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Fairness Driven Secure Routing in Overlapped WSN Using Bait Detection

Rasika R. Vibhute, Sanjay Pingat

Department of Computer Engineering, Smt.Kashibai Navle College of Engineering, Vadgaon (BK), Savitribai Phule University, Pune, Maharashtra, India

Department of Computer Engineering, Smt.Kashibai Navle College of Engineering, Vadgaon (BK), Savitribai Phule University Pune, Maharashtra India

ABSTRACT: Wireless sensor network gain enormous attention because of multiple overlapping WSN. Deploying wireless networks on the same area get advantage. WSN lifetime is expected to be extended by cooperative packet sending across huge wireless sensor network. But WSN designer do not consider the heterogeneity in the characteristics of each WSN such as battery capacity, operation start time, and the number of sensor nodes, nodes locations, energy power consumption, packet size and/or data transmission timing, and route discovery. In a heterogeneous type of wireless network, naive lifetime enhancement with cooperation may not be fair. So in proposed fair cooperative routing method for heterogeneous overlapped WSN this system implement an energy pool to manage the large amount of battery power reduction by cooperative packet forwarding. The energy pool is used as broker for fair cooperation. In order to make packet transmission easy this system present systematic and novel way of fairness driven queue management scheme. Fairness driven scheme helps to congestion control by monitoring UDP data packet among overlapping wireless communication with a stochastic nearest node. By using the address of nearest sensor node as a bait destination address to bait compromised nodes to transfer a reply message (RREP) and malicious nodes are detected by a reverse tracing technique thereby prevents and ensures security.

KEYWORDS: Routing, wireless network, UDP, shared Node, Hop to Hop to communication etc

I. INTRODUCTION

Proposed a fair cooperative routing method is uses heterogeneity of wireless networks and, to overcome overlapping improvement on certain networks. This design adds one or a few *shared nodes* those can use multiple channels to transmit data packets. Proposed work assumes that sinks and shared nodes can communicate with any WSNs, different WSNs can apply cooperative routing with each other because of that shared nodes permit sensor nodes to transmit data from another WSN as the function of access points between respective WSN network area. While receiving a data packet, shared node choose the route to send the packet, according to proposed route selection methods. This cooperation increase the lifetime of each network equally as possible. In wireless sensor network clustering of sensor nodes is important methods so that it is better scalability and the support for data aggregation. Data aggregation helps to avoid duplicate data packet being forwarded between multiple sensor nodes into one data packet by removing same information. This reduces the packet sending overload and the total amount of data. This energy consumption is decreased in clustering, because the energy consumption is well balanced by dynamic sensor selection of cluster heads. By changing the cluster head role among other sensor nodes dynamically in WSN, every node is expected to spend the same large amount of energy over time. Still, in multi hop forwarding, a CH around a sink node seeks to have higher network traffic than other CHs. As a result, nodes around sinks node die earlier than other nodes, even in clustered WSN. In a multiple-sink WSN, sensor nodes are divided into a multiple clusters. Sensor nodes within a cluster are connected with one sink, which is part of that cluster. The address of the closet node is used as the bait destination address, baiting compromised sensor to send RREP response acknowledgement and finds the malicious nodes by using the reverse trace. Finally the detected compromised node is listed in the black hole list and notifies the remaining sensors in the network to stop any packet transfer with them. As a result, my proposed scheme can reduce packets loss.

II. REVIEW OF LITERATURE

This paper present huge coverage and connectivity to create a single requirement called connected coverage. Proposed work show that connected coverage is different from needed non-combined covered area and connection. At last,

