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Data Aggregation in Wireless Sensor Network

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Abstract: Cluster head selection method is a critical and energy constraint in wireless sensor network. This process required significant amount of energy affecting the performance and operation of wireless sensor network. The benefits distributed wireless sensor network provides different type of data for different variety of sensor in same network but because of complex network operations, it shows poor performance. For improve performance of WSNs are needed at some parameters such as energypotency, network lifetime, node readying, fault lenience and dormancy. This is based on two level multi-hop WSNs.This process ends up in low energy consumption that prolongs the network lifetime and stability.

Keywords: Multi-hop level, Cluster-Head selection, Wireless Sensor Network, Matlab-tool.

I. INTRODUCTION

In recent times advances in concentrated and low potential design have led to the development of less sized battery operated sensor are having the ability of detecting ambient condition such as sound, temperature, sound and monitoring data. Sensors are generally equipped with data processing and communication capabilities. The environment surrounding the sensor parameters are measured by the sensing circuity and then it transforms them into an electric signal. Processing such a signal allows some properties about objects located and events happening near the sensor. Each sensor has an on board radio that can be used to send the collected data to involved parties. Such the process of technological development has given support practitioners to envision aggregation the limited capabilities of the distinct sensors in a largescale network that can operate unattended [1].Innumerous civil and armed forces applications can be supplement with leveraged by network sensors. A network of sensors can employed to gather meteorological variables such as pressure and temperature.

This measurement can used in preparing or detecting harsh natural phenomena. In disaster management situation such as earthquakes, sensors networks can used to selectively map the affected regions directing emergency response units to survivors. In military situation sensor network can used in surveillance missions and can be used to detect moving targets, chemical gases, or the presence or micro agents. One of the bigger advantages wireless sensor network is unattended in harsh environment in which contemporarily human in the loop monitoring are critical.

Grouping sensor nodes into clusters has been widely used by research area in order to get the network scalability. Each cluster has a leader, they offer as the cluster-head. This work can be done for ad-hoc networks [2, 3], but in this paper we are using mat-lab tool. These proposed clustering methods are depending on the node deployment and bootstrapping scheme. Furthermore, a CH can aggregate the data collected by the sensors. Its cluster and thus decrease the number of relayed packets [4, 5].

II. LITERATURE SURVEY

Energy is more importance in wireless sensor network because of its hostile place of deployment; nodes cannotrecharged or replaced easily. Clustering is one of the techniques used heavily to provide stability, load balance and conserving the energy dissipation of the nodes. A large number of clustering techniques have evolved in time starting with LEACH [1].In this paper we will discuss LEACH and some Multi-hop protocols for clustering in WSNs.

LEACH is low energy adaptive cluster protocol. This is only single hop communication between base station and nodes. This protocol has many variants, as LEACH-DT, Advance LEACH etc. In LEACH, protocol has a two phase: setup phase and steady phase.

1.1 **Setup Phase**:Setup phase is cluster formation phase. Nodes selects a random number between 0 and 1.if random numbers greater than threshold value then node becomes cluster head for current round. Threshold for particular round.

1.2 **Steady phase**: In this phase, cluster head allocates time slot to each nodes. When nodes sends their data to cluster head. Cluster head receives all data and apply aggregation and compression. Then cluster sends fused data to base station.

Now SEP is stable election protocol. This is the multi-hop protocol. It can be used single hop and multi-hop communication. SEP is also work same as LEACH by selecting a number between 1 and 0. Then calculating threshold value. SEP has two nodes. One is Normal nodes and advanced node. Advanced node has a more energy than normal node so selection of cluster head is dominated to advanced node always time.
DEEC is distributed energy efficient clustering protocol. This is multi-hop protocol in wireless sensor network. Its uses an adaptive algorithm in order to control the energy consumption of nodes.

In recent time, much research has been carried out to address energy imbalance for clustered WSNs. Number of strategies such as using node mobility[7,8,9], movable sink, hierarchical deployment, non-uniform clustering, data compression and traffic aggregation etc. have been proposed for solving energy problem.

