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Enhanced and Energy Efficient Ring Routing Protocol for WSN with Cluster Head and Mobile Sink Node

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Abstract—In wireless sensor networks, energy efficiency is considered to be a crucial issue due to the limited battery capacity of the sensor nodes. Due to the converge cast nature of traditional WSN packet forwarding approaches resulting in the concentration of data traffic towards the sinks, the nodes in the vicinity of the static sinks are more likely to deplete their batteries before other nodes. Load-balancing is implicitly provided by the sink mobility, shifting the hotspots around the sinks and spreading the increased energy drainage around the sink, which helps achieving uniform energy consumption that extends the network lifetime. To ease the data collection efforts in such scenarios, thus making mobile sinks more applicable, heterogeneous architectures stemming from the marriage of WSNs with other types of networks are also possible. In this project addition propose a novel hierarchical routing protocol for WSNs with a mobile sink, named Ring Routing. By visiting each selected ANs node can efficiently gather data from cluster heads and transport the data to the static data sink.. The results show that when each cluster has at-most two cluster heads, the scheme achieves over more energy saving per node and more energy saving on cluster heads comparing with data collection through multi-hop relay to the static data sink.

Index Terms—Mobile sinks, distributed routing, data dissemination, energy efficiency, mobility, wireless sensor networks

I-INTRODUCTION

Sensor networks are deployed to sense, monitor, and report events of interest in a wide range of applications including, but are not limited to, military, health care, and animal tracking. In many applications, such monitoring networks consist of energy constrained nodes that

are expected to operate over an extended period of time, making energy efficient monitoring an important feature for unattended networks. In such scenarios, nodes are designed to transmit information only when a relevant event is detected.

Consequently, given the location of an event-triggered node, the location of a real event reported by the node can be approximated within the node's sensing range. In the example depicted in Fig. 1.1, the locations of the combat vehicle at different time intervals can be revealed to an adversary observing nodes transmissions. There are three parameters that can be associated with an event detected and reported by a sensor node: the description of the event, the time of the event, and the location of the event.

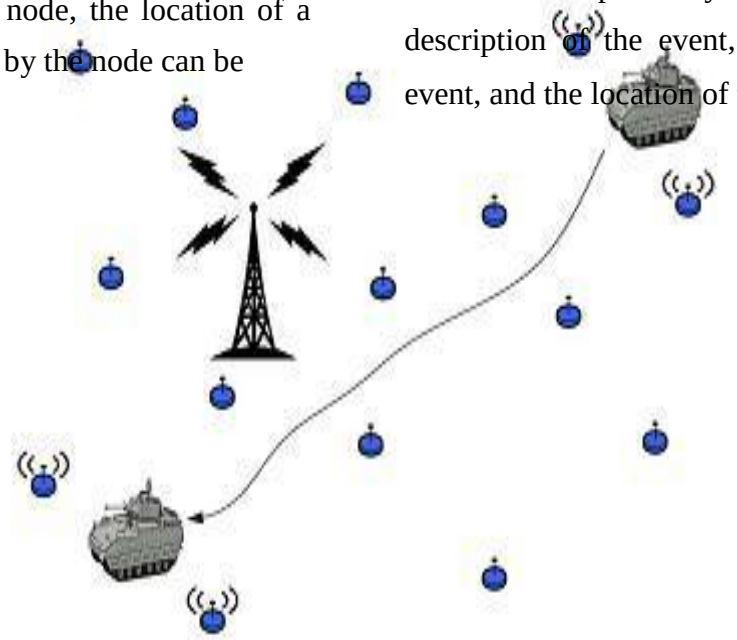


Figure 1.1 A sensor network deployed in a battlefield. Only nodes in close proximity to the combat vehicle are broadcasting information, while other nodes are in sleep mode.

When sensor networks are deployed in untrustworthy environments, protecting the privacy of the three parameters that can be attributed to an event-triggered transmission becomes an important security feature in the design of wireless sensor networks. While transmitting the "description" of a sensed event in a private manner can be achieved via encryption primitives, hiding the timing and spatial information of reported events cannot be achieved via cryptographic means. Encrypting a message before transmission, for instance, can hide the context of the message from unauthorized

observers, but the mere existence of the ciphertext is indicative of information transmission. The source anonymity problem in wireless sensor networks is the problem of studying techniques that provide time and location privacy for events reported by sensor nodes.

