Analysis of Different Packet Dropping Detection and Removal Techniques

Priyanka Salunkhe
Dept. of Computer Sci.& Eng, Priyadarshini Bhagwati college of Engineering, Nagpur, India.

Archana A. Nikose
Dept. of Computer Sci.&Eng, Priyadarshini Bhagwati college of Engineering, Nagpur, India.

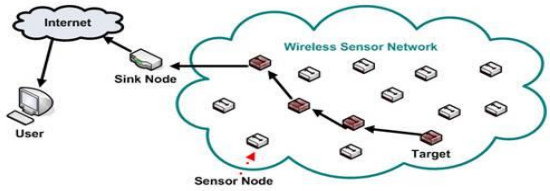
Abstract – In recent years, an efficient design of a Wireless Sensor Network (WSN) has become a leading area of research. It consists of base stations and numbers of nodes (wireless sensors). These networks are used to monitor physical or environmental conditions and co-operatively pass data through the network to a main location. A requisite application in WSN is node fault detection i.e. one of the key technology. In focus of achieving secure routing and increase the network lifetime, this work proposes a routing protocol called as Cost-Aware SEcure Routing (CASER). CASER proposed routing strategies for message forwarding like shortest path and secure message forwarding. It addresses two conflicting issues through two adjustable parameters: energy balance control (EBC) and probabilistic-based random walking. Self-Deployment of mobile sensors to achieve target coverage in presence of obstacles. Probabilistic based random walking the proposed protocol can achieve a high message delivery ratio in case of security while preventing routing from malicious tracebacks. Our theoretical analysis and NS2 simulation result will elaborate that we can increase the lifetime of network and the number of messages that can be delivered under non-uniform energy deployment by more than four times. The main objective to have a network which gives assurance of packet delivery and give the node time to regain, so that it will be able to carry further load packets on the network.

Index Terms – CASER, DARA, EBC, Fault detection, NS2, PADRA, Security.

1. INTRODUCTION

Wireless sensor networks (WSN) is built with nodes that are used to observe the surroundings like temperature, humidity, pressure, position, vibration, sound etc. These nodes can be used in various real-time applications to perform various tasks like smart detecting, a discovery of neighbor node, data processing and storage, data collection, target tracking, monitor and controlling, synchronization, node localization, and effective routing between the base station and nodes. Target is to cooperatively sense, collect and process the information about objects in the node failure, and then send it to the observer for processing and analyzing.

The sensors are wireless data acquisition devices for the more powerful actor nodes which process the sensor readings and put forward an appropriate response. A failure of an actor may cause the network to partition into disjoint blocks and thus violate such a connectivity requirement. The remote setup which WSANs often serve makes the deployment of additional resources to replace the failed actors impractical. The repositioning of nodes becomes the best recovery option. When a node fails, its neighbors will individually consult their possibly incomplete routing table to decide on the appropriate course of actions. If the failed node is critical to the network connectivity, the neighbor that belongs to the smallest block reacts. It require every node to maintain a list of their multi-hop neighbors and determine the scope of the recovery by checking the failed node.



Cost-Aware SEcure Routing (CASER) protocol for WSNs to balance the energy consumption and increase network lifetime. CASER has the flexibility to support multiple routing strategies in message forwarding to extend the lifetime while increasing routing security. CASER has an excellent routing performance in terms of energy balance and routing path distribution for routing path security. Distributed Actor Recovery Algorithm (DARA) is used to check data packet is or not recovered in the routing list. Partition Detection & Recovery Algorithm (PADRA) informs that if data packet has not been recovered go through another best path available. We also proposed a non-uniform energy deployment scheme to maximize the sensor network lifetime.

2. LITERATURE SURVEY

[1] G. SNEHA PRANEETHA[1] elaborates conflicting issues in WSN like energy consumption and security. To overcome this problem some parameters are used Energy balance control using PSO (Particle Swarm optimization) and Lifetime optimization TORA (Temporally Ordered Routing Algorithm). They presented secure and efficient CASER protocol for

WSNs to balance the energy consumption and increase network lifetime. This design guarantees a high message delivery ratio until energy runs out from all sensor nodes at about the same time.

[2] K. Gowsic#1 A. Sivanantham#2Dr.N. Shanthi#3 B. Preetha#4 discussed Wireless sensor network often used in a challenging application where data transmission is daunting. In order to improve the reliability of the data transmission two novel energy-aware routing algorithms for wireless ad hoc networks called Signal Interference Noise Ratio (SINR) and TABU energy routing has been proposed in this work. SINR addresses some parameters like energy-efficiency, reliability and operation of network. It deliberates the energy consumption and the remaining battery energy of nodes as well as quality of links to find energy-efficient and reliable routes that increase the operational lifetime of the network. TABU on the other hand, is an energy-efficient routing algorithm which finds routes minimizing the total energy required for end-to-end packet traversal. RMER and RMECR are proposed of networks in which either hop-by-hop or end-to-end retransmissions ensure reliability. This makes SINR an elegant solution to increase energy-efficiency, reliability and lifespan of wireless ad hoc networks.

[3] P. Haritha1, Dr. K. Rama Krishniah2, D. Sarath Babu3 discussed Lifetime optimization and security are two conflicting design issues for multi-hop wireless sensor networks (WSNs) with non-replenish able energy resources. In this paper, we first propose a novel secure and efficient Cost-Aware SEcure Routing (CASER) protocol to address these two conflicting issues through two adjustable parameters: energy balance control (EBC) and probabilistic based random walking. Then discover that the energy consumption is severely disproportional to the uniform energy deployment for the given network topology, which greatly reduces the lifetime of the sensor networks. In this paper to solve this problem, we propose an efficient non-uniform energy deployment strategy to optimize the lifetime and message delivery ratio under the same energy resource and security requirement. We also provide a quantitative security analysis on the proposed routing protocol. This paper demonstrate that the proposed CASER protocol can provide an excellent tradeoff between routing efficiency and energy balance, and can significantly extend the lifetime of the sensor networks in all scenarios.

