

Abstract

The best routing protocol is a requirement of any application that incorporates a wireless sensor network (WSN) to determine the best path, minimize congestion, route optimization, minimum traffic delays, effective data transfer, and network stability. In this research we discuss the design challenges of WSN and its architecture that might impact routing protocols. We also discussed various routing protocols for WSN that could be divided into four categories: location based, hierarchical, quality of service (QoS)-based and data-centric. We also presented the new routing protocol model for a heterogeneous randomly deployed wireless sensor network named Stable Election with Sink Mobility (SESM). This routing protocol can work for such applications where the sink node is mobilized on a predefined path within the area of the network. Sensor nodes select cluster head (CH) by-election based on residual energy and probability of being selected. Our proposed protocol results prove that there is an increase in network stability time, throughput, and network lifetime. We have compared our results and it has outperformed the existing famous protocols, Stable Election Protocol (SEP) and Low-Energy Adaptive Clustering Hierarchy (LEACH) protocol.

Keywords: Clustering, Energy Efficiency, Heterogeneous, Routing Protocol, Sink Mobility, Wireless Sensor Network

