World Academy of Science, Engineering and Technology
International Journal of Electrical and Computer Engineering
Vol:18, No:02, 2024

Performance Evaluation of Routing Protocol in Cognitive Radio with Multi Technological Environment

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Abstract : Over the past few years, mobile communication technologies have seen significant evolution. This fact promoted the implementation of many systems in a multi-technological setting. From one system to another, the Quality of Service (QoS) provided to mobile consumers gets better. The growing number of normalized standards extends the available services for each consumer, moreover, most of the available radio frequencies have already been allocated, such as 3G, Wifi, Wimax, and LTE. A study by the Federal Communications Commission (FCC) found that certain frequency bands are partially occupied in particular locations and times. So, the idea of Cognitive Radio (CR) is to share the spectrum between a primary user (PU) and a secondary user (SU). The main objective of this spectrum management is to achieve a maximum rate of exploitation of the radio spectrum. In general, the CR can greatly improve the quality of service (QoS) and improve the reliability of the link. The problem will reside in the possibility of proposing a technique to improve the reliability of the wireless link by using the CR with some routing protocols. However, users declared that the links were unreliable and that it was an incompatibility with QoS. In our case, we choose the QoS parameter "bandwidth" to perform a supervised classification. In this paper, we propose a comparative study between some routing protocols, taking into account the variation of different technologies on the existing spectral bandwidth like 3G, WIFI, WIMAX, and LTE. Due to the simulation results, we observe that LTE has significantly higher availability bandwidth compared with other technologies. The performance of the OLSR protocol is better than other on-demand routing protocols (DSR, AODV and DSDV), in LTE technology because of the proper receiving of packets, less packet drop and the throughput. Numerous simulations of routing protocols have been made using simulators such as NS3.

Keywords : cognitive radio, multi technology, network simulator (NS3), routing protocol
Conference Title : ICCRNC 2024 : International Conference on Cognitive Radio Networking and Communications
Conference Location : Paris, France
Conference Dates : February 19-20, 2024