III. PROPOSED ALGORITHM DETALED

There are so many assumption taken in to account of proposed algorithm. That assumption are listed below-

1. All networks is active state or initial state.
2. Base station is always middle region.
3. Every and each nodes has their compute
4. Its residual energy and various operation.
5. Node is assigned unwanted place.

Now in this protocol is used residual energy of wireless sensor network. Each nodes has residual energy for each round. Therefore, each node can take its energy by knowing average energy in each round. This method limits network stability for the term of energy efficient. In this network provides advance node and normal nodes. Advance node has higher energy than normal node. In this condition, most of the node are alive. Advance node choses the cluster head. As the time passes by nodes starts, dying and normal nodes become to cluster head. Its gives less network overhead. This algorithm has a different cluster head selection. In the proposed methods advance nodes and normal nodes depends on threshold value. Advance node treated like normal node when there residual energy equal or less then energy threshold value. In multi-hop network model, assume that there are n sensor nodes. Sensor nodes always have data to transmit base station.
Now total energy of two level multi-hop networks-

$$Et = N*(1-m)*Eo+N*m*(1+a)*Eo \quad (1)$$

After that we have two level multi-hop network, the proposed algorithm are calculating

$$P1 = \frac{Popt}{(1+am)} \quad (2)$$

$$P2 = \frac{Popt(1+a)}{(1+am)} \quad (3)$$

Threshold scheme for heterogeneous environment based up on the Eo, Base station distance, cluster size, etc. but proposed algorithm depends on residual energy of sensor node.
Case 1: When nodes residual energy is greater to proposed threshold value.
Case2: When nodes residual energy is less than proposed threshold value.

IV. SIMULATIONS AND RESULT

Additional parameters required for simulation are list below.

Parameter	Value
E*elec*	5 nJ/bit
E*fs*	10 Pj/bit/m2
E*mp*	0.0013 pj/bit/m4
E*o*	1 j
E*da*	5nj/bit/message
d*o*	70m
S	5000bits
P*opt*	0.1

