

SURVEY ON WIRELESS COMMUNICATION

Alpna Devi & C.B.Prasad

World Institute of Technology (Gurugram University)

Abstract

Communication Systems can be Wired, or Wireless depends upon the medium used for communication can be Guided or Unguided. In Wired Communication, the medium is a physical path between sender and receiver like Co-axial Cables, Twisted Pair Cables and Optical Fiber Links etc. which provide a path to the signal to propagate from one point to other is called Guided Medium. Wireless communication is one of the important mediums. In the wireless communication technology network transfer of data take place through the air, without requiring any cables, by using electromagnetic waves like radio frequencies, infrared, satellite, etc. Now a days wireless represents variety of devices and technologies including smart phones to laptops, tabs, computers, walkie- talky, Bluetooth, etc. In this the space allows for signal transmission without any guidance, the medium used in Wireless Communication is called Unguided Medium. In day-to-day life wireless communication system has become an essential part and these devices, allows user to communicate even from remote operated areas. There are many devices used, Advantage & Disadvantage of it, Smart city, wireless network security.

Keywords: guided and unguided wireless, 3G and 4G network, Bluetooth, Wi-Fi, GPS, Satellite.

INTRODUCTION

In present telecommunication has become an important part of our daily lives and has been effecting widely to the advancement in various fields. Wireless broadband technology which transmits multiplexed information or data on a wide band of frequencies. The Wireless technologies are designed to reduce the time and different types of distortions and problems created by cables. It is more convenient than wired networking. Wireless fidelity-popularly known as Wi-Fi technology was developed by IEEE 802.11 standards in 1997 which provided users the liberty to connect to the internet.

Incompatible 3G wireless standards. Three of these five standards are currently in different stages of realization. The existence of these multiple standards is not likely to solve the well-known problem of interoperability of wireless networks. 3G wireless access systems provide basic data services along with voice and messaging capabilities.

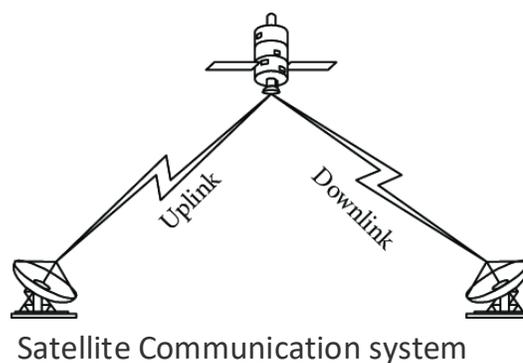
The wireless network technologies (3G, 4G and forthcoming 5G wireless services) are witnessed of exciting innovations and research. It will continue to represent a fast growth in communication sector in the future. These technologies increased the targets and organization's ability to reach customers regardless of their locations. 3G mobile networks – that are common on the existing

wireless network technology provides broadband transmission with high speed. Mobile and wireless networks transfer data of up to 2 megabits per second (Mbps) in some areas of the world, but the international 3G networks standard known as IMT-2000 . The service providers are already researching and developing a next-generation, true broadband wireless cellular system, known as the Fourth Generation or simply the 4G. Wireless service providers and application vendors will strive to meet the services and applications, namely m-commerce, m-business, ubiquitous business, and pervasive healthcare. The primary purpose of this paper is to present services, evolution, and issues of mobile and wireless networks. More specifically, we present mobile services mobility, and access quality for mobile and wireless networks, the next-generation networks, integration and interoperability, and access to multiple expectations as new technology evolves to form tomorrow's wireless networks. What lies ahead of the next generation wireless technologies such as 3G, 4G & 5G wireless networks, and broadband fixed wireless communications generates great opportunities for wireless industries.

Different types of wireless communication

1- Satellite communication

Satellite communication is a type of wireless communication by which people on the earth can communicate with each other. Due to the curvature of the earth to send a signal to another country is not possible in this communication. That's why satellites are orbiting the earth so that they can send a signal amongst themselves and eventually to the distant country. All of this happens at an incredibly fast speed.

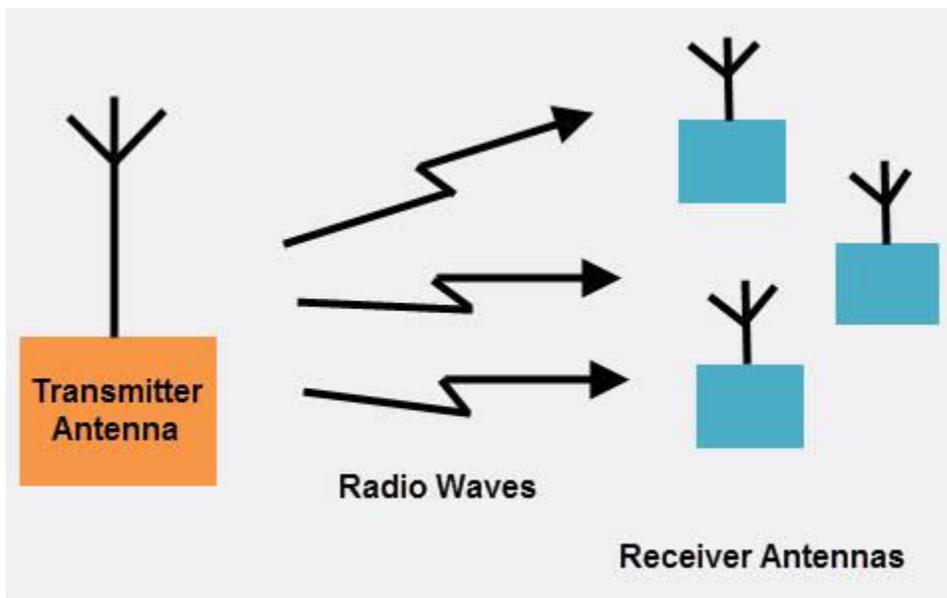


2- Infrared Communication

At homes in the form of a television when there is a line-of-sight visibility. That means that if you stand between the transmitter and receiver or between the sender or the receiver it will not work.

