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Enhance Quality Of Service Using Priority Based Multi Sencar In Wireless Sensor Network

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Abstract— Due to limited energy recourses and high energy efficiency for mobile data collection in wireless sensor network. which implement three layer framework sensor layer, cluster head layer, mobile collector(called Sencar)layer. This framework employs distributed load balanced clustering and dual data uploading. The sensor nodes self organize themselves into cluster .The sensor layer sends data into multiple cluster heads in each cluster to balance the work load. Then which enables two cluster heads to simultaneously upload data to mobile collector b using multi user multi input multi output(MU-MIMO)technique. But The three layer structure of the network provides collision to the sink because of two cluster heads in the network. The usage of two cluster head reduces the efficiency. The usage of two cluster head provides only 60% efficiency. In Wireless Sensor Network are usually unattended and without tamper resistant hardware they are highly susceptible to such attacks. Ascertaining trustworthiness of data and reputation of sensor nodes is crucial for Wireless Sensor Network. So which implement the four layer structure it resembles like Fishbone structure. The four layer framework consist sensor layer, cluster head layer, aggregator layer,sencar layer. The effective use of this structure is only one cluster head is there to connect the various sensor nodes which will reduce the collision. The mobile node will take the undefined path and communicate with the sink when any nodes get damaged. For effective transmission the cluster head handles the sensor nodes based on the priority. Thus, the sink can be saved with its energy by reducing the repeated information. This gives 80% efficiency and takes 18% shorter data collection time which further saves the lifetime of the nodes.

Index Terms— Wireless Sensor Network, Clustering, MIMO.

INTRODUCTION

Project overview

Sensor Networks is a collection of spatially deployed in wireless sensors to monitor several changes of environmental conditions such as air pollutant concentration, forest fire, and object moving for collaborative manner without relying on any primary infrastructure support. In recent times, a number of research efforts have been made to improve sensor hardware and network architectures in order to efficiently organize WSNs for a variety of applications.

Wireless Sensor Networks (WSNs) is the multi-hop communication wireless networks. Due to a wide diversity of WSN application requirements, although a general purpose WSN design cannot fulfill the requirements of all applications. According to some specific applications, several network parameters such as node density, sensing range, and transmission range have to be carefully considered at the network design phase. To achieve this, it is critical to capture the effects of network parameters on the network performance with respect to application requirements.

Wireless sensor networks are placed to monitor the sensing field and collect data from it. Usually, two approaches can be implemented to accomplish the data collection tasks: through direct communication, and multi-hop forwarding. In the first phase, sensor nodes upload the data directly to sink through one-hop wireless communication; this may result in long communication distances and destroy the energy efficiency of sensor nodes. On the other hand, by multi-hop forwarding, data are informed to the sink over multiple relays, and the communication distance is minimized. However, since nodes near the sink commonly have a much denser forwarding load, their energy may be exhausted very fast, which reduces the network performance. The goal of the sensor node is to gather the data at fixed intervals then transfer the data into digital signal and eventually send the signal to the sink or the base node. Before monitoring the location, the sensor nodes must forms a network and identify their neighbor nodes.

Energy consumption can takes place while uploading the data and sensing the field to Mobile Collector. Wireless sensor networks are a trend of the past few years, and they involve deploying a large number of small nodes. The nodes then sense environmental changes and report them to other nodes over flexible network architecture. Sensor nodes are used in hostile environments or over large geographical areas. A wireless sensor network consists of hundreds or thousands of low cost nodes which could either have a fixed location or randomly deployed to monitor the environment. Due to their small size, they have a number of

limitations, an issue that I will discuss later. Sensors usually communicate with each other using a multi hop approach. The flow of data ends at special nodes called base stations (sometimes they are also referred to as sinks).

