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ENERGY BASED AODV(EAODV) CERTAINTY SOLUTION FOR TENTATIVE NODE ENERGY IN MANET

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ABSTRACT

Mobile ad hoc network is a group of mobile wireless nodes, routing is an effective way of expanding the lifetime of ad hoc networks. Routing and Reliable Minimum Energy Routing, which is called Reliable Minimum Energy Costs, EADOV caters to three important requirements of ad hoc networks: Energy-efficiency, reliability, and expansion of network life span. It understands energy consumption and the remaining battery energy of the nodes. Routing protocol usually establishes the shortest route based on the number of nodes between the source and is to find a low energy adaptive reliable path, which requires minimum power for the reliable packet transfer in the ad hoc. In MANET, the routing protocol As a packet route, MANET depends on the constraints, such as the minimum power of the battery, the power of the battery is limited to the mobile node in MANET Battery supply maximizes protocol and network life span to use routing power. Energy consumed in MANET during this calculated energy has been included in the selection of optimal path, for the data to route Minimum energy is required.

KEYWORDS: MANET, EADOV, Threshold, AODV Routing Protocol, NS Simulation.

INTRODUCTION

Efficient energy routing is an effective mechanism for reducing the energy cost of data communication in wireless ad hoc networks. Generally, routes are discovered by considering the energy consumed for the end-to-end packet path (E2E).[1] The flexibility and mobility Wireless networks offer them a network of choice. There are two categories of wireless networks, i.e. infrastructure-based wireless networks and wireless ad hawk networks, an ad hoc wireless network designed to remove the natural limit of wired backbone networks and infrastructure-based wireless networks. The network is a collection of mobile nodes distribution a wireless channel and is dynamically creating a provisional network topology without the existence of network infrastructure or centralized administration.

Whenever an access point or base station is not included, the ad hoc network can be set up quickly and cheaply. Wireless multi-hop ad-hoc networks are created by mobile users or groups of mobile devices spread over a certain geographical area. We call networks that create networks or nodes. Each node is equipped with a radio transmitter and receiver which allows it to communicate with the remaining nodes. Nodes in an ad hoc network can be generated in data and can move any other node in the network. Ad hoc networks are stronger than conventional wireless networks because of their non-hierarchical distributed control and management mechanisms.

These nodes can act as both host and router. As a host, the nodes work as a source and destination in the network, and in the form of router, nodes work as intermediate bridges between the source and destination of all neighboring nodes in the network.[2] The routing protocol maintains the network topology for the wireless ad hoc network. If a link breaks, then the routing protocol is responsible for repairing that link to maintain the stability of the network. Various strategies in different routing protocols to progress broken links; restore strategies are quite specific for each strategic routing protocol; Therefore it is difficult to analyze the pros and cons of each protocol. What we can do is to find link break potentials of different types of routing protocols, since the problem greatly influences the functionality of the routing protocol. Two categories of most popular routing protocols, table-driven and on-demand routing protocols are discussed in this title. We will analyze the problem of link breaks, the effect of the problem on each category's routing protocol and the routing table for them will be updated.[3]

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RELATED WORK

Sanehi Siroh1, Manoj Yadav[4] A mobile adhoc network is a network in which nodes are dynamic in nature and has limited bandwidth and minimum battery power. For providing the scalable routing the nodes are divided into clusters, in clusters there should be a cluster head which contains all the information about its nodes, as in the flat routing every node perform the same role therefore network lifetime is less.

Jaspreet Singh, Kartik Sharma[5]Mobile ad-hoc networks are infrastructure-less networks used for communication between two or more nodes without a common access point. It is a collection of nodes that is connected through a wireless medium forming changing topologies. In mobile ad-hoc networks all the nodes are mobile in nature and having limited battery charge. Continuous change in position of nodes in the network degrades the battery charge of the nodes therefore it is necessary to save the battery power of those nodes so that the network lifetime can be long lasting. Nodes are in network are working in the presence of limited energy then energy efficient routing is necessary for reducing energy consumption. In this paper we proposed energy efficient Aodv routing protocol in which Dijkstra algorithm is enhanced to improve the overall performance of the network. Existing systems are not capable of finding the shortest and energy based path among the nodes in the network if multiple nodes fail simultaneously. Performance parameters are Packet delivery ratio, Throughput, Energy consumption and routing overhead. The simulation is done using NS2 network simulator

M. Tamilarasi, T.G. Palanivelu "Integrated Energy-Aware Mechanism for Manets Using On-Demand Routing" [3] in this title a mechanism involving the integration of load balancing approach and transmission power control approach is introduced to maximize the life-span of MANETs. The mechanism is applied on Ad hoc On-demand Vector (AODV) protocol to make it as energy aware AODV (EA_AODV).