Propose definition also supports the concept of graceful reduction by providing approach of estimating the degree of compliance with the application requirements. This work demonstrate the applicability of our definition based on the analyzed lifetime definitions and using some sort of example as scenarios to explain the various aspects affecting sensor network lifetime [1]. Proposed system refer the important aspect of more energy consumption rates as the energy hole problem, which may result in disaster such as premature death of the entire wireless network. So to represent proposed an analytical modeling for this problem, which can help understand the relevance of different factors on energy consumption rate. Using this model, this study the effectiveness of multiple existing techniques towards reducing the .energy hole problem, including deployment support, traffic compression and aggregation. This work had used simulation results to validate our analysis [2]. We consider multi-domain sensor networks, by which we mean a set of sensor networks that co-exist at the same physical location but run by different network owner. In this network setting, the lifetime of all networks can be improved, if the nodes cooperate and also send packets originating from another domain. There is a risk, however, that single purpose network is beneficial of the cooperativeness of the other networks and explore them [3].We deal with scoping as a general concept for the creation and maintaining wireless communication network where, node subsets and describe a flexible and modular architecture that meets the requirements of multi-purpose WSNs. The energy consumption and thus the unattended network lifetime of wireless sensor nodes may not be the dominating cost, but only one facets contributing to the total cost of a wireless network. Another energy cost factors include the development of WSN systems, maintenance and the return-of-investment [4]. From this paper we consider cooperation strategies for developing sensor network lifetime in overlapped wireless sensor networks through a linear programming paradigm. While in this model is detailed enough to capture the essence of the multi-domain cooperation we dramatically avoid implementation particular details. Hence, we use our framework to determine almost achievable performance benchmarks in idealized yet practical settings [5].This framework presents linear programming towards cooperation of neighbor sensor network in comparison on cooperating network, Where neighbor sensor network cooperate with each other for packet transmission. It result in network lifetime is increased significantly and cooperation reduces the probability of disjoint partitions created because of limited transmission ranges of sensor nodes. Removing disjoint partition is possible because of having shorter transmission range in sensor network [6].This survey enhancement a routing method for cooperative forwarding in such multiple WSNs that will extends network lifetime. In multiple WSNs, every sink node location differs from the each other, and few nodes around a sink node in single WSN may be long from a sink in another WSN. Proposed work focus on this problem in the proposed method, with a node that is far from a sink in its own network and near to a sink in another network being able to send packets from a node in another WSN to the relevant sink [7].This Paper focuses on the many sink node problems in long area wireless sensor networks. Various problems depends on design condition are presented. This network finds location sink nodes to the sensor network, where we are given a time constraint that states the minimum required operational time for the sensor network. It will manage battery resource of wireless sensor nodes to extend network life time in WSN [8]. This paper presents novel way which is based on the decoupling of WSN network and application ownership. The main function of this technique is to create a framework that allows sensor network infrastructures to be shared among multiple applications that is belongs to different authorities [9]. Multiple WSNs are deployed in the same location and their sensor network cooperate with the other WSN, Which may be improve their operability, by improving its lifetime by commercial routing for increasing the data entropy by a common data collection[10].

III. SYSTEM ANALYSIS

The following figure shows that how the communication is done between different wireless sensor networks. Proposed system manages overlapped wireless sensor network with following architecture.

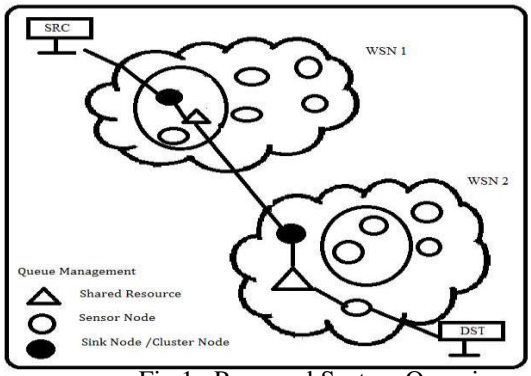


Fig.1. Proposed System Overview

3. Increase lifetime of WSN:-

The original idea behind using multipath routing approach in WSN was to provide path resilience and reliable data transmission. In the fault tolerance domain, whenever a sensor node does not send its data packets towards the sink, it can benefit from the availability of alternative paths to transfer its data packets from node or link failures.

4. Maximize the success ratio:-

Active routing scheme need to design for maximizing success ratio.

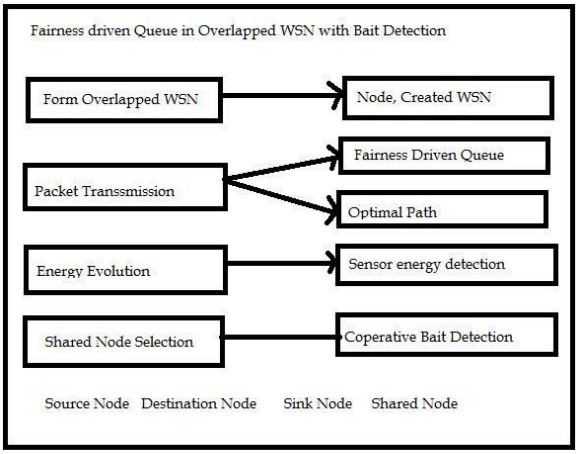


Fig. 2. System Overview –Block Diagram

Improve the quality of a single-hop wireless link/hyperlink. It does not naturally show the transmission capability of an end to end path. Minimizing the total number of transmissions to deliver a packet from a source node to a destination node does not necessarily maximize the end-to-end throughput. Active trust based routing scheme for secure communication in wireless sensor network. Cooperation between sensor WSN:-It is assumed that a WSN has a rational and selfish character and will only cooperate with another network if this association provides services that justify the cooperation.

