

# A Review of Issues and Challenges in Wireless Technology

Konatam Tejaswi, Dr. Syed Umar

Department of Computer Science and Engineering, K. L. University, Guntur, Andhra Pradesh, India

## ABSTRACT

With the advent of wireless technology, wired infrastructure is substituted with wireless infrastructure and also peoples trails have been minimized in accessing the data at different places and entry to mobility devices have reduced human trials. As we know that the size of the wireless system should be small and bandwidth constrained wireless devices, wireless networks are just some of the key challenges of the signal size and price, consumer protection, (quality of service) QoS, minimizing data rate enhancements, are fading consciousness are some of the problems in the wireless systems. Research issues and challenges of wireless networks are discussed here with the intension of giving an idea to the reader.

**Keywords:** Wireless LAN , Packets, Transmission Range , IEEE 802.11 , IR-DSSS, OFDM, DSSS , FHSS, Access Point , APS, Quality of Service

## I. INTRODUCTION

Wireless networks has increased in the recent past, similarly there is a rapid growth of the Internet over the past 10 -20 years, The exponential growth of mobile communication, wireless communication, and wireless Internet and wireless home networking platforms will continue to enjoy. Wireless LAN (WLAN) technology with the advent of computer networks, the bandwidth of the network through a wall socket connection could not achieve a useable amount. They travel to next creation of mobile equipments; people are permitted to get access to the information saved. The people can use these from anywhere using their palmtops and gets instantly gets the permissions to the network.

This is the innovation and ability of distribution in the area of wireless system. Now-a-days, we have seen the widespread adoption of wireless networks in the home consumer markets, the rate of expansion was widely reported and easy wireless enterprise environments have been less exploited holes in the standard security system. Over time, some form of security to connect it became clear that the resources needed to prevent outsiders. Wireless access points, we present a security issue, the current is larger than that of the earlier Internet connections. This is a good, secure solution for

producing a wireless solution and is a good stepping stone.

The remaining of this discussion is systematically as follows; we present a classification of the first and the second section of the IEEE 802.11 wireless networks operating in two modes, giving the talk. We then research challenges, and the third section provides a brief description about the problems with wireless networks and in the fourth section of the paper we will finally end.

## II. METHODS AND MATERIAL

### Taxonomy of Wireless Networks

Wireless networks are a special feature of the packets (slots) will be transmitted to the presence of wireless links. Provided that the transmission range of the sender to the receiver device to another device, the wireless medium, to send messages through the air in a wireless network. This adds to the flexibility of a wireless network, how to set up and structured. Apart from this it assists the mobility of the device.

## IEEE 802.11

IEEE 802.11 wireless local area network (WLAN) communication is a basic unit. The first is the standard IEEE 802.11 wireless local area network, initiated in 1997 intended for household purpose and office environments, and transmission technologies are i) infrared (IR), ii) the frequency spectrum (FHSS Hopping Spread), iii) Direct Sequence Spread Spectrum supports three types (DSSS). Orthogonal Frequency Division Multiplexing have two other transmission technologies (OFDM) and Direct Sequence Spread Spectrum High rate (IR-DSSS). Orthogonal Frequency Division Multiplexing modulation project was initiated in 2001. Standard wireless networks, namely, infrastructure networks and adhoc networks to introduce the two operating systems.

### A. Infrastructure Networks

The basic operating mode (Figure a), one of which must be related to the Access Point, All Stas approach the access point (AP) to a network. By Stas AP communicate with each other. A basic plan, one with permanent network device installations. It is host to a wireless access point or a base station that connects via a fixed point called a fixed topology, can be set up with. The latter is often a wired link, connected to the backbone network. Cellular networks and wireless local area networks (WLANs), like most of the static infrastructure networks operate. Media coverage of the base station, all within a wireless backbone network to connect and communicate with the hosts to be used. This started from or destined to host a wireless base station that connects directly to the host have to pass through all means of communication. In addition, an infrastructure network with partially unchanged or a flamboyant structure is formed. One of the networks that come under this is the satellite communication network. This is a space component, ground component section satellites are in space. All information will be held by the remote satellite links to the land base through the gateway stations (GSS), there is also a popular base station.

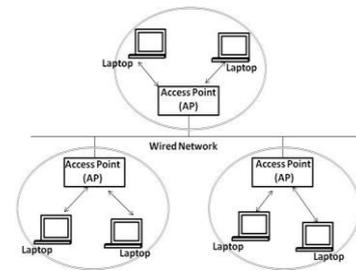


Figure 1 : Infra structure wireless network

The ambulant presenter moves away from the covering of the main point to maintain an ongoing connection, such as a terminal handoff occurs proxy for communication from the main point to other one of the hands on the mobile host. Coverage of many of the neighboring base stations overlap with one another, whether you're an ambulant presenter can be connected to one of the base stations can also be gained depending on the definite standards.

