

## **Abstract**

Broadband technology and wireless is two telecommunications technologies that growing swiftly. One of them is WiMAX technology, promised high-speed with broader access coverage than technology wireless before. This thing causes more and more user to obtain amenity to access various applications every time and everywhere. Requirement base of service user is varying and the many amounts user in one Base Station ( BS), hence allocation process of bandwidth in communications system wireless will become very complex. To overcome this thing IEEE 802.16 as standard for WiMAX has a mechanism of Bandwidth Request-grant for allocation of uplink bandwidth between base station (BS) and subscriber station ( SS).

In this final project, evaluation of bandwidth request-grant mechanism is done with measuring throughput, delay and packet loss system when overcoming VoIP traffic based on result of simulation applies software network OPNET 14.0.

Simulation result done at this research got : first scenario, maximum throughput is obtained when bandwidth request 64 kbps for amounts user 10, 20, 30, 40, 50 equal to 52.93 kbps,32.67 kbps,21.87 kbps,16.49 kbps, and 13.21 kbps. Packet loss when bandwidth request 64 Kbps and 128 Kbps with number of user 10, 20, and 30 appropriate to ITU G.107 where packet loss less than 20%. Delay when bandwidth request 128 kbps, 192 kbps, 256 kbps, and 320 kbps with number of user increases that there are still be tolerated by residing in at range 0-150 ms ( ITU G.114). Scenario 2, maximum throughput is obtained when bandwidth request 64 Kbps for speed of user 0 km/h,5 km/h,60 km/h and 80 km/h equal to 52.93 kbps, 51.21 kbps, 48.04 kbps and 31.97 kbps. Packet loss when bandwidth request 64 kbps and 128 kbps with speed of user 0 km/h, 5 km/h, and 60 km/h still be tolerated by less than 20% ( ITU G.107). At the time of bandwidth request 128 Kbps, 192 Kbps, 256 Kbps, and 320 Kbps with speed of user increases, delay still be tolerated by residing in at range 0-150 ms ( ITU G.114).

**Key words :** WiMAX, Bandwidth Request-grant, VoIP