A base station links the sensor network to another network to disseminate the data sensed for further processing. Base stations have enhanced capabilities over simple sensor nodes since they must do complex data processing; this justifies the fact that bases stations have workstation/laptop class processors, and of course enough memory, energy, storage and computational power to perform their tasks well.The biggest problems of sensor networks are power consumption, which is greatly affected by the communication between nodes. To solve this issue, aggregation points are introduced to the network. This reduces the total number of messages exchanged between nodes and saves some energy. Usually, aggregation points are regular nodes that receive data from neighboring nodes, perform some kind of processing, and then forward the filtered data to the next hop. Similar to aggregation points is clustering. The communication within a cluster must travel through the cluster head, which then is forwarded to a neighboring cluster head until it reaches its destination, the base station. Another method for saving energy is setting the nodes to go idle if they are not needed and wake up when required. Of course, the challenge is to find a pattern at which energy consumption is made evenly for all the nodes in the network. Each sensor nodes operates with the help of batteries that have limited memory and limited computing power. Unlike other batteries the batteries of the sensor nodes are unchangeable and un-rechargeable, the available energy in the batteries determine the lifetime of the sensor networks so the energy is the main parameter that have to be considered while designing the wireless sensor networks.

Existing system

In existing system implement a three layer of framework structure it consist of sensor layer, cluster head layer, sencar layer(for mobile collector).this framework employs for load balanced clustering and dual data uploading, which is referred to as LBC-DDU. The aim in this existing project to achieve good scalability, long network lifetime and low data collection latency . At the sensor layer split the nodes into cluster form as particular coverage area and load balanced algorithm is proposed form sensors to self organize themselves into clusters. In cluster head layer allocate the two cluster head for work load balancing and facilitate load balanced clustering and dual data uploading, which is referred as LBC-DDU. Multiple cluster heads are allocated within the cluster form to cooperate with each other to perform energy saving and inter cluster communication .In sencar layer(mobile data collection) which enables two cluster heads to simultaneously upload data to sencar for its moving trajectory planning in each time by utilizing multi-user multiple-input and multi-output(MU-MIMO)technique. Here by using selecting polling to gathered data from cluster head effectively in case of any failure occurs in cluster head. This result shows by using two cluster head achieve to over 50 percentage of energy saving per node and 60 percentage of energy saving on cluster heads comparing with data collections and 20 percentage shorter data collection.

Disadvantages

- Overall performance (Qos) is not achieved efficiently.
- Energy efficiency is less because two cluster heads were used.
- Traffic occurs which increases the time consumption of nodes.
- Importance is not given to the prioritized node.

Proposed system

The proposed system , Implement four layer structure which resembles like fish bone structure for effective transmission of information to sink. Fish Bone structure is used for wide range of wireless sensor network .The four layers consist of sensor layer , cluster head layer , aggregator layer and sencar layer . In sensor layer greater advantage of use of priority based condition for effective transmission, it give priority which node gathered high data that node information send data to aggregator node. In cluster head layer, for effective transmission using only one cluster head handles sensor node based on priority which will reduced collision. In aggregator layer, aggregator node is used to reduced the repeated data it is placed in between multiple sensor nodes and cluster head. Sencar layer Mobile node is always in moving trajectory for transmit the data if any overwhelming occur at cluster nodes through the undefined path. Then finally gathered data transmit from cluster head to sink through the polling point effectively without data loss and repeated data. It save the life time of network and reduced data gathering delay was achieved. This result shows 80% energy efficiency and takes 18% shorter data collection time which further saves the lifetime of the nodes.

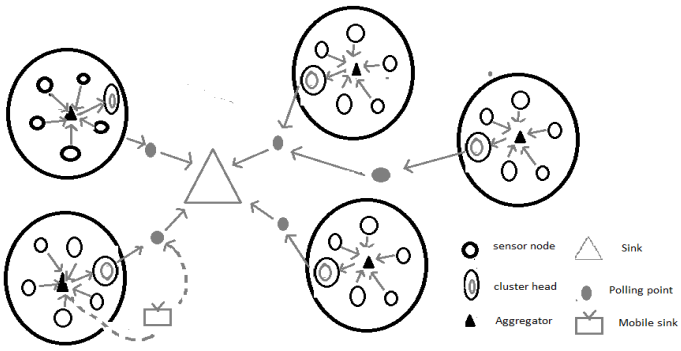
Advantages

- Energy consumption is less.
- Avoid collision using one cluster head.
- Reduced repeated data.

