

ABSTRACT

Cognitive radio (CR) network is a technology that allows unlicensed secondary users (SU) to access channels belonging to licensed primary users (PUs). Cognitive radio is divided into two models, namely distributed and centralized model. The challenge of implementing cognitive radio is determining the route with the best quality of service (QoS) so that several algorithms are used to get the desired route. One of the algorithms that can be used for route selection on cognitive radio networks is spectrum leasing (SL). Spectrum leasing is one of the algorithms included in the centralized model of the cognitive radio network. Spectrum leasing allows the secondary user to access the primary user's empty channel at a predetermined time. In this final project, testing and modeling of the spectrum leasing algorithm on the AODV routing protocol with the cognitive radio network concept will be carried out. The test is carried out by simulating the route selection in the modeling using the NS 2.35 and Matlab applications and comparing the simulation results from the two. This test resulted in the choice of the best route for cognitive radio network modeling which will later be used for replacement telecommunications networks at disaster locations.

The testing process is carried out with various parameters and conditions, namely the distance between PUs, throughput testing at different propagation conditions and different numbers of PUs, as well as throughput, delay and PDR testing on each route. The results of the throughput test using NS 2.35 on each route for 20 seconds showed the highest number on the k2 and k3 routes was 760.61 kbps and the highest throughput in the Matlab simulation on the k3 route was 796.8 kbps, the highest Packet Delivery Ratio value was shown by the route k2 and k3 are 100%, and route k3 has the lowest end-to-end delay value with a value of 30,603 ms, so the best route choice to use in modeling is route k3.

The comparison results when using Two Ray Ground propagation shows the stability of throughput in simulations and calculations. From the performance analysis obtained, the SL algorithm modeling on the CR network can be used as an alternative route for communication during an emergency.

Keywords : Cognitive radio, Spectrum leasing, NS2.35, Matlab, AODV