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WIRELESS SENSOR NODE ADDRESSING USING PYTHON

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Abstract- A wireless sensor network (WSN) is made up of a large number of sensor nodes that are all tasked with doing some kind of monitoring and reporting, and the devices in the network are completely autonomous. Energy consumption for data transmission to the sink node is likely to increase as the number of sensor nodes in the network grows from tens to hundreds of thousands or even millions. A single sensor cannot send data to the sink station on its own, due to the fact that each sensor node has a different minimum range of communication. Using dijkstra's algorithm, we are able to determine the shortest path from a source node to a destination node, allowing us to bypass intermediate nodes and send the data directly. This is made possible by the byte string addressing scheme, which allows us to compare the first byte of data from the destination node with the corresponding byte from the source node.

Keywords: Byte String addressing ,dijistras algorithm,energy consumption.

1. INTRODUCTION

Small devices called sensor nodes, equipped with computing and wireless communication capabilities, make up a wireless sensor network (WSN) that is used to keep tabs on things like temperature, noise, vibration, pressure, and motion over a large area. Since the nodes in wireless sensor networks run on batteries, energy efficiency is crucial. As a result, several protocols have been devised with the aim of reducing the power requirements of such nodes. Due to the battery-operated nature of the nodes, energy consumption is a major consideration in wireless sensor networks.

Considering that most Wireless sensor network applications use batteries as their energy source1, energy conservation is a crucial consideration when designing a routing protocol for wireless sensor networks, and that each node in such a network typically has its own set of sensors and its own energy source. Sensors in a wireless sensor network have widely varying energy consumption rates due to the wide variety of communication protocols in use. Presented are findings for sensor node energy consumption, sent and received power, operating voltage requirements, the impact of transmission power on energy consumption, and several approaches to assessing lifespan.

In this article, we describe and evaluate the behaviour of sensor nodes as they approach the end of their useful lives. We use dijistra's approach to determine the least-resource-intensive route from each sensor node to the central sink node and

compare our results to those of competing models. Although there are numerous drawbacks to wireless sensor networks, everything is being worked on by employing them. In this case, we are striving to extend the lifespan of sensor nodes and lower their energy requirements.

We all know that the major disadvantage of wsn is power consumption because every node has its functionalities and continuously monitors, so we need to develop a better algorithm. In this case, we're using a dijkstra's algorithm and a byte string addressing scheme to reduce power consumption while still allowing wireless sensor networks to be useful.

This dissertation's overarching goal is to provide a parametric model that can be utilised to ascertain the current residual energy in any given section of the network at any given time. There should be a central monitoring node where data about the network's unused energy may be stored and easily accessible by other applications. The thesis also seeks to lessen the power needed to get information on how much power is still available in each network node.

2. PROPOSED SYSTEM

Byte String Addressing Scheme

Byte string addressing is refer to the a length of data is converted into number of byte ,the data collected by the each sensor whatever it is like heat ,temperature,light..etc,of a sensor node .If the source sensor node wants to transimit the data to the destination node throughout calculating the shortest path by using the dijistras algorithm.After obtaining the shortest path we transmit the data directly to the destination node using bytestring addressing scheme.first byte of the given data is consisting node id or node name,based on node nmae or node id ,data is transmited to the respected destination node by calculating the shortest path.length of string or data is separated into bytes by using the special character.that of (/) or " ".the purpose of byte string addresing schme is ,if the neighbouring node access the data ,before it accessing it checks the first byte ,first byte consisting the node id,if the node id is same as data accessing node id ,then only the respected node access the data otherwise ,node transmit the data and the data is tramsit to destination node.

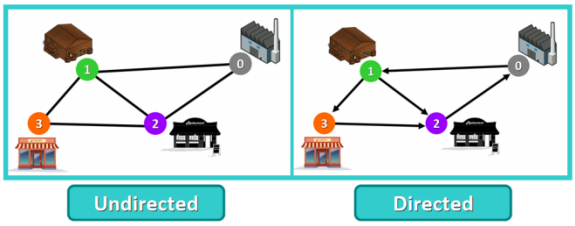

Fig1: System Architecture

3. RESULTS

3.1 Shortest path calculation:

Dijkstra'salgorithm is used for finding the shortest path among all nodes in a coverage area,andin this prims algorithm is used because prims algorithm is also used for finding the minimum spanning tree. In wireless sensor network consisting several autonomus sensor nodes, each sensor having a its own node ID .In this algorithm ,we assign a weight to each and every node in a coverage region ,the node which wants to transmit the data ,that node acts as a source node and source node weight is zero. Fig 5.1 shows the nodes in coverage area and its their distance .If the source nodes wan want trantransmit data to destination nodes through best path among all other paths in the region. So through this which we can reduce the power consumption and increase the lifetime of the network. Finding the shortest path among all other regions show in fig . In adaoc network , a sensor node cannot transmit the datan directly to the sink nodes because a sensor

node in wireless sensor network having the communication range that off 100Meters ,so that in between the range only sensor nodes can communicate. Thorugh the shortest path data can transmit to the sink node without consuming the more power.fig 1 shows that ,we consider ,in a coverage area only 6 nodes are there , if any node wants to transmit data within the coverage area nodes, then only program is running ,otherwise it exit the program and specifies the node is not specifies within the region .