SYSTEM DESIGN

The architecture diagram, represent the process of flowing effective data from sensor nodes to sink. First it form the topology fish bone structure

of four layers it consist of sensor layer, aggregator layer, cluster head layer ,sencar layer. At sensor layer ,form sensor as cluster form then collect the information from physical environment after it send information to aggregator node as priority based condition it mean which node collect highest data it give first priority and go to aggregator node, then it give second prioritize to other high data collected node for effective transmission.



Aggregator node receive data from multiple sensor nodes it comparing previous information and current incoming information if it match the previous information it reject that data send only information to cluster head node .so it reduce the repeated data for saving with energy in sink. At Cluster head node ,after it send to cluster head node here using only one cluster head node for avoiding collision then it send cluster head data to polling point. here using mobile though undefined path to communicate failure node incase in any cluster head node and aggregator node ,mobile node is always in moving trajectory it receive damaged node data and directly send to polling point. The polling point collect data from each cluster head node and mobile .finally it moving each polling pond and send information to sink without loss of data and reduced repeated data effectively ,avoid collision data. This result shows 80% energy efficiency and takes 18% shorter data collection time which further saves the lifetime of the nodes.

PROJECT DESCRIPTION

Topology formation

Topology formation of construction of project design in ns2 should take place. each node should send hello packet to its neighbor node which are its communication range to update their topology.Construction of project design in NS2 should takes place. In the network area of 1600x900 dimension, 42 nodes are deloyed.Mesh topology has been formed among the nodes. This was to help keep the viewer's attention and focus on the node and also help mimic an optical perspective of the network node.There were three events occurring in the trace file which are send ('s') for packets sent, receive ("r") for packet received.

Cluster formation and Data aggregation

Nodes are formed into clusters and in each cluster node having highest energy will be elected as the cluster head.In purpose of nodes share their energy levels within cluster. If node finds that it is having highest energy level in its cluster, it advertise itself that it is cluster head to its cluster members. After receiving this message cluster members acknowledge.Each cluster contains one aggregator node, which is to aggregate the data.Each node is set by some priority. Based on priority sensor node get access to transmit data to aggregator node. The aggregator node receives data and removes duplicate data. Then send this data to Cluster head.

Polling point selection

Cluster head chooses nearest polling point and send data. The polling points collects information from the cluster heads and transmits the information to the sink. Each cluster head will have the unique polling points that gathers data and gives to the sink. This reduces the collision and provides separate access to the sink.

Mobile sink data collection

Incase of node failure mobile sink collects data from aggregator. The emergency situation can be handled efficiently with the help of mobile node. In case of any, the mobile node is always in moving strategy it will take the work position of that particular node and provide the actual operations.

Data transmission to sink

Data transmission from polling point to sink. Performance take place. the sink can be saved with its energy by reducing the repeated information. The data send with 80% efficiency and takes 18% shorter data collection time so its saves the lifetime of the nodes.

CONCLUSION

In this project implemented four layer structure sensor layer, cluster head layer,Sencar layer, aggregator layer. In this layers, at sensor layer sends the data as priority based condition for effective transmission .At aggregator layer reduced the repeated information for saved with energy in sink. At cluster head layer, collision is reduced effectively with the help of one cluster head. At Sencar layer, the cluster head have unique polling point it collect data and send to sink,the mobile node will take the undefined path and communicate with the sink when any nodes get damaged. .This gives 80% efficiency and takes 18% shorter data collection time which further saves the lifetime of the nodes.

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