ABSTRACT

Cognitive Radio Network (CRN) is a wireless network that utilizes white space or empty gaps to transmit data. to be able to build a CRN can be used Software Defined Radio (SDR) which allows for emergency network needs. Applying CRN to address the need for an emergency network that can be used in the event of a natural disaster is a solution when the network infrastructure is damaged by a natural disaster. However, the weakness of CRN is that it has minimal energy and the difficulty of recharging energy at the site of a natural disaster. To use energy efficiently, Energy Harvesting (EH) is needed for less energy use.

This final project analyzes the performance of Quality of Services with EHR-QL algorithm on CRN route selection. QoS calculations are in the form of throughput, packet delivery ratio, and delay with learning rate values in different conditions, as well as the number of primary users at 10 nodes and 6 nodes.

The tests carried out resulted in the characteristics of EHR-QL. Where the higher the learning rate, the easier it is to determine the route used due to the higher Q-Value value, reaching 0.800 when the learning rate is 0.9, and the addition of EH can estimate the remaining energy for the next transmission. In the NS2 scenario using TCP QoS measurement has high performance at throughput up to 9356.66 Kbps when the data rate is 1 MBps, packet delivery almost reaches 100% and delay reaches 3435.46 ms. EHR-QL test results and calculations are suitable for overcoming network needs in disaster emergency areas.

Keywords: *Cognitive Radio Network, Energy Harvesting, Algoritma EHR-QL, Quality of Service*