

## ABSTRACT

The development of telecommunication technology today has increased very rapidly, along with the human need for telecommunication technology services. It is characterized by the need for multimedia communications which of course requires considerable bitrate and bandwidth. The presence of WiMAX (Worldwide Interoperability for Microwave Access) based on IEEE 802.16 standard as one of Broadband technology alternative which has high access speed and wide range assessed can fulfill requirement of Internet access in large scale. WiMAX networks are also supported with flexible architecture because it can be used on Line of Sight (LOS) and Non Line of Sight (NLOS) and network construction is easier. WiMAX is an evolution of BWA (Broadband Wireless Access) technology with more attractive features.

Based on the need of an access network technology capable of sending information in the form of voice, data and video with a high enough speed for the purposes of the implementation of the learning process of Telecommunication Engineering D3 students of Telkom University. So, in an effort to find a solution to these needs, in this final project is done designing and implementation of WiMAX access network using Base Station RedMAX AN-100U with sectoral antenna 120o.

In this final project testing is done in the form of conformance test, functional test and performance test. The conformance test result proves that the frequency spectrum used is 3.5 GHz with a maximum transfer rate of 11.84 Mbps on the channel bandwidth of 7 MHz. In functional tests some features of the device such as adaptive and non-adaptive modulation can be used, and this WiMAX network can be used as an access network for triple play services. While in the performance test testing is done between the base station and subscriber and get the best value RSSI -53.5 dBm and SNR 33.7 dB in the LOS with a distance of 310 meters. In NLOS state the value of RSSI obtained -83 dBm and SNR 21 dB with a distance of 468 meters.

***Keywords: WiMAX, IEEE 802.16, Broadband Wireless Access, RedMAX AN-100U***