Aggregation of Data Packets in Wireless Sensor Network

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Abstract—**Wireless sensor networks (WSNs) contain a large number of small sensor nodes, whose main function is to sense the desired phenomena in a particular region of interest. These networks have a large number of applications such as habitat monitoring, disaster management, security and military etc.The sensor areas are very small in size and have limited operating capacity as these nodules have very low battery capacity, as these nodes have very low battery power. WSNs are also prone to failure, due to low battery capacity. Data aggregation is an energy efficient method for WSNs. Due to the high node density in sensory networks the same data is heard by multiple nodes, leading to loss of function. These demolitions can be removed using data collection methods while moving packets from source nodes to low-level channels. Investigators are still faced with the dilemma of choosing the most efficient and effective data integration process in existing WSN documents. This research project presents a comprehensive analysis of data collection documents in the WSN environment in particular. The current state of data consolidation in WSNs is still distributed in various categories. Methodical analysis of data integration in WSNs is presented that includes tools and methodologies. A detailed analysis of this research work will help researchers identify key aspects of data aggregation strategies and will also help select the most appropriate data aggregation process.**

Keywords*— *WSNs- Wireless Sensor Networks

Introduction

Wireless sensor networks (WSNs) contain a large number of sensor nodes used in regions of particular interest. Sensor nodes communicate with short-range radio signals and interact with each other to accomplish common tasks. There are different types of networks in Wireless Sensor Networks that are important in areas like military application, industrial process management, home intelligence, security and surveillance etc.However, the sensor nodes have limitations of bandwidth, power, memory, processing resources and limited life. The main function of a node is to detect target objects such as temperature, brightness, temperature and report that data to the host controller or immersed in response to queries. In WSNs, power consumption is less calculated compared to data transfers. Instead of sending sensible data each time to each immersion, if the data is first collected and compiled using aggregation functions such as sum (), avg () etc. and then transferred to the sink, it will save a lot of energy. For WSNs, data integration is the process of collecting and compiling useful data

I. METHODOLOGY

To aggregate the packets, we performed the aggregation of packets which were in the radius of 20 mm . And then the aggregated packets are sent to the sink mote via any one mote.

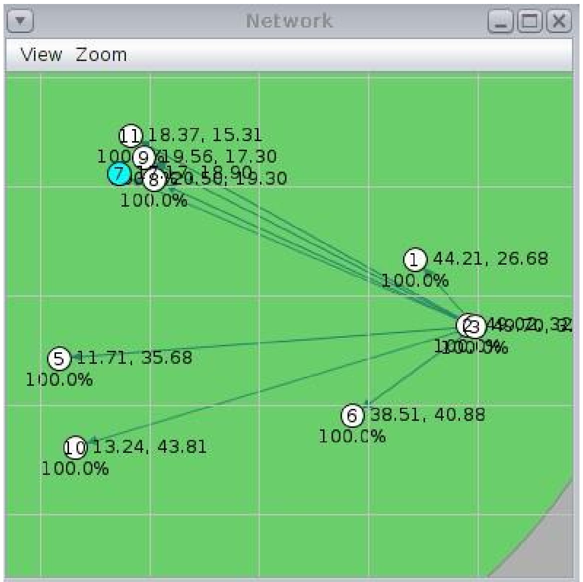


fig (1)

In the above diagram (*fig 1.)*, we can see that the sink mote is receiving the aggregated packet.

To aggregate the packets, we have used an empty character array and then we have aggregated the packets which are present in the same radius keeping in mind that the size of the packet should not be greater than 30 characters.

II. Results and discussion

In this methodology, data is processed at intermediate motes in order to reduce consumption of critical resources such as energy, computation time etc. This approach also increases the network lifetime as it tries to reduce the energy consumption at every node. In figure 2 we can see the aggregation message .

In this approach, we found that energy consumption is less as compared to sending data without aggregation. In fig 4 we can observe this.

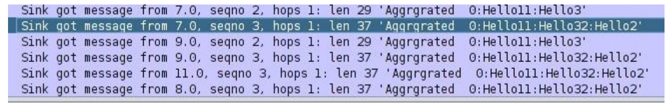


fig (2)

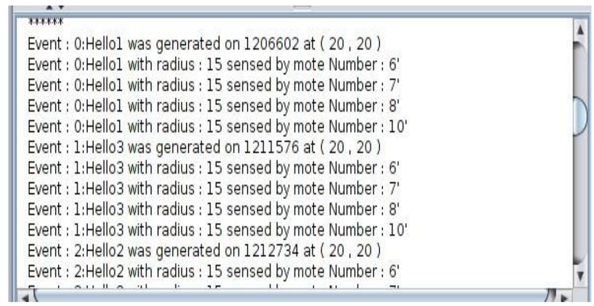
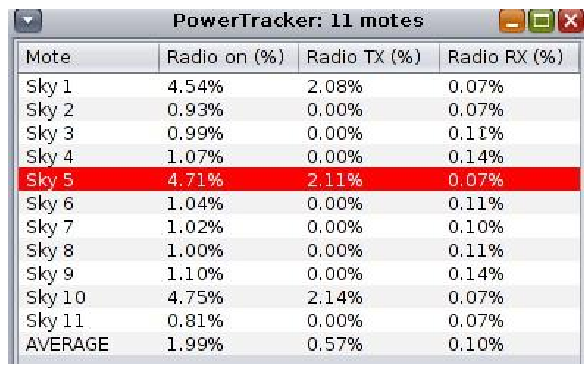


fig (3)



PowerTracker: 11 motes

Mote	Radio on (%)	Radio TX (%)	Radio RX (%)
Sky 1	4.54%	2.08%	0.07%
Sky 2	0.93%	0.00%	0.07%
Sky 3	0.99%	0.00%	0.11%
Sky 4	1.07%	0.00%	0.14%
Sky 5	4.71%	2.11%	0.07%
Sky 6	1.04%	0.00%	0.11%
Sky 7	1.02%	0.00%	0.10%
Sky 8	1.00%	0.00%	0.11%
Sky 9	1.10%	0.00%	0.14%
Sky 10	4.75%	2.14%	0.07%
Sky 11	0.81%	0.00%	0.07%
AVERAGE	1.99%	0.57%	0.10%

fig (4)

III. Conclusion and Future Scope

We have used the simple aggregation technique i.e SUM the packets which are in the given radius. As a future work, we will try different aggregation techniques like -

1) Adaptive Data Aggregation Techniques
2) Cluster Based Data Aggregation Techniques
3) Network Lifetime Based Data Aggregation Techniques

And compare the power consumption result.

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