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ENERGY EFFICIENT MOBILE SINK PATH STATERGY FOR WIRELESS SENSOR NETWORK

Mrs.S.K.Suba
Assistant Professor, ECE.
S.A Engineering College
Chennai, India

Ms.G.Renu prabha
Student, ECE
S.A Engineering College
Chennai, India

Ms.R.Swetha
Student, ECE
S.A Engineering College
Chennai, India

Ms.V.Vaishnavi
Student, ECE
S.A Engineering College
Chennai, India

***Abstract*In our paper we discuss about the tradeoff between the data gathering latency and energy saving in mobile data gathering by exploring a local data aggregation and the moving length of the SenCar. Mobile data collection proposed a three layer framework in wireless sensor network they are sensor layer, cluster head layer and mobile collector layer. These three framework layer employs load balanced clustering and dual data uploading algorithm, which is also referred to as LBC-DDU. Priority signal is not assigned in LBC-DDU. To overcome this issue, we proposed a priority based multi SenCar technique in WSNs. We coordinate the mobility of Sensor Car to fully enjoy the benefits of dual data uploading, which ultimately leads to a data collection tour with both short data uploading time and short moving trajectory. The packet dead rate is high because waiting for Sensor Car for a long time and no priority assigning. Dual cluster whenever received the packet rate exceed more than threshold value it updates packet size information to base station. Depend on packet priority SenCar analysis the shortest route by MUMIMO Technique and travel to upload data from dual cluster meanwhile it can transmit to the base station.**

Keywords—SenCar, polling point selection,Ad-hoc on demand distance vectoring,cluster head selection

I.INTRODUCTION

A wireless sensor network is also called a wireless sensor and actuator network (WSAN) are used to monitor physical or environmental conditions, such as temperature, sound etc. and to cooperatively pass their data through the network to a main location. Wireless sensor networks development was motivated by military applications such as battlefield surveillance. Today such networks are used in many applications such as industrial process monitoring and control, machine health monitoring, and so on. The WSN is built of "nodes"- from a few to several hundreds or even thousands, where each node is connected to one or several sensors. The topology of the wireless sensor networks vary form a simple star network to an advanced multi-hop wireless mesh network. In computer science and telecommunications, wireless sensor networks are an active research area with numerous workshops and conferences arranged, for example IPSN, EWSN. Due to some disadvantages of the mesh networks we use single hop data transmission between the sensor nodes in the network. One node can no longer operate, the rest of the odes can still communicate with each other, directly or through one or more intermediate nodes. Multi hop communication is used to overcome disadvantages of single hop communication like using of much energy and time delay multi hopping. Multi hop or ad hoc, wireless networks use more wireless hops to convey information form a source to a destination. Multi hop communication is required when the communication range of the sensor nodes is limited or the number of sensor nodes is very large in a network. Multi hop communication can be used in Cluster Head communication method.

II. RELATED WORK

Author [1] Biswanath Mukherjee A wireless sensor network (WSN) has important applications such as remote environmental monitoring and target tracking. This has been enabled by the availability, particularly in recent years, of sensors that are smaller, cheaper, and intelligent. These sensors are equipped with wireless interfaces with which they can communicate with one another to form a network. The

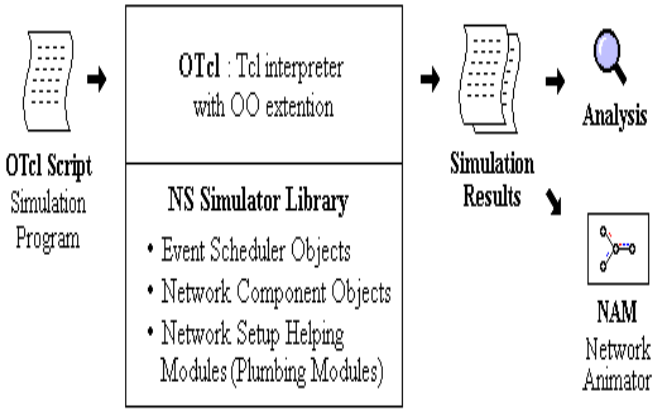
design objectives, cost, hardware, and system constraints. The goal of our survey is to present a comprehensive review of the recent literature. Following a top-down approach, we give an overview of several new applications and then review the literature on various aspects of WSNs. We classify the problems into three different categories are internal platform and underlying operating system, communication protocol stack, and network services, provisioning, and deployment. We review the major development in these three categories and outline new challenges. Author [2] Marco Conti In the last years, wireless sensor networks (WSNs) have gained increasing attention from both the research community and actual users. As sensor nodes are generally battery-powered devices, the critical aspects to face concern how to reduce the energy consumption of nodes, so that the network lifetime can be extended to reasonable times. In this paper we first break down the energy consumption for the components of a typical sensor node, and discuss the main directions to energy conservation in WSNs. Then, we present a systematic and comprehensive taxonomy of the energy conservation schemes, which are subsequently discussed in depth. Special attention has been devoted to promising solutions which have not yet obtained a wide attention in the literature, such as techniques for energy efficient data acquisition. Finally conclude the paper with insights for research directions about energy conservation in WSNs.

