Review Paper on IEEE 802.11ax: Wireless Local Area Networks

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ABSTRACT
Recently, IEEE 802 started a task cluster to analysis and deliver next generation WIFI technologies for the plot of dense networks with an oversized range of location and access purpose.The proposal is specific because the IEEE 802.11ax change.. because of the vital network size increase achieved by 802.11ax, the term high-capability WIFI (HEW) is additionally utilized in relation to this new mode and tasks or 802 11axification. This paper summarizes the IEEE 802.11ax standardization activities ongoing and presents a summary of the foremost vital options planned within the 802.11ax changed. Expected options and challenges for 802.11ax with style of physical layer (PHY) and media access management sub-layer (MAC), toward a replacement era of wireless LANs, also are mentioned.
Keywords:- 802.11ax, WLANs, GRAP, OFDMA, MU-MIMO,Medium access management, multiple accesses

I.   INTRODUCTION

The IEEE standard aimed at WLANs was introduced in 1988 as IEEE 802.4L, a neighborhood of the IEEE 802.4 token bus wired local area network, so modification its name to IEEE 802.11 to make a local area network normal in 1990. This normal describes the physical layer (PHY) and medium access management sub-layer (MAC) explicit for wireless connectedness for mounted, transportable and moving terminal at intervals space[a neighborhood]area. when delay for severalyears, IEEE 802.11 working party approved the draft and later evolving into several amendments, notably for higher speed physical layer transmission, Particularly IEEE 802.11a, 11b, 11g, 11n, 11ac, for sweetening of upper level service support like 11e (quality of service) and 11i (security), for wireless access in conveyance environments, 11p and for mesh networking, 11s. The list ofmost well linked popular past and present 802.11

II. METHODOLOGY

A. Beyond 802.11ac

The tremendous growth of mobile information traffic and also the advent of information-hungry wireless applications highlight the upcoming would like for giant bandwidth and high rate in following generation mobile network. This can be consummate by spreading the air boundary ideas grasp by 802.11n: wider channel bandwidth (20/40/80/160/80+80 MHz), a lot of multiple-input multiple-output (MIMO) dimensional streams (up to eight antennas), and high-density modulation (up to 256-QAM). specifically downlink multi-user MIMO technology (up to four clients) adopted improves the spectrum potency by permitting cooccurring transmissions of multiple information frames to completelyunlike users. 802.11ac is regressive compatible with 802.11a & 802.11n, and also the 1st generation 802.11ac chips square measure already accessible within the market.
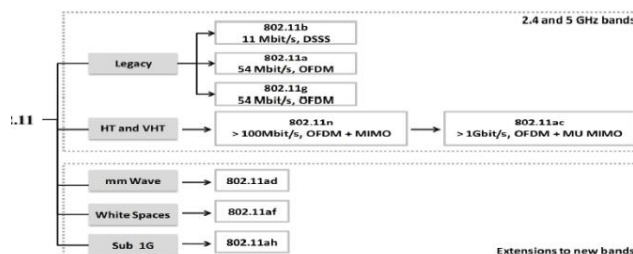

Fig 1 wi-fi technology evolution

B.802.11ax Project Target & Timeline

The IEEE Standards Association (IEEE-SA) Standards Board permitted 802.11ax in March, 2014. The scopes of 802.11ax change is to outline standardized modifications to each the 802.11 PHY and also the IEEE 802.11 Macintosh that alter a minimum of one mode of operation capable of supporting at minimum of four times development within the average around per station
(measured at the Macintosh knowledge service access point) in an exceedingly dense distribution situation, whereas maintaining or up the ability capability per station. It shall implement backward compatibility and harmony with legacy IEEE 802.11 devices operationwithin the same band.

III.   DIFFICULTIES FOR GIFT 802.11IN DENSEDEPLOYMENT

As the present IEEE 802.11 WLANs adopting inter-frame house (IFS), go into reverse window size, and beacon, to effectively control the operation of Macintosh, vulnerability beneath dense preparation arises as a standard difficult for users since the rear off parameters of its collision turning

away mechanism area unitfar away from the optimum setting in some network configuration conditions
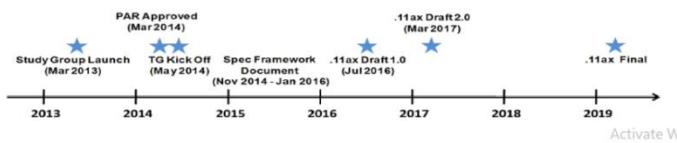

Fig 2 predicted 802.11

IV. POSSIBLE TECHNOLOGIES AND CHALLENGES FOR802.11AX

A. OFDMA PHY and CCA

A good method to alleviate the intensive argumentsand totally use the channelsource is to split the full frequency spectrum into multiple narrow-band sub-channels and mobile stations completely different set of sub-channels supported their channel choice methods and transmit their packets at the same time. OFDMA is additionally referred to as multiuser OFDM to permit multiple users to share the radio blocks focused at one single carrier frequencyIn a given frequency waveband, there sometimes exist multiple carrier repetition and therefore multiple sub-carrier time planes of radio blocks. On the opposite hand, OFDMA PHY creates a brand new and basic challenge in 802.11ax MAC style. The main interaction between MAC and PHY lies in adaptation modulation and cryptography (AMC) and clear channel assessment (CCA). Tradition IEEE 802.11 PHY truly conveys knowledge through all knowledge sub-carriers of the only carrier repetition at just once, and therefore CSMA/CA protocol and its variants will utterly work. The CCA may also be faithfully dead. CCA and therefore CSMA/CA face new challenges for OFDMA. the one user occupies a particular carrier frequency does not essentially imply non-permissible for alternative users to access the radio blocks at this carrier frequency.

B. DL/UL MU-MIMO

802.11ax shall probably continue the use of Multi-input Multi-output (MIMO) technology and it shall reference technology supported 802.11ac technology. some key changes can be ready to boost theoreticalrate to multi-gigabit counting on modulation and cryptography, channel information measure, and MIMO configuration.
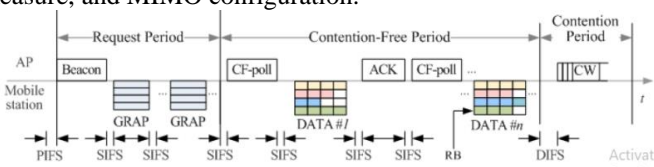

Fig3the proposed access schema for 802.11ax

V. CONCLUSION

The IEEE 802.11ax standardization activities current and discuss the expected options and challenges within the style of

PHY and MAC for IEEE 802.11ax change. produce a well-performing PHY and MAC protocol for band spanking new generation WLANs will be a difficult task, however it is additionally a remarkable space of analysis. the necessity for brand spanking new generation WLAN protocol is articulated. Toward the complete style of recent generation WLAN, there additionally stay several attention-grabbing analysistopics that need any investigation. Associate analytical model that accurately evaluates the normalized system saturation or un-saturation output has not however been studied.

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