International Journal on Applications in Information and Communication Engineering
Volume 1: Issue 5: May 2015, pp 1-4. www.aetsjournal.com ISSN (Online) : 2394-6237

An Extensive Spirit Standardized Tree Based Energy Secured Routing In Wireless Sensor Network

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Abstract— In the wireless sensor network increasing the network lifetime is very much essential along with that, securing the data across the node for different application is also essential. The existing system is GSTEB .This reduces the energy consumption of the network and also reduces the security while transferring the data across the node. In this algorithm, the BS assigns the root node and broadcasts the data to the sensor nodes. But, it has a drawback such as, for each transaction if the same base station is used then its nodal energy is reduced to a greater extent leading to nodal failure at each round of transaction. This reduces the lifetime of a network to a greater extent. For this, an efficient algorithm for increasing the network lifetime and to securing the data across the node is proposed. It is a moving strategy called as Energy Aware Sink Relocation for the mobile sinks in WSN. For routing purpose the MCP (Maximum Capacity Path) algorithm is proposed. And also re- locatable sink method for relocating sinks and increasing network lifetime along with security is also increased with efficient algorithm.

Keywords— GSTEB,EASR,MCP,BS

I. INTRODUCTION

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In this modern world, there are many applications based on wireless sensor network. The efficiency of the system depends upon the network lifetime of the system. For this purpose we consider the GSTEB model .In this model there is low energy consumption and low balance over the entire network. In the due course of constant usage of the assigned root node it may lead to node failure. In order to overcome this failure we introduce EASR and MCP algorithm for improving network life time and provide intelligent routing.

As the proliferation of wireless and mobile devices continues, a wide range of context-aware applications are deployed, including smart space, modern logistics and so on. In these applications, location information is the basis of other services, such as geographic routing, boundary detection, and network coverage control. In some other applications, such as military surveillance and environment monitoring, sensed data without location information are almost useless.

With the advances in Micro-Electro-Mechanical Systems (MEMS)-based sensor technology, low-power digital electronics and low-power wireless communication it is now possible to produce wireless sensor nodes in quantity at low cost. Although these sensor nodes are not as powerful or accurate as their expensive macro-sensor counterparts, we are able to build a high quality, fault-tolerant sensor network by making thousands of sensor nodes work together. Through the cooperation of wireless sensor nodes, WSN collects large amounts of information and sends them to the Base Station (BS). WSN has a wide range of potential applications including military surveillance, disaster prediction, environment monitoring, *etc.* Thus it has become one of the most important research fields and has aroused extensive research interest.A WSN consists of small-sized sensor devices, which are equipped with limited battery power and are capable of wireless communications. For increasing the network lifetime, in our concept we introduce the energy -aware sink relocation (EASR) for mobile sinks in WSNs. We propose a sink relocating scheme to guide the sink when and where to move to Some mathematical performance analyses are given to demonstrate that the proposed sink relocating scheme can prolong the network lifetime of a WSN. We have also conducted simulations to investigate the performance of the EASR method against some traditional methods by numerical simulation.

II. LITERATURE SURVEY

A survey of routing protocols in wireless sensor networks , This paper surveys recent routing protocols for sensor networks and presents a classification for the various approaches pursued. Moreover, protocols using contemporary methodologies such as network flow and QoS modeling are also discussed .Data centric protocols avoids redundant transmission. It is not feasible. It does not provide long lifetime to network[2].

HEED:A hybrid, energy -efficient, distributed clustering approach for ad hoc sensor networks, We present

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a p rotocol, HEED (Hy brid Ener gy -Efficient Distributed clustering), that p eriodically selects cluster heads accordin g to a hy brid of the node residual ener gy and a secondary p arameter, such as node p roximity to its neighbors or node degr ee. It supp orts scalable data aggregation.[3] It increase the network lifetime. It is not efficient comp ared than other p rotocols.

Pegasis: Power-efficient gatherin g in sensor information sy stem In this p ap er, we p rop ose PEGASIS (p ower-efficient gatherin g in sensor information sy stems), a near op timal chain-b ased p rotocol that is an imp rovement over LEACH. It eliminatin g the overh ead of dy namic cluster formation[4]. Performance is better then LEACH. It selects long p ath for transmission, it reduce the node ener gy.

TREEPSI: Tree based ener gy efficient p rotocol for sensor information , In this p ap er, we p rop ose TREEPSI (tree based ener gy efficient p rotocol for sensor information) which gives up to 30% better p erformance (in terms of ener gy efficiency) than PEGASIS.[5] The p erformance is better than PEGASIS. It balance the WSN loads. It does not p rovide p rolong network lifetime.

