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Analysis on Life Scalability and Security in Wireless Sensor Network(WSN)

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Abstract: *Analytic models to estimate the entire network lifetime from network initialization until it are completely disabled, and determine the boundary of energy hole in a data-gathering WSN. But in order to balance the energy consumption is very bad since all the sense nodes are mostly dead stage. In this paper, there are propose two mechanisms to hold the maximum node energy. Whenever sense node dead and reaching low powered energy via ON-OFF state. Another model is to find the shortest sense node route along with security mechanism (PLGPA). These two mechanisms will help to send and gather data periodically.*

Keywords: *Wireless sensor network, GCKLN algorthim, PLGPA mechanism.*

I. INTRODUCTION

Wireless sensor networks (WSNs), which are capable of sensing, computing, and wireless communication are widely applied to many applications such as military surveillance, environmental monitoring, infrastructure and facility diagnosis, and other industry applications . A data-gathering WSN consists of a large number of battery powered sensor nodes that sense the monitored area . Periodically send the sensing results to the sink. Since the Battery powered sensor nodes are constrained in energy resource and generally deployed in unattended hostile environment, it is crucial to prolong the network lifetime of WSN. Meanwhile ,as energy consumption is exponentially increased with the communication distance according to the energy consumption model,multi-hop communication is beneficial to data gathering for energy conservation. However, since the nodes close to the sink should forward the data packets from other nodes, they exhaust their energy quickly, leading to an energy hole around the sink. As a result, the entire network is subject to premature death because it is separated by the energy hole.There have been several existing works studying the energy consumption and network lifetime analysis for WSNs. Wireless sensor networks (WSN), sometimes called wireless sensor and actuator networks (WSAN), are spatially distributed autonomous sensors to monitor physical or environmental conditions, such as temperature, sound, pressure, etc. and to cooperatively pass their data through the network to a main location. GEOGRAPHIC routing is one of the most promising routing schemes in wireless sensor networks (WSNs) , due to its simplicity, scalability, and efficiency. In such a scheme, regardless of the network size, the forwarding decision is determined purely based on the location of each node and it can be done even when there are irregular radio ranges and localization errors. Energy hole is crucial and challenging for lifetime analysis in WSNs, because it can lead to a premature death of the network. first prove that the energy hole problem is inevitable in the WSN under some specific conditions. They analyze in what condition the energy holes could appear. discuss the load balancing techniques to mitigate energy hole problem in large- scale WSNs, and propose a distributed heuristic solution to balance the energy consumption of sensor nodes by adjusting their transmission power. The energy hole problem has also been studied in cluster-based locates around the sink, and design energy-efficient routing protocols to mitigate the unbalanced energy consumption and prolong the network lifetime and highly depends on some network parameters, such as the energy consumption model and transmission range of sensor nodes. However, theoretic analysis is not provided in existing works to estimate the emerging time and location of the energy hole, as well as its evolution process.

An analytic model to estimate the traffic load, energy consumption and lifetime of sensor nodes during the entire network lifetime. Furthermore, we estimate the network lifetime under a given percentage of dead nodes, and the remaining energy of the network based on our analytical results. Extensive simulations demonstrate that the proposed analytic model can estimate the network lifetime within an error rate smaller than 5%.(ii) Based on the lifetime analysis of sensor nodes, we investigate the temporal and spatial evolution of energy hole from emerging to partitioning the network, which provides a theoretical basis to mitigate or even avoid energy hole in WSNs. (iii) To validate the effectiveness of our analytical results in guiding the WSN design, we apply them to WSN routing. The improved routing scheme based on our analytical results efficiently balances the energy consumption and significantly improves the network lifetime, including FNDT and ANDT. The remainder of the paper is organized as follows. Sec- tion introduces the system model and formulates our prob- lem mathematically.. We determine the boundary of energy hole in Sec- tion IV as well as some observations on network characteris- tics. Section V validates the analytic model by comparing the analytical results with extensive simulation results. Network lifetime is a crucial performance metric to evaluate data-gathering wireless sensor networks (WSNs) where battery-powered sensor nodes periodically sense the environment and forward collected samples to a sink node.

II. LITERATURE SURVEY

Battery Energy Management in Heterogeneous Wireless Machine-to-Machine Network.. B-RPL to leverage distributed sleep model and introduced routing metrics. A battery energy will efficient data packet transmission and forwarding method is provided to select the most battery energy efficient route among multiple active routes to transmit and forward data packets. Simulation results show that compared with standard RPL, the proposed B-RPL can extend network lifetime by two times and improve data packet delivery rate by 75%.(Liu, Kaikai,2012)

Sleep Scheduling for Geographic Routing in Duty-Cycled Mobile Sensor Networks The first one is the geographic-distance-based connected-k neighbourhood for the first path will be (GCKNF) sleep scheduling algorithm. The second one is the geographic-distance-based connected-k neighborhood of the geographic of the second path will (GCKNA) sleep scheduling algorithm. By theoretical analysis and simulations, we show that when there are mobile sensors, geographic routing can achieve much shorter average lengths for the first transmission path explored in WSNs employing .GCKNF sleep scheduling and all transmission paths searched in WSNs employing.GCKNA sleep scheduling compared with those in WSNs employing CKN and GSS sleep scheduling.(Chunsheng Zhu).