Fei Dai et al [7] the basic idea of this paper was to save power by using efficient broadcasting techniques that are achieved to conduct broadcasting using directional antennas for ad hoc networks. This paper firstly focuses on energy consumption as well as forwarding packets directionally by introducing directional antennas. Syropoulos et al [8], have implemented the use of Directional Antennas for energy efficient communication in ad hoc networks.Jin-Man Kim et al., [9] introduced an Energy Mean Value algorithm to enhance AODV routing protocol and to improve the network lifetime of MANET.

METHODOLOGY

Route Discovery

A route exists, then the router just forwards the message to the next node. Otherwise, this message saves messages in the queue, and then one path initiates a request to set a route. The following flow chart shows the process:

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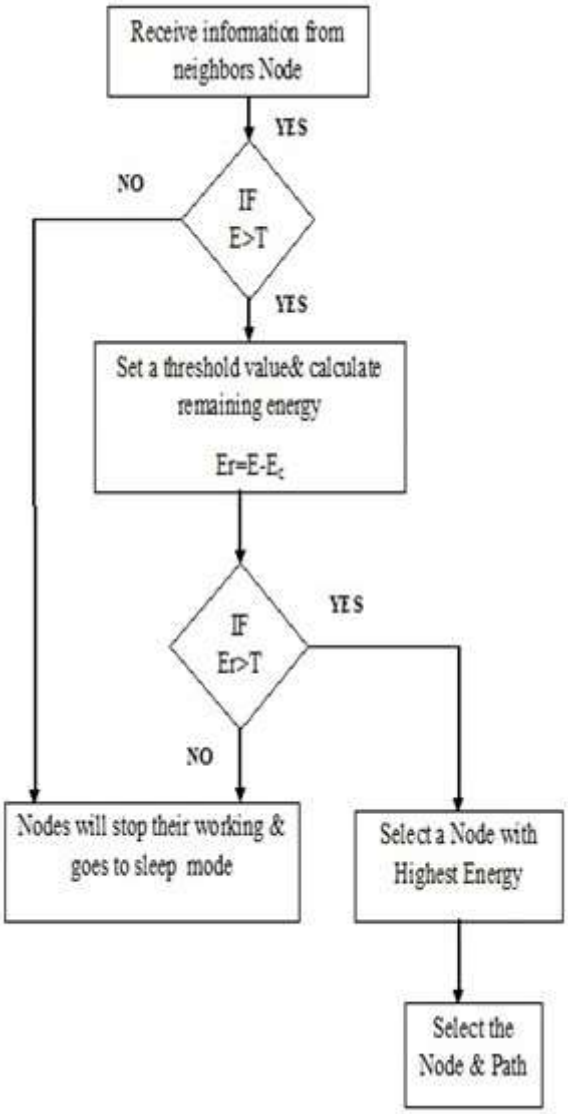

Figure 1: Flow chart of EAODV Route Discovery

Proposed Algorithm

In this paper we present a new perspective to improve the performance of the network. In this approach, we try to create an energy-conscious network to find untrusted nodes in the network and increase energy usage and suddenly try to solve the problem of losing the session. Due to the sudden loss of the session, most of the energy packets are wasted in the foam damages, regeneration and delay.

Proposed Connection Establishment Algorithm & Routing Update With THRESHOLD VALUE

Initial energy = E (Suppose E = 100)
Threshold energy= T_1= 10% of E //for alert the energy level.
1) If {(E > T_1) && (radio range from source to next hop (up to destination) < 250m)
Then

{Establish connection from source to destination selecting path algo}
(i) Consider the node energy as the routing metric i.e. higher energy nodes are participating in route search, to avoid the low energy nodes, thresholds participate in forwarding data packets by value-based scenarios, so as to increase the node life, minimizes the delay.

