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A Survey on Event Detection for Geographical Packets Forwarding in Wireless Sensor Networks

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***Abstract*- Geographical packets forwarding of sporadic alarm packets to a base station in a wireless sensor network (WSN), where the nodes are sleep-wake cycling periodically and asynchronously. Local forwarding algorithms that can be tuned so as to tradeoff the end-to-end delay against a total cost, such as the hop count or total energy. At each forwarding node en-route to the sink, the local forwarding problem of minimizing one-hop waiting delay subject to a lower bound constraint on a suitable reward offered by the next-hop relay; the constraint serves. The reward metric is used for local problem for end-to-end delay. At each relay wake-up instant, when a relay reveals its reward value, the forwarding node's problem is to forward the packet or to wait for further relays to wake-up.local forwarding problem as a partially observable Markov decision process (POMDP) and obtain inner and outer bounds for the optimal policy.i.e., local geographical routing of sporadic alarm packets in a large WSN.**

***Keywords*- Sleep-wake cycling, geographical forwarding rules, wireless networks with intermittent links, reward metric, Wireless sensor networks**

I. INTRODUCTION

Packet forwarding in class of wireless sensor networks (WSNs) in which local inferences based on sensor measurements could result in the generation of occasional "alarm" packets that need to be routed to a base-station. Such a situation could arise, for example, in a WSN for human intrusion detection or fire detection in a large region. Consider asynchronous sleep-wake cycling where the sleep-wake process of each node is statistically independent of the sleep-wake process of any other node in the network.

In geographical forwarding of packets in a large wireless sensor network (WSN) with sleep-wake cycling nodes, the local decision problem faced by a node that has "custody" of packet and set of next-hop relay nodes to forward the packet towards the sink. To this local problem, the idea being that such a solution, if adopted by every node, could provide a reasonable heuristic for the end-to-end forwarding problem. Towards this end, a relay selection problem comprising a forwarding node and a collection of relay nodes, and and waking up sequentially at random times.

At each relay wake-up instant the forwarder can choose to probe a relay to learn its reward value, and based on forwarder rules can then decide whether to stop (forward its packet to the chosen relay) or to continue to wait for further relays to wake-up. Geographical forwarding of sporadic alarm packets to a base station in a wireless sensor network (WSN), where the nodes are sleep-wake cycling periodically and to develop local forwarding algorithms that can be tuned so as to trade-off the end-to-end delay, such as the hop count .

At each forwarding node en-route to the sink, the local forwarding problem of minimizing one-hop waiting delay subject to a lower bound constraint on a suitable reward offered by the next-hop relay; the constraint serves to tune the trade-off. The reward metric used for the local problem is based on the end-to-end.

II. PREVIOUS WORK

K.P. Naveen and Anurag Kumar [1], proposed relay Selection For Geographical Forwarding In Sleep Wake Cycling Wireless Sensor Network.Distributed Bellman Ford algorithm (e.g., LOCAL-OPT algorithm proposed by Kim et al.) is used to obtain the optimal solution and end-to-end geographical forwarding in a sleep-wake cycling wireless sensor network. Local forwarding problem as a partially observable Markov decision process (POMDP) and obtain inner and outer bounds for the optimal policy.

K.P. Naveen and A. Kumar [2], proposed Tunable Locally-Optimal Geographical Forwarding in Wireless Sensor Networks with Sleep-Wake Cycling Nodes. Efficient Local forwarding problem where the relays wake-up at random time. LOCAL-OPT algorithm is used. Wireless sensor networks, asynchronous geographic random represent forwarding for Ad-Hoc sensor network.

J. Kim, X. Lin, and N. Shroff [3] , proposed Optimal Any cast Technique for Delay-Sensitive Energy-Constrained Asynchronous Sensor Networks. The wireless sensor networks, asynchronous sleep-wake scheduling protocols can be used to significantly reduce energy consumption without incurring the communication overhead for clock synchronization needed for synchronous sleep-wake scheduling protocols. M. Zorzi and R. R. Rao [4], proposed Geographic Random Forwarding (GeRaF) for Ad Hoc and Sensor Networks. Novel forwarding technique based on geographical location of the nodes involved and random selection of the relaying node via contention among receivers.

An idealized scheme best relay is discussed and its performance is evaluated by means of both simulation and analytical techniques.