1. Reduce Delay:-
The delay need to reduce in multipath routing because backup routes are identified during route discovery.

2. Load Balancing:-
An s traffic distribution is not equal in all links in the network, spreading the traffic along multiple routes can alleviate congestion in some links and bottlenecks.

Fairness driven management in WSN

In this paper proposed work presents novel approach for secure and efficient overlapped wireless network communication. In Sensor nodes consume their energy only by communication, which is a reasonable assumption in sensor networks with simple sensors. Sinks and shared nodes have sufficiently large batteries or power supply. We define the

WSNs' lifetime as the time when a first sensor node depletes it's all battery energy. For heterogeneity, the battery capacity of a sensor node, the number of nodes, nodes' locations, energy consumption by communication, packet size, data transmission timing and operation start time are different by each WSN.

Mathematical Model

T Proposed work design the overlapped WSNs model for fair cooperation routing. In a sensing field, m different

WSNs N1,

・ ・ ・, Nm are constructed, and each network Ni, 1 ≤ i ≤ m, has a set of unique sensor nodes Ni = {ni1, ni2. . . ni|Ni |} and the sink BSi. q Shared nodes s1. . . Sq also exists in the area. All WSNs are able to use these shared nodes as relay node for packet forwarding. For guaranteeing the lifetime improvement by the cooperation, we define *network lifetime Li* , the estimated lifetime of *Ni* , is obtained by

Route Discovery Delay:

Let the route discovery be the case where the sender does not have or lost the routes to the next hop and the corresponding destination, and it needs to (re)discover the latter

*DelayRD(D, I *)[s] = CostComm(D,I *)[s]+ CostComp(D)[s]*

Shortest Path Problem:

Input: a weighted graph

G= (V, E)

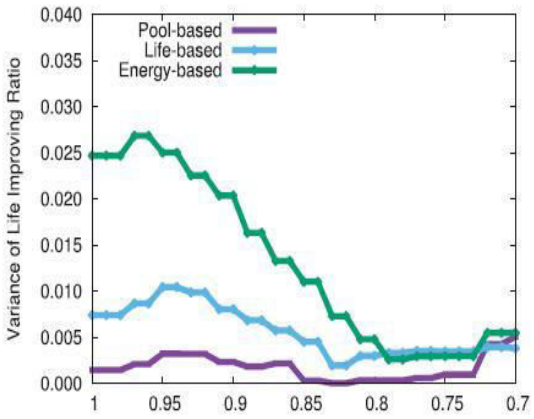
- The edges can be directed or not
- Sometimes, we allow negative edge weights

Note: use BFS for un weighted graphs

Output: the path between two given nodes U and v that minimizes the total weight (or cost, length) Sometimes, we want to compute all-pair shortest paths Sometimes; we want to compute shortest paths from U to all other nodes.

IV. RESULT ANALYSIS

Following figures shows the fairness driven approach for network lifetime increase in overlapped heterogeneous and homogeneous wireless sensor communication.



The proposed system mainly focuses on improvement of throughput of wireless communication in overlapped network for heterogeneous and homogeneous WSN. Using Fairness driven queue management the results are improved .It gives extended lifetime for the network and gives better transmission rate for network. Proposed approach is based on cooperative bait detection technique to identify and prevent abnormal nodes attack in network. Proposed network adds the benefit of pool based detection that can overcome just using proposed algorithm. Proposed result can be an efficient for unfairness detection on well-mannered responsive network however affected a congestion collapse. It gives rise to

the need for router-based fairness-driven queue management schemes to shield responsive flows and to regulate unresponsive and misbehaving flows.

RESULT TABLE:-

In this section performance metrics are use d to evaluate performance of routing protocols and data dissemination protocols scheme when no in networking processing is performed and no caching is used.

Parameter	**Value**
Simulation Time	500ms
Terrain Area	600*500
Time Arrival	32ms
Protocol	DSR
No of Node	25,45,100

