



## STUDY OF WIRELESS LAN TECHNOLOGY: SPECIAL REFERENCE TO IEEE 802.11 STANDARDS

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### ABSTRACT

*Arrange advancements are generally in light of wireline arrangements. Be that as it may, the presentation of the IEEE 802.11 principles have had a colossal effect available with the end goal that portable workstations, PCs, printers, cellphones, and VoIP telephones, MP3 players in our homes, in workplaces and even out in the open territories have consolidated the remote LAN innovation. Remote broadband advancements these days give boundless broadband access to clients which were beforehand offered just to wireline clients. In this paper, we audit and compress one of the rising remote broadband innovation i.e. IEEE 802.11, which is an arrangement of physical layer standard for executing remote neighborhood PC correspondence in the 2.4, 3.6, 5 and 60GHz recurrence band. They settle innovation issues or add usefulness which is relied upon to be required by future applications. Despite the fact that a portion of the prior renditions of these innovations are out of date, (for example, HiperLAN) now yet we have included them in this audit for culmination.*

**Keywords:** Wireless Communications, IEEE802.11, HiperLAN, WLAN, Wi-fi.

### 1. INTRODUCTION

The remote broadband innovations were produced with the point of giving administrations similar to those gave to the wire line systems. Cell arranges now offer help for high transmission capacity information exchange for various portable clients all the while. What's more, they likewise give portability support to voice correspondence. Remote information systems can be isolated into a few sorts

relying upon their zone of scope. They are:

**WLAN:** Wireless Local Area network, in Zone with a cell range up to hundred meters, basically in home and office conditions [1].

**WMAN:** Wireless Metropolitan Area Network; for the most part cover more extensive regions as substantial as whole urban communities. **WWAN:** Remote Wide Area Network with a cell run around 50 km, cover domains greater than a city [2].

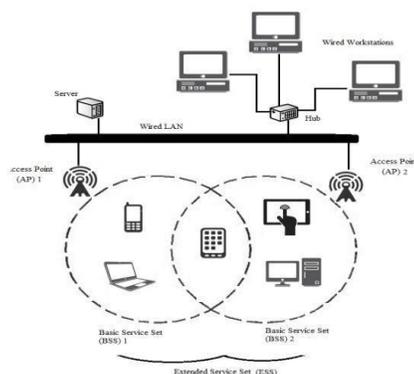
However out of these norms, WLAN and late advancements in WLAN innovation would be our principle range of study in this paper. The IEEE 802.11 is the most broadly sent WLAN innovation starting today. Another outstanding is the HiperLAN standard by ETSI. Both these advancements are joined under the Wireless Fidelity (Wi-fi) organization together. In writing however, IEEE802.11 and Wi-fi is utilized conversely and we will likewise take after a similar tradition in this paper. A normal WLAN arrange comprises of an Access Point (AP) in the center/focus and various stations (STAs) are associated with this focal Access Point (AP). Now, there are fundamentally two modes in which correspondence can happen [3].

## 2. DEVELOPMENT OF IEEE 802.11

The Physical layer (PHY) and medium get to control (MAC) layer were mostly focused by the IEEE 802 venture. Right when the likelihood of remote neighborhood (WLAN) was at first envisioned, it was as of late pondered another PHY of one of the

available rules. The principal competitor which was considered for this was IEEE's most conspicuous standard 802.3. However later discoveries demonstrated that the radio medium carried on very unique in relation to the customary all around acted wire. As there was lessening indeed, even over short detachments, impacts couldn't be perceived. Henceforth, 802.3's bearer sense various access with impact location (CSMA/CD) couldn't be connected [4].

The following applicant standard considered was 802.4. By then of time, its planned medium get to i.e. the token transport idea was accepted to be better than 802.3's conflict based plan. Henceforth, WLAN started as 802.4L. Later in 1990 it got to be distinctly evident that token taking care of in radio systems was fairly troublesome. The institutionalization body understood the need of a remote correspondence standard that would have its own exceptionally one of a kind MAC. At long last, on March 21, 1991, the venture 802.11 was affirmed (figure 1).



**Figure 1 WLAN Network Architecture**

### 3. IEEE 802.11 FAMILY

The most generally sent 802.11 standard has a considerable measure of augmentation and numerous more are at present a work in progress. Initially presented in 1999, the IEEE 802.11 gauges was basically created remembering the home and the workplace condition for remote neighborhood. The Initial measures gave a most extreme information rate of 2Mbps for every AP which expanded to 11 Mbps per AP with the arrangement of IEEE 802.11b. Newer expansions like IEEE 802.11g and IEEE 802.11a gave greatest information rate of

54Mbps for every AP utilizing different strategies to help up the most extreme information rates [5]. WLAN gadgets in light of IEEE 802.11g at present offer information rate 100-125Mbps [6].

#### 3.1. Physical (PHY) Layer

The IEEE 802.11 utilizations assortment of PHY layers with the point of expanding the total throughput of the system. IEEE 802.11 standard incorporates three PHY layers in particular:

1. FHSS (Frequency Hopping Spread Spectrum)

#### 2. Table 1 OFDM PHY layer modulation techniques

Data Rate (Mbps)	Modulation	Coding rate	Coded bits/sub Carrier	Code bits/OFDM symbol	Data bits/OFDM symbol
6	BPSK	1/2	1	48	24
9	BPSK	3/4	1	48	36
12	QPSK	1/2	2	96	48
18	QPSK	3/4	2	96	72
24	16-QAM	1/2	4	192	96
36	16-QAM	3/4	4	192	144
48	64-QAM	2/3	6	288	192
54	64-QAM	3/4	6	288	216

## 4. CONCLUSION

A portion of the reasons which can be referred to for such across the board utilization of WLANs are low framework cost, simplicity of advancement, support for versatile client correspondence, organization without cabling and simplicity of adding new client to the system bringing about a tremendous decline in execution cost. As the significance of portable client has expanded complex, WLANs have increased much significance in homes, schools, workplaces and so on and developed as a get to innovation in short separation interchanges. Still today, WLANs experiences a considerable measure of issues. A standout amongst the most vital disadvantages is the utilization of shared medium in which execution gets extensively corrupted as the quantity of STAs increments in the WLAN arrange. The issue of unapproved get to and spying in WLANs are a portion of the genuine security issues which have been a long standing cerebral pain for the IEEE working gathering. Diverse security encryption plans had been actualized previously. Be that as it may, so far all such encryption frameworks have been demonstrated to have security vulnerabilities.

## REFERENCES

1. 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.
2. IEEE 802.11b-1999, IEEE Standard for Local and Metropolitan Area Networks Specific Requirements – Part 11: Wireless LAN Medium
3. Access Control (MAC) and Physical Layer (PHY) Specifications High Speed Physical Layer Extension in the 2.4 GHz Band, September 16, 1999
4. IEEE 802.11a-1999, IEEE Standard for Local and Metropolitan Area Networks Specific Requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications High Speed Physical Layer in the 5 GHz Band, 1999.
5. IEEE 802.11g-2003, IEEE Standard for Local and Metropolitan Area Networks Specific Requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 4: Further Higher Data Rate Extension in the 2.4 GHz Band, June 27, 2003.
6. U.S. Apply autonomy, 802.11g Speed Acceleration How We Do It, [www.usr.com/download/whitepapers/125mbps-wp.pdf](http://www.usr.com/download/whitepapers/125mbps-wp.pdf) 2004.