

Survey of Energy base multipath route selection using LEACH in MANET

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ABSTRACT:- Mobile Ad Hoc Networks (MANET) is gaining importance because of their flexibility, mobility and ability to work with a limited infrastructure. In multi-hop wireless network, proper utilization of battery power is very much necessary to maintain network connectivity. In order to overcome the network from inefficient routing problem, this paper presents different energy efficient routing protocols for mobile ad hoc networks. We focus our efforts on methods to reduce the energy consumption in communications between ad hoc network nodes. Routing is a critical issue in MANET and hence the focus of this paper along with the performance analysis of routing protocols. If the battery power of a node drains quickly then its connectivity in its neighborhood will be lost. So the study of network lifetime is very much crucial as compared to other network parameters. Considering this importance we will make an attempt to simulating the routing performance of proposed protocol in ad hoc network.

KEYWORDS:- MANET, AOMDV, LEACH, Cluster Head.

I. INTRODUCTION

Wireless mobile ad hoc network [13] is usually defined as a set of wireless mobile nodes dynamically self-organizing a temporary network without any central administration or existing network infrastructure. Since the nodes in wireless ad hoc networks can serve as routers, they are movable so they can form any type of topology. They forward packets for other nodes if they are on the route from source to the destination (like intermediate node. Besides other issues, routing is an important problem in need of a solution that not only works well with a small network, but also sustains scalability as the network gets expanded and the application data gets transmitted in larger volume. Since mobile nodes have limited transmission capacity, they mostly intercommunicate by multi hop relay. Multi hop routing is challenged by limited wireless

bandwidth, low device power, dynamically changing network topology, and high vulnerability to failure, to name just a few. To answer those challenges, many routing algorithms in MANETs [13] were proposed. There are different dimensions to categorize them: proactive routing versus on-demand routing, or single-path routing versus multipath routing. In proactive protocols, routes between every two nodes are established in advance even though no transmission is in Demand and in reactive routing routes between every two nodes are established when needed. Multipath on-demand protocols try to improve these problems by computing and caching multiple paths obtained during a single route discovery process. The link failures in the primary path, through which data transmission is actually taking place, cause the source to switch to an alternate path instead of initiating another route discovery. A new route discovery occurs only when all pre-computed paths break. This approach can result in reduced delay since packets do not need to be buffered at the source when an alternate path is available.

Current protocol provides multipath route discovery and path maintenance mechanism on the basis of a calculated cumulative metric value only on signal strength between two nodes in a path. This metric only address strength of link of the current path, does not address the durability of the path; which fully depends on the residual energy of node .Also does not consider the consistency of node through the previous behavior. Since it does not consider node's behavior and energy, it cannot be applied in heterogeneous MANETS having high mobility nature [3].

II. LITERATURE SURVEY

Abedelhalim Hnini et. al. [1] in his title "Effect of a Node's Death on Behavior of the LEACH Protocol and its Descendants" analyze the different LEACH variation protocol and identifies the pros and cons of all existing LEACH protocol, author also proposed a approach to enhances the performance based on dead node and end-to-end delay minimization of all existing LEACH protocol.

Ashlyn Antoo et. al. [2] proposed “EEM-LEACH: Energy Efficient Multi-hop LEACH Routing Protocol for Clustered WSNs” in this work they presented that chooses a multi-hop path with minimum communication cost from each node to the base station. This minimizes cost per data packet. If the cost for direct data transfer is less than the cost for communication via cluster head, nodes send data directly to the base station preventing the nodes near the base station from dying quickly. Since cluster heads are selected according to the residual energy and average energy consumption of nodes, the network lifetime can be prolonged.

Sheetal Sisodia et. al. [4] “Performance Evaluation of a Table Driven and On-Demand Routing Protocol in Energy Constraint MANETs” This paper addresses energy conservation which is a very important factor in Energy Constraint Mobile ad-hoc Networks (MANETs) and also try to reduce routing overhead for efficient functioning of the network. Every protocol gives different results depending upon the application.

Nicola Costagliola, Pedro Garçia López [5] “Energy- and Delay-Efficient Routing in Mobile Ad Hoc Networks” In this paper they discuss how we improved the *MChannel* group communication middleware for Mobile Ad-hoc Networks (MANETs) in order to let it become both delay- and energy-aware. *MChannel* makes use of the Optimized Link State Routing (OLSR) protocol, which is natively based on a simple hop-count metric for the route selection process. Based on such metric, OLSR exploits Dijkstra’s algorithm to find optimal paths across the network. We added a new module to *MChannel*, enabling unicast routing based on two alternative metrics, namely end-to-end delay and overall network lifetime. With such new module, we prove that network lifetime and average end-to-end delay improves, compared to the original OLSR protocol implementation included in the mentioned middleware.