[4] 1Nagalgaonkar Pramod, 2Dhanraj Biradar, 3Gaikwad RanjitSharnappa provided in this paper a thorough investigation of faults that occurred in real WSN deployments. By focusing only on the faults, the lessons learned from the different deployments can be used by any application even if the investigated trial had a different research focus. We proposed taxonomy to classify faults and failures that occur in WSN. We also studied the problem of fault detection and recovery, surveying the different techniques currently applied in WSN research. A classification of the available fault tolerance techniques for wireless sensor networks has been proposed considering the various mechanisms adopted by the solutions. To our knowledge this is the first work that provides a concise survey and classification in this area. Through the classification proposed it is possible to compare the different solutions identifying the strong and weak points of each of them. This allows for a correct selection of the techniques that are more suitable to specific applications.

[5] Er. Jaspreet Kaur, Er. Parminder Kaur specifies that last few years Wireless Sensor Networks have gained attention of lots of researchers in various applications like environmental monitoring, battle field and health care monitoring etc. Sensor nodes in WSN are prone to failure due to hardware failure, depletion of energy, malicious attacks etc. This paper presents the survey on various fault detection and recovery technique.

[6] B. Sireesh[1], G.TagoriSai Prasad[2] , elaborates routing performance in terms of energy maintenance and path delivery ratio under non uniform energy deployment by more than four times by using SERS algorithm. It also provides high security as well as high efficiency on transmitting the message. It achieves high message delivery ratio, high performance, reduce the energy waste and also improves the security and reduces attacks.

[7] Ian F. Akyildiz et al elaborates a Wireless sensor and actor networks (WSANs) refer to a group of sensors and actors linked by wireless medium to perform distributed sensing and acting tasks. The realization of wireless sensor and actor networks (WSANs) needs to satisfy the requirements introduced by the coexistence of sensors and actors. In WSANs, sensors gather information about the physical world, while actors take decisions and then perform appropriate actions upon the environment, which allows a user to effectively sense and act from a distance. In order to provide effective sensing and acting, coordination mechanisms are required among sensors and actors. Moreover, to perform right and timely actions, sensor data must be valid at the time of acting. This paper explores sensor-actor and actor-actor coordination and describes research challenges for coordination and communication problems.

[8] G.Wang, G. Cao, and T. La Porta discussed Adequate coverage is very important for sensor networks to fulfil the issued sensing tasks. In many working environments, it is necessary to make use of mobile sensors, which can move to the correct places to provide the required coverage. In this paper, we study the problem of placing mobile sensors to get high coverage. Based on Voronoi diagrams, we design two sets of distributed protocols for controlling the movement of sensors, one favoring communication and one favoringmovement. In each set of protocols, we use Voronoi diagrams to detect coverage holes and use one of three algorithms to calculate the target locations of sensors if holes

exist. Simulation results show the effectiveness of our protocols and give insight on choosing protocols and calculation algorithms under different application requirements and working conditions.

[9] Er. Saurabh, Dr. Rinkle Rani Aggarwal elaborates WSNs have unique specifications of themselves that describe them different from other networks. Fault tolerance is one of the most significant of many challenges in these networks. Five key features need to be considered when developing WSN solutions: scalability, security, reliability, self-healing and robustness. In this paper the main objective is to provide a comparative study of fault detection techniques using different approaches. Sensor nodes have various energy and computational constraints. To provide quality service by coverage protocols, there arises a need for developing protocols to provide fault tolerance, event reporting, and maintain energy efficiency.

[10] Monika Nagpal[1] , Praveen Kumar[2] elaborates the emergency of mobility in distributed system has led to the start of new era of computing. Recent technological advances in mobile or handheld devices and wireless technology had made the mobile computing affordable. Due to new emerging characteristics of mobile node, mobile computing environment is more prone as compared to fixed infrastructure. In this paper, we present failure recovery techniques, issues and challenges with respect to mobile distributed systems.

[11] G. VenniraSelvi 1, R. Manoharan 2 illustrates fault tolerant and reliable dissemination is an important issue in WSN, due to the deployment of sensor nodes in hostile environment. Most of the clustering algorithms are concentrated to increases the network lifetime and reduces the energy consumption among the sensor nodes and do not consider the reliability of the networks. Fault tolerance techniques detect and recover the sensor nodes from hardware and software failure to increase the reliability of the networks. This paper studies different approaches for fault tolerant issues and we summarize and compare the current work that has been done in fault tolerant for clustering algorithm.

3. CONCLUSION

In this project, a secure and efficient Cost-Aware SEcure Routing (CASER) protocol for WSNs to balance the energy consumption and increase network lifetime. Our analysis and simulation to showing that we can increase the lifetime of wireless sensor network and to maintain a list of their multi-hop neighbors and determine the scope of the recovery by checking whether the failed nodes. It also provides the assurances to packet delivery. CASER has advantage to support multiple routing. The main objective is to have a network which gives assurance of packet delivery and give the time to the nodes for regain, so that it will be able to carry further load Packets on the network. This can be done by using shortest path. Multi-hop-based schemes often impose high node repositioning overhead and the repaired inter-actor topology using two-hop schemes may differ significantly from its prefailure status.

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