An energy -aware routing p rotocol in wireless sensor network [6], In this p ap er, we p rop ose a novel energy -aware routing p rotocol (EAP) for a lon g-lived sensor network. We use a simp le temp erature sensing ap p lication to evaluate the p erformance of EAP and results show that our p rotocol signif icantly outp erforms LEACH and HEED in terms of network lifetime and the amount of data gathered. It minimize the energy consump tion. It balance the loads. .It has far better p erformance than HEED when node density is high.

III. EXISTING SYSTEM

GSTEB is mainly for achieve lon g life time network when transmitting data. In each round BS assign the root node and broadcast its ID and it coordinates to all sensor nodes. GSTEB can chan ge the root node and r econstruct the tree with short delay and low energy consump tion for both cases. For this reason it does not achieve p rolon g network lif etime. GSTEB can p erform 5 op erations such as

- Initial phase
- Tree constructing phase
- Self organized data collecting
- Transmitting p hase
- Information exchan ge p hase

A. Initial Phase

In Initial Phase, the network parameters are initialized. Initial Phase is divided into three steps.

Step 1: When Initial Phase b egins, B S broadcasts a p acket to all the nodes to inform them of b eginnin g time, the len gth of time slot and the number of nodes N.When all t he nodes receiv e the p acket, they will comp ute their own energy -level (EL) usin g function:

$$EL(i) = \lceil residual\_Energy(i)/\alpha \rceil$$

EL is a p arameter for load balance, and it is an estimated ener gy value rather than a true one and only used in Case2, i is the ID of each node, and is a constant which reflects the minimu m ener gy unit and can be changed dep ending on our demands.

Step 2: Each node sends its p acket in a circle with a certain radius during its own time slot after *Step 1*. For examp le, in the time slot, the node whose ID is will send out its p acket. This p acket contains a p reamble and the infor mation such as coordinates and EL of nod e i. All the other nodes durin g this time slot will mon itor the channel, and if some of them ar e the neighbors of node i, they can receive this p acket and record the information of nod e i in memory. The nodes which are not in the ran ge of can't mon itor the p reamble in this time slot, so they can know they are not the neighbors of node i and will turn off their radios, then switch to sleep mode to save en er gy . After all nodes send their information, each node records a table in their memory which contains the information of all its neighbors.

Step 3: Each node sends a p acket which contains all its neighbors' information durin g its own time slot when *Step 2* is over. Then its neighbors can r eceive this p acket and record the information in memory. The len gth of time slots in *Steps 2* and

3 is p redefined, thus when time is up , each node h as sent its information before In itial Phase end ed. After Initial Phase, each nod e records two tables in memory which contain the information of all its neighbors and its neighbors' neighbors.

B. Tree Constructing Phase

Within each round, GSTEB p erforms the followin g step s to build a routin g tree. Between Case1 and Case2 there are some differences in the steps of routing tree constructing:

Step 1: BS assigns a node as root and broadcasts root ID and root coordinates to all sensor nodes.

Step 2: Each node tries to select a p arent in its neighbors usin g EL and coordinates which are recorded in data for long distance. If the sensor node cannot find a suitable parent node, it will transmit its data directly to BS.

Step 3: Because every node chooses the parent from its

Neighbors and every node record its neighbors' neighbors' each node can know all its neighbors' parent nodes by Computing, and it can also know all its child nodes.

C. Self-Organized Data Collecting and Transmitting Phase

After the routing tree is constructed, each sensor node collects information to generate a DATA_PKT which needs to be transmitted to BS. For Case1, TDMA and Frequency Hopping Spread Spectrum (FHSS) are both applied. This phase is divided into several TDMA time slots. In a time slot, only the leaf nodes try to send their DATA_PKTs. After a node receives all the data from its child nodes, this node itself

serves as a leaf node and tries to send the fused data in the next time slot.

D.Information Exchanging Phase

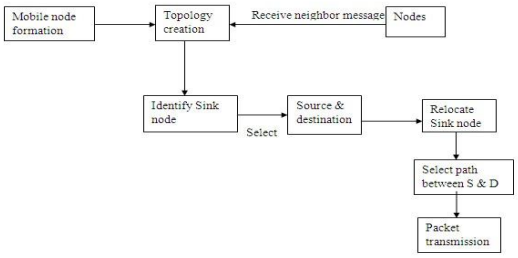
For Case1, since each node needs to generate and transmit a DATA_PKT in each round, it may exhaust its energy and die. The dying of any sensor node can influence the topography. So the nodes that are going to die need to inform others. The process is also divided into time slots. In each time slot, the nodes whose energy is going to be exhausted will compute a random delay which makes only one node broadcast in this time slot. When the delay is ended, these nodes are trying to broadcast a packet to the whole network

IV. PROPOSED SYSTEM

To overcome the problems presented in our existing system and also to increase or prolong the network life time, we propose a moving strategy called energy-aware sink relocation (EASR) for mobile sinks in WSNs. For routing purpose we have to implement the MCP (Maximum Capacity Path) algorithm. And also we use the relocatable sinks method to relocating the sinks.

