Abstract

IEEE 802. 15. 4a standard based geographical routing provides low data rate connectivity at a very small power consumption and low complexity to inexpensive devices. The existing geographical relies on finding the least power consuming path by creating and maintaining routing tables. Beacon packets are used for computing power and energy consumption between two nodes. This power and energy consumption information is used for creating and updating the routing tables at various nodes. For every change in the data transmission conditions, multiple beacon packets are exchanged between various nodes for updating the routing tables. The network time and power consumption during this interval is undesired and hence must be minimized. In this paper, multiple beacons based energy efficient geographical (MbIEG) routing scheme for IEEE 802. 15. 4a standard is presented. The proposed scheme uses three types of beacon packets of different bit length. The network initialization is done using the beacon packet of standard bit length, while the intermediate network update is done using beacon packets of smaller size. The reduction in beacon packet size reduces the transmission time and power consumption. Using selective update procedure, the number of computations required is reduced for finding the optimal energy efficient route to destination. Simulation results show that the proposed scheme can achieve same performance as the existing topology in terms of route length and delivery ratio. Due to reduction in intermediate
power consumption and number of computations the overall energy consumption of the network is reduced. Reduction in complexity, computations and energy consumption make the proposed scheme useful for achieving low-power consumption, low cost solutions for IEEE 802.15.4a networks.

References


Index Terms

Computer Science Wireless
Keywords
Energy efficient topology  Geographical routing  Interference  IEEE 802. 15. 4a