Security and Communication New Routing for Contrasting Wireless Sensor Networks

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Abstract: In the earlier systems middle hop nodes which works for each and every data transmission consumes maximum energy which repeatedly affects the life time of the wireless sensor network. Power-efficient Energy-Aware routing protocol for wireless sensor networks is proposed that saves the energy by efficiently selecting the energy efficient path in the routing process. We propose use of a heterogeneous sensor network where query operators are assigned to sparsely deploy resource-rich nodes within a dense network of low power sensor nodes. Energy proficiency is a standout amongst the most critical problem in mobility based wireless sensor network. Routing procedures for WSNs are responsible for selecting and maintaining the routes in the network and ensure reliable and effective communication in inadequate periods. Proposed new sub optimal paths occasionally to increase the lifetime of the network limitations of current approaches, propose a new MAC layer protocol called Convergent MAC (CMAC) that supports low latency and high throughput as well as low duty cycle operation. The proposed EAUM-WCH protocol is more efficient in balancing the stability and consumption of energy in the network and improves the lifetime of the wireless sensor network. In order to increase the energy efficiency further transmission power of the nodes is also adjusted based on the location of their neighbor. To the best of our knowledge, this is the first attempt to build an energy aware routing infrastructure to enable in-network processing of spatio-temporal queries.

Index Terms: CMAC, MANET, MAC, Location aware, scalability, hierarchical, Clustering, Review, Cluster-Head, Energy Effectiveness, Information gathering, Security. Delivery Ratio, Energy Consumption, end-to-end delay.

1. INTRODUCTION

Wireless sensor networks (WSNs) have established much attention all over the globe due to its sensing capability and stability. The Micro Electro Mechanical System has introduced low powered compact sensor nodes [1]. The sensor nodes perform desired measurements, process the measured data and transmit it to a base station, commonly referred to as the sink node, over a wireless channel [2]. At the node level, data communication is the dominant component of energy consumption, and protocol design for sensor networks is geared towards reducing data traffic in the network [3]. A large number of cheap sensor nodes sense and transmit data and some powerful nodes, henceforth referred as Query Processor (QP) nodes execute query operators to combine and process data arriving from multiple target regions [4]. While sensing and broadcasting information energy is devoured by a sensor node. Information broadcasting throughout medium is the most energy consuming task [5]. Recent advances in wireless communication technologies and the manufacture of inexpensive wireless devices have led to the introduction of low-power wireless sensor networks [6]. Mobile Ad-hoc networks (MANET) are self configuring and self-organizing multi hop wireless networks where, the network structure changes dynamically [7]. To achieve high quality of service, the energy and lifetime improvement in wireless sensor network has been concentrated as the core motivation for developing any transmission prototype. Various kinds of design patterns are developed according to the concept of energy conservation in WSN [8].
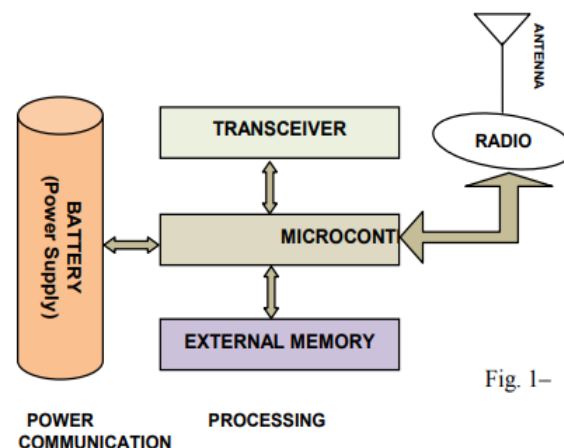