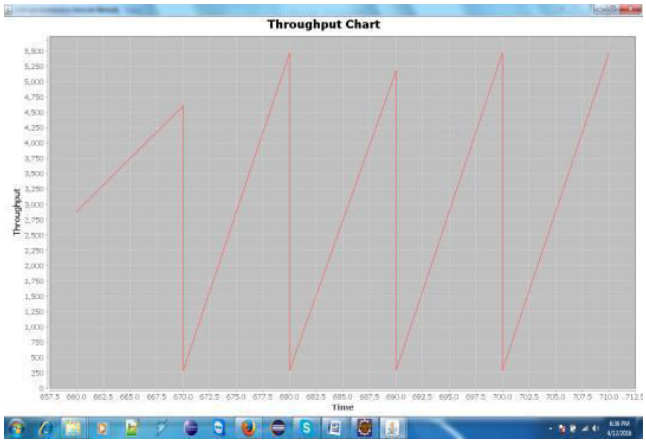
Comparison with similar System

Goals	Existing System	Proposed System
Throughput	80	90
Network	Overlapped WSN	Overlapped Clustered Heterogeneous & Homogeneous
Controller	KGC	Hop to Hop
Security	Secret Key	Bait detection
Protocol	AODV	DSR

Performance Measure Used:

1. Throughput Maximization:-

Throughput maximization by reduce delay ratio and improving packet delivery ratio in WSN. In overlapped WSN sensor nodes are heavy loaded so that there is the problem of more energy consumption.

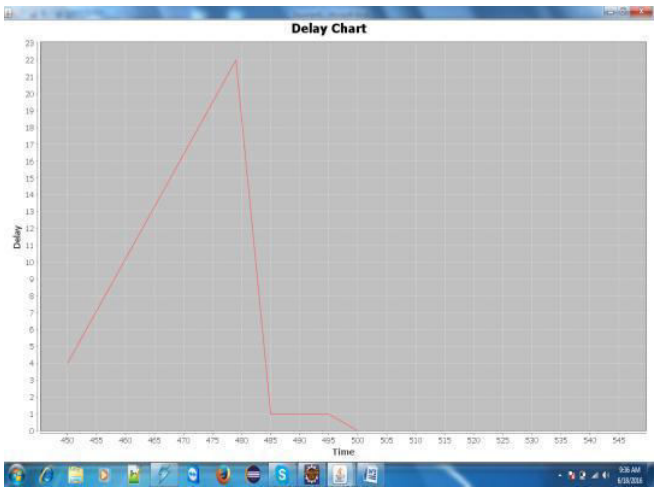


2. Packet Delivery Ratio

This measure is used for average packet delivery ratio to verify WSN communication. Packet transmission needs to send packet energy efficient which result in maximizing throughput.

Average End to End Delay (ms)

Average end to end delay ratio reduced by queue management for efficient network communication.



Outcome and success Definition:-

Heterogeneous wireless sensor network structure is deployed in same area so it may be overlapped because of same bandwidth criteria. So proposed work focus on different type of overlapped sensor networks, It is expected that the sensor nodes lifetime is networks required cooperated on wireless network. However, the sensor network the existing methods do not cover the heterogeneity in every wireless network, fairness in order to lifetime enhancement is required. In proposed a fair cooperative routing method which has share nodes, with the goal of achieving fair lifetime improvement in heterogeneous overlapped sensor networks. Simulation results showed that the proposed method extended the network lifetime. In wireless sensor network, *Pool-based* cooperation achieved quite small variety of lifetime improvement, that is, it provided quite fair cooperation. To enhance lifetime of overlapped WSN proposes a technique of fairness driven queue management. This work also support for attack detection overlapped WSN.

Proposed system designed to implement following..

1. Create Wireless sensor Network
2. Cluster sensor node type
3. Route discovery and Routing table
4. Bait detection
5. Shared Node Assignment and Routing
6. Throughput Maximization

1. Network Formation:

In this module implements wireless sensor network by simulation.

Here simulation shows that source and destination node communication with clustered network. Proposed simulation shows that heavy loaded nodes are type of homogeneous and heterogeneous wireless network.

V. CONCLUSON

Heterogeneous wireless sensor network structure is deployed in same area so it may be overlapped because of same bandwidth criteria. So proposed work focus on different type of overlapped sensor networks. It is expected that the sensor nodes lifetime is networks required cooperated on wireless network. However, the sensor network the existing methods do not cover the heterogeneity in every wireless network, fairness in order to lifetime enhancement is required. In proposed a fair cooperative routing method which has share nodes, with the goal of achieving fair lifetime improvement in heterogeneous overlapped sensor networks. Simulation results showed that the proposed method extended the network lifetime. In wireless sensor network, *Pool-based* cooperation achieved quite small variety of lifetime improvement, that is, it provided quite fair cooperation. To enhance lifetime of overlapped WSN proposes a technique of fairness driven queue management. This work also support for attack detection overlapped WSN. In fairness driven queue management scheme help UDP protocol for congestion control in overlapping wireless communication. This work enhance the network lifetime by using bait detection to avoid network failure by malicious nodes.

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