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A Survey on Sort Range Communication

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Abstract—wireless sensor network are becomes more popular now in these days due to their adoptability in indoor as well as outdoor communication systems. In this presented paper provides the detailed description about the WSN network and their relative application, in addition of that this paper provide the previously made efforts on routing in WSN networks. Routing is working as backbone for any communication network thus data in a network travels on the basis of routing guidelines, this paper provide the information of routing techniques that are supportable with WSN network and also we provide the future proposed work under optimization of routing path discovery.

Keywords— routing, WSN, route optimization, route discovery

I. INTRODUCTION

Wireless communications is, by any measure, the fastest growing division of the communications industry. As such, it has captured the attention of the media and the imagination of the public. Cellular phones have experienced exponential growth over the last decade, and this growth continues unabated worldwide, with more than a billion worldwide cell phone users projected in the near future. Indeed, cellular phones have become a critical business tool and part of everyday life in most developed countries, and are rapidly supplanting antiquated wire line systems in many developing countries. In addition, wireless local area networks are currently poised to supplement or replace wired networks in many businesses and campuses. Many new applications, including wireless sensor networks, automated highways and factories, smart homes and appliances, and remote telemedicine, are emerging from research ideas to concrete systems. The explosive growth of wireless systems coupled with the proliferation of laptop and palmtop computers indicate a bright future for wireless networks, both as stand-alone systems and as part of the larger networking infrastructure. However, many technical challenges remain in designing robust wireless networks that deliver the performance necessary to support emerging applications. [1]

A wireless sensor network (WSN) involves 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. The more modern networks are bi-directional, also enabling control of sensor activity. The development of wireless sensor networks was motivated by military applications such as battlefield surveillance; today such networks are used in many industrial and consumer applications, such as industrial process monitoring and control, machine health monitoring, and so on.[2]Wireless sensor. networks satisfy these requirements. Desirable functions for sensor nodes include: ease of installation, self-identification, self-diagnosis, reliability, time awareness for coordination with other nodes, some software functions and DSP, and standard control protocols and network interfaces.

In this section we discuss general facts about the wireless sensor networks, in the next section we discuss the different routing strategy and previously made efforts for routing technique for wireless sensor networks.

II. BACKGROUND

This section provides the literature collection of study conducted, which includes the research papers and articles. Recent advances in wireless sensor networks have led to many new protocols specifically designed for sensor networks where energy awareness is an essential consideration. Most of the attention, however, has been given to the routing protocols since they might differ depending on the application and network architecture. This paper [3] surveys recent routing protocols for sensor networks and presents a classification for the various approaches pursued. The three main categories explored in this paper are data-centric, hierarchical and location-based. Each routing protocol is described and discussed under the appropriate category. Moreover, protocols using contemporary methodologies such as network flow and quality of service modeling are also discussed.

In paper [4] address the problem of unsupervised outlier detection in wireless sensor networks, we develop an approach that (1) is flexible with respect to the outlier definition, (2) computes the result in-network to reduce both bandwidth and energy usage, (3) only uses single hop communication thus permitting very simple node failure detection and message reliability assurance mechanisms (e.g., carrier-sense), and (4) seamlessly accommodates dynamic updates to data. We examine performance using simulation with real sensor data streams. Our results demonstrate that our approach is accurate and imposes a reasonable communication load and level of power consumption.

This has brought about developing low cost, low-power and multi-function sensor nodes. However, the major fact that sensor node runs out of energy quickly. In the research area of wireless sensor networks the power efficient time is a major issue in [5]. There are various routing protocols in which optimal routing can be achieved in the context of power. In this paper intend to discuss some of the major power-efficient hierarchical routing protocols for wireless sensor networks. First we will discuss some of power-efficient Hierarchical routing protocols in brief. Author also highlights the important features, Drawbacks and area of application of each routing technique. Finally, provides a comparative study on these various protocols.

This paper [6] surveys how formal verification can be used to prove the correctness of ad hoc routing protocols, which are fundamental infrastructure of wireless sensor networks. The existing techniques fall into two classes: verification on small-scale networks and verification on unbounded networks. The former one is always fully automatic and easy to use, thanks to the limited state space generated in verification. However, it cannot prove the correctness over all cases. The latter one can provide a complete proof based on abstractions of unbounded network. However, it usually needs user intervention and expertise in verification. The two kinds of technique are illustrated by verifications against some key properties such as stability, loop-freedom and deadlock-freedom. To conclude, they can be used to find faults and prove correctness, respectively. We believe that they can together aid the development of correct ad hoc routing protocols and their reliable implementations.

