# ABSTRACT

Currently users of data services is growing exponentially and the content accessed by the users are browsing, social media, video streaming and VOIP. Real time and multimedia communications with Quality of Service (QoS) support are important in wireless networks of any nature due to network limited capacity. This QoS is to support the growing demand of services like VoIP, streaming and video conferencing. The most connection commonly used is wireless LAN IEEe 802.11. Wireless Local Area Networks (WLANs) have emerged as one of the prevailing technologies for the broadband wireless access. However, there is a constraint on Wi-Fi network for media sharing method that relies on the CSMA/CA. There is a mechanism requirement to improve the Quality of Service in a Wi-Fi network with a certain method that delivering good Wi-Fi service for real-time and non-real time traffic.

The introduction in the IEEE 802.11e standard of a new contention access scheme called Enhanced Distributed Channel Access (EDCA) has provided a new mechanisms for QoS support compared with previous method called Distributed Coordination Function (DCF) used in the widely deployed 802.11 WLANs. EDCA scheme provide four traffic type (voice, video, best effor and background task) which is called Access Category (AC) to define the priority. Real time traffic such as VoIP requires good throughput and delay so the priority is the highest.

There are three parameters in EDCA to improve Quality of Service i.e TXOP (Transmission Opportunity), AIFS (Arbitrary Inter Frame Space) and CW (Contention Windows). Based on the main reference for throughput and delay improvement, this research will adjust contention window value adaptively. Adjustment is based on number of station involved in the network and collision probability. The more number of stations or the lower contention window value will result higher collision probability. Different Access Category will have different adjustment to get optimum throughput and delay improvement.

To validate the result of contention window adjustment, simulation using NS-2 is applied. Simulation is done during low traffic (non-saturated) and high traffic (saturated) network. The algorithm avoids saturation and protects the admitted traffics from being degraded, through a continuous monitoring of the available resources. The proposed algorithm leads the throughput improvement by 2.29% and delay improvement by 3.32% in average for all traffic category. VOIP traffic gets the highest improvement for all condition of traffic. Best effort traffic gets very small improvement during low traffic and considered no improvement during saturated traffic.