III.PROPOSED SYSTEM

Mobile Elements (ME) is one which act like travelling across the network and fetch the data from the RP. It travel and collect the data from every RP for saving the energy of the every node in networks. By providing single ME is not fare one to obtain the data across the networks. Multiple ME can solve the time consuming problem and send the data within a deadline. In very large network MME can prevent the deadline expiration problem. Here each is allocated a set of Sensor Nodes. The ME collects data only from allocated set of sensor nodes. By providing this technique then the battery power will maintained for the every node in the networks. Providing MME in the network can improve the battery power of every sensor nodes. When the data are transmitted from the base station through multi-hop every RP must be ready to receive and send the data to the ME when it occurs near the RP, so we can transmit the data with low energy consumption.

IV. NETWORK SIMULATOR2

NS-2 is an open-source simulation tool running on Unix-like operating systems. It is a discreet event simulator targeted at networking research and provides substantial support for simulation of routing, multicast protocols and IP protocols, such as UDP, TCP, RTP and SRM over wired, wireless and satellite networks. It has many advantages that make it a useful tool, such as support for multiple protocols and the capability of graphically detailing network traffic. NS-2 started as a variant of the REAL network simulator in 1989. REAL is a network simulator originally intended for studying the dynamic behavior of flow and congestion control schemes in packet-switched data networks. In 1995 ns development was supported by Defense Advanced Research Projects Agency DARPA through the VINT project at LBL, Xerox PARC, UCB, and USC/ISI. The wireless code from the UCB Daedelus and CMU Monarch projects and sun Microsystems have added the wireless capabilities to ns-2. Valery Naumov proposed a list-based improvement for ns-2 involving maintaining a double linked list to organize mobile nodes based on their X-coordinates. When sending a packet, only those neighbor nodes are considered, which are within a circle corresponding to the carrier-sense threshold energy-level, below which a node cannot hear the packet. Compared to the original version, where all nodes in the topology are considered, its considerable gain in run-time, performance goes down by about 4 to 20 times, depending on the size of the topology. NS-2 is available on several platforms such as FreeBSD, Linux, sunOS and Solaris. NS-2 also builds and runs under Windows with Cygwin. Simple scenarios should run on any reasonable machine; however, very large scenarios benefit from large amounts of memory and fast CPU's.



V.CLUSTER FORMATION AND SETUP

The process of grouping the nodes into a single known as cluster formation. The purpose of cluster formation is to reduced the transfer rate and allocation of group into sub groups and finally one will be selected. Cluster will be formed static position will be fixed and data exchange between cluster head. This cluster has n number of nodes those are having same characteristics and also they are in the single area. This group of single nodes forms the network. There are lot of clusters comes under a base station. Each non-cluster head node chooses one of the strongest received signal strength (RSS) of the advertisement as its cluster head, and transmits a join-request (Join-REQ) message back to the chosen cluster head. The information about the node's capability of being a cooperative node, that is, its current energy status is added into the message. If a cluster head receives the advertisement message from another cluster head y, and if the received RSS exceeds a threshold, it will mark cluster head y as the neighboring cluster head and it record ID. If the sink receives the advertisement message, it will find the cluster head with the maximum RSS, and sends the sink-position message to that cluster head marking it as the target cluster head (TCH).

