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DESIGN AND ANALYSIS OF LOAD BALANCING IN WSN USING CLUSTER BASED APPROACH: A SURVEY

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Abstract: Information collection is one of the main problems in wireless sensor network which is totally depend on sensor node. Clustering provides a logical view which is more effective than physical view. It ultimately extend lifetime of the network and achieve scalability. In this paper, the survey of load balancing issue of WSN using clusters base approach.

Keywords: Wireless Sensor Networks, Clustering, Load Balancing

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INTRODUCTION

A wireless sensor network is composed of a large number of sensor nodes and one or more sink nodes (base stations). The sensor nodes are deployed inside the area of interest to collect useful information from the surrounding environment and report it to a base station located generally at the extremity of the area of interest. For example, the sensor nodes can monitor and report certain events like the movement of objects. The role of the base station is to gather the information sent by the sensor nodes and send it back to the user (control node), and eventually send queries to the sensor nodes. Generally, the base station is much more powerful in terms of resources than the sensor nodes.

A sensor node is a small device that includes four basic components: a data acquisition unit, a processing unit, a wireless communication unit and an energy unit. The sensor node is equipped with low-power batteries suitable for its small size, which limits the ability of the sensor node in terms of processing, storage and transmission. In most cases, the sensor nodes are disposable and should last until their energy runs out. Thus, the energy is the most precious resource in a wireless sensor network. The conservation of energy and the maintenance of the wireless sensor network as long as possible are important challenges.

When the sensor nodes communicate directly with the base station, the sensor nodes located farther away from the base station will have a higher energy load due to the long range communication. When the sensor nodes use a multi-hop communication to reach the base station, the sensor nodes located close to the base station will have a higher energy load because they relay the packets of other nodes.

The clustering-based communication mode is considered as the most suitable communication mode for the wireless sensor networks. Clustering consists in selecting a set of cluster-heads from the set of sensor nodes and then regrouping the remaining sensor nodes around the cluster-heads. The cluster-members send the data to the cluster-head that sends it back to the base station. Clustering gives better results, it reduces and balances the energy consumption and improves the lifetime and scalability of the wireless sensor network. Clustering is often used with a data aggregation technique. Thus, the number of sent messages and transmission ranges can be reduced.

When the sensor nodes make the decision to become cluster-heads based on a limited view, the formed clusters will not be effective. In the proposed protocol, the sensor nodes base on their local parameters and the parameters of their neighbors in order to have a global view and ensure a good distribution of the cluster-heads.

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Most of the clustering-based protocols use a single-hop communication to send data from the cluster-heads to the base station. In fact, they assume that all sensor nodes can communicate directly with each other or with the base station .This becomes impossible when the size of the area of interest increases. The proposed protocol uses a multi-hop communication between the cluster-heads to conserve energy and cover a large area of interest. To reduce the amount of information to be sent to the base station, we integrated data aggregation. Moreover, the rotation of cluster-heads and the use of the low-power sleep mode by the sensor nodes that do not participate in routing allow to balance the load and reduce energy consumption significantly.

Literature Review:

I have studied plenty recent papers that were good in this research area. All researchers have tried to improve the lifetime of network using some Load balancing cluster algorithms and protocols.

Ian F. Akyildiz, Weilian Su, Yogesh Sankarasubramaniam, and Erdal Cayirci [1] in (2002) proposed recent advancement in wireless communication and electronics has enabled the development of low cost sensor networks.

Ameer Ahmed Abbasi, Mohamed Younis [2] in (2007) proposed a taxonomy and general classification of published clustering schemes. We survey different clustering algorithms for WSN.

Mohammed A. Merzoug and Abdallah Boukerram [3] in (2011) proposed a cluster-based communication protocol that uses a multi-hop communication mode between the cluster-heads. The protocol aims to reduce and evenly distribute the energy consumption among the sensor nodes.

Dipak Wajgi and Dr. Nileshsingh V. Thakur [4] in (2012) They have examine the proposed load balancing algorithms for wireless sensor networks. Load balancing can be used to extend the lifetime of a sensor network by reducing energy consumption.

Gichrel Wang, Dong kyun Kim and Gihwan Cho [5] in (2012) They introduce the generates large-sized clusters where any two nodes are atmost two hops away from each other to raise the quality of clusters. Second, our scheme employs the verification of two-hop distant nodes to preserve the quality of the large-sized clusters and refrains from splitting the clusters.

Yongxin Feng, Wenbo Zhang, Xiaobo Tan and Lidong Fu [6] in (2012) proposed In terms of the characteristics of itself node number, density and topology dynamic change in wireless sensor network,according to the wireless transmission energy consumption model REDM, Load-balanced Hierarchical Topology Control Algorithmbased on LEACH algorithm is designed. The algorithm still uses the concept of "round". Substitute cluster head and load evaluationmethod are introduced in view of frequent election of cluster head after cluster head failure

Vaibhav V. Deshpande and A. R. Bhagat Patil [7] in (2013) introduce the Clustering is an efficient way to improve lifetime of wireless sensor network. To enhance lifetime of sensor network this paper proposes to have multiple cluster heads within the cluster of sensor nodes.