II-RELATED WORKS

Mario di francesco and Sajal k. Das crewman stated, Wireless sensor networks (WSNs) have emerged as an effective solution for a wide range of applications. Most of the traditional WSN architectures consist of static no des which are densely deployed over a sensing area. Recently, several WSN architectures based on mobile elements (MEs) have been proposed. Most of them exploit mobility to address the problem of data collection in WSNs.

In this paper defined WSNs with MEs and provide a comprehensive taxonomy of their architectures, based on the role of the MEs. Then, we present an overview of the data collection process in such scenario, and identify the corresponding issues and challenges. On the basis of these issues, we provide an extensive survey of the related literature. Finally, we compare the underlying approaches and solutions, with hints to op en problems and future research directions.

The authors **Elyes ben hamida, Guillaume chelius** decribes in wireless sensor networks, data dissemination is generally performed from the sensor nodes towards a static sink. In this paper, we address the particular case where the sink is mobile, according to an unpredictable mobility pattern. First, we study existing approaches. As an alternative, we present the Line-Based Data Dissemination (LBDD) protocol. Next, we analytically evaluate the communication cost of this protocol and we compare it to other approaches. Finally, realistic simulations are performed and results show that LBDD outperforms previous approaches and presents the best tradeoff among the evaluated protocols.

Youngsang yun and Ye xia proposes a framework to maximize the lifetime of the wireless sensor networks (WSN) by using a mobile sink when the underlying applications tolerate delayed information delivery to the sink. Within a prescribed delay tolerance level, each node does not need to send the data immediately as it becomes available. Instead, the node can store the data temporarily and transmit it when the mobile sink is at the most favorable location for achieving the

longest WSN lifetime. To find the best solution in the proposed framework, we formulate optimization problems that maximize the lifetime of the WSN subject to the delay bound constraints, node energy constraints, and flow conservation constraints. We conduct extensive computational experiments on the optimization problems and find that the lifetime can be increased significantly as compared to not only the stationary sink model but also more traditional mobile sink models. We also show that the delay tolerance level does not affect the maximum lifetime of the WSN.

III-EXISTING SYSTEM

Ring Routing is an energy efficient, reliable routing protocol that provides fast data delivery. Extensive simulations are conducted to evaluate the performance of Ring Routing. It is compared with two existing mobile sink routing protocols, Line-Based Data Dissemination (LBDD) and Railroad terms of energy consumption, lifetime and data reporting delay metrics. Ring Routing outperforms its competitors in almost all scenarios and proves to be a successful routing solution.

Ring Routing, is a hierarchical mobile sink routing protocol. In this existing system, the most influential hierarchical mobile sink routing protocols are reviewed and their benefits and drawbacks are determined. Lastly the highlights of Ring Routing with respect to these protocols are determined.

DRAWBACKS OF EXISTING SYSTEM

- How to find anchor node and compatible pairs for each sink node is not studied.
- Partition the continuous space to locate the optimal anchor node for each sink node is not carried out.
- To achieve optimal overall routing diversity is not carried out.
- Schedule uploading from multiple sink in not done.

IV-PROPOSED SYSTEM METHODOLOGY

The proposed system includes solving the problem of how to find anchor node and compatible pairs for each sink node. A discretization scheme is developed