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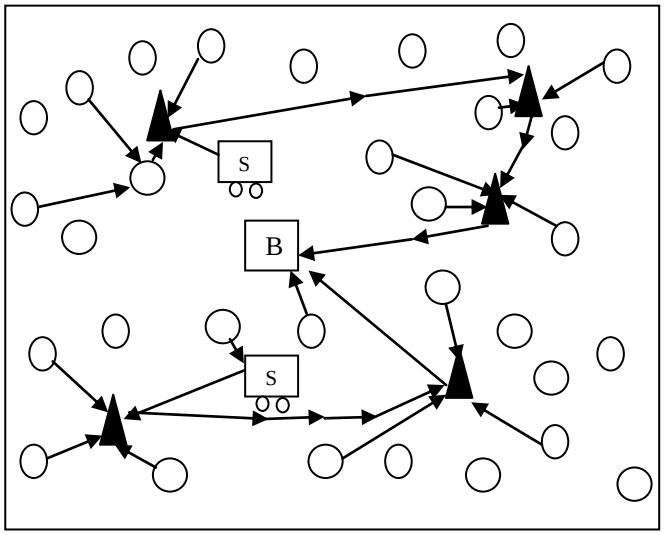
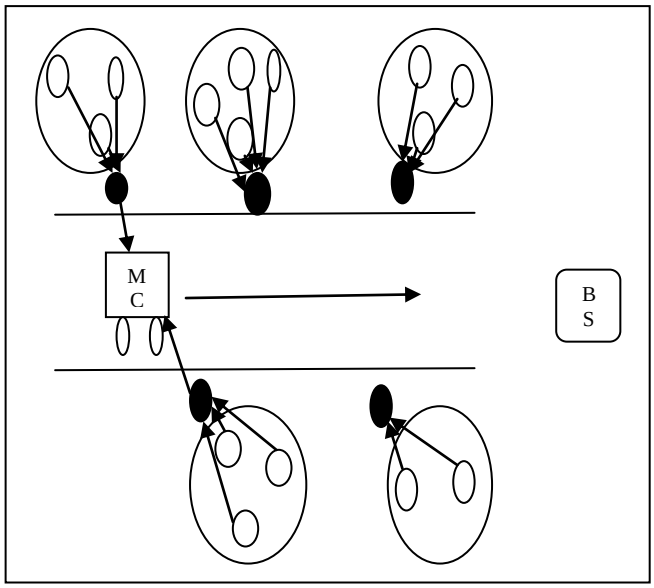
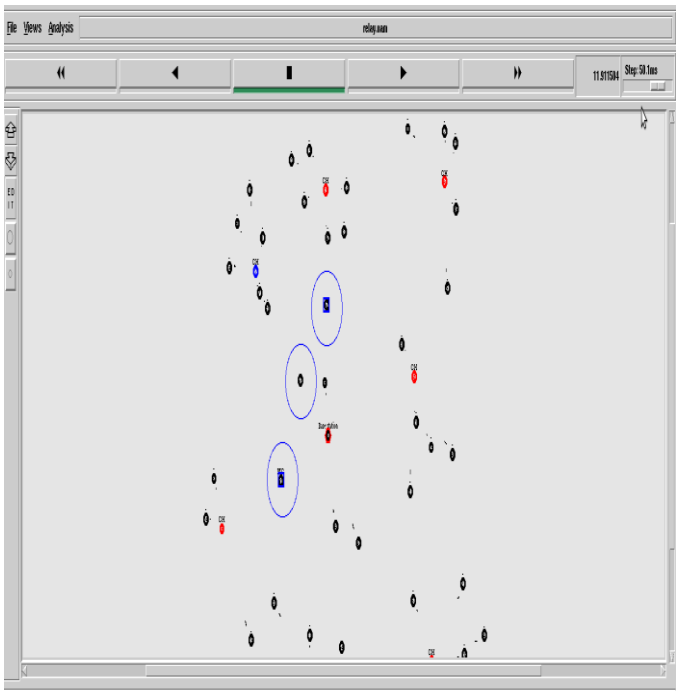




