كلية العلوم
قســــــم الانظمة الطبية الذكية

Lecture: (2)

INTRODUCTION ABOUT WIRELESS TOPOLOGIES

Subject: Wireless Sensor Network

Level: Third

Lecturer: M.Sc Ola Ali

Introduction

- **Data Network** is a network that allows computers to exchange data.
  - The simplest data network is two PCs connected through a cable.
  - Most data networks connect many devices.

- **internetwork** is a collection of individual networks connected by networking devices and function as a single large network.
  - The public Internet is the most common example which it is a single network that connects millions of computers.

- **Local Area Network (LAN)** is a network that enabled multiple users in a relatively small geographic area to exchange files and messages and to access shared resources such as printers and disk storage.

- **Wide Area Network (WAN)** is a network that introduced to interconnect these LANs so that geographically dispersed users could also share information.

Introduction

- A wireless network enables people to communicate and access applications and information without wires.

- This provides freedom of movement and the ability to extend applications to different parts of a building, city, or nearly anywhere in the world.

- wireless networks use either radio waves or infrared light for communication between users, servers, and databases. This type of communication is invisible to the human eye. In addition, the actual medium (air) is transparent to the user.

- To provide a good wireless infrastructure, a solid wired infrastructure is a requirement, as this is the backbone for all wired access

