

一种基于能耗均衡的非均匀分簇路由算法

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摘要: 针对在一些链状结构拓扑应用中, 传统 WSNs 路由存在严重的能耗不均衡问题. 提出了一种能耗均衡的非均匀分簇路由算法. 在簇首选举阶段, 提出了一种基于定时器的选举方法, 在全局网络中每个节点根据相对剩余能量和与汇聚节点的距离设置竞争簇首的时间, 时间越小成功竞选概率越大; 在成簇阶段, 节点根据保存的簇首信息, 选择加入距离最近且通信半径更大的簇; 在数据传输阶段, 簇首以相对剩余能量和能量开销指标为参数构建基于最小生成树的最优多跳路径. 仿真结果表明, 与已有的分簇路由协议 LEACH、DEEC 和 EEUC 相比, 所提算法更能有效地均衡能量消耗, 延长网络生命周期.

关键词: 链状拓扑; WSNs; 分簇路由; 能耗均衡; 网络生命周期

An Uneven Clustering Routing Algorithm Based on Energy Consumption Balance

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Abstract: Aiming at some chain topology applications, there is a serious imbalance of energy consumption in traditional WSNs routing. This paper proposes an energy balanced and uneven clustering routing algorithm. In the cluster head election stage, an election method based on the timer is proposed. In the global network, each node sets the time of competition according to the relative residual energy and the distance from the converging node. The smaller the time is, the more successful election probability is, the higher the election probability is. In the data transmission phase, the cluster head constructs the optimal multi hop path based on the minimum spanning tree with the parameters of the relative residual energy and the energy cost. The simulation results show that compared with the existing cluster routing protocols LEACH, DEEC and EEUC, the proposed algorithm can effectively balance the energy consumption and prolong the network life cycle.

Key words: chain topology ;wireless sensor networks;cluster routing;energy consumption balance ;network life cycle

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