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Data aggregation techniques in WSN:Survey

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Abstract

Different data aggregation techniques require varying amounts of energy to process raw data. The choice of data aggregation method depends on the application requirements as well as the relative energy savings obtained by using this method. As various sensor nodes often detect common phenomena, there will be some redundancy in the data. Meanwhile many applications deploy more sensors than the exact requirement so as to accurately sense the target phenomena. In this paper, importance of data gathering is explained; various Hierarchical clustering approaches are compared.

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Keywords: WSN; Data Gathering; Data aggregation; Clustered based protocols; Single Hop; Multi Hop;

1. **INTRODUCTION:** Data aggregation, an essential paradigm for wireless routing in sensor networks aim to combine the data coming from different sources. Data aggregation can also eliminate redundancy, minimize the number of transmissions and thus save the energy. Data aggregation can also be performed via signal processing and called as data fusion. Data fusion combines some signals and removes the signal noise deploying some techniques and at the end, produces an accurate signal. The objective of data aggregation is to reduce the required communication at various levels, and so as to reduce the total energy consumption. When energy consumption for aggregation is less than energy consumption for raw data transmission to the upper level, data

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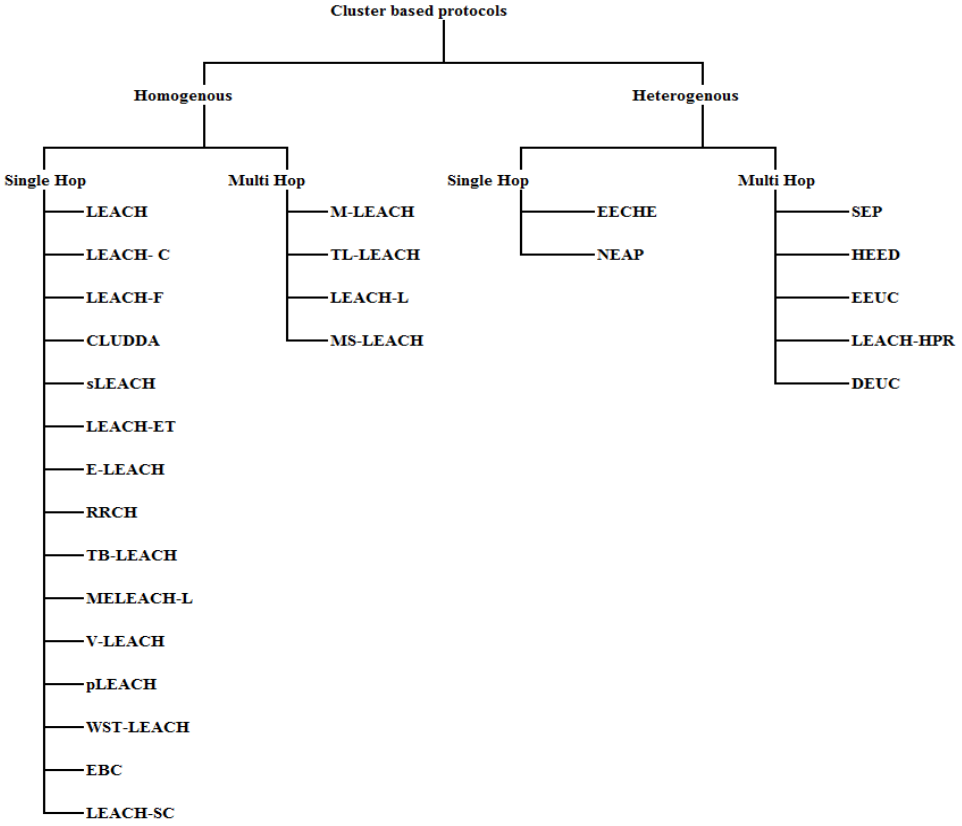
aggregation saves energy. Eliminating the redundancy as well as energy consumption is always an issue which aggregation protocol considered it. [16][3][2][23][13][21].Clustering – based aggregation protocol is approach in WSN for minimum communication and maximize overall network lifetime. Clustering reduces direct transmission to the base station by in network data aggregation as well as decreases energy consumption by reducing the transmitting distance. Better aggregation for large number of nodes is provided by Hierarchical clustering. [16][25][26][27].

1. Cluster Based protocols:



2.

a) HOMOGENOUS SINGLE HOP:

LEACH: (Low energy adaptive clustering Hierarchy): .It protects from battery reduction and stability in nodes energy consumption. However it wastes energy during Cluster Head (CH) selection Phase& also uses a huge amount of energy when CH is at large distance from the sink. Moreover it doesn't guarantee of good CH distribution.

i) **LEACH-C-(Low energy adaptive clustering Hierarchy-Centralized):** In LEACH_C the base station initiates centralized algorithm to elect the CHs according to their location info. It forms better balanced Clusters. However it wastes energy to attain global information & not robust.

ii) **LEACH-F-(Fixed)**: LEACH-F is an effective clustering technique which is based on LEACH protocol wherein this clusters becomes fixed after its formation.It balances the energy consumption between sensors and also avoids setup overhead. Though it has Fixed Round time and it spoils energy and info due to CH death prior completing the round energy limitation.

iii) **CLUDDA-(clustered diffusion with dynamic data aggregation):** CLUDD which employs in-network processing to remove unneeded transmission and avoids flooding problem. It also achieves dynamic