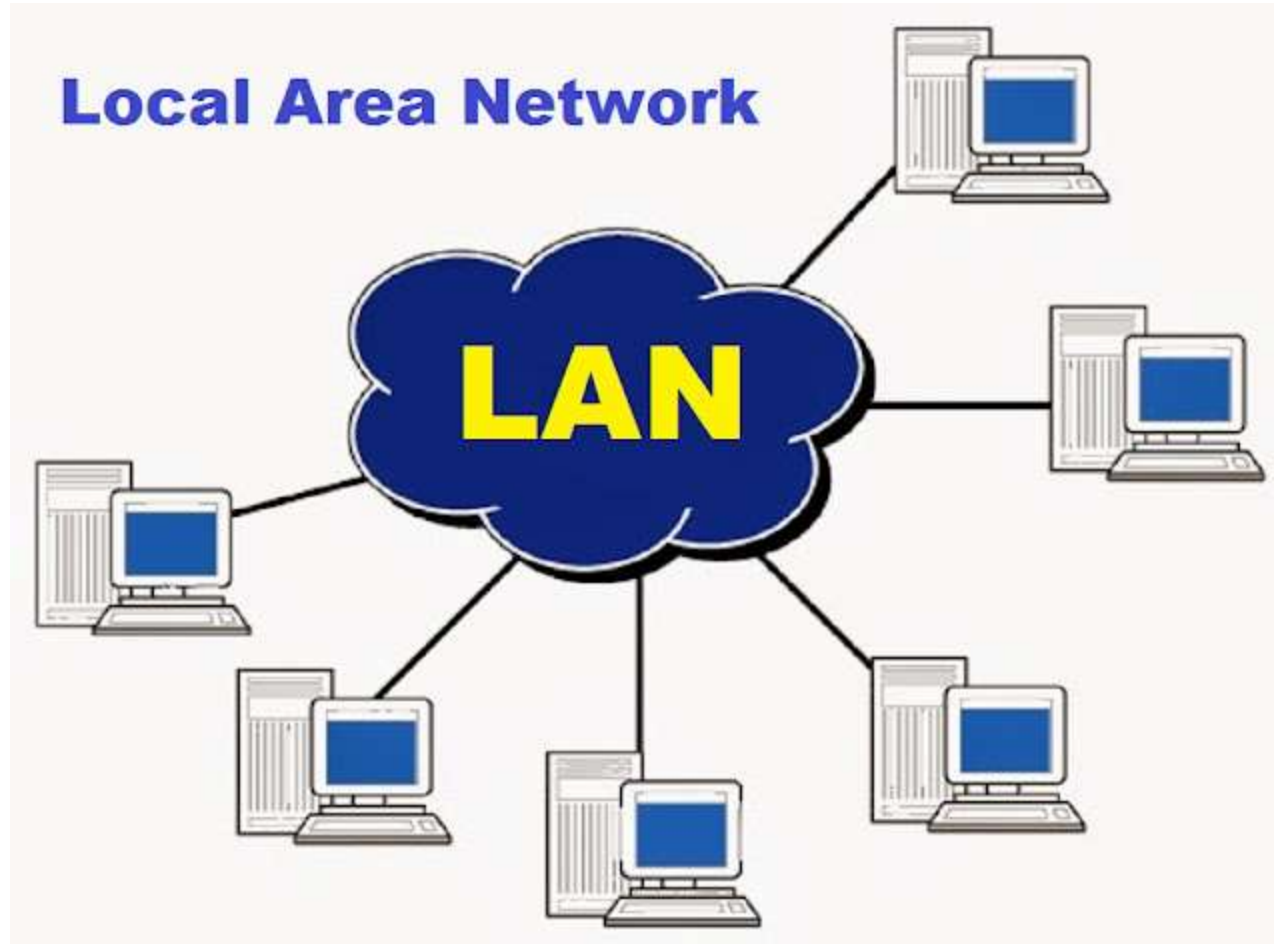- It ranges from about 500 meters to 1 kilometer

LAN

Types

- ## LAN with cable

  - It is connected with a network cable, such as with one computer, another computer is also connected to the same cable and with the same printer, scanner, mouse, keyboard etc.

- ## Wired LAN

  - It connects two or more computers using communication.

Topologies

- Network topology refers to the structural arrangement of a network

Uses:

- Reduce network operational and maintenance costs

- Increase network performance

- Ensure optimal network health by the effective allocation of resources

- Locate and troubleshoot errors faster

Types

- 1. Star Topology

- 2. Bus Topology

- 3. Ring Topology

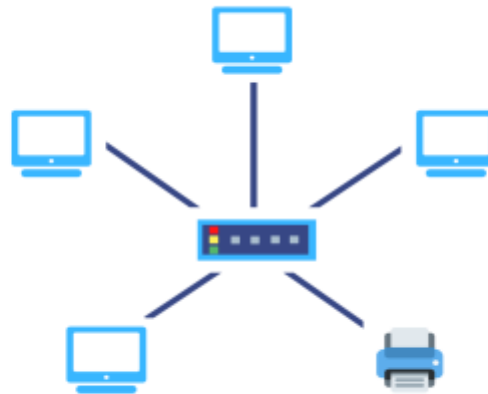- 4. Mesh Topology

- 5. Hybrid Topology

- 6. Tree Topology

Star Topology

- Each peripheral node is connected to a central hub or switch.

Advantages

- Design and implementation easy

- Less cabling

- New nodes can be added or removed easily

- Troubleshooting and maintenance are easy

Disadvantages

- Network performance and overall bandwidth limited

- If the central hub fails, all the nodes will be affected