

Forest Fire Detection Using New Routing Protocol

ABSTRACT

The Mobile Ad-Hoc Network (MANET) has received significant interest from researchers for several applications. In spite of developing and proposing numerous routing protocols for MANET, there are still routing protocols that are too inefficient in terms of sending data and energy consumption, which limits the lifetime of the network for forest fire monitoring. Therefore, this paper presents the development of a Location Aided Routing (LAR) protocol in forest fire detection. The new routing protocol is named the LAR-Based Reliable Routing Protocol (LARRR), which is used to detect a forest fire based on three criteria: the route length between nodes, the temperature sensing, and the number of packets within node buffers (i.e., route busyness). The performance of the LARRR protocol is evaluated by using widely known evaluation measurements, which are the Packet Delivery Ratio (PDR), Energy Consumption (EC), End-to-End Delay (E2E Delay), and Routing Overhead (RO). The simulation results show that the proposed LARRR protocol achieves 70% PDR, 403 joules of EC, 2.733 s of E2E delay, and 43.04 RO. In addition, the performance of the proposed LARRR protocol outperforms its competitors and is able to detect forest fires efficiently