Peyman Arebi Technical and Vocational University Bushehr, Iran [6] “A New Method for Restoration Broken Links in Wireless Ad-hoc Networks by Estimation Energy Consumption”. Ad Hoc networks allow a set of wireless hosts to exchange information without any special infrastructure. One of the most important issues in wireless ad-hoc Network improves routing protocol process. Among the various factors which cause disorder in such a network and routing protocol process, broken links due to the lack of energy is the most important ones. This paper proposes a novel method based on energy estimation to restore broken links and reconstruct the paths of them. So

investigate Effect of broken links on topology control and routing process in Ad Hoc network.

V. Ramesh, Dr. P. Subbaiah Research Scholar, Sathyabama University, Chennai, [7] “energy efficient pre-emptive dynamic source routing protocol for Manet” TN, India. An Ad-hoc network, a self-organizing wireless network is made up of mobile nodes, each node act as relay for providing data communication, which operates on batteries. In Ad-hoc network the topology changes often and needs large and frequent exchange of data among the network nodes for efficient routing. Existing routing protocols are proactive and reactive protocols. DSR is a simple and efficient reactive routing protocol. We have proposed Pre-emptive DSR (PDSR) in the earlier work with some modifications to the existing DSR algorithm. PDSR algorithm performs routing between source and destination.

Nini Wei, Yi Song [8] “A Energy-Aware Routing Strategy Based on Dynamic Priority Factor in Ad Hoc Networks” How to design a special and Energy efficient multihop routing protocol is one of the key technologies about Ad hoc networks research. The traditional routing protocols like DBF, AODV, DSDV and DSR are the shortest path protocols in Ad hoc network. According to the view of energy, the shortest path may be not the optimal routing. In this paper, a new energy-aware routing policy based on dynamic priority factor named EDSR for ad hoc is proposed, which is based on the classic DSR (the routing protocol on demand). Simulation with the NS2 then compared with the on-demand routing DSR from the energy-consuming and the number of remaining nodes.

Martin M. Mhlanga, Thomas O. Olwal, Martin M. Mhlanga, Thomas O. Olwal [9] “Energy Optimization based Path Selection Algorithm for IEEE 802.11s Wireless Mesh Networks” It is everyone’s dream to have network connectivity anywhere at all times. This dream can only be realized provided there are feasible solutions that are put in place for the next generation of wireless works. Wireless Mesh Networks (WMNs) configures itself and because of its cost effectiveness, it is therefore seen as a solution for the next generation networks. However, this field still has a lot of limitations and the main constrain is that the energy of the nodes is very limited, especially when the network is deployed in rural areas where electricity is a scares resource. This research therefore presents an energy optimization based path selection algorithm for IEEE 802.11s WMNs which is aimed at addressing the above mentioned constrains. As a newly proposed standard specifically designed for WMN, the IEEE 802.11s does not consider energy conservation as a

priority in its protocol. As a result, the main goal for this research is that paths with enough energy for transmission in the network must be selected when transmitting packets.

Vinay Rishiwal, S. Verma and S. K. Bajpai [10] "QoS Based Power Aware Routing in MANETs" In this paper, QoS based power aware routing protocol (Q-PAR) is proposed and evaluated that selects an energy stable QoS constrained end to end path. The selected route is energy stable and satisfies the bandwidth constraint of the application. The protocol Q-PAR is divided in to two phases. In the first route discovery phase, the bandwidth and energy constraints are built in into the DSR route discovery mechanism. In the event of an impending link failure, the second phase, a repair mechanism is invoked to search for an energy stable alternate path locally

Imane M. A. Fahrnv, Hesham A. Hefny, Laila Nassef [11] "PEEBR: Predictive Energy Efficient Bee Routing Algorithm for Ad-hoc Wireless Mobile Networks" Over the last decade, numerous research efforts have been made to develop energy-efficient routing protocols for the Mobile Ad-hoc wireless Networks MANET. However, these energy-efficient protocols have added an overhead on the network and its nodes which could result in overall network performance degradation. In this research paper, a new swarm intelligent routing algorithm inspired from Bees; the Bees Colony Optimization (BCO) model is introduced. The proposed Predictive Energy Efficient Bee Routing PEEBR algorithm aims to predict the amount of energy that will be consumed by all the nodes along each of the potential routing paths between a certain source node and a destination node using two types of bee agent. PEEBR is a bio-inspired routing algorithm that considers energy conservation during route discovery, evaluation and selection.

