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Research Article

IMPLEMENTATION OF AUTONOMOUS ROUTE DISCOVERY THROUGH SHORTEST ROUTING ENERGY LEVEL

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Abstract

The purpose of the work is to enhance routing methods in networking conventionally data delivery to another node has often been stressed, which causes long delay in Packets Transmission. Network lifetime maximization has been significant problem in MANET. In the proposed system, Link capacity-energy aware wireless distributed computing (LEA-WDC) used for maximizing network lifetime, although the header node is only involved in managing a task, dividing it into sub tasks, and then allocating the sub-tasks to slave nodes to collect the results. Then the header node sends the collected results to sink or authorized destination node. In this work Shortest Tree Routing (STR) along with calculating Energy Level, Cost & Hop Count of all the Available Routes. Based on all these factors best route is identified and packets are transmitted. A coordinator is assigned to do node calculations and user will specify optimum or minimum cost during data transmission initially. Coordinator node will verify whether Nodes can transmit the packets successfully based on their energy levels. Packets are encrypted using RC4 Algorithm.

Keywords*:* Link capacity-energy aware wireless distributed computing, Shortest Tree routing, RC4.

1. Introduction

The wireless transmissions and the fame of portable computing devices have made the vision of "communication anytime and anyplace" possible. Users can travel everywhere, while at the same time still remaining connected with the rest of the world. Mobile computing, which has received intensive attention recently, Generally, most of the mobile computing applications today require single hop connectivity to the wired network. This is the distinguishing cellular network model that supports the needs of wireless communications by installing base stations or access points. In such networks, communications between two mobile hosts entirely rely on the wired strength and the fixed base stations. The wired backbone infrastructure may be unavailable for use by mobile hosts for many reasons, such

as unpredicted natural disasters and radio shadows. Also, it might be infeasible to make sufficient fixed access points due to cost and performance concerns; for instance, having fixed network infrastructure in desert areas, festival grounds, or outdoor assemblies, outdoor activities is sometimes prohibitive. In emergency search-and-rescue or military exercises, a temporary communication network also needs to be installed immediately. A mobile ad hoc network (MANET) can be a better choice. A MANET consists of a set of mobile hosts operating without the assistance of the established infrastructure of central administration (e.g., base stations or access points). Communication is done through wireless links among mobile hosts through their antennas. Due to concerns such as radio power limitation and channel application, a mobile host may not be able to communicate directly with other hosts in a single hop fashion. In this case, a multihop scenario occurs, in which the packets sent by the source host must be relayed by several intermediate hosts before reaching the destination host. Thus, each mobile host in a MANET must serve as a router. Extensive efforts have been devoted to MANET-related research, such as medium access control, broadcast, routing, distributed algorithms, and QoS transmission problems. In this, we will focus on the routing problem, which is one of the most important issues in MANET. In this paper, we present a strategy for maximizing the lifetime of single-hop WDC networks, as depicted in Fig. 1, in which a task with a service time constraint is initiated at the header node and then distributed to slave nodes as sub-tasks. Each slave node is composed of processing and communication sub-systems. As mentioned above, because the header node manages the overall system, it is assumed that that node is supplied with external power or a sufficiently large battery. In contrast, each slave node has an internal limited battery power supply. Under the limited residual energy of distributed nodes, the network lifetime depends on the energy utilization of processing and the communication powers of each slave node according to the quantity of allocated sub-tasks. Hence, maximizing the network life-time of WDC should account for the interaction between the processing and communication sub-systems for the given allocated sub-tasks while the task time constraint is satisfied. To achieve this inter-layer optimization, it is necessary to perform a cross-layer optimization by controlling the processing and communication parameters associated with the application and physical layers.

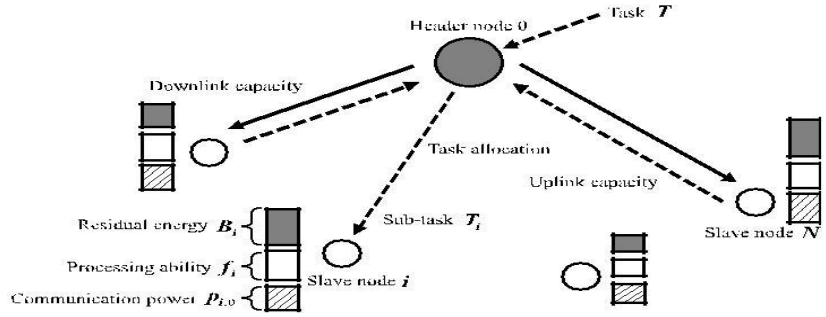

Fig. 1 System overview of wireless distributed computing network.

