Improved Cluster base routing by probalistic optimization in Wireless sensor networks

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Abstract - Wireless sensor networks have been attracting the attention of the research community due to their potential applications in several areas. The emergence and development of micro-electromechanical systems (MEMS), sensor technology, embedded technology and wireless communication technology has become more sophisticated and progressive, to promote wireless sensor networks (Wireless Sensor Networks, WSN). Wireless sensor network capable of real-time monitoring, sensing and acquisition information monitoring object, and information processing, integration, self-organizing communication sent to the needs of users, has been widely used in the defense and military, environmental monitoring, production safety, medical care, space exploration, urban traffic management, forest fire monitoring, smart home and other fields. WSN has a very broad application prospects and high research value, and attaches great importance by both academia and industry in recent years has become a hot area of research. But because of the limited energy of sensor nodes, storage, computing and communication capabilities, how energy efficient way to gather information and transmitted to the base station to become a very critical issue

Keywords - *WSN, REACIN, optimization, cluster*

I. INTRODUCTION

WSN is a term which stands for wireless sensor networks which is a network containing many sensor nodes in its networks. It is a group of thousands of sensor devices which used to communicate with wireless networks by utilizing less energy. WSN is a technology which has much application like to control environment, in medical line, military application etc. [1]. Clustering relay based indicators that the site is a good choice for scalability to be able to a large number of hundreds of possible nodes. A group comprises a group with at least one group of customers (CH). CHS is managing your node in your group and are also sometimes responsible for sending the full facts in a remote database (sic). Regular re-clustering of course, can serve CHS nodes with high residual energy. While designing a sensor network it is very important to take care about its decisive, efficiency, significance and effect on environment etc. [2] WSN are the dense networks which consist of low-power, sensors, nodes etc.

Sensor uses battery for its processing and the most important which has to be noted down that the replacement of battery is done after one year in ground water sensors. The working of sensor depends upon the source of energy it absorb, capability of evaluation and memory too. The communication process within the wireless network is done through gateway which gives a wireless connectivity and dispersed nodes [2]. Here data is transmitted from one node to other and makes a complete communication. As there are many application of WSN in the global world but the main concept in this paper is about the utilization of networks inn efficient manner. As these networks are situated in all around like , into the earth, soil, air etc. and have precise working but they utilizes excess amount of energy . As we discuss above the Sensor nodes work on battery and have limited durability. It is the most common problem in the WSN and in other hand applications of WSN is increasing day to day inventions which require high speed for communication purpose and more battery usage. Here this work also represents the efficient utilization of WSN by various means of technique given by different authors. This study is discussed in next section of this paper.

To make effective communication between the nodes routing protocol is used which helps to choose a clear way to nodes to travel. It a very hard work to select a clear and significant path for the nodes. As in WSN data is transmitted from nodes on network to another network or within same network. If we talk about the small space of WSN it is very simple to communicate as nodes and base stations are close to each other but if the space area increases then it becomes very difficult to communicate without any routing protocol with number of nodes. Proper routing is very essential for clear communication between sensor node and base stations. [3]

Further in this paper there is a discussion about the related work to increase the efficiency of the WSN system, in section III there is a discussion about the proposed methodology and in section IV there is a discussion about results and at last there is summary of the whole work in section V.

II. RELATED WORK

Kumarawadu, et al. [4]: In this paper, there is a comprehensive analysis and classification of a clustering algorithm that is available for WSN. On the basis of

construction of parameters and cluster heads there is a classification and analysis of WSN. Then it gives a study on challenges in designing and gives a discussion on the performances of issues related to clustering techniques.

Tian, et al. [5]: In the given paper, as efficient chain-cluster routing (ECR) is proposed for WSN. There is also an introduction of thought of protocol architecture. By using hybrid way this protocol maintains the networks and also takes the benefits of central control and distributed algorithm for the formation of topology containing two-hierarchical chain structure. The simulated result shows the merits of ECR by comparing with LEACH and PEGASIS which are termed.

