A Minimum HOP Count Based Energy Effective Approach To Optimise Routing In WSN Research Article

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ABSTRACT
To optimize the communication over the network, it is required to control and reduce the energy consumption. In this research work, the optimization on energy consumption is suggested in case of route generation in sensor network. The presented work is about to perform a dynamic route generation approach under parametric analysis. As each participating node in network path consumes some amount of energy, the idea is here to reduce the number of participating nodes over the route. To reduce the intermediate nodes, the each node will identify the high energy nodes on boundary of its sensing range instead of identifying the minimum distance hop. The work is to utilize the complete sensing range of nodes so that energy effective path will be generated over the network.

Keywords- wireless sensor network,energy,routing,nodes,hop count,distance,multihop,power.

1. INTRODUCTION
Wireless sensor network is made up of several small sensors called nodes. There are three components in a node. These components are: A sensing unit for data acquisition from the physical surrounding environment, a processing unit for local data processing and storage, a wireless communication unit for data transmission. The sensor nodes collect and route data either to other sensor node or back to an external base stations. Sensor nodes carry limited resources and generally irreplaceable power sources. It is difficult to replace or recharge the batteries because nodes are deployed in critical terrain also in large number. Sensor network’s life time depends on energy which is supplied to it. That’s why it is mandatory to design energy efficient routing protocol. There are many protocols that are designed specifically for wireless sensor network likes routing, power management and data dissemination. There is a battery equipped with each node with limited capacity which is very difficult to change or recharge due to the kind of environment in which they are
deployed. There are many significant application areas of wireless sensor such as scientific, production and delivery, logistic, environmental monitoring, agriculture, military, structural health monitoring or healthcare applications.

The structure of a typical wireless sensor node consists of four main parts:

(i) Sensor unit
(ii) Processing
(iii) Communication unit
(iv) Power supply unit

Fig-1: Sensor Node Structure

Sensor nodes can also include a location finding system to obtain the location and a mobilizer to change the location. To increase the lifetime of a sensor network the combination of different techniques is needed. To reduce energy consumption to the minimal during network activities, energy efficient protocols are used. Other components consume a large percentage of energy such as radio even in the idle state and central processing unit. That’s why, power management schemes are used to switch off components that are not yet needed.

In section II, the work already done in the area of shortest path routing and alternate path routing is defined. In section III, the presented work methodology and routing scheme is explored. In section IV, the conclusion driven from the work is defined.

2. LITERATURE SURVEY

1. In this paper author has presented an optimal routing approach in sensor network under energy specification analysis and optimal route generation. Author defined a quantize mechanism for effective route generation.

2. In this paper author has defined an opportunistic routing over the sensor network. Author defined a challenging framework to improve the network communication in sensor network. Author improved the route generation and optimization. Author has reduced the energy consumption and generate effective route.
3. In this paper author has defined an effective routing in sensor network for structured communication. Author defined the sensor deployment specific communication in sensor network. Author defined the work to perform effective deployment of nodes and network. Author defined the deployment of nodes in classified sensor network. Author improved the communication under location specific and deployment specific communication network. Author defined the route generation and optimization in effective structured sensor network. Author defined the coverage specific routing to provide effective deployment of nodes under constraint specification.

4. In this paper author has defined an effective communication routing and scheduling so that the network life will be improved. Author has defined the power effective communication so that the energy effective network communication. Author has defined the periodic communication in sensor network so that the sleep scheduling scheme and deployment of sensor network will be improved. Author defined the effective packet delivery with effective scheduled routing in sensor network.

5. In this paper author has defined effective route generation in sensor network. Author improved the routing under the reliability and low cost communication in sensor network. Author defined hop effective communication so that the reliable communication will be drawn. Author improves the hop effective routing policy so that the effective route quality will be improved. Author defined the network topology specific route generation in sensor network. Author provided the effective packet communication to reduce the communication cost. Author defined work to improve the network life time, reliability and communication by reducing the overhead.

6. In this paper author has defined an energy effective route generation in sensor network. Author has defined the battery effective communication in sensor network. Author defined work under restrictions of node deployment. Author has defined the energy limited routing to conserve the energy and to improve network life. Author has defined two main energy effective schedule approach called random communication and synchronized communication. Author has defined a sleep scheduling scheme to generate route between two ends. Author has defined a new protocol to generate route under tree specification analysis and scheduling mechanism so that the energy effective balanced communication is drawn over the network. Author defined the fault tolerant communication in sensor network. Author presented a energy effective communication so that the network life will be improved and the performance of network will be adaptive.

7. In this paper author has defined an effective power effective scheduling and routing under multihop scheduling and energy effective routing. Author has defined multicast communication routing in sensor network. Author improved the broadcasting over the network with performance improvement. Author has defined suboptimal algorithm under the performance study.

8. In this paper author has improved the geographic routing and duty cycle specific sensor network. Author defined a greedy forwarding communication over the sensor network. Author defined the
greedy based approach to optimize the routing for long distance communication. Author defined the algorithm analysis under different parameters that shows the significant improvement.