### B. Ad Hoc Networks

In Figure 2 network access points (APS) there are no 2nd operating method, standalone method or adhoc method is used. In this mode, stations (Stas) directly with each other to form a temporary network. An adhoc system, such as a packet radio system, one having no standard structure. Its broadcast coverage of the wireless receiver directly to the host to freely broadcast with other presenter. The host is not in a wireless coverage area, you would like it to send messages to another host, in-order to do that they broadcast it to the presenter first of its communication scope and it works as a relay host to moves ahead the information so as to reach its objective. The main benefit of this arrangement is pliability. Any opening on adhoc system without the need for a fixed infrastructure can be made easily. In addition there is a critical tool to maintain network connectivity, which is a temporary system is normally additionally strong compared to that of an Infrastructure system. In other words, if an adhoc network is broken and the reason is not functioning of the wireless presenter, but failed to malfunction of a base station connected to the base station and the blocking of all wireless communication between hosts, that it is possible to partition the network to other hosts on the network infrastructure. In fact, a few disadvantages are also there for adhoc systems. First one is that because of changes in system structure due to host mobility to

perform adhoc networks, routing is much more difficult and complicated.

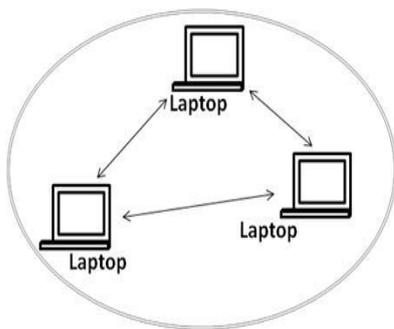


Figure 2. Ad Hoc wireless network

Each time synchronization as a host of wireless, power management, and packet scheduling algorithms, such as the actions of its own, since the latter may be, it is very strenuous to manage or synchronize the correct functioning of the adhoc system. The construction of an infrastructure network, these algorithms is often implemented as base systems or, melodies.

### III. RESULTS AND DISCUSSION

#### Research Challenges of Wireless Networks

Wireless devices must be compact with a limited bandwidth of wireless systems, the wireless networks just pose with important problems for enhancing the data rate, lowering or decreasing the size, price, end user security, and quality of service.

##### A. Signal Fading

Apart from wired system there are distorted signals transmitted through a wireless medium with irregular boundary of an open, unprotected, and the ever-changing growth over the medium may be weak. Besides, the same signal at the receiver before it was granted and due to the constraints of the reflection, diffraction, and scattering in different ways to travel. Dispersed in different ways at different times of the signals take to reach the destination. Therefore, compared with the transmitted signal, the signal after adding of all the scattered signals can be outstandingly distorted and diminished. The data signal is transmitted to the receiver, and thus cannot be recognized. The unreliable nature of wireless media can cause a huge data or information misplacement.

##### B. Mobility

Keeping in mind the obligations levied from the wired system between instruments, free to all equipments in a wireless system. A user roams around it to assist mobility so that the existing relation can be still in existence. In an Infrastructure network, mobile host moves from the one coverage handoff i.e. from a starting point or access point to another point therefore, during a handoff protocol is necessary to ensure a seamless transition. The handoff decisions that must be done, the way the data is sent gives or defines the handoff method. Some other cases the data or information is lost during the hand shake. In an adhoc system, structure varies, a mobile host moves. The topological changes to meet the still existing data communication, the transmitted path is to be re calculated, i.e. May have a large number of mobile hosts in an ad hoc network, so that worked well in this environment is often the configuration changes to the design in order to have an reliable and efficient routing protocol imposes a significant challenge.

##### C. Power and Energy

The size of a mini equipments in general are simple, minor, and are designed to execute a group of instructions as desired. The main energy point is installed in a fixed device will not be able to release more energy. If an instrument or equipment is authorized to roam independently, it is usually difficult to get an un-interrupted flow of energy. To preserve power, portable equipment must be capable of working in successful and in a well-organized way. In particular, some of the communication activities to reduce the number of transmissions and receptions in an intelligent manner so as to transmit and receive

##### D. Data Rate

If the service provided to support future high-speed multimedia applications improving the current data rates, in particular, is required. Such as error-resilient coding data compression rate of the data by reducing interference, power control, and is a function of different components which include as information transfer protocol. Therefore, the manufacturer takes into account such components so as to reach the accomplished higher data rates which are essential for the implementation of a well thought out design. Multimedia applications such

as video conferencing, data compression is supported by a wireless network plays a major role. Currently, such as the order of 75 to 100. Now the challenge is compression standards such as MPEG-4 compression ratios produce compression rates also produce high-quality audio and video compression algorithms is to improve the communication. Unfortunately, the extremely squeezed multimedia information network errors and is highly susceptible to interference, and such necessitates the need of algorithms to protect delicate information so that it is protected from getting lost. Error control algorithms for efficient low-overhead should be explored. Other means is to expand the data rates and traffic characteristics of the network to adapt to changes in the timing of the intelligent data transfer protocols will be appointed.