2. Literature Survey

Initially we order the nodes based on the energy criterion and then focusing towards node path; this can be done using Proactive route algorithm for finding optimal path between Source Destination nodes. Fast processing and per traversal can be done using selective flooding approach and results are in genetic. We have improved results with high accuracy and optimality in rendering routes. [1] optimizing localization route using particle swarm-a genetic approach

We analyze the environmental and node health data to evaluate system performance. The close integration of WSNs with their environment provides environmental data at densities previously impossible. We show that the sensor data is also useful for predicting system operation and network failure[2] analysis of wireless sensor networks for habitat monitoring

The sever power constraints strongly affect the existence of active nodes and hence the network lifetime. In order to prolong the network life time we have to overcome the scarcity in energy resources and preserve the processing of the sensor nodes as long as possible.

Power management approaches efficiently reduce the sensor nodes energy consumption individually in each sensor node and the adaptive efficient routing technique has greatly appeals a great attention in research. The potential paradigms of soft-computing (SC) highly addressed their adaptability and compatibility to overwhelm the complex challenges in WSNs. This paper is introducing and surveying some of the Soft Computing proposed routing models for WSNs that optimally prolongs its life time [3] routing wireless sensor networks based on soft computing paradigms.

Using OPNET simulator tools for the performance of OLSR routing protocol simulation, create in small network (30 nodes), medium size network (40 nodes) and large network (50 nodes) the complexity of the mobile ad-hoc network. The MPR count,"HELLO"message sent ,routing traffic sent and received, total TC message sent and forward, total hello message and TC traffic sent are analysis.[4] Simulation and Performance Analysis of OLSR Routing Protocol Using OPNET.

Home Automation system based on Wireless Sensor Networks (WSN) that allows managing and saving the energy consumption of home appliances.[5] Home Energy Saving through Wireless Sensor Networks

3. System Architecture

The system architecture framework for the proposed model is as shown in figure 2.

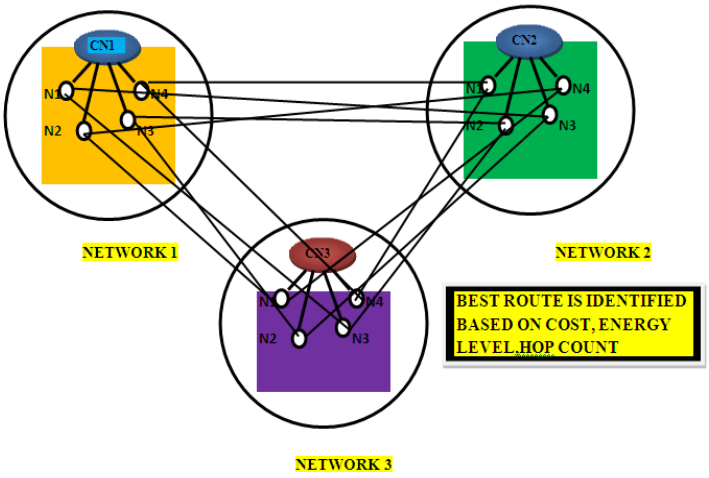

Fig 2.System Architecture.

Modules

A. Node Construction

B. Cluster Head Selection

C. Path Selection Based On STR Protocol

D. Data Transmission

A. Node Construction

In this Project concept, first we have to construct a network which consists of 'n' number of Nodes. So that nodes can request data from other nodes in the network. All nodes connected through the network. Network is used to store all the Nodes information like Node Id and other information. Also network will monitor all the Nodes Communication for security purpose.

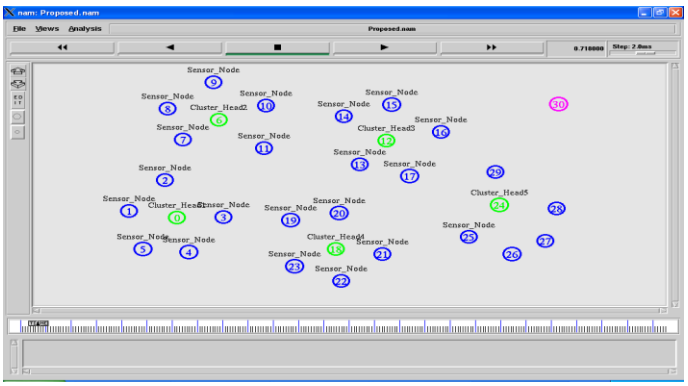

Fig 3.Node Construction

B. Cluster Head Selection

In this module, network assigns energy for each node and it selects the cluster head based on number of in degree implementation. Once we created node group in the cluster head, any of the node in network can request to cluster head for path selection. Then only source node sends the data to the destination node.

