Introduction to WIFI

Contents

- Introduction
- Wi-Fi Technology
- Wi-Fi Network Elements
- Wi-Fi Network Topologies
- Hotspots
- How a Wi-Fi Network Works
- Advantages
- Limitations
- Conclusion

WIFI Technology

WIFI is an alternative network to wired network which is commonly used for connecting devices in wireless mode.

WIFI Technology

WIFI is stand for Wireless Fidelity is generic term that refers to IEEE802.11 standard for Wireless Local Networks or WLANs.

Introduction

WIFI connects computers to each other, to the internet and to the wired network.

The WIFI Technology

WIFI uses radio technology to transmit and receive data at high speed.

- IEEE 802.11b
- IEEE 802.11a
- IEEE 802.11g

IEEE 802.11b

- Appear in Late 1999
- 2.4Ghz radio spectrum
- 11Mbps (theoretical speed) within 30m range
- 4-6Mbps (actual speed)
- 100-150 feet range
- Most popular and Less expansive
- Interference from mobile phones and Bluetooth devices which can reduce the transmission speed

IEEE 802.11a

- introduced in 2001
- 5.0Ghz radio spectrum
- 54Mbps (theoretical speed)
- 15-20Mbps (actual speed)
- 50-75 feet range
- more expansive
- not compatible with IEEE 802.11b

IEEE 802.11g

- introduced in 2003
- combine the feature of both standards (a,b)
- 100-150 feet range
- 54Mbps speed
- 2.4Ghz radio spectrum
- compatible with b

Elements of WIFI network

- **Access Point (AP)** - The AP is a wireless LAN transceiver or “base station” that can connect one or many wireless devices simultaneously to the Internet.

- **Wi-Fi cards** - They accept the wireless signal and relay information. They can be internal and external.

Elements of WIFI network

- **Safeguards** - Firewalls and anti-virus software protect networks from uninvited users and keep information secure.

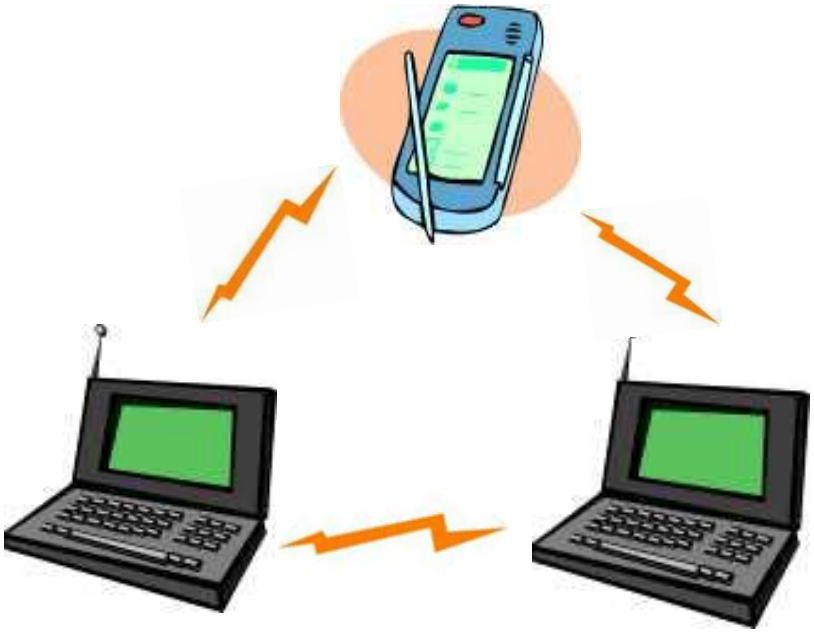
WIFI Topologies

- Peer-to-peer topology (Ad-hoc Mode)
- AP-based topology (Infrastructure Mode)

Peer-to-peer Topology

- AP is not required.
- Client devices within a cell can communicate with each other directly.
- It is useful for setting up a wireless network quickly and easily.

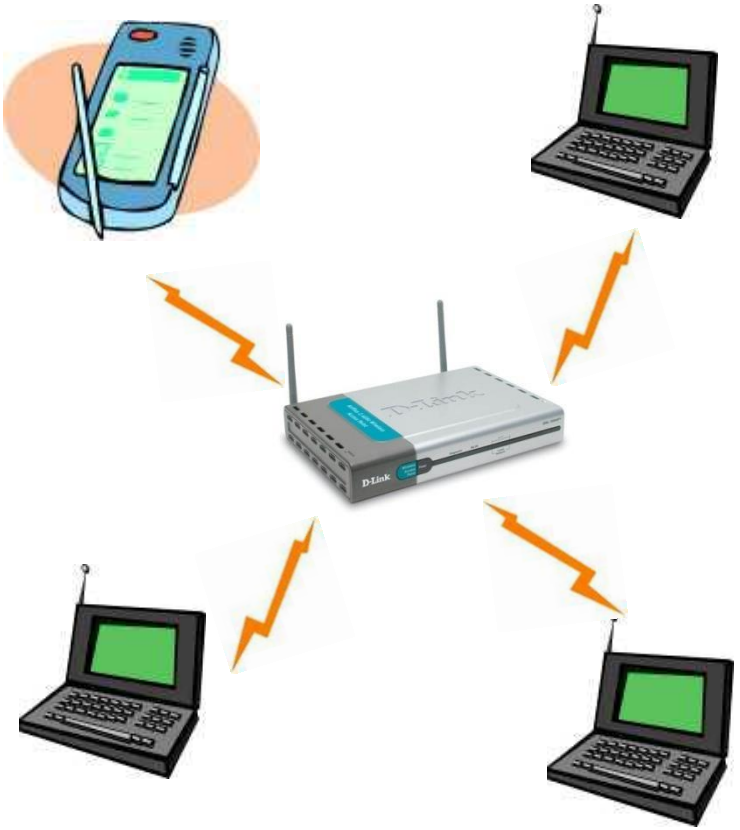
Peer-to-peer Topology



Infrastructure network

- The client communicate through Access Point.
- Any communication has to go through AP.
- If a Mobile Station (MS), like a computer, a PDA, or a phone, wants to communicate with another MS, it needs to send the information to AP first, then AP sends it to the destination MS.

Infrastructure network



Hotspots

- A Hotspot is a geographical area that has a readily accessible wireless network
- Hotspots are equipped with Broad band Internet connection and one or more Access points that allow users to access the internet wirelessly

Hotspots

- Hotspots can be setup in any public location that can support an Internet connection. All the locations discussed previously are examples of Hotspots.

Hotspots

- Hotspots can be setup in any public location that can support an Internet connection. All the locations discussed previously are examples of Hotspots.

How a Wi-Fi Network Works

- A Wi-Fi hotspot is created by installing an access point to an internet connection.
- An access point acts as a base station.
- When Wi-Fi enabled device encounters a hotspot the device can then connect to that network wirelessly.

How a Wi-Fi Network Works

- A single access point can support up to 30 users and can function within a range of 100 – 150 feet indoors and up to 300 feet outdoors.

- Many access points can be connected to each other via Ethernet cables to create a single large network.

How a Wi-Fi Network Works

Advantages

- Mobility
- Ease of Installation
- Flexibility
- Cost
- Reliability
- Security
- Use unlicensed part of the radio spectrum
- Roaming
- Speed

Limitations

- Interference
- Degradation in performance
- High power consumption
- Limited range

Conclusion

- Wi-Fi is a simple and cost effective way to connect to internet without the need of wires.
- It is growing in popularity because of decreasing costs and the freedom it gives to users.