Fig. 1– A Simple node architecture

2. RELATED WORK

There are four main categories of routing protocols in WSN are data-centric, hierarchical, location-based and multipath: In data-centric routing, the sink sends queries to certain regions and waits for data from the sensors located in the selected regions [9]. We propose that the cost and delay involved in transmitting raw data to a remote server for offline result computation can be eliminated by processing

data from spatially distributed regions within the network [10]. Received-Signal Strength-Indicator (RSSI) the information broadcasting consume greatest power is used to resolve signal quality which can shift because of multipath [11]. In this context, researchers have proposed numerous routing protocols to improve performance demands of different applications through the network layer of wireless sensor networks protocol stack [12]. The goal of Wireless sensor network is to have long life time and high reliability with maximum coverage. Routing techniques are the most important issue for networks where resources are limited. LEACH is one of the first hierarchical routing approaches for sensor networks [13].

3. SYSTEM MODEL

We present the proposed communication architecture to model spatio temporal monitoring applications we show the bird's eye view of a sensor field with data streams emerging from multiple target regions and being merged at intermediate nodes in the network into a single output stream directed towards the sink [14]. We assume that a user query specified in a declarative language like SQL has been converted to a query tree (specifying the order of evaluation of operators) by using query optimization techniques based on power conservation [15]. This path is selected by the proposed protocol for routing from source to sink. Sink represents the command node. Command nodes can be stationary or mobile [16]. The proposed protocol collects routes that have the minimum residual energy of nodes relatively large and have the least hop-count, and then determines a proper route among them, which consumes the minimum network energy compared to any other routes [17].
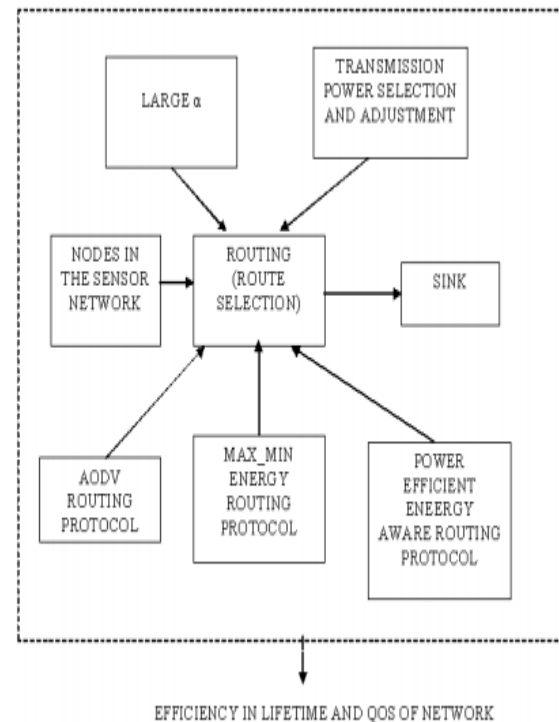

Figure2: Block Diagram of system model

4. PROPOSED SYSTEM

Proposed a MAC layer protocol called Convergent MAC (CMAC) that supports low latency and high throughput as well as low duty cycle operation CMAC has three main components [18]. The battery powered sensors have limited energy and so protocols should minimize their data communication and computation. One of the routing protocols that were proposed early on, which provides some QoS, is the Sequential Assignment Routing (SAR) protocol [19]. It manipulates the entire network to regulate to the arbitrary adaptability of sensor nodes. It is a dynamic and energy capable method which improves the time span of network, throughput level and energy effectiveness [20].
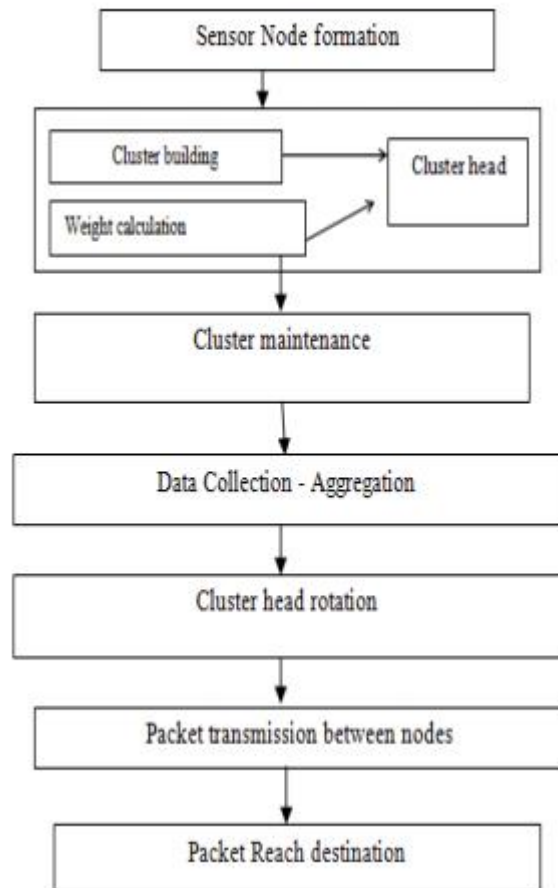
Fig. 3 - Proposed architecture for WSNs