3- Broadcast Radio

The most famous and probably the first kind of wireless communication is broadcast radio remote control Infrared communication is present. IR transmits information by means of invisible light. This means that on the electromagnetic spectrum that lies between microwaves and visible. It requires a transmitter and a photo receiver to receive the light beam. Since any disruption to the light will result in the photo receiver not receiving it, IR will only function cross various frequencies. That's why your car radio is able to receive signals from many different radio stations. There are many example of radio communication such as Radio stations send out informative and entertaining programs. Maritime radio channels allow ships to communicate with each other and the shore. Radio transmitters send out data in the form of radio waves to receiving antenna. Radio waves are electromagnetic signals. Signals that's are transmitted are narrow, and waves can be sent here.



Broadcast communication

4- Microwave Communication

Microwave technology is an effective type of communication that is used worldwide, and this technology can be divided into 2 types: -

- 1-Satellite Microwave Communication
- 2-Terrestrial Microwave Communication

Satellite Microwave Communication

This is the most effective method of transmitting microwaves signals over worldwide or globally. Like Infrared technologies, it requires a clear line of sight. This means that to send a signal over a long distance, sending it up to a satellite first is a good idea. The only problem occurs in dense cloudy weather the signal to the satellite can be blocked by atmospheric.

Terrestrial Microwave Communication

Microwave technologies are a very secure form of communication. If a signal needs to be transmitted over a short distance, it can be enough to connect two antennae with a clear line of sight. The signal can be transmitted between the two receivers. This negates the need to connect to an outside network.

5- Wi-Fi

Mobile Communication systems Wi-Fi is a low powered wireless electronic network. These are available in almost everywhere in the world. Essentially a physical wired network is connected to a router that creates a highly localized and low power wireless network. By using this, it is possible to connect a range of devices to the local network. However, public wireless internet access is always a big and easy target for thieves and hackers. Therefore, it is essential for both of the users who are connecting to these networks. The mobile phone industry uses similar technology to Wi-Fi but on a much grander and safer scale. Almost all the Mobile phone companies provide nationwide coverage or may be at international scale. This is done by means of a complex blend of local networks and transmitters together with satellite support.



6- Bluetooth Technology

Bluetooth is a new technology but is becoming more and more prevalent. It is basically a simple and easy method to send information across a short distance. However, this information can be

either messages or even files. It was originally designed to be a replacement for physical cables. However, it does have its downsides. It has a maximum reach of 30 feet.

Future Work

In the future we will study and research about the latest and fast responding technology of wireless communication that will help us to achieve our targets and goals easily with highly efficiency.

CONCLUSION

Wireless networks are quite common everywhere. Technology has been created to store, transmit and receive data through networks at extremely high speed. This research paper discuss wireless networks which are increasingly becoming preferred over wired networks by many users. The paper has an overview of networking and then proceeded to define wireless networking and discuss the various technologies that are used in wireless network. In this paper wireless network solutions are increasing in popularity as they become more affordable and are adopted by common people. This research paper has elaborated how wireless networks provide freedom from place restriction, scalability and flexibility. The most popular technologies which are popular are Bluetooth, Wi-Fi, broadcast, satellite and Cellular networks. The paper has discussed about the mobility of wireless networks. It has been noted that despite their merits, there are a few significant issues with wireless networks which are primarily: quality assurance and security issues. Wireless links are noisier and less reliable than wired links due to the interference that occurs when the signals are transmitted. Bluetooth is a new standard developed by a group of electronics manufacturers that will allow any sort of electronic equipment to make its own connections without wires. Using strong encryption standards and can resolve the security issues inherent with wireless networks.

REFERENCES

- [1] Yan, L. and Fang, X. (2013) Decoupled Wireless Network Architecture for High-Speed Railway. 2013
- [2] IEEE 802.15.4a Standard. Part 15.4: Wireless MAC and PHY Specifications for Low-Rate Wireless Personal Area Networks.
- [3] Bluetooth TM. Specification of the Bluetooth System; New Jersey, 2004.
- [4] Overview Research on Wireless Network communication by Mohaiminul Islam & Shangzhu Jin, 2019.
- [5] Kumar, A "Evolution of Mobile Wireless Communication Networks", International Journal of Electronics & Communication Technology,
- [6] Malone S, Case Study: A Path towards a Secure, Multi-role Wireless LAN in a Higher Education Environment, SANS Institute, Massachusetts.

[7] Minakaris, K V and Economides, AA 2003, Wireless technology in educational systems

[8] Jordan & Abdallah, "Wireless communications and networking: an overview", IEEE Antennas and Propagation Magazine.

[9] Kumar, A & Manjunath, K 2008, Wireless Networking, Morgan Kaufmann, Boston.