VI. CLUSTER HEAD SELECTION

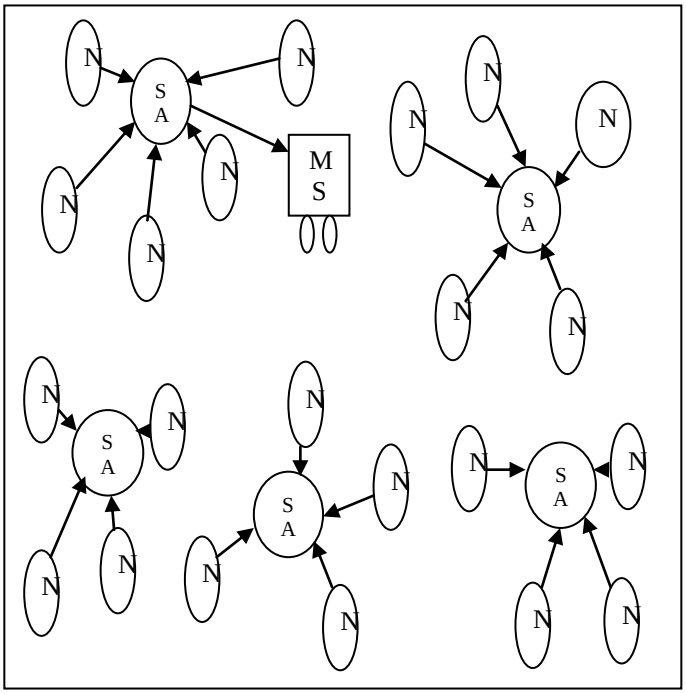
Initially, when clusters are being created, each node decides whether or not to become a cluster head for each round as specified by the original Low-Energy Adaptive Clustering Hierarchy (LEACH) protocol. LEACH is a TDMA (Time Division Multiple Access) cluster based approach where a node elects itself to be cluster head by some probability and broadcast an advertisement message to all other nodes in the network. A non cluster head node selects a cluster head to join based on the received signal strength. Each self-selected cluster head, broadcasts an advertisement (ADV) message using non-persistent carrier sense multiple access (CSMA) protocol. The message contains the header identifier (ID). The cluster head role among the cluster head election candidates with high residual energy and backbone tree is constructed with new selected CH (Cluster Head). Within this meantime the energy drained out CH regains energy through energy harvesting. This revised version of the algorithm reduces the message overhead of electing new CH at an instance of unavailability of existing cluster head. Whenever nodes are selecting the CH, based on energy. If the less energy of the cluster head to be change cluster member and then select the next cluster head based on high energy cluster member to make cluster head. That node announces that is route CH also it will send selection request o all the neighbors. Route CH will collect the data from nearby sensors and finally it will hand over the data to the given sink. Cluster-Head Based Priority Traverse (CBPT) is a novel traversing technique in which mobile sink node follows the data collection path decided by the static sink, which is an efficient technique for the data collection from the clusters. Now senscar get the priority cluster head data collection network structure. The data collection using prioritized table is suitable routing for delay sensitive data collection network structure. The sensor car moves along a fixed track and its predictable. The network is divided into several equal clusters. Each cluster head collects data and sends it to the sencar. It is selected based on residual energy.

