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Routing With Reliability in Mobile WSNs

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Abstract
In Wireless Sensor Networks (WSNs), sensor nodes have limited battery power, so energy consumption is essential issue. Every sensor node can obtain its location information from GPS or other positioning system and send data to sink at any time. Wireless sensor networks (WSNs) are resource constrained. Energy is one of the most important resources in such networks. Therefore, optimal use of energy is necessary. Energy-efficient routing protocol is proposed for WSNs. The protocol is reliable in terms of data delivery at the base station (BS). Mobility in sensor nodes and in the BS is considered. The proposed protocol is hierarchical and cluster based. Each cluster consists of one cluster head (CH) node, two deputy CH nodes, and some ordinary sensor nodes. Considering the reliability aspect of the protocol, it puts best effort to ensure a specified throughput level at the BS. Depending on the topology of the network, the data transmission from the CH node to the BS is carried out either directly or in multihop fashion.

Index Terms-Energy efficiency, mobile base station (BS), mobile nodes, reliability, routing protocol, wireless sensor networks.

I. Introduction

Wireless Sensor Networks (WSNs) is an advanced technology with a wide range of potential applications such as patient monitoring systems, earthquake detection, environment monitoring, military applications (such as navigation, surveillance, security and target tracking management). A wireless sensor networks is a collection of nodes organized into a cooperative network. Sensor networks spatially distributed autonomous sensors to monitor physical and environmental conditions at different locations, such as temperature, pressure, motion sound, vibration etc. For WSNs, many protocols have been specifically designed must be efficient, fast, resource friendly where energy awareness is an essential design issue. In wireless sensor networks, there are unique challenges with regards to unit power consumption, overall size and heat transfer.
Architecture of a System

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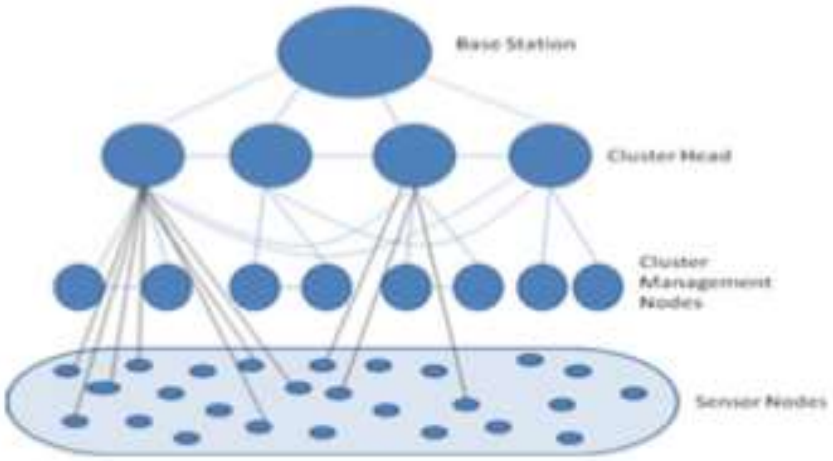


Fig. 1. WSN system architecture.

Remote sensor systems are accumulation of huge number of sensor hubs. In fig there are two bunches. In each bunch one of the part assigned as CH.

CH: Acts as pseudo focal co-facilitator for that specific bunch. Significant part is to give intra bunch information gathering from part hubs likewise it deals with amassed information.

DCH: Job of DCH is to gather data around encompassing which will be sent to the base station for confirmation.

BS: It takes the full control of the WS hubs and it chooses who will move toward becoming CH and DCH bunches.

Sensor Node: Sensor hub is equipped for playing out some handling, gathering tangible data and speaking with other associated hubs in the system.