Analysis on Network Life scalability and Security Scheme in wireless sensor network (WSN).When we transmit the data via MANET network, It will reduce the battery energy consumption even for minimal data packet transformation. Since all the node might be in ON status. Also there was a limited security during data transfer from source to destination (may have the chances to hack the data by hackers).So we are going to use sleep scheduling mode by default for all the node. Whenever transfer the data via MANET, the particular node alone will be in ON status and rest of the node still remain in the OFF mode. So we can save the battery power long time. GCKN Algorithms is used in our project to identified the node and path for transfer the data. PLGPA protocol will provide the more security during data transfer. Recently, the research focus on geographic routing, a promising routing scheme in wireless sensor networks (WSNs), is shifting toward duty-cycled WSNs in which sensors are sleep scheduled to reduce energy consumption. **(**Ju Ren)

III. ALGORITHMS

1 .PLGPA MECHANISM

In PLGP, forwarding nodes do not know what path a packet took, allowing adversaries to divert packets to any part of the network, even if that area is logically further away from the destination than the malicious node. PLGPA protocol will provide the more security during data transfer.

2.GCKNF ALGORITHM

1) Send probe packet pu to neighbors and receive the ack packet.

2) Compute whether u's current neighbours

$CNu \geq \min(k, du)$.

3) Maintain its transmission radius if the above condition xzholds or its current transmission radius is the maximum. Otherwise, increase its transmission radius until

$CNu \geq \min(k, du)$.

Second: Run the following at each node u.

1) Get its geographic location gu and sink location gs.

2) Broadcast gu and receive the geographic locations of its all neighbors Au. Let Gu be the set of these geographic locations.

3) Unicast a flag to w, w ∈ Au and gw is the closest to sink in Gu.

Third: Run the following at each node u.

1) Pick a random rank ranku.

2) Broadcast ranku and receive the ranks of its currently awake neighbors Nu. Let Ru be the set of these ranks.

3) Broadcast Ru and receive Rv from each v ∈ Nu.

4) If |Nu| < k or |Nv| < k for any v ∈ Nu, remain awake.

Return.

5) Compute Cu = {v|v ∈ Nu and rankv < ranku}.

6) Go to sleep if the following three conditions hold. Remain awake otherwise.

• Any two nodes in Cu are connected either directly themselves or indirectly through nodes within u's two-hop neighborhood that have rank less than ranku.

• Any node in Nu has at least k neighbors from Cu.

• It does not receive a flag.

7) Return.

GCKN algorithms, which effectively extend existing geographic routing algorithms designed for static WSNs into duty-cycled mobile WSNs by applying sleep scheduling. The GCKNF sleep scheduling algorithm is designed to explore shorter first transmission paths for geographic routing in dutycycled mobile WSNs.

They demonstrate that GCKNF and GCKNA are very effective in shortening the length of the transmission path explored by geographic routing in duty-cycled mobile WSNs compared with the CKN sleep scheduling algorithm and the GSS algorithm. Our work has shown that sleep scheduling is a worthy research direction to adapt geographic forwarding methods into duty-cycled mobile WSN.

IV.NETWORK MODEL

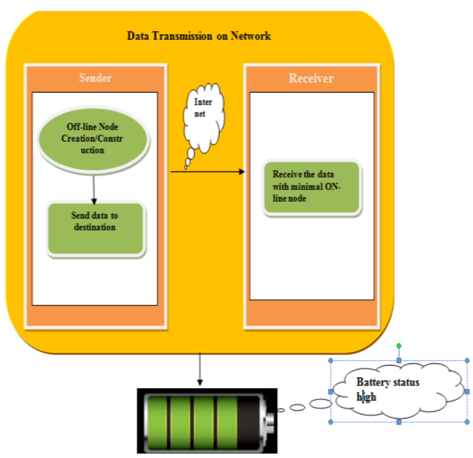

Figure1.Architecture design

The sleep scheduling mode by default for all the node. Whenever transfer the data via MANET, the particular node alone will be in ON status and rest of the node still remain in the OFF mode. So we can save the battery power long time. GCKN Algorithms is used in our project to identified the node and path for transfer the data. PLGPA protocol will provide the more security during data transfer.

