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Event Reporting Delay Reduction in Packet Forwarding Used in Synchronous Sleep Wake Scheduling For WSN

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***Abstract*—** Wireless sensor networks mostly used in event reporting systems,where sensors are placed in the network to sense any of events. But mostly,its not possible to reach in every environment condition and recharge the battries. So, the system should be proposed with minimum consumption of battery. Previously, various approaches are used to increase battery lifetime and minimum delay. Sleep wake scheduling tapproaches were used to increase lifetime,but it could result in delays. So,by using sleep wake scheduling efficiently eith anycast forwarding techniques, we can get result of minimum delay. In this paper ,we used sleep wake scheduling with anycast packet forwarding to reduce theses delays with increasing the lifetime.

***Keywords*-**wireless sensor network, anycast packet forwarding, sleep wake scheduling,energy efficieny,delay

I. Introduction

In systems, most of the energy is consumed when the radios are on, waiting for an arrival to occur. Sleep-wake scheduling is an effective mechanism to prolong the lifetime of these energy-constrained wireless sensor networks. However, sleep-wake scheduling could result in substantial delays because a transmitting node needs to wait for its next-hop relay node to wake up. An interesting line of work attempts to reduce these delays by developing anycast-based packet forwarding schemes, where each node opportunistically forwards a packet to the first neighboring node that wakes up among multiple candidate nodes. In this paper, we first study how to optimize the anycast forwarding schemes for minimizing the expected packet-delivery delays from the sensor nodes to the sink. Based on this result, we then provide a solution to the joint control problem of how to optimally control the system parameters of the sleep-wake scheduling protocol and the anycast packet-forwarding protocol to maximize the network lifetime, subject to a constraint on the expected endto- end packet-delivery delay. Our numerical results indicate that the proposed solution can outperform prior heuristic solutions in the literature, especially under the practical scenarios where there are obstructions, e.g., a lake or a mountain, in the coverage area of wireless sensor networks.

Sensor networks are highly distributed networks of small, lightweight wireless nodes, deployed in large numbers to monitor the environment or system by the measurement of physical parameters such as temperature, pressure, or relative humidity.

II. SUBJECT STRATEGY

This section first presents the architecture of a proposed system. Next, the coordinator selection methods are presented.

A. Architecture

Our proposed system consists of two phases

- Configuration phase and
- Operation phase

1.Configuration phase:

When nodes are deployed, the configuration phase begins, during which, nodes optimize the control parameters of the anycast forwarding policy and their wake-up rates. It is during this phase that the optimization algorithms discussed above will be executed. In this phase, sensor nodes do not even need to follow asynchronous sleep-wake patterns.

2.Operation phase :

In this phase, each node alternates between two sub-phases, i.e., the sleeping sub-phase and the event-reporting sub-phase. In the sleeping sub-phase, each node simply follows the sleepwake pattern determined in the configuration phase, waiting for events to occur. Note that since we are interested in asynchronous sleep-wake scheduling protocols, the sensor nodes do not exchange synchronization messages in this sleeping sub-phase. Finally, when an event occurs, the information needs to be passed on to the sink as soon as possible, which becomes the event-reporting sub-phase. It is in this event reporting sub-phase when the anycast forwarding protocol is actually applied, using the control parameters chosen during the configuration phase.

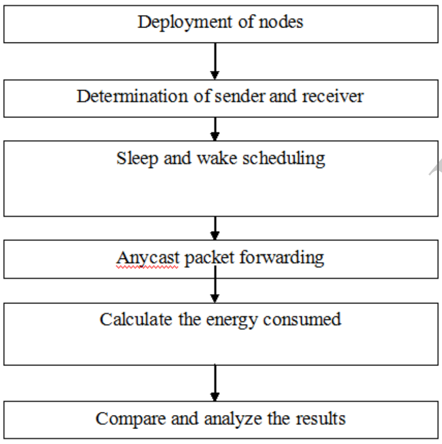

Fig. Flow chart of System Architecture

III. LITERATURE REVIEW

1. Synchronized sleep-wake organizing

In these techniques, signal nodes consistently or aperiodically come back synchronization information with close by nodes. In synchronized sleep wake scheduling, each node knows exactly when its neighbour nodes will wake up. Then each node in wireless sensor network needs to exchange synchronization message with other nodes. It causes the additional communication overhead. So,its not possible to have information about all nodes and their timings.If,this could be done,there result in overloaded cost.However, such synchronization procedure could have additional connections cost, and eat a lot of energy.

Issues in existing system

To have synchronised schedule,each node should communicate with other node.So, its not possible for big networks. It causes communication overheads. Costs of additional connections and waste energy by communicating with other nodes.

2) On-demand sleep-wake organizing

In this system, nodes turn off most of their tour and always turn on another low-powered receiver to concentrate on wake-up contacting from close by nodes when there is a need for delivering offers. However, this on need sleep-wake organizing can significantly enhance the cost of signal motes due to the additional receiver.

Issues in existing system

By adding another low power receiver, system costs increases.So. According to cost feature,its not feasible.

3)Packet-forwarding schemes

Under traditional packet-forwarding techniques, every node has one particular next-hop delivering node in the group, and it has to hold on for the next-hop node to wake up when it needs to forward a package.

Issues in existing system

Maximum delays occur in this scheme.

4) Asynchronous sleep-wake scheduling

In this system, the sleep-wake schedule at each node is individual of that of other nodes, and thus the nodes do not need either a synchronization procedure or another low-power receiver. However, because it is not possible for each node to have complete details of the sleep-wake schedule of other nodes, it happens upon additional difficulties along the route to the strain because each node needs to hold on for its next-hop node to wake up before it can exchange. This hold on could be unwanted for delay-sensitive applications, such as fire identification or tsunami aware, which need that the occasion verifying hold on be little.

