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SAMCAR:Spectrum Aware Multi-Coefficient based shortest Anypath Routing in Cognitive Radio Networks

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Abstract

Wireless communication technology has grown tremendously with an advancement of better communication quality. The communication quality depends on the available spectrum bands but due to increased demand, the spectrum scarcity has become a challenging issue. Besides, insignificant spectrum utilization in a wireless network degrades the performance issues. Recently dynamic spectrum management is proposed as a recommended solution by Federeal Communication Commission (FCC) which can enhance the spectrum management. Owing to this spectrum management, Cognitive Radio networks converging to offer possible solution. Accordingly, in this paper, we look at Cognitive Capacity Harvesting network and developed a mult-hop cognitive radio network routing protocol. The proposed routing protocol Multi-Coefficient based Shortest Anypath Routing (MCSAR) is devised based on the link quality, energy consumption and trust values for identifying the next-hop. Additionally, we incorporate the improved Bellman-Ford algorithm for further optimization of the communication. Generally, anypath routing provides two optimal paths in which selection of one optimal path becomes a challenging issue. In order to overcome this issue, we propose priority weight computation where distance from current node to destination node and its trust factors are considered for forwarding node selection. The performance of proposed approach is compared against conventional/existing anypath routing schemes. The extensive simulation result obtained ensures better efficiency in terms of packet delivery ratio, overhead of communication and computation, end-to-end delay, and throughput.

Author Keywords

Anypath routing, Cognitive Radio Networks, Cognitive Capacitive Harvesting, Multi-Coefficient Shortest Anypath Routing, Routing Protocol

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