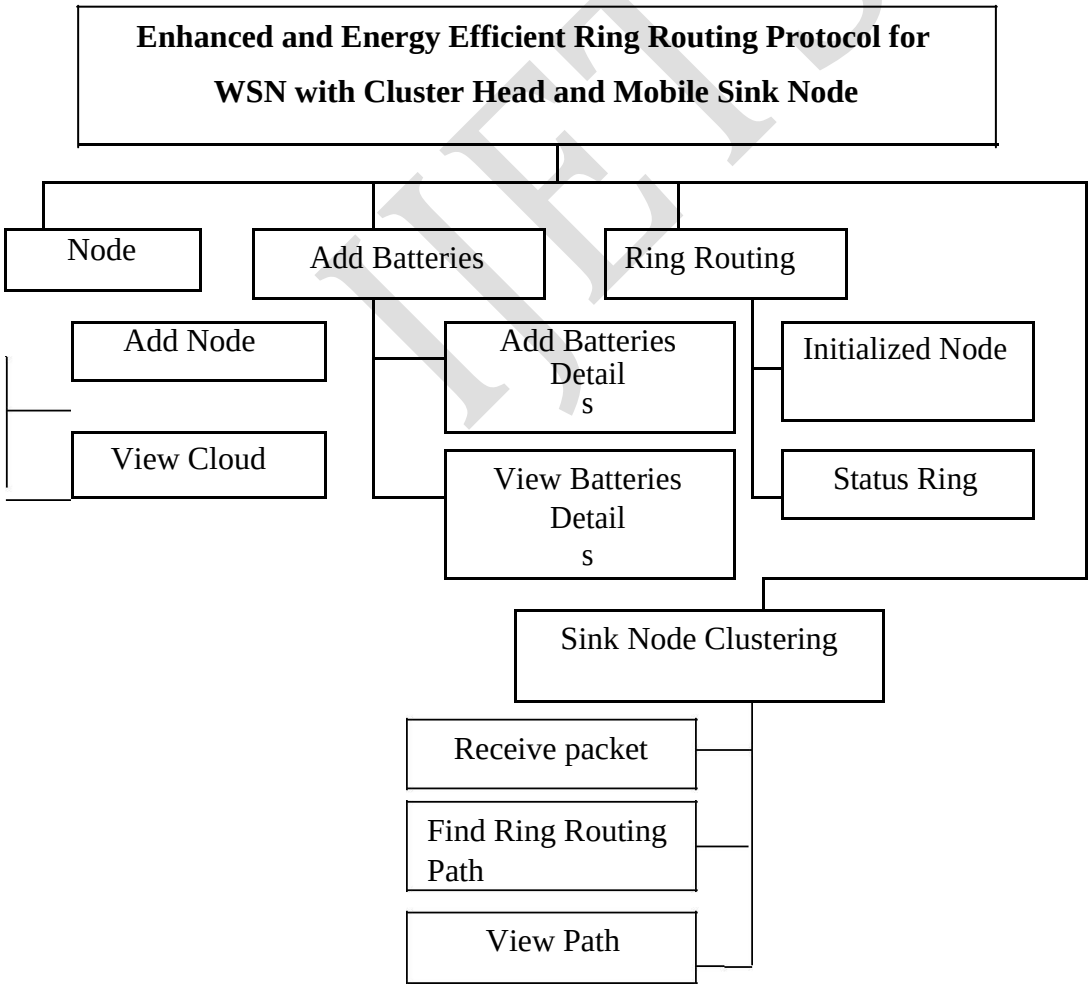
to partition the continuous space to locate the optimal anchor node for each sensor network. Then finding the compatible pairs becomes a matching problem to achieve optimal overall routing diversity. The second problem is how to schedule uploading from multiple sink node. An algorithm that adapts to the transmission scheduling algorithms is included.

ADVANTAGES

The proposed system has following advantages.

- To find anchor node pairs for each sink node is studied.
- Partition the continuous routing to locate the optimal polling point for each sink node is carried out.
- To achieve optimal overall routing diversity is carried out.
- Schedule uploading from multiple sink nodes in done.

ARCHITECTURE OF PROPOSED METHODOLOGY



V-CONCLUSION

The proposed system introduces a method to improve routing performance with small routing states. It solves the local minimum problem by embedding a network topology to a low-dimensional Euclidean space where hop distances between pairwise nodes. Based on accurate hop distance comparison between neighboring nodes, the greedy forwarding can find the shortest path between two nodes. The project shows that the routing quality can be improved by embedding a network topology to a Euclidean space. Nearest node location need not be retrieved from base station, since partial path information (achieved through maintaining trusted value of the path) is maintained. Calculation overhead is reduced since it maintains the quality details of previous communications.

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