Hee Yong ,Youn Chansu ,Yu Ben Lee[12] "Routing Algorithms for Balanced Energy Consumption in Ad Hoc Networks" In mobile ad-hoc network (MANET), a node communicates directly with the nodes within wireless range and indirectly with other nodes using a dynamically computed, multi-hop route via the other nodes of the MANET. In order to facilitate communication within the network, a routing protocol is used to discover routes between nodes. The primary goal of such an Ad hoc Network routing protocol is correct and efficient route establishment between a pair of nodes so that messages may be delivered in a timely manner. Although establishing efficient routes is an important goal, a more challenging goal is to provide energy efficient routing protocols, since a critical limiting factor for a

mobile node is its operation time, restricted by battery capacity.

Liu Huiyun [14] in his work titled "An Optimized LEACH algorithm in Wireless Sensor Network" in his proposed CDE-LEACH protocol can effectively maximize coverage of network, and reduce the network energy consumption effectively. The improved LEACH algorithm can effectively reduce energy consumption of sensor nodes in the network and prolong the life cycle of the network. In future that work enhanced while inbuilt CDE-LEACH with decision tree based cluster approach and reliable cluster head node decides for central coordination between members and base station.

III. OBJECTIVE

Wireless mobile ad-hoc network are resource constraint devices because that is portable with certain limitation that is like energy of node's, radio range, frequency, routing etc. so aim is to design a technique to efficient and reliable service provides to the mobile ad-hoc nodes with the modification of LEACH and AOMDV routing. That work can minimize routing overhead of the network, provide load balance communication to all nodes with based on equal priority and also increase the life time of the network. For that purpose modified the LEACH protocol with energy module that will work according to higher energy scheme with minimum utilization routing overhead. That protocol will ensure that there will be no dropping of data packets in the network and hence ensure that there will be successful data transfer with lowest overhead required.

The Following Objective to design the protocol of High energy and Movement based Cluster head selection (HM-LEACH) with AOMDV routing

- Proposed work under the wireless mobile ad-hoc network environment with energy aware base routing strategies, which give the energy information about each node, while nodes in radio range.
- It provides reliable as well as low overhead and increases throughput of the network.
- It provides maximum network life time because cluster head gives maximum energy contains paths from source to destination.
- Proposed work use AOMDV (ad-hoc on demand multipath distance vector) routing and balance the network load to send the data with multipath with higher energy approach.
- Objective to change the cluster head in TDMA manner, that combination of energy of node, estimated energy requirement for communication and its mobility.

- Aim to design the protocol that minimizes the number of dead node and node isolation problem.

Proposed work also minimizes the end-to-end delay because cluster base routing protocol provides data delivery through multipath as well as minimum energy utilization base approach.

IV. PROPOSED WORK

Due to the limited battery power the energy proficient consumption is necessary. In this paper we propose a new energy based load aware scheme to enhance the life of network and utilizes the node energy efficiently using LEACH protocol. In this work the possibility congestion is recognize on the basis of energy consumption. If the load in any node or link are more than in that case the node energy depleted rapidly then at that time the particular threshold value is fixed for number of packets at that link or node, if the number of packets are larger than threshold value then in that case the loaded node immediately reply to sender please slow your transmission by that the sender slowly transmitting and also aware about the load in that node then the energy utilization increases because if the node is not transferring data then in that case all the nodes that are deliver their data retransmit their data because of packet losing due to heavy loaded. We also select the path on the bases of node mobility and higher energy measurement base mechanism through that approach if node velocity is lower and energy is higher than it's more reliable as compare to other route and select that path is best feasible path for communication.

V. PERFORMANCE METRICS

- **Packet Delivery Ratio:** The ratio between the number of packets originated by the application layer CBR sources and the number of packets received by the CBR sink at the final destination.
- **Average End-to-end Delay:** This includes all the possible delays caused by buffering during route discovery latency, queuing at the interface queue, retransmission delays at the MAC, and propagation and transfer times.
- **Packet Dropped:** The routers might fail to deliver or drop some packets or data if they arrive when their buffer are already full. Some, none, or all the packets or data might be dropped, depending on the state of the network, and it is impossible to determine what will happen in advance.
- **Routing Load:** The total number of routing

packets transmitted during the simulation. For packets sent over multiple hops, each transmission of the packet or each hop counts.

- **Member in Cluster Head:** During the simulation pause time, number of member node ménage per cluster head is calculated by dead nodes and that depends of TDMA based slot in every pause time.

VI. CONCLUSION

In this paper, we studied various energy based routing protocol of mobile ad-hoc network (MANETs). We also study the importance of energy conservation for improving network life time. We also describe about enhanced low energy adaptive cluster hierarchical routing that increase the performance of the network and also minimized the energy consumption from the network, because proposed approach based cluster head are responsible to provide higher energy based path between communicator nodes and also provide efficient inter cluster communication with minimum overhead. Further our proposed approach simulates by the network simulator-2 and analyzes the network behaviour during communication.

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