II. Existing System:

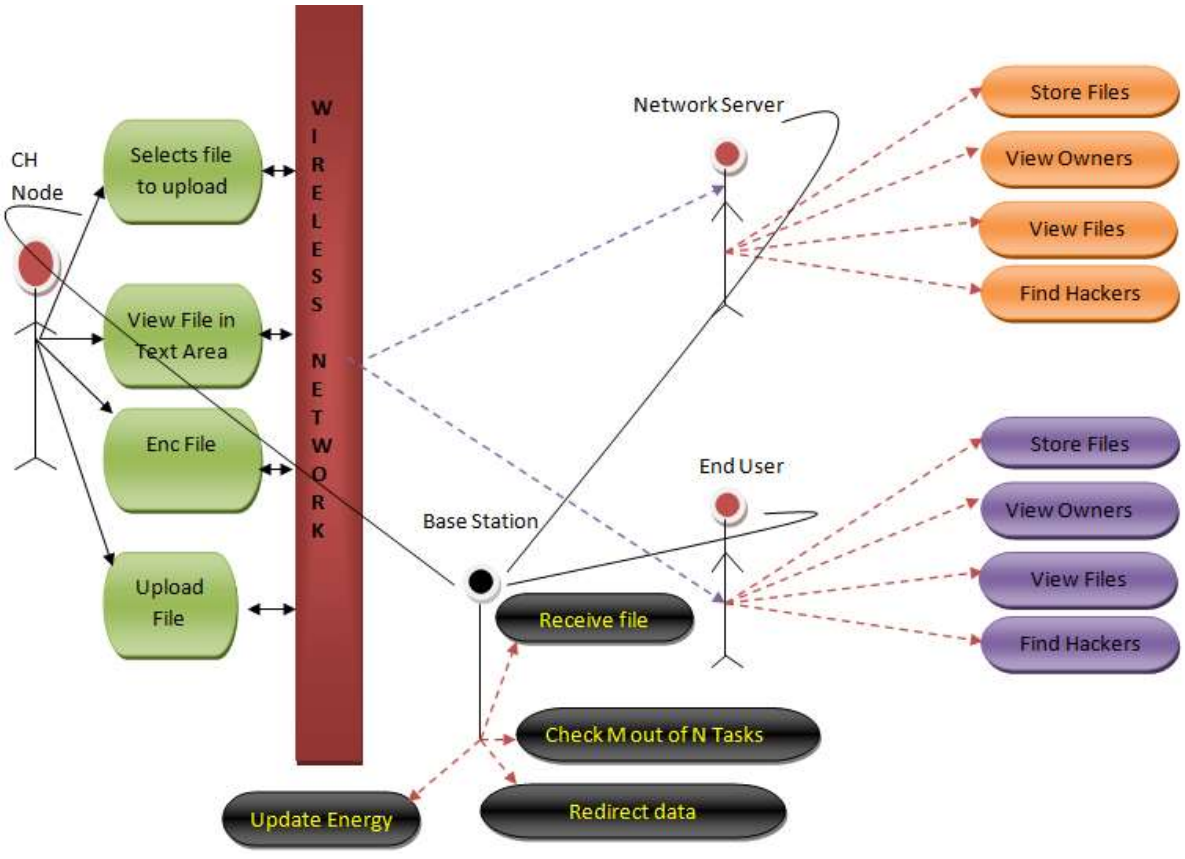
From paper [2], we look at communication protocols, which can have Significant impact on the overall energy dispersion of these networks. Based on our finding that the conventional protocols of direct transmission, minimum-transmission-energy, multihop routing, and static clustering may not be optimal for sensor networks, we propose LEACH (Low-Energy Adaptive Clustering Hierarchy), a clustering-based protocol that utilizes randomized rotation of local cluster base stations (cluster-heads) to evenly distribute the energy load among the sensors in the network. LEACH uses localized coordination to enable scalability and robustness for dynamic networks, and incorporates data fusion into the routing protocol to reduce the amount of information that must be transmitted to the base station. Simulations show that LEACH can achieve as much as a factor of 8 reduction in energy dissipation compared with conventional routing protocols. In addition, LEACH is able to distribute energy dissipation evenly throughout the sensors, doubling the useful system lifetime for the networks we simulated.

From paper [3], a short literature review of the existing routing protocol is carried out. Then a novel hierarchical routing protocol, which addresses network survivability and redundancy issues, is introduced. Initial analysis shows promising results of the proposed protocol over LEACH.

- Hierarchical routing is considered to be an energy-efficient and scalable approach. There are several hierarchical routing protocols proposed for WSN. All these protocols consider a WSN with static sensor nodes.
- Dynamic source routing (DSR), ad hoc on-demand distance vector (AODV) routing, destination-sequenced distance vector (DSDV) routing, temporally ordered routing algorithm (TORA), and zone routing protocol are some routing protocols that exist for mobile ad hoc networks.
- In a mobile WSN, the communication links may come up and fail very dynamically. Therefore, the routing protocol has to take care of the connectivity issue also in such a WSN setup. Data packets are to be routed taking this connectivity issue into consideration. Otherwise, there will be significant loss of data packets due to failed links apart from all other reasons such as frequent death of sensor nodes or noise of the wireless links.

From paper [4], maker shows an outline of best in class coordinating techniques in remote adhoc and sensor frameworks and components the ideal conditions/hindrances and execution issues of each guiding strategy. The fact of the matter is to perceive coordinating traditions that will have the ability to help the compactness of sensor centres in WSNs including both static and adaptable (mixed WSN) centre points.