S. Liu, K. W. Fan, and P. Sinha [5], proposed CMAC: An Energy Efficient MAC Layer Protocol using Convergent Packet Forwarding for Wireless Sensor Networks. In this paper, Low duty cycle operation is critical to conserve energy in wireless sensor networks. The design of a new low duty-cycle MAC layer protocol called Convergent MAC (CMAC). CMAC avoids synchronization overhead while supporting low latency.

V. Paruchuri, S. Basavaraju, A. Durresi, R. Kannan, and S. S. Iyengar [6], proposed Random Asynchronous Wakeup Protocol for Sensor Networks. Random Asynchronous Wakeup (RAW), a power saving technique for sensor networks that reduces energy consumption without significantly affecting the latency. RAW is a distributed, randomized algorithm where nodes make local decisions on whether to sleep. Each node is awake for a randomly chosen fixed interval per time frame and large node density results in existence of several paths between two given nodes whose path length and delay characteristics are similar to the shortest path. Thus, a packet can be forwarded to several nodes in order to be delivered to the destination without affecting much the path length and delay experienced by the packet when compared to when forwarded through the shortest path.

III. PROPOSED WORK

In proposed work first step is creation of topology. After topology creation, and solution the system model of geographical forwarding, also known as location aware routing. In geographical forwarding it is assumed that each node in the network knows its location as well as the location of the sink i.e., to neighbors within the forwarding region. Somewhere in the network a node has just received a packet to forward (refer Fig. 1); for the local problem refer to forwarding node as the source and think of the time at which it gets the packet. There is an unknown number of relays in the forwarding region of the source. Somewhere in the network a node has just received a packet to forward (refer Fig. 1); for the local problem we refer to this forwarding node as the source. There is an unknown number of relays in the forwarding region of the source.

In the geographical forwarding context, this lack of information on the number of relays could model the fact that the neighborhood of a forwarding node could vary over time due, for example, to node failures, variation in channel conditions, or (in a mobile network) the entry or exit of mobile relays. The source desires to forward the packet within the interval ,while knowing that the relays wake-up independently and uniformly over (O,T),. When a neighbor node wakes up, the source can evaluate it for its use as a relay, e.g., in terms of the progress it makes toward the destination node, the quality of the channel to the relay, the energy level of the relay, etc., Thus, at each relay wake-up given the reward values of the relays that have woken up thus far, the source is faced with the sequential decision problem of whether to forward the packet or wait for further relays to wake-up. By solving the local problem using a "suitable" reward metric, and then applying its solution at each hop toward the sink, we expect to capture the end-to-end problem of minimizing total delay subject to a constraint on an end-to end total cost metric For instance, if the constraint is on hop count then it is reasonable to choose the local reward metric to be the progress, toward sink, made by a relay. Smaller end-to-end hop count can be achieved by using a larger progress constraint at each hop and vice versa. For total-power constraint we find that using a combination a reward for the local problem performs well for the end-to-end problem.

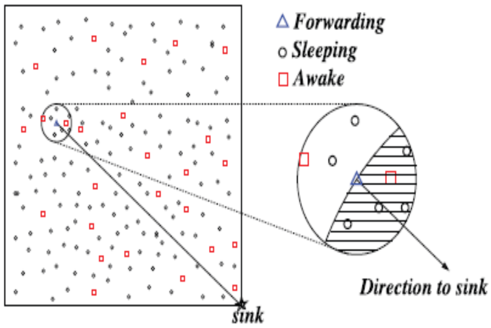

Fig: llustration of the local forwarding problem

IV. PROPOSED SOLUTION

From the idea of the proposed system we are clear with two outcomes.

1. Event Detection for geographical forwarding rules

Nodes know their own locations and that of the sink, and the forward packets to neighbors that are closer to sink, i.e., to neighbors within the forwarding region.

2. Reward metric

Applying its solution at each hop towards the sink, we expect to capture the end to end problem of minimizing total delay subject to a constraint .

V. CONCLUSION

The proposed system can minimize communication latency while providing energy efficient periodic sleep cycles for nodes in wireless sensor networks. Also system can reduce the average delay. Geographical forwarding of packets in a wireless sensor networks detect certain infrequent events and forward these alarms to a base station.

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