S. Balaganesh, S. Periyasamy [8] in (2014) introduce the Wireless sensor networks have concerned significant attention over the past few years. A growing list of monitoring and tracking applications can employ WSNs for increased effectiveness especially in hostile and remote areas. In these applications a large number of sensors are needed and requiring effective management of the network.In this paper, we propose Load Balanced Connection Aware Clustering algorithm (LBCACA) to make clusters and choose cluster head in WSNs. It considers sensor node status, connection condition, connection density, distance from base station and transmission count to find effective cluster head and build clusters.

Hossein Jadidoleslamy [9] in (2014) introduce the WSNs' clustering and it be represented a new centralized clustering algorithm for homogenous and large-scale WSNs. The proposed clustering algorithm is based on calculating distances between sensor nodes, Distance Average (DA) between each node and other nodes, finding distance average range, dividing it into K sub-range and selecting associated nodes of each sub-range.

Naveen Sharma and Anand Nayyar [10] in (2014) introducethe In recent times wireless sensor networks have grown enormously and become progressively attractive in wide varietyof applications because of their low cost, low power, small in size, self-organizing behavior in harsh environments. Routing is a vital technology in WSN. There are many routing protocols like: location based, multipath, data centric, mobility based, hierarchical routing, hybrid routing etc.

Saifullah Khalid, Ashraf Masood, Faisal Bashir Hussain, Haider Abbas, and Abdul Ghafoor [11] in (2014) proposed a novellifetime maximization protocol for mobile sensor networks with uncontrolled mobility considering residual energy, traffic load, and mobility of a node. The protocol being generic is equally applicable to heterogeneous, homogenous, static, and mobile sensornetworks.

Rahul K Ghotekar, Deepak C. Mehetre [12] in (2014) proposed over viewing techniques which are used in wireless sensor network for load balancing. Wireless sensor network having different nodes with different kind of energy which can be improve the lifetime of the network and its dependability. This paper will provide the person who reads with the ground work for research in load balancing techniques for wireless sensor networks.

Can Tunca, Sinan Isik, M. Yunus Donmez, and Cem Ersoy [13] in (2014) They have present a survey of the existing distributed mobile sink routing protocols. In order to provide an insight to the rationale and the concerns of a mobile sink routing protocol, design requirements and challenges associated with the problem of mobile sink routing are determined and explained. A definitive and detailed categorization is made and the protocols' advantages and drawbacks are determined with respect to their target applications.

CONCLUSION:

In this paper to introduce the overall survey of load balancing issue of WSN using cluster base approach**.**

REFERENCES

1.   Ian F. Akyildiz, Weilian Su, Yogesh Sankarasubramaniam, and Erdal Cayirci, " A Survey On Sensor Networks" , pp.102-114, IEEE-2002.

2.   Ameer Ahmed Abbasi, Mohamed Younis, " A Survey On Clustering Algorithms For Wireless Sensor Networks" , pp.2826-2841, ELSEVIER-june-2007.

3.   Mohammed A. Merzoug and Abdallah Boukerram, "Cluster Based Communication Protocol For Load Balancing in Wireless sensor Networks", pp.105-112, Vol. 3, No.6, IEEE-2011.

4.   Dipak Wajgi and Dr. Nileshsingh V. Thakur, "Load Balancing Algorithms In Wireless Sensor Network: A Survey", pp.456-460, Vol. 2, No.4, IEEE-August-2012.

5.   Gichrel Wang, Dongkyun Kim and Gihwan Cho, "A Secure Cluster Formation Scheme In Wireless Sensor Networks",pp.1-14,HINDAWI-September-2012.

6.   Yongxin Feng, Wenbo Zhang, Xiaobo Tan and Lidong Fu, "Research on the Algorithm of Load Balanced Hierarchical Topology Control for WSN", pp.347-352, NSP-2013.

7.   Vaibhav V. Deshpande and A. R. Bhagat Patil, "Energy Distributed Clustering For Improving Lifetime Of Wireless Sensor Networks", IEEE-May-2013.

8. S. Balaganesh, S. Periyasamy, "Load Balanced Connection Aware Clustering Algorithm for Wireless Sensor Networks", pp.3781-3787, Vol.2, Issue 1, ISSN-2014.

9. Hossein Jadidoleslamy, "A Novel Clustering Algorithm for Homogenous and Large Scale Wireless Sensor Networks: Based on Sensor Nodes Deployment Location Coordinates", pp.97-109, Vol.14, No. 2, IJCSNS-Feb-2014.

10. Naveen Sharma and Anand Nayyar, "A Comprehensive Review of Cluster Based Energy Efficient Routing Protocols for Wireless Sensor Networks", pp.441-453, Vol 3, Issue 1, ISSN-January-2014.

11. Saifullah Khalid, Ashraf Masood, Faisal Bashir Hussain, Haider Abbas, and Abdul Ghafoor, "Load Balanced Routing For Lifetime Maximization in Mobile Wireless Sensor Networks",pp.1-12,HINDAWI-2014.

12. Rahul K Ghotekar, Deepak C. Mehetre, " Load Balancing For Achieving the Network Lifetime In WSN-A Survey",pp.53-58,Vol 1,Issue 4,ISSN-May-2014.

13. Can Tunca, Sinan Isik, M. Yunus Donmez, and Cem Ersoy, "Distributed Mobile Sink Routing for Wireless Sensor Networks: A Survey", pp.877-896, Vol 16, No. 2, Second Quarter IEEE-2014.