General Wireless Topologies

- WPAN

- WLAN

- WMAN

- WWAN

General Wireless Topologies
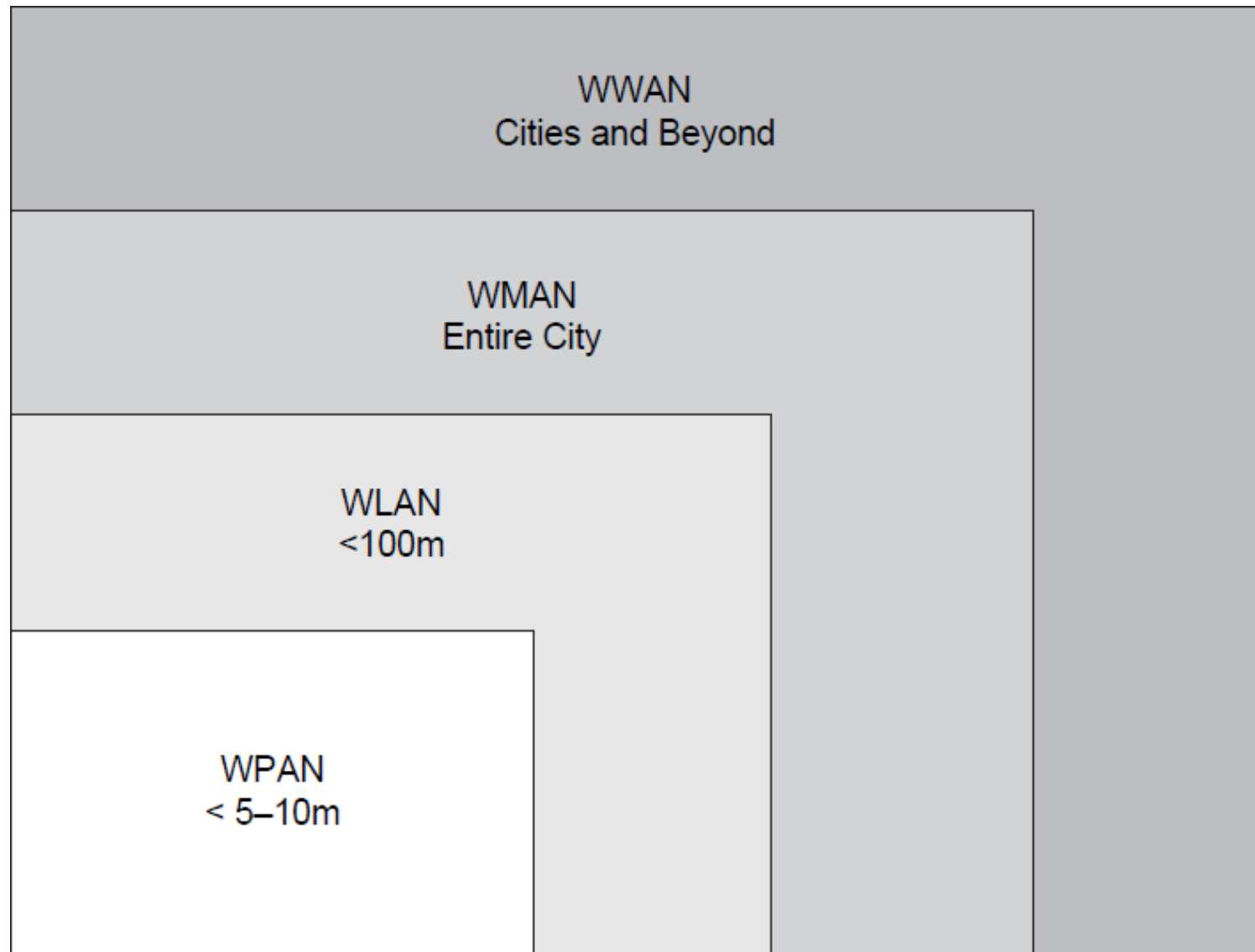
WPAN

Wireless Personal Area Network

WPAN

Wireless PAN Enables the Interconnection of Computer Devices Within Close Reach of the User
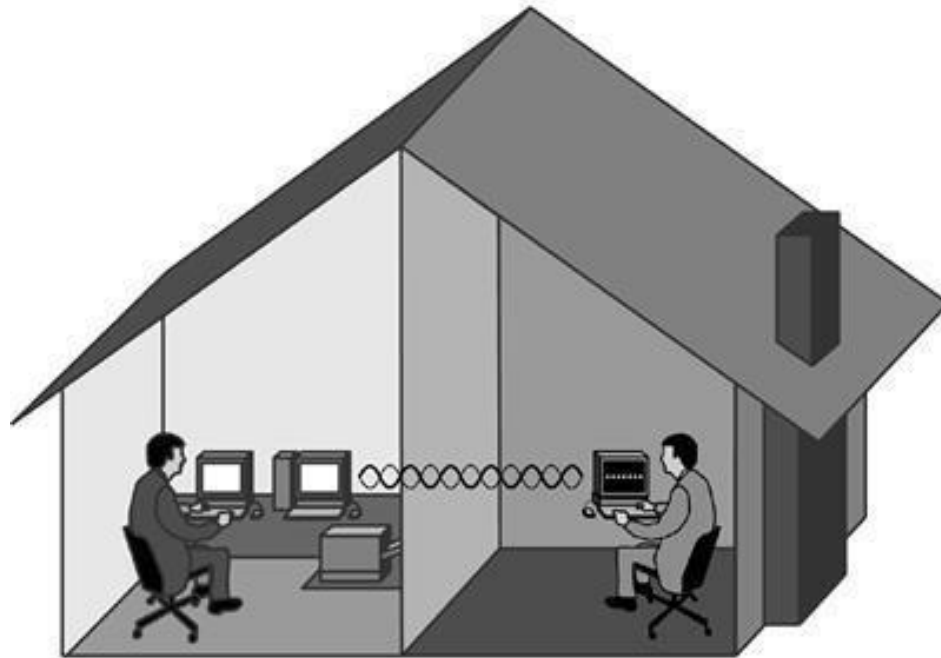
WPAN

-- A WPAN is a network that is designed to operate within a 20-foot range.

-- Most wireless PANs use **radio waves** for carrying information through air. For example, the *Bluetooth*

--Some wireless PANs employ **infrared light** to carry information from one point to another,

- It is free from radio frequency interference
- The line-of-sight requirement between computer devices limits the placement of wireless components.

WLAN

Wireless Local Area Network

WLAN

A Wireless LAN Enables the Interconnection of Computer Devices Within a Building

WLAN

- WLANs are designed for a larger area than that of a WPAN, close to 100 meters from Access Point (AP) to client, or from client to client.

- Wireless LANs are similar to traditional wired Ethernet LANs in their performance, components, costs, and operation.