5. METHODOLOGY

CMAC: Proposed a MAC layer protocol called Convergent MAC (CMAC) that supports low latency and high throughput as well as low duty cycle operation. Aggressive RTS equipped with double channel check for channel assessment, any cast to quickly discover forwarder, and convergent packet forwarding to reduce the any cast overhead [21]. CMAC uses unsynchronized wake-up scheduling with a pre-defined idle duty cycle this wake-up scheduling scheme the duration between successive wake-ups is fixed according to the duty cycle and active period. However to make the following mechanisms work at expected performance we evenly randomize the wake-up time of each node for the first times it goes back to sleep after receiving a packet [22].
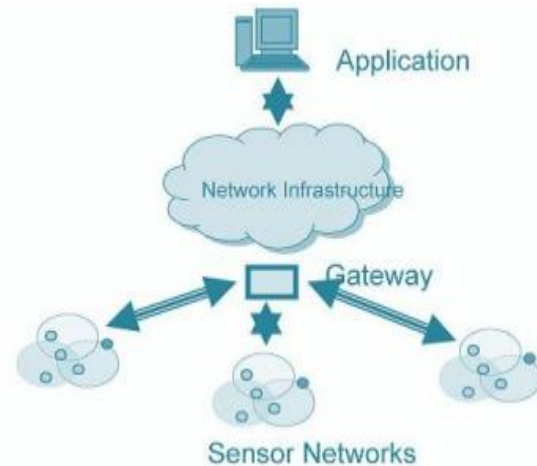

Figure 4. Basic Architecture of Wireless Sensor Network

A. Cluster Building

To perform the operation of building a cluster, the proposed protocol determines links by means of:

Step 1: Input link neighborhood,

Step 2: Stability value of the each and every link calculation,

Step 3: Linked nodes energy consumption values,

Step4: The linked nodes distance calculation.

Links weight is the major criteria to determine the nodes weight. Then, it is followed by the election of cluster head according to the weights and also elects the cluster child of the cluster [23].

B. Cluster Head Rotation

Cluster head consumed energy is comparatively higher than that of the cluster child nodes because it receives all the information from the cluster child nodes acts as a forwarder in the current cluster and also handle the operation of backbone network information forwarding process. Here event based CH rotation method is proposed with the help of the following packet definitions [24].

Step 1: CH rotation data packet, including CH address.

Step 2: CH rotation response information packet.

Step 3: CH appointment packet, including CH address appointment.

Step 4: CH lost contact data, when cluster nodes been unsuccessful to connect in the particular time period then the data packets are multicast to other cluster nodes.

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C. Quality of Service Routing Protocols for WSN

Quality of Service (QoS) requirements like delay, reliability and fault tolerance are as important in routing in WSNs as energy efficiency. A routing protocols that support QoS with energy efficiency.

Step1: Sequential Assignment Routing (SAR) protocol one of the routing protocols that was proposed early on, which provides some QoS, is the Sequential Assignment Routing (SAR) protocol.