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(ii)Rather than selecting paths for data transmission that maximizes the network lifetime And minimizes the power consumption.

(iii) When Source node has some data for transmission, it first checks that the route is available from source to destination or not.

If route already exist in source routing table then start transmission on that route.

(iv)Else sends RREQ to initiate route discovery process for finding reliable path for communication.

Else

{No connection establishment}

2) If {(**E** = = **T**$_1$)}

{Nodes will stop their working & goes to sleep mode}

3) If {(node energy charge up E = = 100) && (radio range from source to next hop ≤ 250m)}

{Go to **step 1}**

End

Simulation Environment

The simulation described in this paper was tested using the NS-2 test-bed, which allows users to create arbitrary network topology [18]. By changing the logical topology of the network, NS-2 users can physically test in an ad hoc network without transferring nodes. NS-2 controls the test scenarios through a wired interface, whereas ad hoc nodes communicate through a wireless interface.

TABLE 1 Simulation Parameter For Case Study

Parameter	**Value**
Number of nodes	40
Dimension of simulated area	800×600
Initial node energy (joules)	100
Threshold value(joule)	10
Simulation time (min)	100
Radio range	250m
Traffic type	CBR, 3pkts/s
Packet size (bytes)	512
Number of traffic connections	TCP/UDP
Maximum Speed (m/s)	35
Node movement	random
Tx energy consumption	1.5J
Rx energy consumption	1.0J
Idle energy consumption	0.017J
Sleeping energy consumption	0.001J
Routing Protocol	EAODV

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RESULT

The results are shown in the graphs. The calculation of the performance is calculated on the basis parameter. These are node energy, packet delivery ratio, throughput and routing load .These parameters are compared with the existing energy based algorithm. The new algorithm is produces high throughput then the earlier one for heavy number of nodes. But in the case of packet delivery ratio, delay and energy the existing algorithm produces better results**.**

TABLE 2. Comparison Simulation for case study

Parameter	**EAODV Threshold Method**	**Without Threshold Method**
No. of Node	40	40
Packet Send	6204	5744
Receive	6071	4948
Routing packet	1502	2509
PDR	97.86%	86.14%
No. of Packet drop	110	731
Average end to end delay(ms)	182.70	293.88

Figure 2: NS Simulation Environment

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Packet Delivery Ratio (PDR) Analysis

Packet Delivery Ratio (PDR) is the ratio of quantity of packets received and quantity of packets sends in network. This performance metrics important to analyze the packet percentage successfully received in network. In this graph the presentation of proposed higher energy based EAODV routing protocol is improved than the normal AODV routing protocol in MANET. Here in case of regular multipath routing the packet delivery fraction value is about 83% at the end of simulation but in proposed case the PDF is reaches more than 97.86% at time in 100 seconds. The packet transmit difference in case of previous and proposed scheme are almost same but the receiving in case of proposed scheme are more by that the PDR arises in case of including energy factor means life time. The packet delivery ratio is shown in the graph.