Issues in existing system

Hold on could result in unwanted delays.

IV.MODULE DESCRIPTION:-

Our system is divided into the following modules

1) Deployment of nodes
2) Sleep and wake scheduling
3) Anycast packet forwarding

1) Deploy ment of Nodes

We consider a wireless sensor network with N nodes. Let N denote the set of all nodes in the network. Each sensor node is in charge of both detecting events and relaying packets. If a node detects an event, the node packs the event information into a packet, and delivers the packet to a sink s via multihop relaying. The master node collecting all information gathered by the sensors is located at the center of the network. Assume that all nodes have a common maximum radio range r and are equipped with omni directional antennas. Nodes can choose an arbitrary transmit power level for each data transmission, provided that their transmission range does not exceed r. Also, network topologies are considered such that for any sensor there exists at least one path connecting the sensor to the sink. The information sensed by a network node is organized into data units of fixed size that can be stored at the sensor in a buffer; the buffer is modeled as a First in First Out (FIFO) queue. No retransmissions of data units is done since data units are never lost while traveling through the network.

i. Start the process
ii. Place the nodes randomly to form a network.
iii. Obtain the position of each node in the network.
iv. Find the node that has data.
v. Find the intermediate node that has less cost than direct transmission
vi. Transmit through the intermediate nodes to reach the destination.
vii. Calculate the transmission cost.
viii. Update the energy table in master node.
ix. Display the energies of the nodes.
x. Repeat step 4 to step 7 until data is available with different nodes.
xi. Calculate the total transmission cost involved in multi hop routing during all transmissions.
xii. Terminate the process.

2) Sleep and Wake Scheduling

seIn this system, the sleep-wake schedule at each node is individual of that of other nodes, and thus the nodes do not need either a synchronization procedure or another low-power receiver. However, because it is not possible for each node to have complete details of the sleep-wake schedule of other nodes, it happens upon additional difficulties along the route to the strain because each node needs to hold on for its next-hop node to wake up before it can exchange. This hold on could be unwanted for delay-sensitive applications, such as fire identification or tsunami aware, which need that the occasion verifying hold on be little.

3) *Anycast Packet Forwarding*

Under anycast packet-forwarding schemes, each node has multiple next-hop relaying nodes in a candidate set (we call this set a forwarding set). A sending node can forward the packet to the first node that wakes up in the forwarding set. The first challenge is for each node to determine its anycast forwarding policy to minimize the end-to-end packetdelivery delay.

V.EXPERIMENTAL RESULTS

Energy consumption balancing with minimum delay is the main problem in event driven wireless sensor networks. The anycast packet delievery scheme is used to resolve this problem.

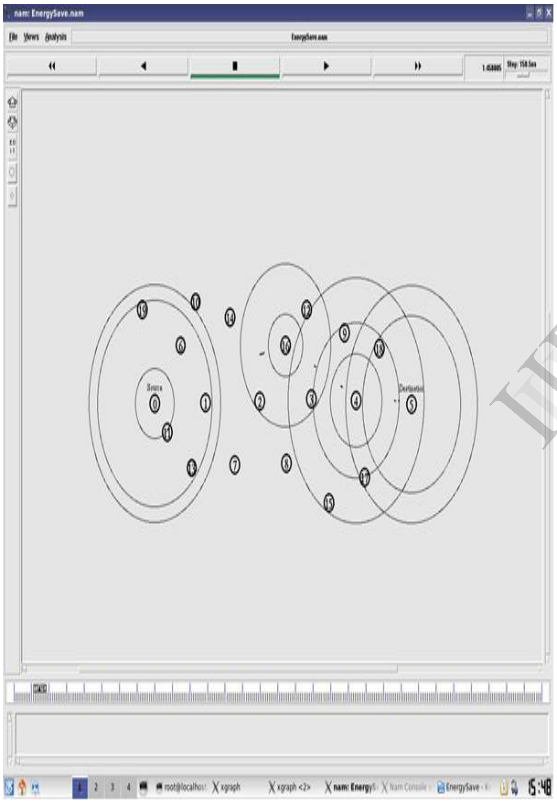

Fig:Packet transmission in anycast packet forwarding

VI.CONCLUSION & FUTURE SCOPE

In this paper, we are highly concentrated of the issue of the maximization of network lifetime & minimization of delay for the improvement of WSN performance. In the event driven wireless sensor network, anycast packet-forwarding scheme is designed to reduce the event-reporting delay and to prolong the lifetime of wireless sensor networks employing asynchronous sleep–wake scheduling. Specifically, two optimization problems are focused. First, when the wake-up rates of the sensor nodes are given, we develop an efficient and distributed algorithm to minimize the expected event-reporting delay from all sensor nodes to the sink. Second, using a specific definition of the network lifetime, lifetime-maximization problem is handled to optimally control the sleep–wake scheduling policy and the anycast policy in order to maximize the network lifetime subject to an upper limit on the expected end-to-end delay. Sleep-wake scheduling with anycast substantially gives better performance than heuristic solutions in the literature under practical scenarios where there are obstructions in the coverage area of the wireless sensor network. Future work will include strategy which will improve the performance of the wireless sensor network and make the network reliable & efficient. The results were validated by network simulations, which showed that the proposed schemes maintained the desired implication throughout the lifetime of the network. Many parameters in WSN remains to be investigated. Future work will be conducted for improving the WSN performance is still in progress.

In Future work it may be investigate how to prevent/mitigate the gang injecting false data attack from mobile compromised sensor nodes. Consider the scenario, when the wireless sensor node moves from one location to another location, it is difficult to identify the false data injection through this proposed mechanism. Thus to arrive an another efficient model, based upon the location of sensor node and the keying material, the false data injection attack or gang injecting false data can be identified.

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