A wireless sensor network is a large collection of sensor nodes with limited power supply and constrained computational capability. Due to the restricted communication range and high density of sensor nodes, packet forwarding in sensor networks is usually performed through multi-hop data transmission. Therefore, routing in wireless sensor networks has been considered an important field of research over the past decade. Nowadays, multipath routing approach is widely used in wireless sensor networks to improve network performance through efficient utilization of available network resources. Accordingly, the main aim of this survey is to present the concept of the multipath routing approach and its fundamental challenges, as well as the basic motivations for utilizing this technique in wireless sensor networks. In addition, we present a comprehensive taxonomy on the existing multipath routing protocols, which are especially designed for wireless sensor networks. We highlight the primary motivation behind the development of each protocol category and explain the operation of different protocols in detail, with emphasis on their advantages and disadvantages. Furthermore, this paper [7] compares and summarizes the state-of-the-art multipath routing techniques from the network application point of view. Finally, identify open issues for further research inthe development of multipath routing protocols for wireless sensor networks.

One of the key challenges for research in wireless sensor networks is the development of routing protocols that provide application-specific service guarantees. This paper presents a new cluster-based Route Optimization and Load-balancing protocol, called ROL, that uses various quality of service (QOS) metrics to meet application requirements. ROL combines several application requirements, specifically it attempts to provide an inclusive solution to prolong network life, provide timely message delivery and improve network robustness. It uses a combination of routing metrics that can beconfigured according to the priorities of user-level applications to improve overall network performance. To this end, an optimization tool for balancing the communication resources for the constraints and priorities of user applications has been developed and Nutrient-flow-based Distributed Clustering (NDC), an algorithm for load balancing is proposed.NDC works seamlessly with any clustering algorithm to equalize, as far as possible, the diameter and the membership of clusters. This paper [8] presents simulation results to show that ROL/NDC gives a higher network lifetime than other similar schemes, such Mires++. In simulation, ROL/NDC maintains a maximum of 7% variation from the optimal cluster population reduces the total number of set-up messages by up to60%, reduces the end-to-end delay by up to56%, and enhances the data delivery ratio by up to0.98% compared to Mires++.

In this section of the paper we describes some efforts and research work conducted previous some years, in the next section we provide the various routing approaches that are frequently used in wireless sensor networks.

III. ROUTING IN WSN

This section of our paper provides the various routing approaches previously proposed and implemented for WSN. most of the authors are classify routing in WSN in three major parts Data-centric, Hierarchical and Location based here we provides over view of all three routing strategy.

1. Data-centric protocols: In data-centric routing, the sink sends queries to certain regions and waits for data from the sensors located in the selected regions. Since data is being requested through queries, attribute-based naming is necessary to specify the properties of data. SPIN [9] is the first data-centric protocol, which considers data negotiation between nodes in order to eliminate redundant data and save energy. Later, Directed Diffusion has been developed and has become a breakthrough in data-centric routing.

2. Flooding and gossiping: Flooding and gossiping are two classical mechanisms to relay data in sensor networks without the need for any routing algorithms and topology maintenance. In flooding, each sensor receiving a data packet broadcasts it to all of its neighbors and this process continues until the packet arrives at the destination or the maximum number of hops for the packet is reached. On the other hand, gossiping is a slightly enhanced version of flooding where the receiving node sends the packet to a randomly selected neighbor, which picks another random neighbor to forward the packet to and so on.

3. Directed Diffusion: Directed Diffusion [18,19] is an important milestone in the data-centric routing research of sensor networks. The idea aims at diffusing data through sensor nodes by using a naming scheme for the data. The main reason behind using such a scheme is to get rid of unnecessary operations of network layer routing in order to save energy.

Direct Diffusion suggests the use of attribute-value pairs for the data and queries the sensors in an on demand basis by using those pairs. In order to create a query, an interest is defined using a list of attribute-value pairs such as name of objects, interval, duration, geographical area, etc. The interest is broadcast by a sink through its neighbors. Each node receiving the interest can do caching for later use. The nodes also have the ability to do in-network data aggregation, which is modeled as a minimum Steiner tree problem [9].The interests in the caches are then used to compare the received data with the values in the interests. The interest entry also contains several gradient fields. A gradient is a reply link to a neighbor from which the interest was received. It is characterized by the data rate, duration and expiration time derived from the received interestsfields. Hence, by utilizing interest and gradients, paths are established between sink and sources. Several paths can be established so that one of them is selected by reinforcement. The sink resends the original interest message through the selected path with a smaller interval hence reinforces the source node on that path to send data more frequently.