Fig 3.1.1: Output of Shortest Path

The above output describes the finding the shortest path between the source node to destination node providing the source node address and destination node address by the user .In this dijkstra's algorithm we assign a weight to each node in the coverage area in order to finding the shortest path among the nodes. The above fig:5.1 tells about the finding the shortest path between the source node "B " and to the destination node "A" .By giving the weights to each node we can easily calculate the distance between the nodes .By looking the fig 5.2 we can identifies the distance between node a to b as well as f to a.

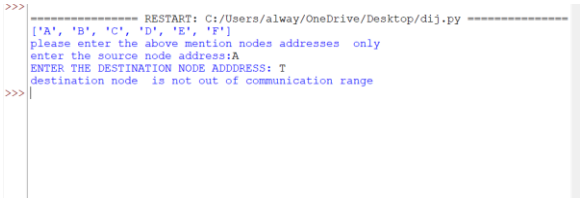

Fig 3.1.2: Defining Communication Range

3.2 Data Transmission through Shortest Path:

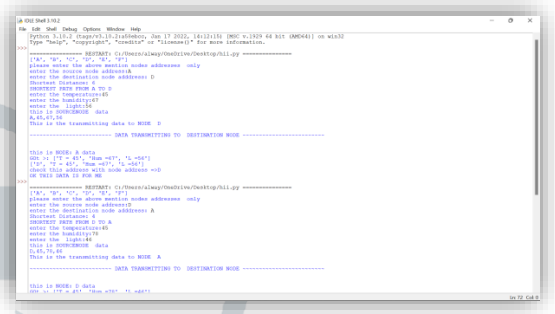

Fig:3.2.1:Data Transmission Output

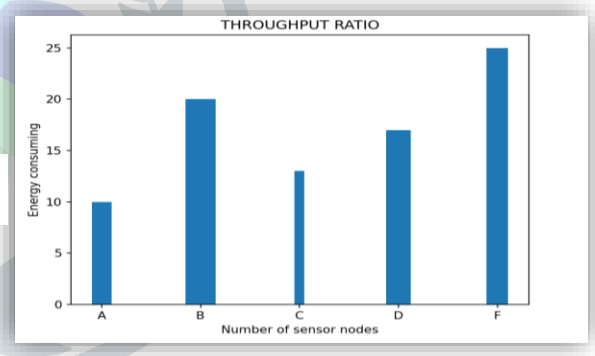

Fig 3.2.2: Throughput Ratio

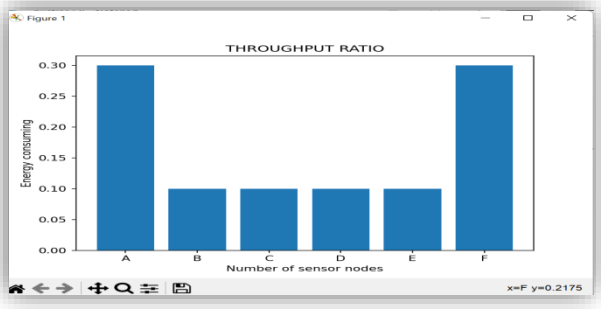

Fig 3.2.3: Energy Consumption Ratio

4. CONCLUSION

A sensor node in a WSN will respond instantly when an event causes a significant change in the value of a detected characteristic. In conclusion, this paper uses a thorough performance evaluation of Dijkstra's algorithm to determine the best route between the various nodes in the coverage area. We can also employ the byte string addressing scheme, which partitions the information gathered by a sensor node into the necessary bytes using a separator character such as a slash (/). In order to lessen the impact that power consumption has on wireless sensor networks, techniques like the byte string addressing scheme and Dijkstra's algorithm have been implemented. With these tools, data can be sent directly from one node to another by determining the shortest route and node address.

Future Scope

There are a variety of uses for wireless sensor networks. One of the most important factors in wireless sensor network performance is how much energy they use. Since most sensor nodes must rely on batteries, and the energy they can provide is limited, this poses a problem. The study of how to create energy-efficient algorithms for routing in wireless sensor networks is expanding quickly. The work presented here focuses on developing WSN-agnostic algorithms that minimize energy consumption. The lifespan of a sensor network may be extended by using a combination of the Byte String addressing method and Dijkstra's algorithm.

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