Step2: SPEED QoS routing Protocol SPEED [6] is designed to support soft real-time communication service by maintaining the desired delivery speed across the network so that the end-to-end delay is minimized.

Step3: Energy-Aware QoS Routing Protocol Real-time traffic is generated by imaging sensors in this QoS energy aware routing protocol this protocol finds the least cost and energy efficient path and the link cost is a function that captures the nodes energy reserve, transmission energy, error rate and some communication parameters [25].

Step4: Message-Initiated Constrained-Based Routing A Message-Initiated Constrained-Based Routing (MCBR) mechanism is proposed in [25]. MCBR is composed of explicit specifications of constraint-based destinations, route constraints and QoS requirements for messages, and a set of QoS aware meta-strategies.
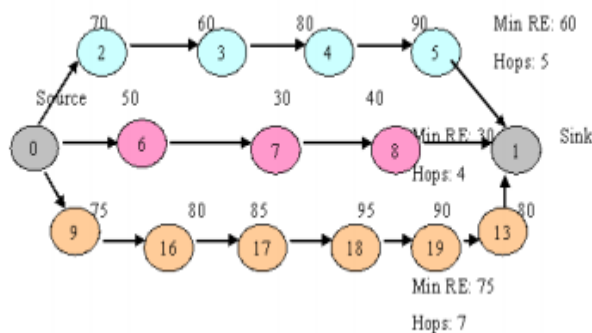

Figure5: Network Establishment Routing Path

6. EXPERIMENT RESULT

NS2 simulation results are obtained from experiment repeats for consistency, comparison of different architectures to the proposed WSN protocol. It was observed that the proposed model had a much better performance reliability compared to other protocols. In our simulations, we evaluate a CMAC variant using a staggered scheduling similar to DMAC after

convergence. When the transmitter intends to converge from any cast to uncast, it synchronizes its schedule with the receiver. EQSR uses the multi-path paradigm together with a Forward Error Correction (FEC) technique to recover from node failures without invoking network wide flooding for path-discovery.
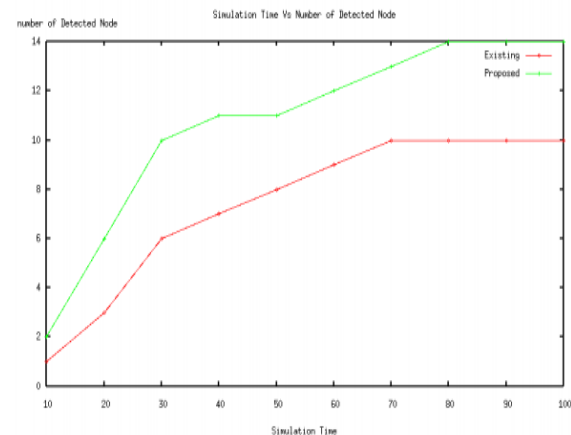

Fig No. 6. Simulation Time Vs Number Of Detected Node

7. CONCLUSION AND FUTRUE ENHANCEMENT

Motivated by the limitations of current approaches we propose a new MAC layer protocol called Convergent MAC (CMAC) that supports low latency and high throughput as well as low duty cycle operation. The protocol is optimized dynamically by a constrained optimization problem. This taxonomy includes flat, hierarchical QoS and location based routings and numerous other it discusses several multi-path routing mechanisms used to enhance network metrics such as lifetime and latency. The compared energy proficient clustered routing methodology depends on CH selection. Many research people are working in this area to improve the performance of the network further with more energy efficient models. Proposed Energy efficient routing protocol for wireless sensor network invokes the residual energy and hop count as parameters. In the future scope new routing algorithms are needed in order to handle the overhead of mobility and topology changes in such energy constrained environment. Location based energy-aware reliable routing by implementing clustering with security such as secured routing for packet transmission can

be implemented and improve quality of service by adding Qos parameters.

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