III. Proposed System:



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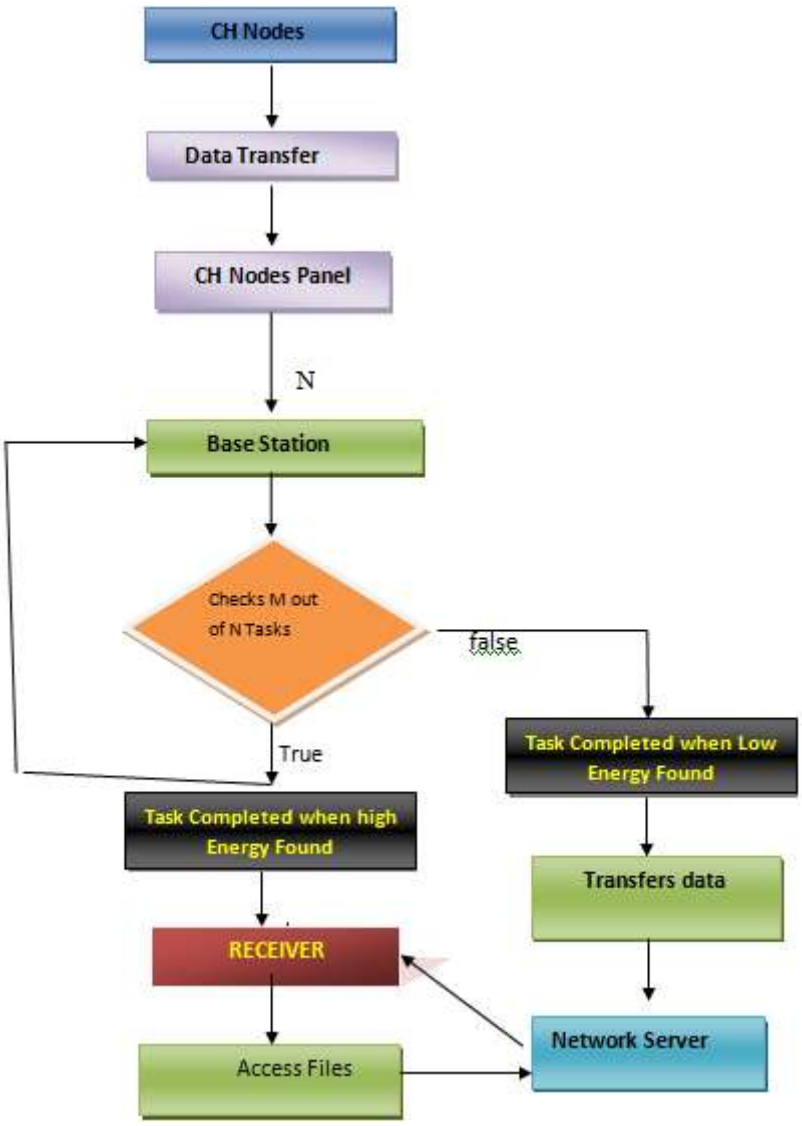
CH node:

- CH node can upload the file through wireless network.
- It can also view the file content on the window, which is being uploaded.
- It can apply Encryption algorithm to improve the security & protection.
- It can select the file to upload.

Wireless Sensor Network:

- It is the medium by which CH node, DCH nodes, Base station communicate with other.
- It is the cluster of all nodes and every node is part of this big cluster



- CH node is the starting point in this flow chart. CH node is transferring data to other nodes.

- CH node panels are combination of CH and DCH node panels. Job of DCH is to collect information around surrounding which will be forwarded to the base station for verification.
- In this case CH node is sending files to the other CH node or sensor node.
- Base station will transfer the files or redirect the file packets to the network server.
- End user can access the file by using the secret Key transferred by the user which will be checked by the network server, if it is genuine or not. After that only data will be handed over to the client or user.
- M out N is the number of tasks allocated for execution. Here M is the number of tasks or job completed in total jobs allocated i.e. N.

  But tasks can be completed in both cases, i.e. in low energy state or high energy state. If M out N condition is false, it will simply count the task M completed at low energy level and transfers the data file to the network server. On the other hand if M out of N condition is true it transfers the data files through the high energy states nodes and then counts how many tasks that is number of M out of N jobs have been completed. Also receiver can access the file in high energy state of the nodes via network server.

Conclusions

We presented the first *k*-out-of-*n* framework that jointly addresses the energy-efficiency and fault-tolerance challenges. It assigns data fragments to nodes such that other nodes retrieve data reliably with minimal energy consumption. It also allows nodes to process distributed data such that the energy consumption for processing the data is minimized. Through system implementation, the feasibility of our solution on real hardware was validated. Though the proposed study covers energy efficient reliable routing, it is failed to represent the basic security issues in Wireless sensor networks. The proposed framework can be improved by utilizing encryption calculation. When the sensor node sense data from environment can be encrypted and the cipher text can be forwards to base station via cluster head. The base station can decode and recover the first information.

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