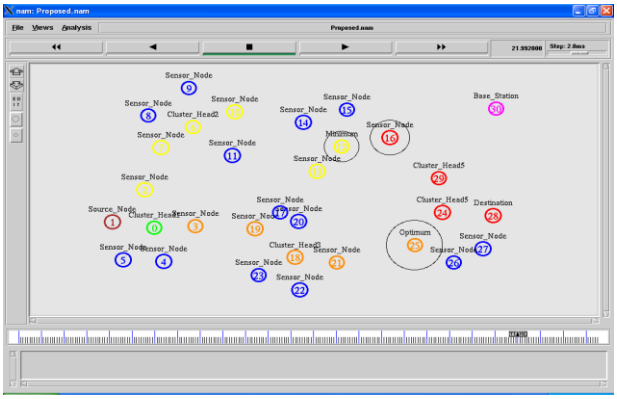

Fig 4. Cluster Head Selection.

C. Path Selection Based On STR Protocol

In this module, source node gives the request to cluster head for path selection. Then the cluster head calculates the node energy for efficient packet transmission. Although it calculates the optimum cost for transmission. After validating the node energy and cost, it finds the minimum hop count based on STR protocol. Thus cluster head selects the best route for packet transmission.

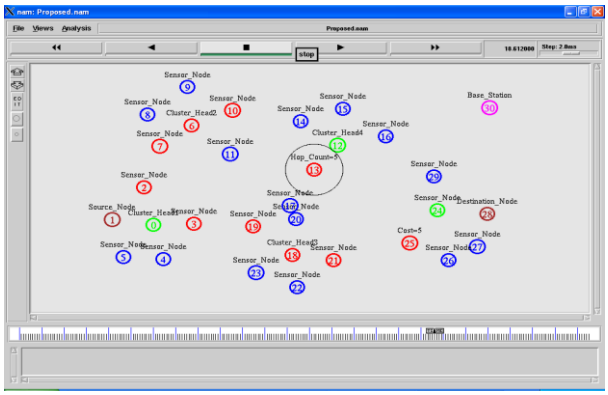

Fig 5.Path Selection.

D. Data Transmission

In this module, after path selection, cluster head sends the efficient path to source node. Then the source node transmits the packet to destination node through neighbor based on secure path. Thus network provides optimum routing path in efficient way based on cluster head selection.

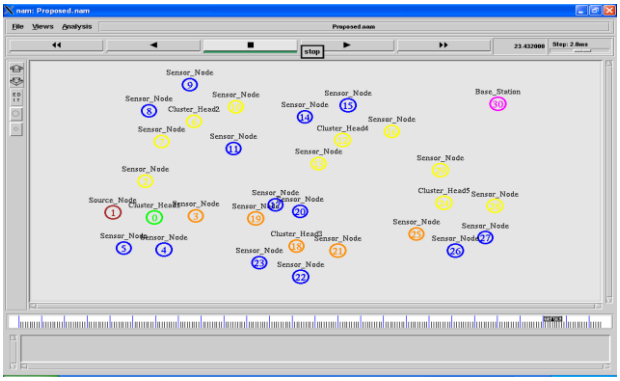

Fig 6. Data Transmission.

4. Result Analysis

In result analysis the performance is measured based on the parameters like hop count vs time which is shown in figure 7 and energy consumption vs time which is shown in figure 8.

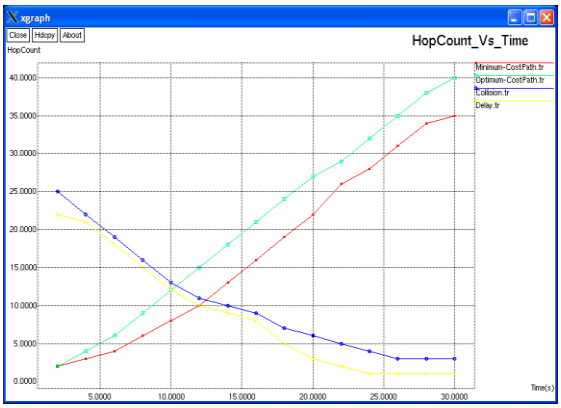

Fig 7.HopCount vs Time.

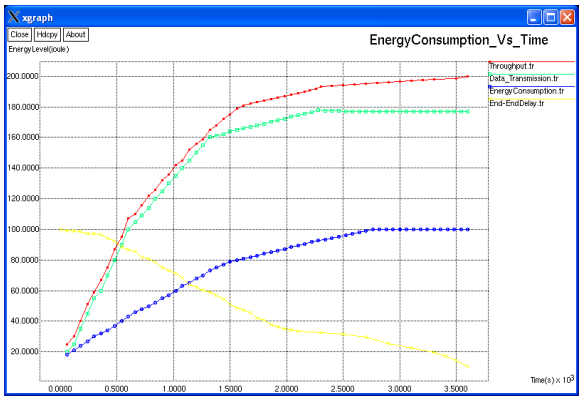

Fig 8. EnergyConsumption vs Time.

5. Conclusion

Wireless distributed computing, is essential to maximize network sustainability and interoperability. Routing is optimized using STR algorithm and calculates the nodes energy Level, cost & hop count of all the available routes in the network.

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