### **E. Security**

Security m-commerce and e-commerce applications, in particular, are a big problem in wireless networking. Mobility of users in a wireless network raises security concerns. Current wireless networks to provide security for its customers to follow the air interface authentication and data encryption techniques. An IEEE 801.11 standard user verifies and enciphers the information between personal computer card and a wireless Local Area network access point which defines a method equivalent privacy (WEP) Wired explains. Where as in big organizations, an Internet Protocol system-level security solution for corporate networks and patented information could be protected. Virtual Private Network (VPN) to access reliable fixed access network is an option. Hackers are getting smarter, so it is imperative to be constantly updated wireless security features.

### **F. (Quality of Service) QoS**

Service quality is reflected in the systems communication standard and resource accessibility which is a measure of the performance of the network. Reliability, delay, jitter, and bandwidth are the four parameters on which QoS can be characterized.

Wire line and wireless networks, QoS cannot be addressed in the environment are a number of important issues. Wireless networks are inherently different from

wire line networks, problems arise because of this. Many of the important characteristics of the wireless network handoff, the dynamic connections, and are transported to the QoS actuating. Traffic Quality of Service specifications (throughput, delay, and loss rate) in a wireless domain are not enough. Where as in a wire line domain, the application layer, usually once a connection is closed; it can be assured that it will continue to exist. In a wireless domain, the relations may be provisionally broke during the known handshake process. It is unlikely that the handoff can take place without interruption for at least a short connection. Should be able to recover from the temporary disruption to applications running on a wireless environment, and they should be able to tolerate specify the maximum connection time of the interruption. Could specify at the time of application, such as by a large loss rate; However, the meaning of this loss rate is overloaded. A loss due to transmission errors, buffer overflow, or loss rate is supposed to reflect. The maximum frequency of interruptions in connection to a wireless network that is worthy of another performance parameter. So there is no satisfactory QoS perceived by the user to request some of the applications of low frequency impedance. For example, an application that is not broken more than once per minute for a voice connection can be guaranteed. Low-impedance frequency handoffs that occur most often refer to. Applications of low-frequency impedance instead accept a maximum connection time of the interruption. For example, it is often short break rather than infrequent long breaks in a video connection may need more.

## **IV. CONCLUSION**

This paper identifies and describes the wireless domain for a variety of research issues and challenges. We have presented an overview of the classification of the first wireless network. Signal problem, the problem of mobility, energy and power, data rate enhancement, security and wireless networks. In addition to a decline in the quality of service issues, problems, issues, such as research and a comprehensive list of the wireless network is an overview of the challenges presented by the popularity of wireless networks is growing at an exponential rate, the data rate enhancements, QoS

issues needed to obtain the size, cost, low-power networking, user security, and reducing the need for the best becomes more challenging.

In the end, the faster wireless networks are becoming increasingly popular, and useful for increasing user demand for wireless applications successfully resolving problems are also discussed.

## V. REFERENCES

- [1] [http://en.wikipedia.org/wiki/Wireless\\_network](http://en.wikipedia.org/wiki/Wireless_network)
- [2] IEEE 802.11-1999, IEEE Standard for Local and Metropolitan Area Networks Specific Requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications, June 12, 1999.
- [3] V.O.K. Li and X. Qiu, Personal Communication Systems (PCS), Proc. IEEE, vol. 83, no. 9, Sept. 1995,
- [4] J. H.Schiller, Mobile Communications, 2nd ed., Addison-Wesley, 2003. Y. Hu and V.O.K. Li, Satellite-Based Internet: A Tutorial, IEEE Commun. Mag., vol. 39, no. 3, Mar. 2001, pp. 154–62
- [5] A.Gupta, I. Wormsbecker, and C. Williamson, Experimental Evaluation of TCP Performance in Multi-Hop Wireless Ad Hoc Networks, Proc. IEEE MASCOTS 2004, Volendam, The Netherlands, 4–8 Oct. 2004, pp. 3–11.
- [6] H. Singh and S. Singh, Energy Consumption of TCP Reno, Newreno, and SACK in Multi-Hop Wireless Networks, ACM SIGMETRICS Perf. Evaluation Rev., vol. 30, no. 1, June 2002, pp. 206-216.
- [7] Chip Craig J. Mathias Principal, Farpoint Group COMNET 2003 Wireless Security: Critical Issues and Solutions 29 January 2003
- [8] Sandra Kay Miller Facing the Challenge of Wireless Security July 2001
- [9] T. Karygiannis and L. Owens. Wireless Network Security:802.11, Bluetooth and Handheld Devices. In NIST Special Publication 800-48, November 2002.
- [10] Paulo Salvador, Ant´onio Nogueira, Rui Valadas Predicting QoS Characteristics on Wireless Networks