

Reduce the Time for Battery Replacement in Sensor Node

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Abstract

Wireless sensor network is most popular research area on consumption of power, improve the throughput and quality of service, through wireless sensor network (WSN). Deploying the WSN in remote area to connect and cover the source and destination points, and they need some energy to transfer data from one node to other, energy consumed means the battery life gradually decreases, to overcome this by replacing with new batteries. Battery replacement is time consuming process were as in large network, to overcome this problem is novel idea is to deploy additional sensor nodes on network.

Keywords: Sensor Node, Battery

INTRODUCTION

A sensor network is group of specialized transducers with communication infrastructures. A sensor network consists of multiple detection stations called sensor nodes, each of which

Structure

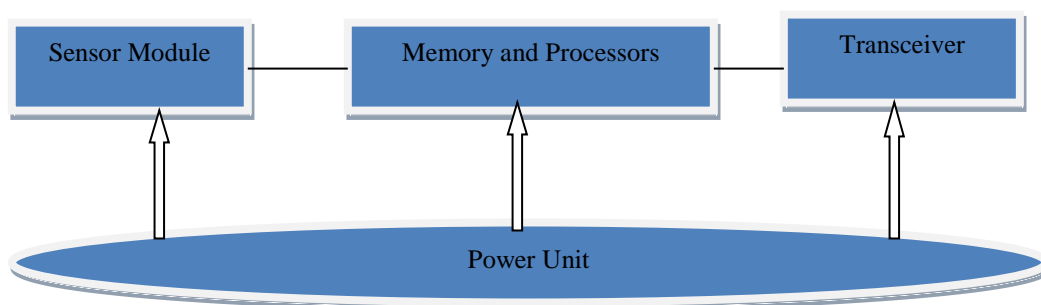


Figure 1: Block diagram of sensor node

WORK RELATED BACK GROUND

Method of reducing time for battery replacement.

Alternate sensor node is in sleeping status, regardless of sensed data on network. In this method simple is that we can install or deploy the more sensors on network. Example, suppose in one area covers the network is 2 sensor nodes we

is small lightweight and portable. Every sensor node equipped with a transducer, microcomputer, transceiver and power source. The transducer generates the electrical signals based on sensed physical effect and phenomena. The microcomputer processes and stores the sensor output. The transceiver, which can hard wired or wireless, receives commands from a central computer and transmit data to the computer. The power for each sensor node is derived from electric utility or from battery. We know that each sensor node contain one battery to supply the power.

Major challenges of WSN is power consumption, wireless communications and manufacturing cost. Deploying large quantities of sensor nodes to from wireless sensor node (WSN). These nodes are primarily equipped with means to sense ,process and communicate data to other nodes. WSN can also have mobility capabilities which enables them to move around and roam the region of interest to harvest information.

can install or deploy 4 sensor nodes. Simple idea is 2 nodes are sleep status and remaining 2 nodes get awake vice versa, awake nodes follows the sleep protocol if no data sensed. From this idea the sensor nodes battery get more longer time to replace the new battery.