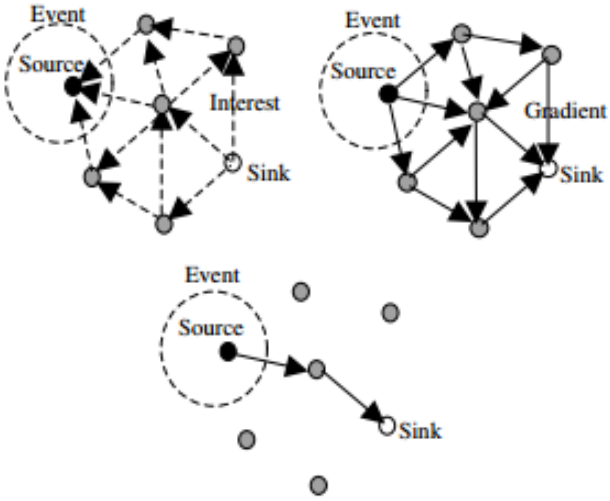

Fig shows the directed diffusion method

4. Energy-aware routing: The approach argues that using the minimum energy path all the time will deplete the energy of nodes on that path. Instead, one of the multiple paths is used with a certain probability so that the whole network lifetime increases. The protocol assumes that each node is addressable through a class-based addressing which includes the location and types of the nodes. There are 3 phases in the protocol:

a. Setup phase
b. Data communication phase
c. Route maintenance phase

Approach is similar to Directed Diffusion in the way potential paths from data sources to the sink are discovered.

5. Rumor routing: Rumor routing is another variation of Directed Diffusion and is mainly intended for contexts in which geographic routing criteria are not applicable. Generally Directed Diffusion floods the query to the entire network when there is no geographic criterion to diffuse tasks. However, in some cases there is only a little amount of data requested from the nodes and thus the use offloading is unnecessary. An alternative approach is to flood the events if number of events is small and number of queries is large. Rumor routing is between event flooding and query flooding. The idea is to route the queries to the nodes that have observed a particular event rather than flooding the entire network to retrieve information about the occurring events.

6. Hierarchical protocols: Similar to other communication networks, scalability is one of the major design attributes of sensor networks. A single-tier network can cause the gateway to overload with the increase in sensors density. Such overload might cause latency in communication and inadequate tracking of events. In addition, the single-gateway architecture is not scalable for a larger set of sensors covering a wider area of interest since the sensors are typically not capable of long-haul communication. To allow the system to cope with additional load and to be able to cover a large area of interest without degrading the service, networking clustering has been pursued in some routing approaches. The main aim of hierarchical routing is to efficiently maintain the energy consumption of sensor nodes by involving them in multi-hop communication within a particular cluster and by performing data aggregation and fusion in order to decrease the number of transmitted messages to the sink. Cluster formation is typically based on the energy reserve of sensors and sensors proximity to the cluster head.

7. Energy-aware routing for cluster-based sensor networks: Different hierarchical routing algorithm based on three tier architecture. Sensors are grouped into clusters prior to network operation. The algorithm employs cluster heads, namely gateways, which are less energy, constrained than sensors and assumed to know the location of sensor nodes. Gateways maintain the states of the sensors and sets upmulti-hop routes for collecting sensors data. ATDMA based MAC is used for nodes to send data to the gateway. The gateway informs each node about slots in which it should listen to other nodes transmission and slots, which the node can use for its own transmission. The command node (sink) communicates only with the gateways.

The sensor is assumed to be capable of operating in an active mode or a low-power stand-by mode. The sensing and processing circuits can be powered on and off. In addition both the radio transmitter and receiver can be independently turned on and off and the transmission power can be programmed based on the required range. The sensor nodes in a cluster can be in one of four main states: sensing only, relaying only, sensing relaying, and inactive. In the sensing state, the node probes the environment and generates data at a constant rate. In the relaying state, the node does not sense the target but its communications circuitry is on to relay the data from other active nodes. When a node is both sensing and relaying messages from other nodes, it is considered in the sensing-relaying state. Otherwise, the node is considered inactive and can turn off its sensing and communication circuitry.

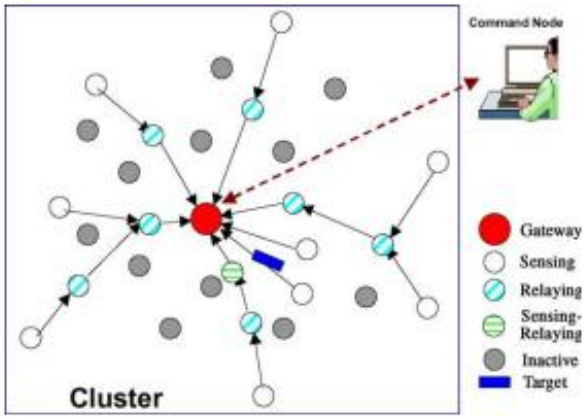

Fig shows the clustered architecture

8. Location-based protocols: Most of the routing protocols for sensor networks require location information for sensor nodes. In most cases location information is needed in order to calculate the distance between two particular nodes so that energy consumption can be estimated. Since, there is no addressing scheme for sensor networks like IP-addresses and they are spatially deployed on a region, location information can be utilized in routing data in an energy efficient way. For instance, if the region to be sensed is known, using the location of sensors, the query can be diffused only to that particular region which will eliminate the number of transmission significantly. Some of the protocols discussed here are designed primarily for mobile ad hoc networks and consider the mobility of nodes during the design. However, they are also well applicable to sensor networks where there is less or no mobility.

