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# WIRELESS NETWORKS

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***Abstract***

**Wireless network is the most common and successful nowadays. To operate wireless networks in a multi-hop fashion, protocols for medium access control, routing, power control, and transport are needed. Since bandwidth in a wireless network may be scarce in comparison to optical fibre there is interest in increasing the efficiency of protocols for these networks. Thus, there have been efforts in advancing a "next'' generation protocol suite that utilizes the shared wireless medium in a more efficient way. Over the past few years the problem of how to address wireless networks in the aggregate has been addressed, with the goal of making some progress toward understanding what their capabilities are and how they are to be operated. The issue is that every wireless network can potentially be different from others in the number of nodes it has, where they are located, the traffic requirements imposed on it. This chapter describes wireless network models in which distance plays an explicit role**

## I. INTRODUCTION

Any type of network that does not require any wire for connection is termed as wireless network**.** A wireless network is set up by using radio frequency which is used to communicate with other devices. The two main components of a wireless network are **wireless router** and **wireless client.** Wireless networking is nowadays popular since it is easy to set up and there is no use of wires.

## II. WORKING

A wireless network works on the principle of radio frequency technology, which works within the electromagnetic spectrum of respective wave propagation. When radio frequency current is supplied to antenna, an electromagnetic field is created. Then the access point broadcast signals that computer detect and tunes.

## III. RADIO FREQUENCY

A radio frequency is a rate of oscillation which ranges from 3kHz to 300GHz. In terms of communication radio frequency plays a very important role. According to the type of connection the radio frequency is tuned and is sent to antenna. For example 300MHz to 3GHz is used in Bluetooth.

| **FREQUENCY** | **DISTANCE** | **DESIGNATION** |
|---|---|---|
| 3-30Hz | $10^5$-$10^4$km | Extremely low frequency(ELF) |
| 30-300Hz | $10^4$-$10^3$km | Super low frequency(SLF) |
| 300-3000Hz | $10^3$-100km | Ultra low frequency(ULF) |
| 3-30kHz | 100-10km | Very low frequency (VLF) |
| 30-300kHz | 10-1km | Low frequency (LF) |
| 300kHz-3MHz | 1km-100m | Medium frequency(MF) |
| 3-30MHz | 100-10m | High frequency (HF) |
| 30-300MHz | 10-1m | Very high frequency(VHF) |
| 300Mhz-3GHz | 1m-10cm | Ultra high frequency(UHF) |
| 3-30GHz | 10-1cm | Super high frequency (SHF) |
| 30-300GHz | 1cm-1mm | Extremely high frequency(EHF) |
| 300GHz-3000GHz | 1mm-0.1mm | Tremendously high frequency |

| | | |
|---|---|---|
| | | (THF) |

**FREQUENCY DISTRIBUTION TABLE**

## IV. TYPES OF WIRELESS NETWORKS

### *A. WI-FI*

Wi-Fi is a network which is primary associated with computer IEEE 802.11 specification to create a wireless local area network. A wireless network consists a router which transmit and receives data from individual device.


In order to connect a Wi-Fi LANcomputer must be equipped with wireless network interface controller. Wi-Fi is a common wireless network nowadays since it allows cheaper deployment of local area network

### *B. CELLULAR*


Cellular is associated with most wireless phones which uses connected transmitters that enables the user to move about while remaining in contact with the network. In this network each cell uses a different set of frequencies from neighbouring cell, to avoid interface and provide guaranteed bandwidth within each cell. In such a network, the respective area to be supplied with radio service is divided into regular shaped cells and each cell is assigned with many frequencies which have corresponding radio base station.

### *C.* BLUETOOTH

Bluetooth is a wireless technology useful for exchanging data in a short range since it uses short-wavelength UHF(Ultra High Frequency) radio waves. It was invented by Telecom Vendor Ericsson in 1994.

Bluetooth was designed to allow bandwidth wireless connection to become simple so that it became common in daily lives. When it is about sharing media files or any kind of file, Bluetooth is the first medium which comes in mind. It operates in the range of 2400-2484 MHz. Bluetooth is one of the most successful example of radio technology.

### *D. WIMAX*

WIMAX stands for worldwide interoperability for microwave access. WIMAX is such a wireless communication designed to provide data rate of 30-40 megabit-per-second. It refers to implementations of the IEEE 802.16 family of wireless networks.

## V. APPLICATIONS OF WIRELESS NETWORKS

1. Cellular phones are part of everyday wireless network.
2. LAN connection in hilly areas for army where there is no range of other networks.
3. Wi-Fi dongles can be easily carried anywhere and can be used

## VI. ADVANTAGES

1. Easy to set up and cheaper.
2. No use of wires which results in great mobility.
3. Wireless network allows easy connectivity between computers.
4. Files can be shared over the wireless network without saving them to disk.

## VII. DISADVANTAGE

1. Devices can connect in a particular range only.
2. Lower speed as compared to wired network.
3. Less secure.

## CONCLUSION

Wireless networks being cheaper are in great demand now a day. It is been observed that wireless networks looks clean due to lack of wires but have less speed, i.e. media sharing is slow, in comparison with wired networks. Wi-Fi, cellular, Bluetooth and WIMAX are types of wireless networks where Wi-Fi provide data connection, cellular connection are cell phones which we use in our day to day life and Bluetooth is used to shares files from one device to another.

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