**LEACH PROTOCOL ANALYSIS**

Recent advancements in wireless sensor network focuses on which real life applications such as military, environmental, health, vehicular, mechanical stress levels on attached objects, disaster management etc. These applications are using some routing and energy protocols. In this work, An energy-efficient LEACH Protocol is presented to improve the lifetime of the sensor network. Anelection of optimal cluster head based on the residual energy. Data ensemble takes place while aggregating the nodes because it can save considerable energy while the source nodes forming one cluster are deployed in a relatively small area when the cluster head node is far away from the source nodes. The EE-LEACH Protocol results in a better packet delivery ratio, lesser energy consumption and lesser E2E delay.

Leach protocol is used to increase the life time of the network by reducing energy consumption; Here, utilization means to increase the usability of node, traffic overhead is estimate the busyness of medium and time interval is define as the overall time taken by the packet transmission from source to destination. The issues which are related to the energy of nodes are analyzed. For calculating the results qualitatively, these above parameters are used.

The proposed approach is implemented using MATLAB 2015a at Intel core i3 processor CPU 1.7 GHz PC with 4 GB of RAM. The results are explained by finding out all the retrieved relevant information by estimating the energy consumption, time interval, utilization and overhead, end to end delay and packet delivery ratio. The experimental results are depicted in the form of tables and graphs. Finally, the findings of the all experimented system will be discussed and analyzed.

**Data Set**

**Leach protocol is a networking protocol, so we have data set and performance measures like we have test cases and test plan is software projects.**

The dataset used for testing the proposed approach contains the following domains:

A local Network

Nodes (approx 20)

DSR protocol for transmission

The performance of the work was assessed by this simulated network of 20 nodes and protocol for transmission and transmitted the data packets with the selection of cluster head on the basis of their (individual node) energy.

**Performance Measures**

For finding relevancy of this (Leach) protocol calculating energy parameter of the concept, existence of node is estimated in certain circumstances and is used for the evaluation of results. We estimate the power issue of node with formation of cluster and cluster head.

**1: Cluster Formation**

The formation of clusters in sensor networks highly depends on the time taken to receive the neighbour node message and the residual energy. Neighbour information retrieval; the neighbour node information are sensed by broadcasting the beacon messages throughout the network and update in the node’s table.

**2: Cluster Head**

The protocol is divided into rounds, and each round is triggered to find out the optimal CH on the basis of energy of a node.

**Qualitative Result Analysis**

For qualitative result, the work is tested on few parameters are used for this: Security, utilization, time interval, traffic overhead.

For performance comparison, the result of proposed work is compared with DSR protocol. The results explain that the work helps in increasing the lifetime of the network. Therefore the work has lower energy consumption The work on the basis of above parameters is depicted in table 1.

|  |  |
| --- | --- |
| **Parameters** | **Result(s)** |
| Security | Not considered |
| Utilization | Increase |
| Overhead | Slightly increase (due to formation and selection of cluster and cluster head respectively) |
| Time Interval | Decrease (due to optimal routing) |
| PDR | Increase |
| E2E | Decrease |

**The code and the lines written are explained in main file only for the documentation. The code will be implemented in the MATLAB software only. After the program will execute the main file will call .fig files and output will be displayed with tables and figures along with explanation. Also, the graphs will be displayed after the output is obtained in various clusters and its nodes.**

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