9. Geographic adaptive fidelity: GAF is an energy-aware location-based routing algorithm designed primarily for mobile ad hoc networks, but may be applicable to sensor networks as well.

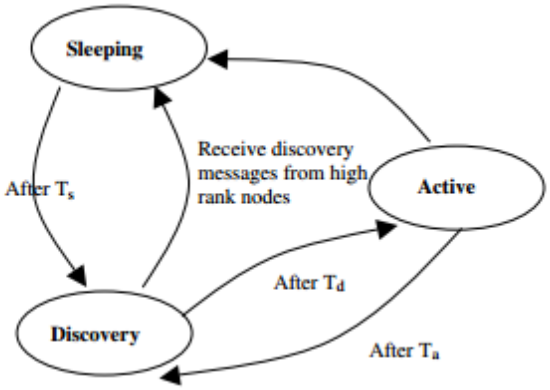

Fig shows the GAF process

GAF conserves energy by turning off unnecessary nodes in the network without affecting the level of routing fidelity. It forms a virtual grid for the covered area. Each node uses its GPS-indicated location to associate itself with a point in the virtual grid. Nodes associated with the same point on the grid are considered equivalent in terms of the cost of packet routing. Such equivalence is exploited in keeping some nodes located in a particular grid area in sleeping state in order to save energy. Thus, GAF can substantially increase the network lifetime as the number of nodes increases.

in addition of that there a large number of routing techniques are available discussion about all the routing techniques are not possible thus in the next section we presents the routing protocol which is proposed by us to find the optimum path using the network simulator 2(NS2).

IV. PROPOSED WORK

In network simulation NS2 is most popular network simulator, which is a discrete event simulator and used to simulate different kind of network organization and network scenarios, each node in this network simulation represents a device in network. These devices may be connected from a link or wireless network according to the programmatic configuration of the desired network scenario.

A routing algorithm calculates the optimal path from user position to destination. This technique shows promise for future handheld indoor navigation systems that can be used in malls, museums, hospitals, and college campuses.
This project should provide the large scale expansion of campuses or premises of colleges, hospitals, all sorts of commercial and non-commercial buildings, precise positioning has gained a lot of importance not only to save time but also to get rapid access to everybody everywhere.

V. CONCLUSION AND FUTURE WORK

In this paper we provide and discuss various routing algorithms which used in WSN communication network. in near future we are provide a navigation system for an campus using NS2 network simulator and a proposed routing technique which promises to provide more efficient and effective results as compared to AODV implementation over WSN network.

REFERENCES

[1] WIRELESS COMMUNICATIONS,Andrea Goldsmith,Stanford University, http://www.cs.ucdavis.edu/~liu/289I/Material/book-goldsmith.pdf
[2] Wireless Sensor Networks,F. L. LEWIS,Associate Director for Research University of Texas at Arlington, 7300 Jack Newell Blvd. SFt. Worth, Texas 76118-7115
[3] A survey on routing protocols for wireless sensor networks,Kemal Akkaya, Mohamed Younis,1570-8705/$ - see front matter 2003 Elsevier B.V. All rights reserved.
[4] In-Network Outlier Detection in Wireless Sensor Networks, Joel W. Branch · Chris Giannella · BoleslawSzymanski · Ran Wolff · HillolKargupta, 2013 - Springer
[5] A Review of Power Efficient Hierarchical Routing Protocols in Wireless Sensor Networks,Sanjay Waware, Dr.NishaSarwade, PallaviGangurde,Vol. 2, Issue 2,Mar-Apr 2012, pp.1096-1102
[6] A Review of Automated Formal Verification of Ad HocRouting Protocols for Wireless Sensor Networks,Zhe Chen,Daqiang Zhang,Rongbo Zhu,Yinxue Ma,Ping Yin,FengXie,Received: 2011-11-01/Accepted: 2012-03-30
[7] Multipath Routing in Wireless Sensor Networks: Survey andResearch Challenges,MarjanRadi, BehnamDezfouli, Kamalrulnizam Abu Bakar and Malrey Lee,Sensors 2012, 12, 650-685; doi:10.3390/s120100650
[8] Adaptive Routing in Wireless Sensor Networks: QoS Optimisation for EnhancedApplication Performance,Mohammad Hammoudeha, Robert Newman,Manchester Metropolitan University, Chester Street, Manchester, M1 5GD, UK
[9] Directeddiffusion: a scalable and robust communication paradigmfor sensor networks, in: Proceedings of the 6th AnnualACM/IEEE International Conference on Mobile Computing and Networking (MobiCom00), Boston, MA, August2000