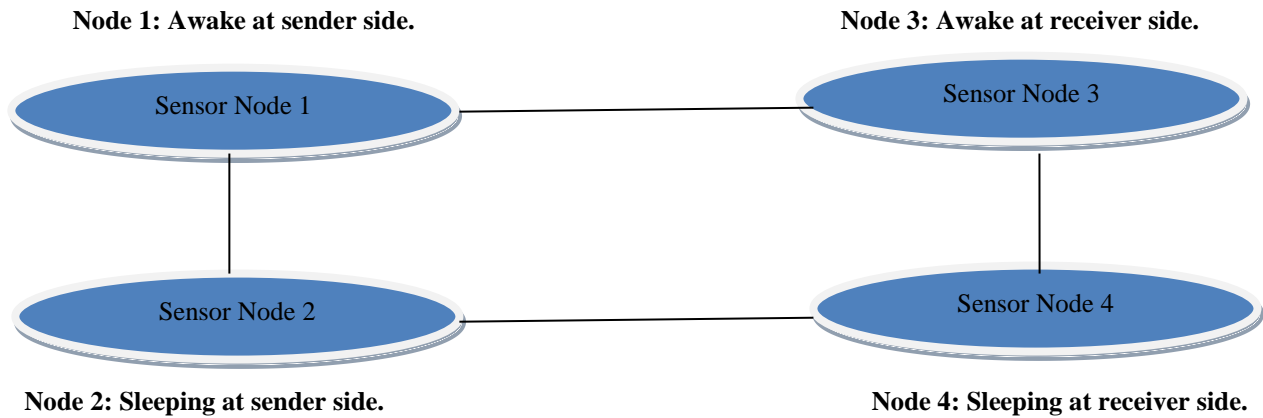


Figure 2: Sensor Network design for Odd nodes.

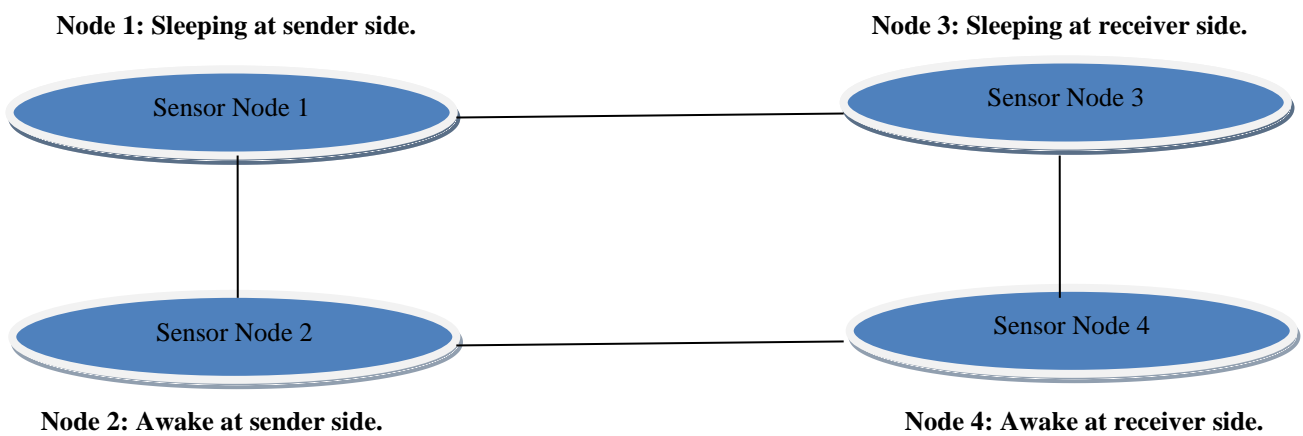


Figure 3: Sensor Network design for even nodes.

From above figures 2 and 3 observes as design the sensor nodes in network are odd nodes are awake and even nodes are sleeping at fixed interval of time vice versa.

months, if four nodes deployed in same network area, the battery replacement time was approximately 3 years 8 months. So form steady, additional sensor nodes are deployed on network were reduced the time for battery replacement.

STEADY REPORT

With constant 128 bits data transmit for 10 min for one day (Used alkaline AA battery (E91-1.5 volts))

S.no	Network Area Covered	Number of sensor Nodes	Life Time of sensor node battery	Observed time to replace battery.
1	500 meters	2	2 years	1 year 11 months
2	500 meters	4 (Alternate day awake the sensor node)	3 years 10 months	3 years 8 months

Figure 4: Table

Above table saying that in same network area with 4 sensor nodes decreases the battery replacement time, because alternate nodes are sleeping at fixed time and awake other nodes vice versa. Only two nodes in the network there were battery replacement time is approximately one year eleven

Advantages of this method

- i) Reduce the time for battery replacement in sensor node.
- ii) Extra sensor nodes is acts as back up the network.
- iii) Alternate sensor nodes awake and sleep ,it will get long battery for utilization in the network.

Disadvantages

- i) Sensor nodes are installed or deployed in 1:1 ratio, so cost increased.

CONCLUSION

Sensor nodes covers with some nodes on network, those are needed to replace sensor node battery after weak or power down. Observed in my steady to reduce the node battery replacement after power down by adding additional sensor

nodes deployed with 1:1 ratio on network, by this design to overcome to reduce battery replacement time.

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