

# REVIEW ON IEEE 802.11 STANDARDS

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## ABSTRACT

Recently , the purpose of this paper is to study types IEEE protocol suite 802.11. Wireless Local Area Network (WLAN) technology has evolved very quickly in recent years. the IEEE 802 set of LAN protocols, and specifies the set of media access control (MAC) and physical layer (PHY) protocols for implementing WLAN Wi-Fi computer communication in various frequencies, including but not limited to frequency bands.

**Keywords:- IEEE 802.11a,b,ac,ah,g,n,etc.**

## INTRODUCTION

Wireless is a term used to describe telecommunications in which electromagnetic waves (rather than some form of wire) carry the signal over part or all of the communication path. wireless, is the transfer of information or power between two or more points. Wireless technology started in the early 20th century with radiotelegraphy using Morse code. When the word wireless is mentioned, people most often mean wireless computer networking as in Wi-Fi or cellular telephony, which is the backbone of personal communications.

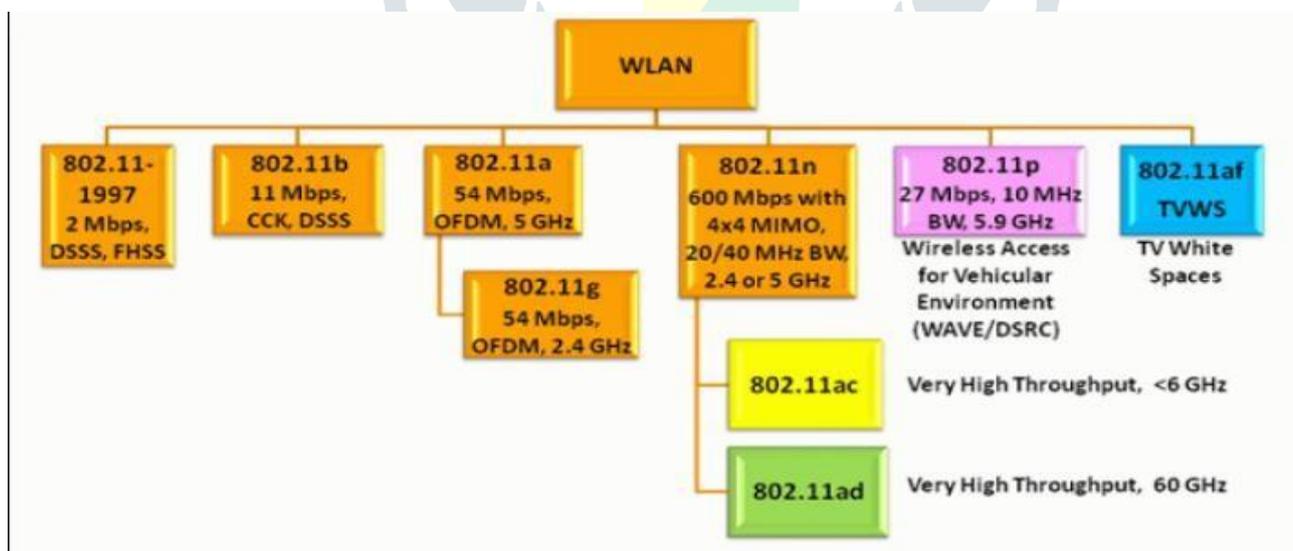
**Common everyday wireless technologies include:**

- 802.11 Wi-Fi: Wireless networking technology for personal computers
- Bluetooth: Technology for interconnecting small devices
- Global System for Mobile Communication (GSM): De facto mobile phone standard in many countries
- Two-Way Radio: Radio communications, as in amateur and citizen band radio services, as well as business and military communications
- WLANs are based on IEEE 802.11 standards specifies an optional MAC layer security system known as Wired Equivalent Privacy (WEP).IEEE (Institute of Electrical and Electronic Engineers) released the 802.11 late 90's. IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board.