Chiwewe, et al. [6]: In this paper, to reduce radio interference and to upgrade energy efficiency in wireless networks a new distributed topology control technique is represented by the author. Every individual node has the ability to take its own decision about its transmission power and a network topology is created by cremation of the decisions which is used to preserve the global connectivity. Simulated result shows that the proposed technique has its own significance as compared to other approaches to controlling topology.

Mathapati, et al. [7]: In this paper, for WSNs EERDAT is proposed which stands for energy efficient reliable data aggregation technique. Initially to control nodes in the cluster coordinator nodes is selected and form clusters. On the basis of energy level and its distance cluster heads are selected for every individual cluster by coordinator nodes. The collection of cluster heads is combined with the packets given by sensor nodes and then transferred to coordinator node. Then there is an evaluation of loss ratio as used to compare with the loss ratio of a threshold value. The result indicates the better performance as compare to other methods.

Bachir, et al. [8]: In this paper, a study on state-of-the-art is given where there is thoroughly present the prime focus of WSN-MAC protocol, the guideline for its design, demerits of existing solutions, etc. on the basis of the previous study we concentrate on the classification of MAC protocols according to the used technique by using thematic taxonomy. Thematic taxonomy is a method where the classification of the protocol is done on the basis of their problem. By using statistical properties of generating traffic an appropriate solution for a particular situation is selected as a key element.

Jian, et al. [9]: In this paper, a cluster-based, energy-efficient scheme is proposed in this paper. To cluster, the networks modified LEACH algorithm is used in this paper. In individual nodes, this algorithm stabilizes the energy consumption to all nodes. Here we used to combine route selection and set-up with the schedule in MAC layer to expand the life duration of networks efficiently. The simulated result shows that the proposed scheme has better performance as compared to the performance of other schemes.

Say, et al. [10]: In this paper, a work is presented on the basis of the multi-hop approach. Here a plausible algorithm is proposed which employs the COFS to engage effective data collection. Both proposed scheme and proposed algorithm show their significant and effectiveness to obtain consumption of low energy and it also extends the life duration of WSN sensors. Here author also introduces energy consumption model. To check the suitability or working of the model simulation is done for the proposed algorithm.

Aslam,et al. [11]: In the paper, a survey is given and which demonstrate a hierarchical routing protocol for energy efficient which is generated from conventional LEACH routing protocol. The major concentration of this study is on the working process of the given protocols to integrate the life time and how they improve the WSNs. This paper also gives a description on some issues faced by LEACH and how upgraded LEACH tackles those issues. Then at last there is a comparison on the features and performances of selected routing protocol.

Zhang, et al. [12]: To reduce the communication and storage overheads a hierarchical trust management scheme is proposed by the author. During trust evaluation, these proposed schemes work on the direct and indirect group of trust in the determination of trust and energy related to sensor nodes in service selection. By using trust varying function this scheme evaluates the dynamic aspects of trust that is used to attain high weight to the most recently obtained value during trust calculation

Pan, et al. [13]: This paper gives there attention to the process to control topology of the upper tier of two-tiered WSNs for ANs and BSs. The network lifetime of WSN is affected by the node lifetime because it is a heterogeneous battery-powered node. By locating BSs optimally we can integrate the topological network lifetime of WSNs. We can also integrate the upper and lower bounds to maximum topological lifetime, which further helps to assess energy provisioning instantly and to control topology necessity. To find the efficiency and optimality of proposed topology numerical results is illustrated.

III. PROPOSED WORK

We explain the various steps of flowchart of proposed work given below:

Step 1: deploy the wireless sensor network

Step 2: generate a random cluster without using any parameter

Step 3: Apply reac-in for the creation of random cluster by distance and energy parameter

Step 4: Generate the cluster on the bases of energy and distance by using probabilistic method , which use optimize parameters

Step 5: Parameter is initialized and generates the cluster, if parameter is optimize then it goes to next step otherwise, it back to step 4.

Step 6: analyze dead nodes and energy.