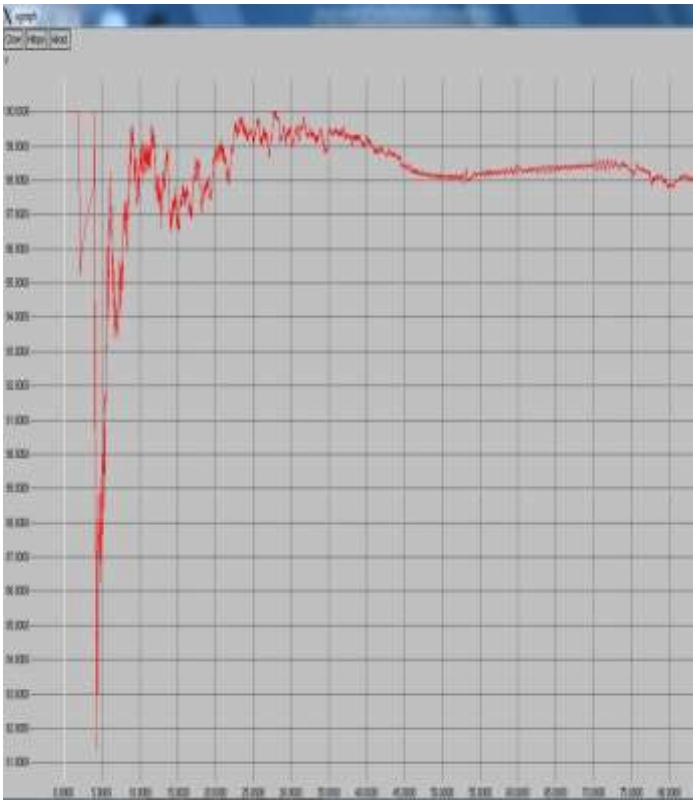

Figure 3.: Packet Delivery Ratio

Throughput Analysis

Throughput represents the number of packets send and received in per unit of time. In this graph the throughput in case of based EAODV multipath routing.

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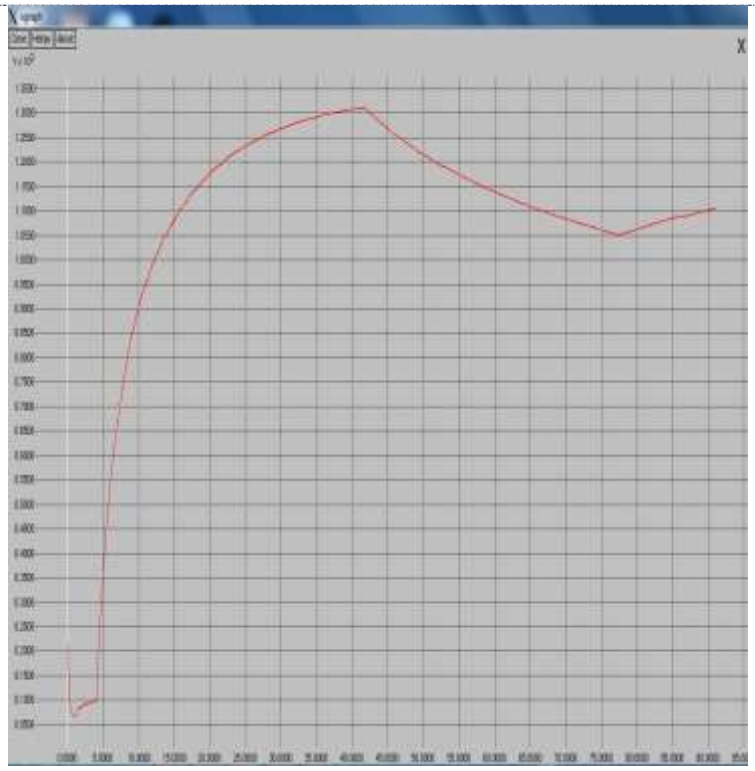

Figure 3.: Throughput Analysis

Routing Load Analysis

The routing load is defined in terms of number of routing packets are deliver in network to establishment connection with receiver. The routing packets are also called the 'connection establishment packets'.