**There are only five most important standard of IEEE 802.11 :-**

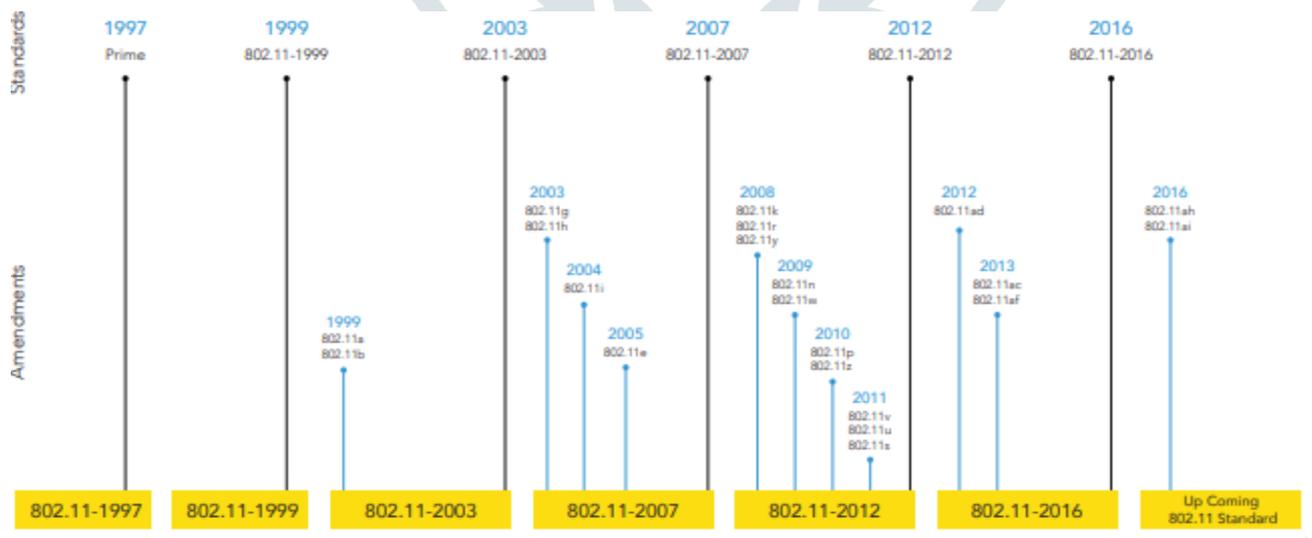
- i. **802.11a -- Orthogonal Frequency Division Multiplexing (OFDM) :-** IEEE 802.11a was developed in the year of 1999. And its used for office . This is an extension to 802.11 that pertains to wireless LANs and goes as fast as 54 Mbps in the 5-GHz band, and the bandwidth of 22 MHz.

- ii. **802.11 b-- Direct-sequence spread spectrum (DSSS) :-** IEEE 802.11a was developed in the year of 1999. And its used for domestic or home. 802.11b uses the same unregulated radio frequency band of 2.4 GHz that was used by the original 802.11 standard, but operates at theoretical data throughput of 11 Mbps. and the bandwidth is 22 MHz
- iii. **802.11g-- OFDM, DSSS (SISO) :-** IEEE 802.11a was developed in the year of 2003.its the combination of both the 802.11a and 802.11b. applies to wireless LANs and is used for transmission over short distances at up to 54-Mbps in the 2.4 GHz bands.
- iv. **802.11n --Multiple-input, multiple-output orthogonal frequency-division multiplexing (MIMO-OFDM) :-** IEEE 802.11a was developed in the year of 2009. It standardized support for multiple-input multiple-output, frame aggregation, and security improvements, among other features, and can be used in the 2.4 GHz or 5 GHz frequency bands. These include such items as multiple antennas, smart antennas, changes to signal encoding schemes, and changes to MAC access protocols
- v. **802.11ac--Multiple-input, multiple- output orthogonal frequency-division multiplexing (MIMO-OFDM):-** IEEE 802.11a was developed in the year of 2013. IEEE Standards Association, providing high-throughput wireless local area networks (WLANs) on the 5 GHz band. IEEE 802.11ac is a Wi-Fi standard for Very High Throughput (VHT) applications. The current generation of 802.11ac Wave 1 products, that have been certified by the Wi-Fi Alliance since mid 2013, deliver a three-fold increase in performance



There are many types of IEEE 802.11 Standards are mention in table :-

Standards	802.11j	802.11y	802.11p	802.11ad	802.11af	802.11ah	802.11aj	802.11ax	802.11ay
Year	2004	2008	2010	2012	2014	2016	2018	Expected (2019)	Expected (2020)
Bandwidth	5/10/20 MHz	5/10/20 MHz	5/10/20 MHz	2,160 MHz	6–8 MHz	1–16 MHz	540-1,080 MHz	-----	8000 MHz
Frequency Range	5/10/20 MHz	3.7 GHz	5.9 GHz	60 GHz	0.054–0.79 GHz	0.7/0.8/0.9 GHz	45-60 GHz	2.4/5/6 GHz	60 GHz
Modulation	OFDM	OFDM	OFDM	OFDM, single carrier, low-power single carrier	MIMO - OFDM	MIMO - OFDM	OFDM, single carrier	MIMO - OFDM	OFDM, single carrier



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