

## ABSTRACT

WiMAX is a multiple access system based on microwave and it support inter-user interoperability. Generally the WiMAX network consists of Subscriber Station (SS), Base Station (BS), and Network Management System (NMS). WiMAX does not only need a package scheduling but also need an admission control algorithm to support QoS of various service classes. On the other hand, there's not a standard of admission control algorithm utilization for IEEE 802.16e. But because of the user demand of accessing the resource so it's necessary to provide the admission control algorithm. In this Final Project, a bandwidth-CAC (Connection Admission Control) algorithm will be simulated applied for WiMAX network. The simulation is done by the designed scenario that is the increasing number of SS and its movement velocity.

This Final Project aims to give suggestion for a WiMAX network planning regarding the selection of admission control algorithm. The method that is used is by simulating the algorithm of CAC bandwidth to the WiMAX admission control process. Bandwidth-CAC algorithm will accept a new connection based on threshold value in their service class. The service classes analyzed in this Final Project are UGS, rtPS, nrtPS, and BE. The measured QoS parameters are throughput, packet loss, average delay, and fairness to observe the WiMAX admission control process when using the algorithm. The design of WiMAX network simulation for this Final Project is using Network Simulator 2 (NS2).

The simulation results show that the total throughput value which keeps increasing for UGS and rtPS service class, but not for nrtPS and BE service class. This is because there's difference of traffic priority on each service class. But the average delay which keeps increasing for all service class. The simulation results show that Bandwidth-CAC algorithm produces value of throughput, delay, and packet loss which keeps increasing for UGS, rtPS, nrtPS, and BE when the MS mobility velocity is increasing from 0, 3, 15, 60, and 120 kmph.

**Keyword : admission control, WiMAX, IEEE 802.16e, QoS**