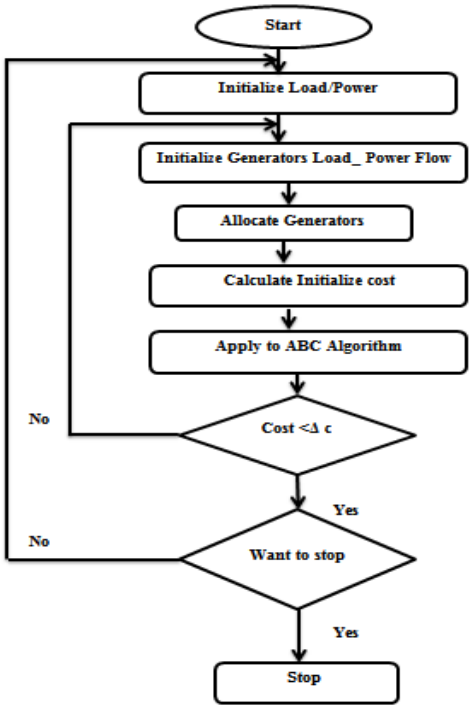

Figure 1.1 Flow chart of proposed methodology

IV. RESULT AND DISCUSSION

Following are the comparison graph between various algorithms on different parameters.

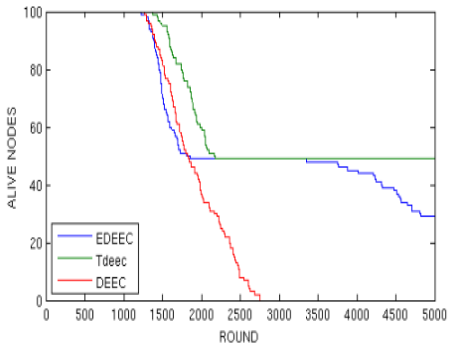

Figure 1.2 Show the alive nodes on 5000 rounds

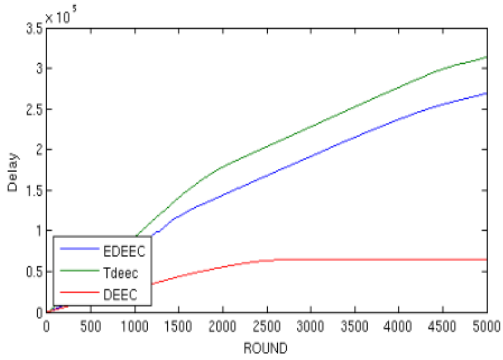

Figure 1.3 Show the Delay on 5000 rounds

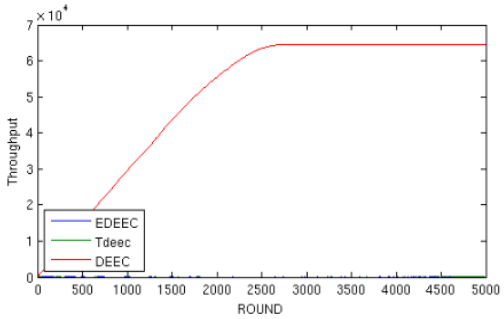

Figure 1.4 Show the throughput on 5000 rounds

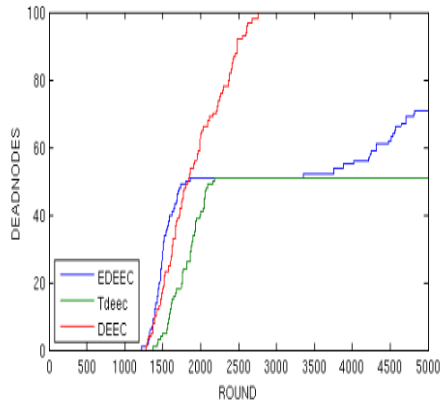

Figure1.5 Show the Dead nodes on 5000 rounds

V. CONCLUSION AND FUTURE SCOPE

Cluster-based routing provides an efficient approach to decline the energy expenditure of the sensor nodes and maximize the lifespan and scalability of WSNs. In WSNs, it is essential to use a routing protocol that is energy efficient, scalable and robust in terms of reliable packet delivery. Many clustering and routing protocols have been proposed for WSNs. In reac-in and probalistic show significance difference between energy, delay and number of dead nodes.

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