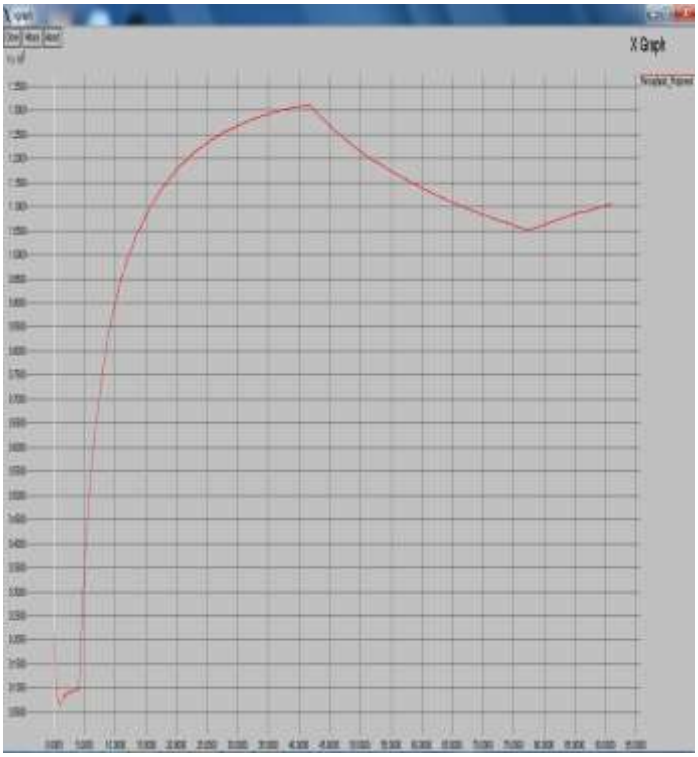

Figure 4.:Routing Packets Analysis

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Packet Loss Analysis

In this type of connection the confirmation from receiving are not sending by that the confirmation about successful data delivery are not sure. The performance of UDP packet transmission is entirely depending on network conditions. This graph represents the UDP packet loss analysis in case of proposed higher energy based EAODV routing and normal AODV in MANET. The packets loss in case of proposed scheme is only about 110 packets but in case of previous scheme about 731 packets are loss in network, it means the performance of EAODV protocol can handle the possibility of congestion but efficient routing has done in proposed scheme by that improve the network performance and reduces energy consumption.

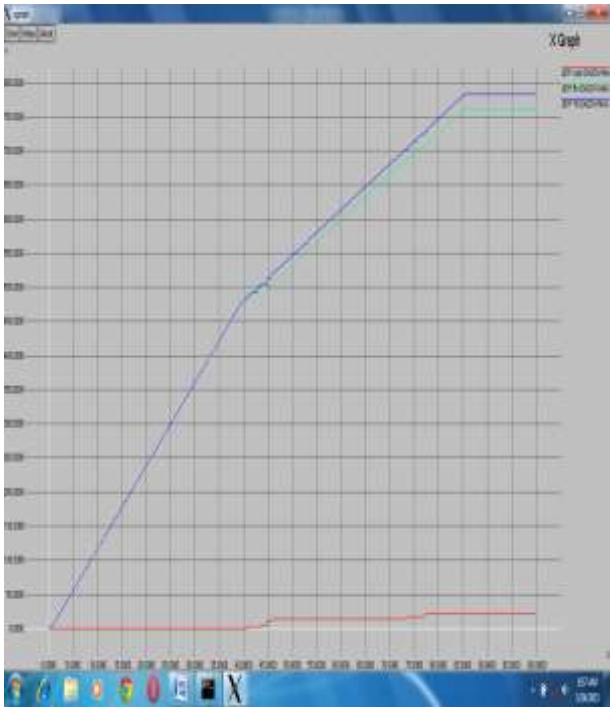

Figure 5.: Packet Loss Analysis

CONCLUSION

The organization of many small, low cost an infrastructure is which have the ability range transceivers known as nodes. The interconnection of these nodes forming a network called AD-Hoc network (MANET). At present in AD-Hoc MANET devices are considerably constrained in terms of computational power, energy, efficiency and communication capabilities due to economic and technology reasons. Due to the workload extension on number of nodes in network leads to increase in packet loss and decrease in network lifetime. Even the rate of message failure as well as node enegry failure in network congestion is occurs also increases by that energy consumption of nodes are enhanced. That‘s why most of the research on MANETs has concentrated on the design of energy and computational efficient routing protocols. MANETs nodes are battery powered which are deployed to perform a specific task for a long period of time. The proposed higher energy capacity based Multipath load balancing mechanism can help in avoiding congestion and can increase the efficiency of the network resource utilization. The proposed energy efficient multipath routing protocol are reduces the workload of intermediate nodes by that the rate of packet reception has increased and the rate of packet loss has decreased as compared to existing EAODV routing. The simulation results are represents the better performance of proposed scheme in Grid MANET, that has efficiently distribute the load as compare to normal EAODV shortest path routing technique. This has lead to the decrease in node failure rate as well as in network congestion thereby increasing the network lifetime.

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