

ABSTRACT

Cognitive Radio (CR) is an intelligent wireless communication system that optimizes the use of the Primary User (PU) frequency spectrum by Secondary Users (SU). One effort to use cognitive radio is to overcome problems in areas after natural disasters. In the application of this CR, there are Universal Peripheral Radio Software (USRP) devices using GNU Radio software that applies Software Defined Radio (SDR). In choosing the path that will be used it has the concept of Route Request (RREQ) and Route Reply (RREP).

In this performance research the selection of paths for multi-hop will utilize the spectrum of channels in Primary Users by Secondary Users by calculating several QoS parameters on the four routes that have been provided. In addition, the calculated QoS values are throughput, packet loss, packet delivery ratio and delay in experiments using two USRP devices, differences in the number of hops and various propagation models to be analyzed.

From the simulation results, it can be concluded that the number of nodes affects the Quality of Service and the propagation antenna model that has the best value is the freespace propagation antenna model with a throughput of 785.53 kbps, packet loss of 17.7%, packet delivery ratio of 82, 3%, and delay of 276.69 ms. With the use of channel spectrum, it can produce a post-disaster communication system by the Cognitive Radio network with good quality so that temporary communication for disaster victims can be helped.

Keywords : *Cognitive radio, SDR, RREQ, RREP, Two-ray ground, Shadowing, FreeSpace*