WMAN

Wireless Metropolitan Area Network

WMAN

Wireless MAN Is an Alterative for Homes and Companies Needing to Connect to an Internet Service
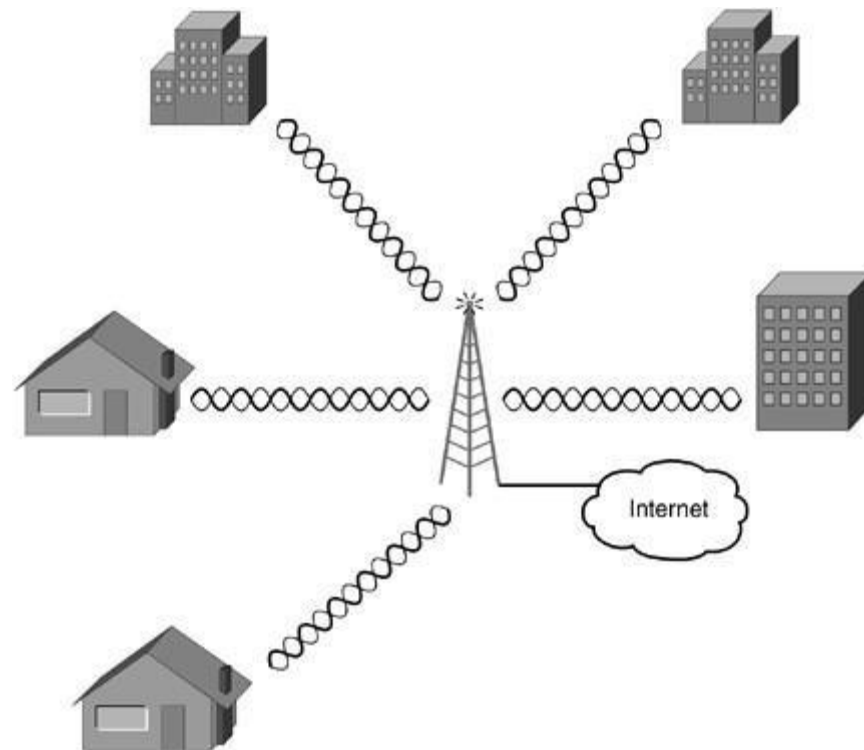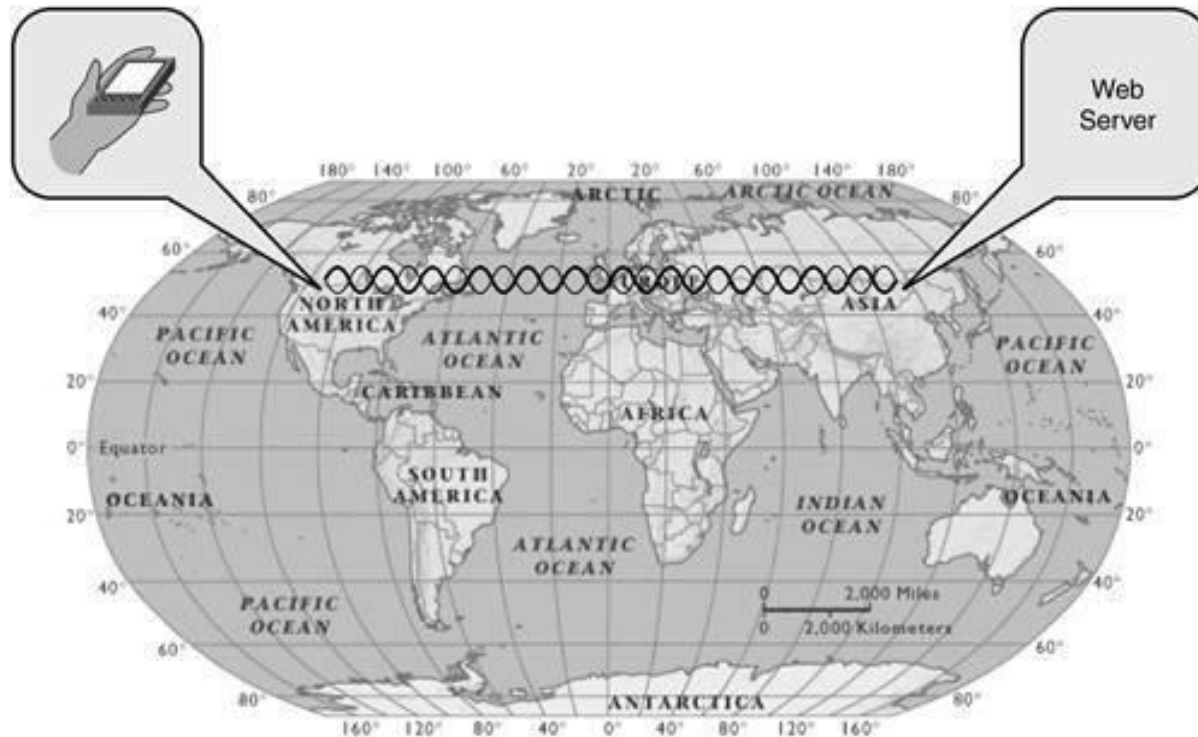
WMAN

- WMAN
- This technology allows the connection of multiple networks in a metropolitan area such as different buildings in a city, which can be an alternative or backup to laying copper or fiber cabling.

- Most well-known is *WiMax*.

WWAN

Wireless Wide Area Network

WWAN

A Wireless WAN is Capable of Supporting Mobile Applications over a Wide Area

WWAN

- WWAN

- These types of networks can be maintained over large areas, such as cities or countries, via multiple satellite systems or antenna sites looked after by an ISP. These types of systems are referred to as 2nd Generation systems.

- WWANs require high cost of deployment because they cover a large geographic area.

References

- Wireless Network Administration: A Beginner's Guide

- Certified Wireless Network Administrator

Thank You