9. Yu Gu (2007) has defined effective scheduling mechanism to improve the routing in surveillance based communication network. Author defined the routing to improve the network lifetime and coverage so that network effectiveness will be improved. Author has defined the effective communication network under energy effectiveness. Author has improved the network under the connectivity requirement. Author has presented a Q-coverage based requirement approach to provide communication under effective sample rate based communication. Author has defined the NP complete problem effective optimized routing under the sensing range based communication. Author has defined the column effective route optimization with the specification of speed and convergence rate. Author provides the priority specification communication over the network.

10. The author has defined an effective route communication so that the network life will be improved. Author defined the communication network to handle these communications over the network. Author has defined the effective balanced data gathering to perform data transmission under range, connectivity, fault effectiveness and power aware communication. Author defined the communication over clustered network so that the cluster head based communication will be performed. Author defined the relay node based communication to generate effective route in sensor network. Author defined the scheduling over the network to improve the communication. Author has defined an effective communication approach to improve the network life and to improve the network communication.

3. PROPOSED WORK

To determine the lifetime of the network energy efficiency plays a major role in wireless sensor networks. There is a battery that gives power to network which is hard to recharge. Now a major issue arise to extend the lifetime of sensors to improve the efficiency. Now the researchers have come up with energy conservation techniques, schemes and protocols to reduce the rate at which the network consumes energy. To reduce the network energy consumption there are number of existing routing approaches so that effective path selection would be done. One of the methods associated with routing in such network is the hop count. Every participating node in sensor network to the communication path consumes some amount of energy either it is a transmission node or a receiver node or the forwarder. The energy consumption over the route will also get reduced if the number of hops over the path will be reduced. This task is focused on same concept. There is multi-parametric approach is recommended to improve the network path. The parameters considered in this task are, distance, and hop count and energy. This task will generate the energy effective route so that a reliable communication will be performed over the network.
3.1 Research Methodology
The distance is the most important factor of a mobile ad-hoc network respective to routing algorithm. We have considered parametric approach in the presented work to identify the right communication path. The parameters which we have used in this work are

- Energy
- Maximum Coverage Range
- Distance

Depending on these above parameters the efficient and reliable communication path will be generated. Now that path will be selected as the main routing path and the communication will be performed over that path. As the algorithm begins, the source and the destination nodes are specified explicitly between which the communication path will be generated. Now the request will be sent to the source node. Now it will wait for the reply. After the reply is received it identify the right communication can be taken place. Now to perform the efficient communication between the source and the destination the effective parameters are required to identify for each neighbour node of current node.

Now we need to find the next effective neighbour over which the communication will be performed. In this work, to identify the best neighbour we will perform the parametric approach on each node. The distance, energy, maximum coverage area and delay analysis on each node are the parameters that we considered here. Usually minimum distance neighbour is considered as the effective next node. But in this work, the maximum distance node within the coverage range with maximum energy is considered as next effective node. Set this node as the best neighbour and the communication will be performed over that node. We have to repeat the process till the destination node is not arrived.

4. RESULTS
The proposed work is about the generation of an approach that will meet the below criteria.

- Dynamically compensate the problem of link failure
- Provide the optimize solution without any data loss.

The presented work is implemented in matlab environment. The proposed system is useful in terms of efficiency and accuracy. The proposed work is about to find the optimal solution of data loss or any broken link in a high speed Sensor network. If there are some chances of occurring of any intrusion or the congestion in the route of the basic routing algorithm, a compromising path to transfer data from some safe route is introduced. The network is designed with some parameters given as

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Parameter Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Nodes</td>
<td>14</td>
</tr>
<tr>
<td>Topography Dimension</td>
<td>500 m x 500 m</td>
</tr>
<tr>
<td>Topology</td>
<td>Fixed</td>
</tr>
</tbody>
</table>
Initial Node 1
Destination Node 7
Transmission Energy 50 NJ
Receiving Energy 50 NJ
Forwarding Energy 10 NJ

The analysis result is shown in figure 2

**Fig-2**: Hop Count Analysis (Existing Vs. Proposed Approach)

Here fig-2 is showing the hop count analysis of existing and proposed approach. As shown in the figure, the proposed work has reduced the number of intermediate nodes. It will reduce the energy consumption and improve the network life.

**Fig-3**: Energy Consumption Analysis (Existing Vs. Proposed Approach)

Here fig-3 is showing the energy consumption analysis of existing and proposed approach. As shown in the figure, the proposed work has reduced the energy consumption over the network.
5. CONCLUSION

In this proposed work we have defined a minimum hop energy effective communication path over the sensor area network. The work is defined for sensor area network with fixed placement of network nodes. These nodes are defined at fixed position and with energy specification. The work has presented a multiple parameters based approach to generate the effective communication path with minimum number of hops over the route. The parameters considered in this work are energy, sensing range and the distance parameters. The work is about to generate a path that will use minimum number of intermediate nodes so that the energy consumption over the route is reduced. The result shows that the energy consumption over the route is reduced.

REFERENCES

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