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A Survey on Energy Efficient Node Discovery in Wireless Sensor Network

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Abstract-In the recent years, wireless sensor networks (WSNs) have gained increasing attention from both the actual users and research community. WSNs have a wide range of applications, ranging from military zones, monitoring environments, remote data collection. A major constraint in designing many such networks is energy. As sensor nodes are generally battery-powered devices, the difficult task in WSNs is how to reduce the consumption of energy on nodes, so that the network lifespan can be increases to reasonable times. Many techniques have been introduced to increase energy efficiency of WSNs. The most important solution to energy consumption in wireless networks namely neighbor node discovery and formulate an efficient protocol with which the nodes can estimate the exact information of their neighbors. The problem of energy consumption in wireless networks can be managed significantly by the method proposed In this paper we first reduce the energy consumption for the components of a sensor nodes and packets delivered to the destination by using Select Most Trusted Routing(SMTR) Algorithm so that data delivery rate is increase. The Paper discusses the main solution for energy conservation in WSNs by reducing consumption of energy on nodes.

Keyword - *Wireless Sensor Networks(WSNs), Neighbor node discovery, network lifetime, Energy Efficiency.*

1. Introduction

Wireless sensor networks(WSNs) have been widely used to monitor and study the environment. WSNs have a wide range of applications, ranging from monitoring environments, military zones, sensitive installations and remote data collection and analysis. A major constraint in designing many such networks is energy. Sensor nodes, often running on batteries, are expected to operate for a long time in order to minimize the labor cost of maintenance and intrusiveness to the environment. Wireless communication tends to dominate energy consumption on sensor nodes, so reducing communication is key to designing energy-efficient sensor applications. To coordinate their operation, it is necessary to maintain a strongly connected network topology at all times. When there is strongly connected network topology that means nodes in a network connected to one another are need to be communicate to each other. And each node must be in active state so that there is no communication failure. Nodes need to actively discover their neighbors with minimal energy. For this each node should maintain the Neighborhood information locally.

The most important solution to energy consumption in wireless networks namely neighbor node discovery and formulate an efficient protocol with which the nodes can estimate the exact information of their neighbors. Neighboring node discovery protocol maintaining reachability information about the paths to other active neighbor nodes, so it aware about node failure. failure of the node may cause the network to partition into different blocks and thus, violate such connectivity goal least destructive topology repair algorithm(LeDiR) algorithm restores connectivity. In the propose system during transmission of packets, if any node in the routing path get fails to transmit the packets. At that time it can automatically chooses the another routing path to transmit the packets to the required destination. Due to strongly connected network topology rate of data delivery increases and thus energy consumption on sensor nodes reduces.

The problem of energy consumption in wireless networks can be managed significantly.

2. Related Work

Yi Zang, kristian Lum, Jun Yang [1] proposed that sensor nodes continuously collect data from the environment. Because of energy constraints on battery-powered nodes, it is difficult to minimize communication. Suppression is a method proposed , which reduce the communication by using predictive model. This model suppress reporting of predictable data. While cascading further reduces communication, it makes failure handling difficult, because nodes can act on incomplete or incorrect information and in turn affect other nodes. cascaded suppression method is more flexible and effective.

He Bin, Zhang Hongtao [2] proposed that problem of energy optimization in wireless sensor network is related to efficiency of information transmission, network utilization and routing algorithm. This problem is solved using dynamic multi-path algorithm based on the q-switch routing, the node transmission sequence and the Dijkstra shortest path algorithm. Dijkstra shortest path algorithm calculate the optimal sequence of transmission distance from the source node to the sink node.Dynamic multi-path routing algorithm minimize and balance the energy of network.. It calculate minimum energy cost and also achieve better result on the lifetime. But when we increase the radius of a network then energy consumption of both algorithm increases.

Ameer A. Abbasi, Mohamed F. Younis, Uthman A. Baroudi [3] proposed that for increasing energy efficiency of node we have to reduce overhead on nodes. Least-Disruptive topology Repair (LeDiR) algorithm recovers the network from partitioning into disjoint block. It relocates the least number of nodes and ensures that no path between any pair of nodes is extended. Due to this path between source and destination node doesn't extended hence it maintain strongly connected network topology and thus data delivery rate increases. Thus due to increase data delivery rate node doesn't need to remain active for long time and thus reduce the consumption of energy on nodes.

Haijun Geng, Xia Yin, Xingang Shi H, Zhiliang Wang H. [4] proposed that Link state multipath routing algorithm(MLSA) is that the network connectivity and the state information of all links are available to the nodes for making routing decision. It is a tree based link-state multipath algorithm, help a node to find multiple next hops for a destination. MLSA only maintains a single tree on each node, locally and independently, based on typical link states, and guarantees the loop-freeness by establishing a underlying partial order over the nodes.. Two main components of a link state routing protocol are an update mechanism and a routing algorithm. It reduce the computation or communication overhead.

Sandeep Kumar Patel, Amit Kumar [5] proposed that Energy Aware Adjacent Node Selection (EAANS) based shortest path routing algorithm that is dijkstra algorithm and other optimal routing approaches. Along with the minimum cost for shortest path here the work focuses on best shortest path. This can be identified by taking the less load based path, loop free, gateway based and less energy consumption oriented path finds best location of smallest hops for energy harvesting. Lesser the hops counts effective will be communications because of less energy consumption and overheads. Identifying the shortest path between source and destination is a routing process. shortest path may fail quickly, because some of the wireless links on the shortest path may be broken shortly after the path is established due to mobility of mobile nodes.

Table 1: Comparison of algorithms

Parameter	**Cascaded suppression method**	**Dijkstra shortest path algorithm**	**EAANS algorithm**
Failure Aware of Node	Makes failure handling	Not aware about the failure.	Not aware about the failure.
Energy efficient Node	less efficient.	Less efficient	more efficient
Shortest Routing Path &Topology	Can't find shortest routing path	Can't perform well.	Perform well.

3. Proposed System

In WSNs ,to reduce the consumption of energy on nodes, so that the network lifetime can be increases to reasonable times. the propose system failure aware and energy efficiency increases by reducing the energy consumption in wireless networks namely neighbor node discovery and formulate an efficient protocol with which the nodes can estimate the exact information of their neighbors. When node have exact information about it neighbor communication will done accurately and thus network will be strongly connected. When there is strongly connected network topology that means nodes in a

network connected to one another are efficiently communicate to each other because each node must be in active state and there is no communication failure. Due to strongly connected network topology all node were strongly connected so there is packets may be delivered to the destination by using shortest path so data delivery rate is high hence ensure the data delivery.

4. Conclusion

An important aspect is related to the timely discovery of the mobile element by the stationary nodes. Energy-efficient discovery schemes are thus required that minimize energy consumption while keeping the probability of missing contacts with the mobile elements as low as possible. The problem of energy consumption in wireless networks can be managed significantly by failure aware of the node and energy efficient node discovery. If any node in the routing path get fails to transmit the packets, at that time it can automatically chooses the another routing path to transmit the packets to the required destination by using SMTR algorithm. This will reduce the communication overhead. The proposed system will reduce the issue of energy consumption in wireless sensor networks (WSNs).

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