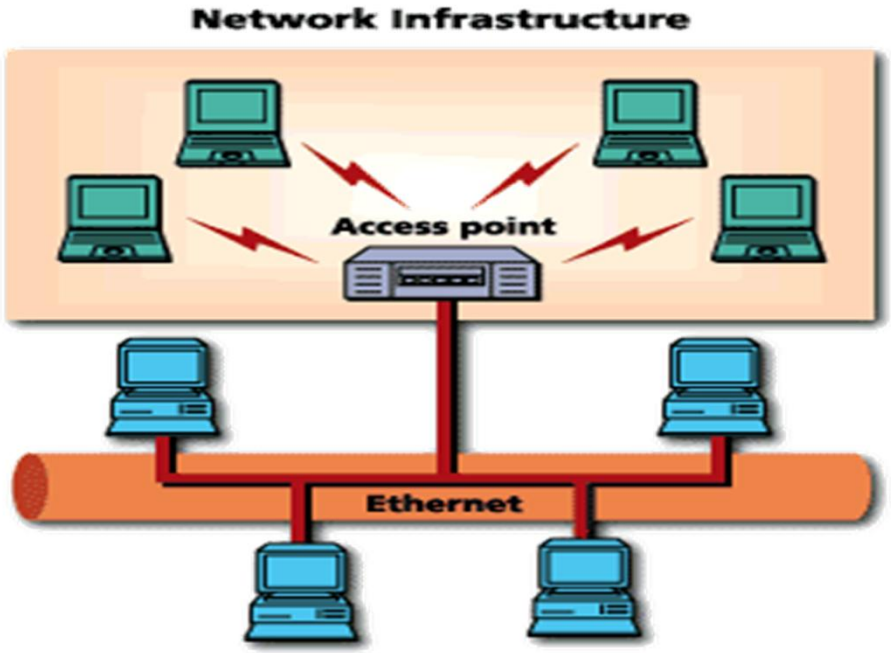
WIRELESS NETWORKS

Introduction

- A wireless LAN or WLAN is a wireless local area network that uses radio waves as its carrier.
- The last link with the users is wireless, to give a network connection to all users in a building or campus.
- The backbone network usually uses cables

Hardware

- PC Card, either with integral antenna or with external antenna/RF module. ISA Card with external antenna connected by cable. Handheld terminals Access points



- There is a need of an access point that bridges wireless LAN traffic into the wired LAN.
- The access point (AP) can also act as a repeater for wireless nodes, effectively doubling the maximum possible distance between nodes.

Introduction

Complete Wireless Networks

- The physical size of the network is determined by the maximum reliable propagation range of the radio signals.
- Referred to as **ad hoc** networks
- Are self-organizing networks without any centralized control
- Suited for temporary situations such as meetings and conferences.

How do wireless LANs work?

- Wireless LANs operate in almost the same way as wired LANs, using the same networking protocols and supporting the most of the same applications.

Types of Wireless networks

- **WLANS: Wireless Local Area Networks**
- WLANS allow users in a local area, such as a university campus or library, to form a network or gain access to the internet. A temporary network can be formed by a small number of users without the need of an access point; given that they do not need access to network resources.
- **WPANS: Wireless Personal Area Networks**
- The two current technologies for wireless personal area networks are Infra Red (IR) and Bluetooth (IEEE 802.15). These will allow the connectivity of personal devices within an area of about 30 feet. However, IR requires a direct line of site and the range is less.

Types of Wireless networks

- **WMANS: Wireless Metropolitan Area Networks**
- 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.
- **WWANS: Wireless Wide Area Networks**
- 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 2G, 3G, 4G etc(2^{nd}, 3^{rd} or 4^{th} Generation) systems.

Advantages over wired network

- users can move around freely within the area of the network with their laptops, handheld devices etc and get an internet connection.
- Users are also able to share files and other resources with other devices that are connected to the network without having to be cabled to a port.
- Not having to lay lots of cables and put them through walls etc. can be a considerable advantage in terms of time and expense. It also makes it easier to add extra devices to the network, as no new cabling is needed.

Advantages over wired network

- If you are a business such as a café, having a wireless network that is accessible to customers can bring you extra business. Customers generally love wireless networks because they are convenient.
- Wireless networks can sometimes handle a larger amount of users because they are not limited by a specific number of connection ports.
- Instant transfer of information to social media is made much easier. For instance, taking a photograph and uploading it to Facebook can generally be done much quicker with wireless technology.

Disadvantages over wired network

- It can require extra costs and equipment to set up, although increasingly routers have built-in wireless capability, as do devices such as laptops, handheld devices, modern DVD players, and TVs.
- Setting up a wireless network can sometimes be difficult for people who are not experienced with computers. (Although there are issues with setting up a wired network too, off course!)
- File-sharing transfer speeds are normally slower with wireless networks than they are with cabled. The speeds can also vary considerably according to your location in relation to the network.

Disadvantages over wired network

- The general speed of a wireless connection is also usually much slower than a wired one. The connection also gets worse the farther you are from the router, which can be a problem in a large building or space.
- Wireless connections can be obstructed by everyday household items and structures such as walls, ceilings, and furniture.
- Wireless networks are generally less secure. There can also be problems with neighbors stealing bandwidth, if the network hasn’t been set up to be password protected. Information is also less secure too and can be easier to hack into.

standards

- Research on wireless network standards