In the data transmission the network will be in ON status in the exisiting system.By using the GCKN algorithm to save the battery level lifetime when to transmits the data the network will be faster and it saves the battery level while the data is tramsmitted to the particular node will be in ON status the other nodes will be in OFF status. During transformation of data via MANET network, It will reduce the battery energy consumption even for minimal data packet transformation. Since all the node might be in ON status. Also there was a limited security during data transfer from source to destination (may have the chances to hack the data by hackers). Whenever transfer the data via MANET, the particular node alone will be in ON status and rest of the node still remain in the OFF mode. So we can save the battery power long time. GCKN Algorithms is used in our project to identified the node and path for transfer the data. PLGPA protocol will provide the more security during data transfer. In the data transmission the network will be in ON status in the exisiting system. In the data transmission the network will be in ON status in the exisiting system.

V. SYSTEM MODELS

During transformation of data via MANET network, It will reduce the battery energy consumption even for minimal data packet transformation. Since all the node might be in ON status. Also there was a limited security during data transfer from source to destination (may have the chances to hack the data by hackers).In this paper, we are proposing the sleep scheduling mode by default for all the node. Whenever transfer the data via MANET, the particular node alone will be in ON status and rest of the node still remain in the OFF mode. So we can save the battery power long time. GCKN Algorithms is used in our project to identified the node and path for transfer the data. PLGPA protocol will provide the more security during data transfer.

Dynamic node construction

We are used Jung algorithm for generating the node construction. Jung algorithm will provide the dynamic shape and automatic node association.

Existing data transmission

This module is used to show the existing data transfer process via network. In this process, we cannot able to save the more battery power.

Sleep Scheduling via network

This module is used to send the data from source to destination via network with minimal battery power consumption.

Battery power saving comparison.

This module is used to identify the battery power energy.

Graph representation strategy

This module is used to find the battery power consumption between existing and proposed via chart.

VI. GRAPH REPRESENTATION

The graph represents the speed ,security, safety of the network and security of the sleep scheduling node..It denotes the battery of the existing and the proposed system of the security systems.we are proposing the sleep scheduling mode by default for all the node. The particular node alone will be in ON status and rest of the node still remain in the OFF mode. So we can save the battery power long time. GCKN Algorithms is used in our project to identified the node and path for transfer the data. PLGPA protocol will provide the more security during data transfer. to find the battery power consumption between existing and proposed via chart.The graph will be enery hole consumption and it wi; save the battery lifetime wll still remain the rest of the battery power long time..The protocol and the GCKN algorthi which for the chart and it is denotes the security,safety of the battery and the data will transfer as soon as possible and it reaches its destination faster than the data transfer as normal.

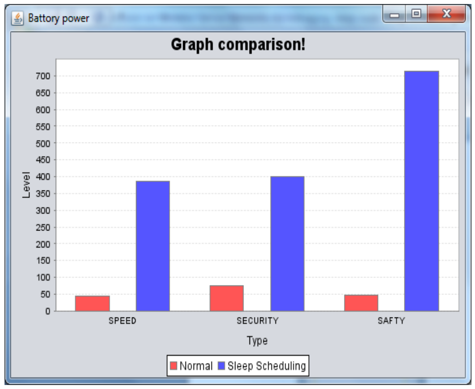

Figure 2.Graph representation

The graph denotes the battery life time of the existing and the proposed system and the speed denotes the battery and the speed of the data transmissions. Our analytical results and observations are instructive and useful for WSN deployment, design, and optimization. It has been proposed that we can balance the energy consumption of the network by non-uniform node deployment.

VII.CONCLUSIONS

Here, geographic routing in duty cycled mobile WSNs is explored and proposed two geographic-distance based connected-k neighborhood (GCKN) sleep scheduling algorithms for geographic routing schemes to be applied into duty-cycled mobile WSNs. This can incorporate the advantage of sleep scheduling and mobility. The first geographic-distance based connected-k neighborhood for first path (GCKNF) sleep scheduling algorithm minimizes the length of first transmission path explored by geographic routing in duty-cycled mobile WSNs. The second geographic-distance based connected neighborhood for all paths (GCKNA) sleep scheduling algorithm reduces the length of all paths searched by geographic routing in duty-cycled mobile WSNs. With the WSN, we have calculated the network lifetime under a given percentage of dead nodes, and analyzed the emerging time and location of energy hole, as well as its evolution process. Moreover, two network characteristics have been found based on our analytic results, which can be leveraged to guide the WSN design and optimization.

In duty-cycled mobile WSNs, from the view of sleep scheduling, GCKNF and GCKNA do not require the geographic routing to change its original geographic forwarding mechanism, and they both consider the connected-k neighborhood requirement and geographic routing requirement to change the asleep or awake state of sensor nodes.In GCKN algorithm they denotes the status of the sensor nodes with wireless design which is evaluated by using the graph and it is optimised. Detailed design of both GCKNF and GCKNA as well as further theoretical analysis and evaluation with respect to GCKNF and GCKNA has been shown in this paper.

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