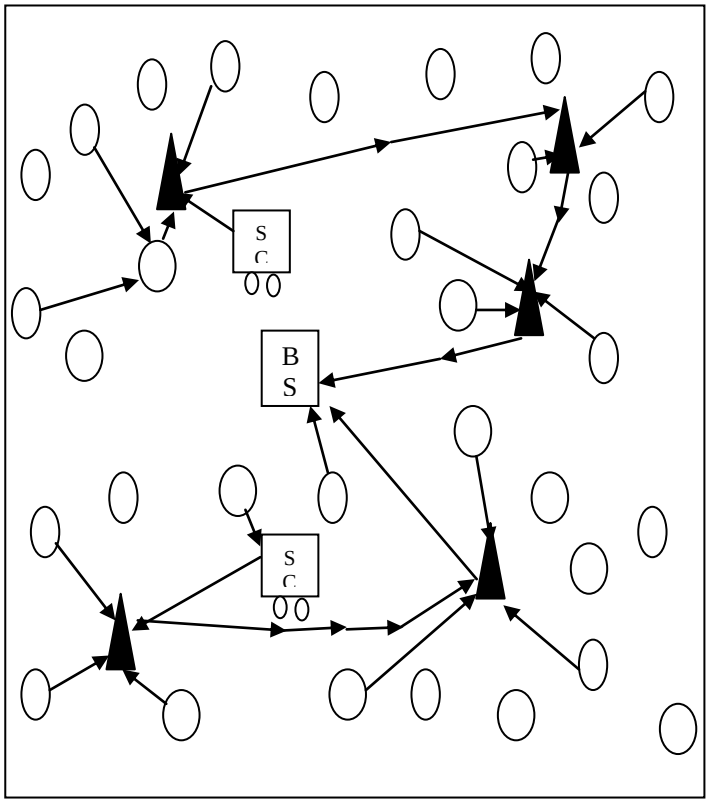


VII.SENCAR CREATION AND FUNCTION

Multi-hop routing, packets have to experience multiple relays before reaching the data sink. Minimizing energy consumption on the forwarding path whenever energy level reach threshold level, stop multi hop transmission and RP gather data only. The sencar will constantly collect nearby sensor nodes related information (such as the residual battery energy) and then, based on this information plan when to move and where to move at. So to avoid the problem in multi-hop routing we are using sencar uploading technique. Here we use three sencar for transmission purpose. Two sencars are used to collect the data from the cluster and deliver it to the base station. Another

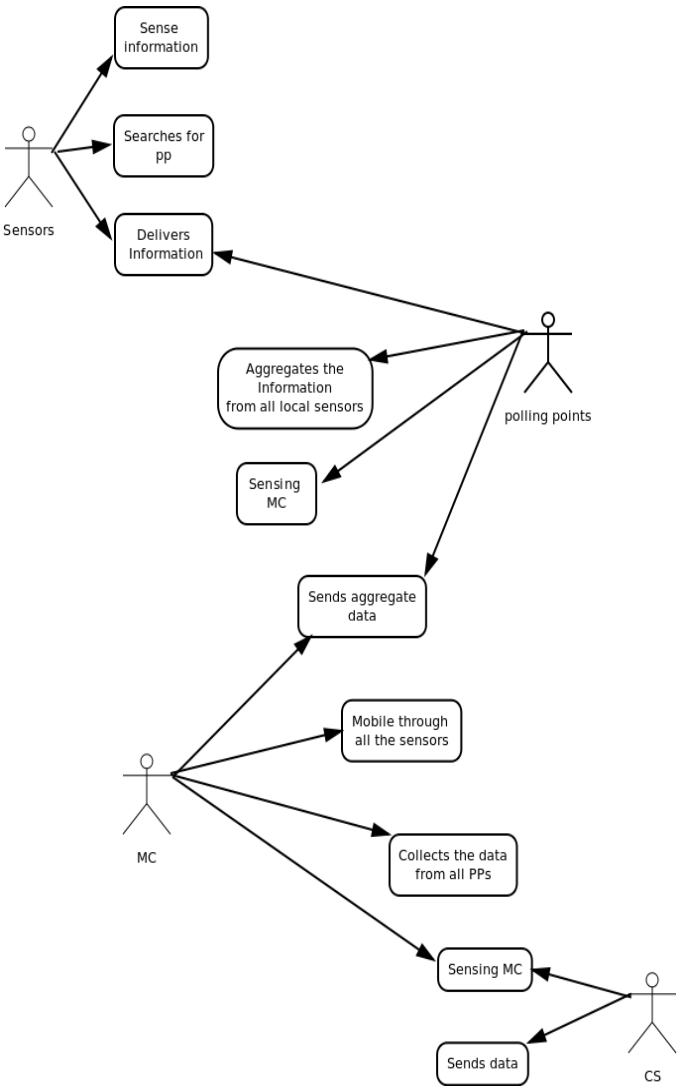
one is used to act as the cluster head during the critical period depend on the polling points by higher priority.





VIII.HANDOVER DATA TO BASE STATION

A sencar uploads data packets to the mobile sink-position in a single hop. The mobile sink starts its tour from the static data sink, which is located either inside or outside the sensing fields, collects data packets at the CBPT and then returns the data to the base station. Finally Mobile sencar handover the data to data sink, such as base station. The proposed mobile elements data collection is analyzed by using multiple mobile elements, in case of more number of nodes failures in large scale network. The energy consumption can be increased up to 21%, throughput rate increased to 40% and tour length up to 40%.



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