

ABSTRACT

IEEE 802.11ax is a sixth generation Wireless Local Area Network (WLAN) standard that focuses on network performance, dense user coverage and service quality, by increasing average user Throughput and high data rates, hence it is referred to as High Efficiency Wireless (HEW)). This standard was designed because of the increasing demand for wireless networks and good Quality of Service (QoS). It takes a fast connection and large bandwidth, so it requires a high data rate. However, the large number of users will cause problems because of the hidden node.

QoS measurement in this final project research is carried out using an Enhanced Distributed Channel Access (EDCA) mechanism with modifications to the MAC and PHY layers. Modification at the MAC layer through the RTS / CTS mechanism to prevent problems from hidden nodes. The PHY layer use 1024-QAM modulation to increase peak rates. IEEE 802.11ax works at frequencies of 2.4 GHz and 5GHz, dividing bandwidth into 20 MHz, 40 MHz, 80 MHz and 160 MHz with Guard intervals (GI) 0.8 μ s, 1.6 μ s and 3.2 μ s. EDCA parameters used in this study are Arbitration Inter-Frame Space Number (AIFSN), Contention Window (CW) and TXOP.

This study points to changes in the value of AIFSN leading to the value of Throughput, Average delay and PDR. The results obtained from the evaluation of improvement with the values $AC_{BK} = 2$, $AC_{BE} = 1$, $AC_{VI} = 1$ and $AC_{VO} = 1$ have better performance compared to those shared with standards that require values $AC_B = 7$, $AC_{BE} = 3$, $AC_{VI} = 2$ and $AC_{VO} = 2$. The average Throughput obtained from improvement is 28.092 Mbps, the Average delay is 5.6 milliseconds and the average PDR is 82.25%. So, it is proven that 802.11ax standard is able to provide higher Throughput values than other standards.

Keyword: *802.11ax, EDCA, PHY, MAC*