The MCP algorithm chooses the efficient path from the multiple path discoveries for efficient message relaying process. The sink nodes are relocated during the packet transmission. It will be changed at each step of packet transmission. The relocatable sinks methods find out the sink node and where is to be located information's.

It provides prolong lifetime for network. It use sink node for achieve long lifetime. The cost of sink node is low. It reduced the energy consumption of network.



Modules of the system:

The system includes 5 modules namely:

- Node formation
- Topology creation
- Base Station Identification
- Best path Finding
- Packet transmission

A. Node Formation:

Mobile nodes are selected.Communication is established .Neighbour nodes are identified. Source and destination nodes are found out.

B. Topology Creation:

Each node transfers an information to neighbour nodes.Information passing enables topology creation. Information contains:

- Creation time
- Expiry time
- Position
- Other essential details

C. Base Station Identification:

Base station is identified by calculating the node energy level. Node with highest energy is selected as a base node. Node with a little higher energy is selected as a sink node.

$$EL(i) = \lceil residual\_Energy(i)/\alpha \rceil$$

D.Best Path Finding:

For finding sink node we use MCP algorithm. It allows reuse of re-locatable link algorithm. It allows usage of EASR for mobile sinks re-location. It reduces energy consumption and Increases network life time

E. Packet Transmission:

Packet is a collection of data or information. Information sharing is done between the source and the destination. These nodes are identified using EASR. This is done in order to achieve uninterrupted communication

V. IMPLEMENTATION AND RESULTS

MCP algorithm to increase the network lifetime. A dynamic algorithm changes the routing path at each round of transmission based on current sensor node battery energy. It achieves better network lifetime compared than static routing algorithm. MCP is one the dynamic algorithm it changes the sink node location at each round of transmission to achieve prolong network lifetime. For message reporting, the EASR method adopts the MCP routing algorithm as the underlying method. MCP algorithm contains three procedural steps for each round of message reporting, the steps are

- It layering the graph G into the layered network N
- For each sensor node then it determines the path with maximum capacity
- Finally it performs the routing and updates the residual energy.

The relocation mechanism contains two steps; the first step is to determine whether to trigger the sink relocation. It can be determine by relocation condition. Sink node collect the residual battery energy of each sensor node for relocation .

The first step checks whether the sink node met the relocation condition or not. After complete the first step then we use MCP to compute the maximum capacity path with the help of neighbor sensor node. After we apply the sink relocation mechanism to relocate the sink node in to the new location to achieve prolong network lifetime. M

CP takes more time to compute the maximum capacity path compared than residual energy data collecting. In our proposed system we used MAODV (Multipath Adhoc On Demand Distance Vector Routing) protocol for path selection. It is more create the bi- directional multicast tree to connect the multicast receivers and sources. Multicast efficient compared than AODV and DSDV. MAODV tree is maintained as group members and each group has one group leader. The group leader maintains the sequence number to ensure freshness of routing information.

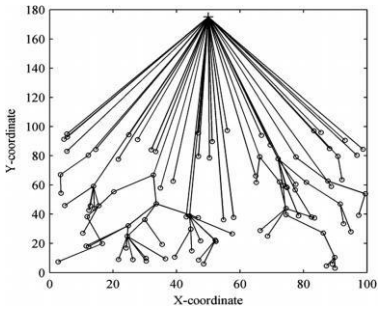


fig 2. Topology generation.

VI. Conclusion and Future Enhancement

The abundant increase the network lifetime is very much essential in tacklin g the problems with the wireless sensor network efficiency . Our proposed work with EASR and MCP provides an prolonged lifetime to the network ,thus enhancin g the efficien cy of the ap plication like certain military or govern mental activity by active sink relocation. It provides prolong lifetime for network alon g with secured data transference. It use sink node for achieve lon g lifetime. The cost of sink node is low. It reduced the en er gy consump tion of network.To propose an amenable system for an distributed wireless network by improving the network lifetime with an conventional minimum transmitted energy routing and consumption.

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