

Dissertation title: Routing Protocols in Wireless Mesh Networks

**Abstract**  
Multi-hop wireless mesh networks (WMNs) are becoming a new attractive communication paradigm. Many cities and public places have deployed or are planning to deploy mesh networks to provide Internet access to residents and local businesses. Routing protocol design is critical to the performance and reliability of WMNs. Traditional routing protocols use a single fixed path to send packets. In contrast, opportunistic routing allows any node that overhears the transmission and is closer to the destination to participate in forwarding the packet. A key issue in the design of opportunistic routing protocols is the forwarder list selection problem. The work in this thesis is divided into two parts. First, a new metric for selecting next hop, Selective Opportunistic Routing (SOR) metric is proposed. It takes a number of criteria under consideration in order to minimize the expected number of transmissions and the overhead which is occurred in most opportunistic routing protocols. Simulation results show that the proposed SOR metric achieves higher improvement in the performance over the conventional forwarder list protocols, Expected Transmission Count (ETX) and Minimum Transmission Selection (MTS) in all network situations. Second, we strengthened our work by studying QoS in WMN, Selective Opportunistic Routing metric based on QoS (SOR-QoS) is proposed. It satisfies more QoS requirements.

Published paper in 2012

Title : Selective Opportunistic Routing based on QoS in Wireless Mesh Network
Abstract: Multi-hop wireless mesh networks are becoming a new attractive communication paradigm. In this paper, a new protocol for selecting next hop, Selective Opportunistic Routing based on QoS (SOR-QoS) protocol is proposed. It takes a number of criteria under consideration in order to minimize the expected number of transmissions and the overhead which is occurred in most opportunistic routing protocols. Simulation results show that the proposed SOR-QoS protocol achieves higher improvement in the performance over the conventional forwarder list protocols, ETX and MTS in all network situations.
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