Table 1: Parameter for simulation

Now cluster flow chart is represented

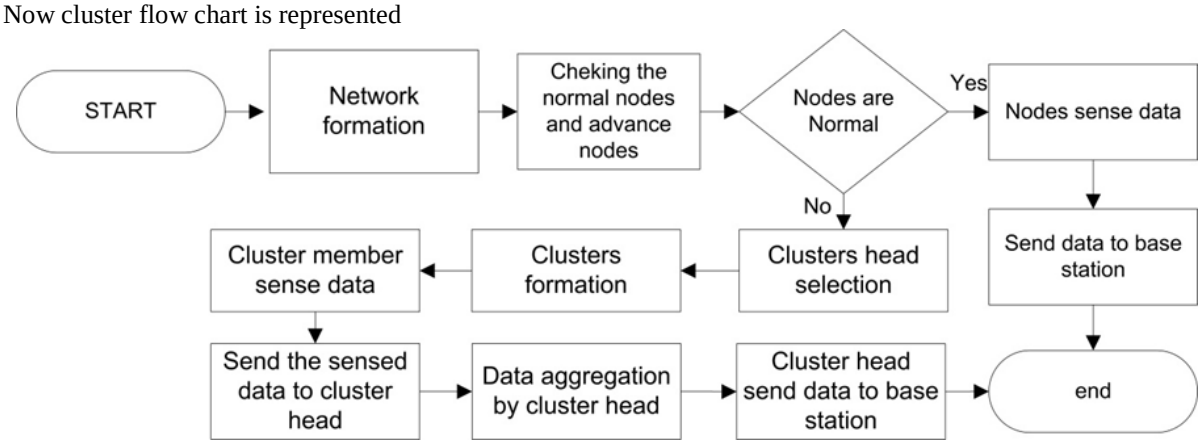

Figure 1: Cluster flow chart

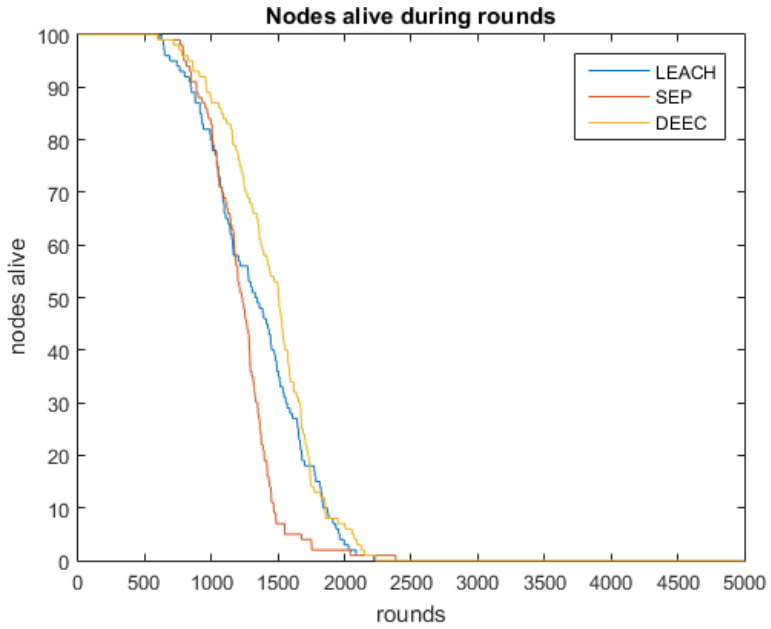

Figure 2: Node alive during rounds

We are comparing protocol Leach SEP and DEECi.So we found that DEECi protocol is better than LEACH and SEP Protocol because during rounds node alive more than LEACH AND SEP. DEECi protocol has large network lifetime instead of LEACH and SEP.

V. CONCLUSTION AND FUTURE WORK

In this paper, we proposed work for multi-hop environment two level multi-hop. It gives prolong network lifetime in heterogeneous wireless sensor network .This scheme is based on energy threshold value. Here custom simulation environment is employ to evaluate the aspect performance of DEECi and comparisons with existing LEACH AND SEP. The simulation results clearly show that the proposed work scheme consistently gave improve performance.

There is a considerable opportunity for further research in mobile nodes schemes. It will be necessary to calculating the speed of mobile nodes with respect to uniform and non-uniform nodes.

REFERANCES

[1]. X.Fan, F.Du (2015), Shuffled frog leaping algorithm based unequal clustering strategy for wsn. Appl. Math. Inform. Sci. Int. J. 9/3/2015

[2]. Gupta, D., &Verma, R. (2014, September). An enhanced cluster-head selection scheme for distributed heterogeneous wireless sensor network. In Advances in Computing, Communications and Informatics (ICACCI, 2014 International Conference) on IEEE.

[3]. J.Yu, Y.Qi, G.Wang, X.Gu, A cluster based routing protocol for wsn with non-uniform node distribution, Int. J. Electron. Commun. 66 (2012).

[4]. J.Yu, W.Liu, J.Song, B.Cao, EEMR: An energy efficient multi-hop routing protocol for wireless sensor network. IEEE, 2008.

[5]. Abbasi, A. A., and Younis, M. (2007). A survey on clustering algorithms for wireless sensor networks. Computer communications, 30(14), 2826-2841.

[6]. Handy, M. J., Haase, M., &Timmermann, D. (2002). Low energy adaptive clustering hierarchy with deterministic cluster-head selection. In Mobile and Wireless Communications Network, 2002. 4th International Workshop on IEEE.

[7]. Smaragdakis, G., Matta, I., &Bestavros, A. (2004, August). SEP: A stable election protocol for clustered heterogeneous wireless sensor networks. In Second international workshop on sensor and actor network protocols and applications (SANPA 2004).

[8]. J.Yu, Y.Qi, G.Wang, 2011 an energy driven unequal clustering protocol for heterogeneous wireless sensor network. J. control theory appl. 9-1-2011, 133-139.

[9]. S. Soro, W.B. Heinzelman, Prolonging the lifetime of wireless sensor networks via unequal clustering. Proc. of the 19th IEEE 2005.