

FITNESS FUNCTION BASED MULTIPATH ROUTING PROTOCOL FOR ENERGY EFFICIENT MOBILE AD HOC NETWORK

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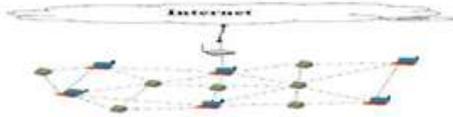
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Abstract - In remote sensor arranges a Mobile Ad-Hoc Network (MANET) is a haphazardly associated different portable hub which frames a system with no fixed topology or structure. The hubs the system relies upon the batteries which of restricted vitality source when the vitality in batteries gets over hubs will misfortunes association with the system this turned into a pivotal issue in MANET. Given the development of protocols to address power consumption, there are different power sources. Fitness-based multi-path routing in FFAOMDV (Fitness Ad-hoc On Request Multipath Distance Vector) power-conscious protocol . The FFAOMDV convention chooses an ideal course between imparting closes. This system make utilizes the broadly utilized AOMDV which is progressed of AODV and a wellness to find an ideal course to planned goal end from all the accessible courses. The wellness capacity will considers two parameter to find the ideal between the hubs are the power in the hubs which are partaking in the transmission and second factor is separation of the courses accessible. This convention diminishes the vitality utilization for the transmissions which assistant improves the system life and lessens the parcel postpone and improve the bundle conveyance proportion.

In recent years, electronic and wireless communications engineering efficiency has improved. As a consequence, the use and implementation of modern remote wireless computing is projected to become more and more popular. The exercise as concern the Internet Protocol (IP) suite will be a major part of this future development. Portable ad hoc networks (MANETs) are designed to carry efficient as well as reliable activity of mobile wireless networks by integrating routing capabilities into cellular nodes. Such networks are supposed to have multichip, complex, unpredictable, as well as short times quickly varying topologies. Such topologies may be comprised of fairly bandwidth-constrained wireless connections [1]. Ad hoc networks are vital to the growth of wireless networks, because they consist of remote nodes that connect without inner run over wireless associations. Ad-hoc wireless networks purposely inherit conventional wire and internet communication issues such as capacity optimization, better data efficiency and energy management. Moreover, latest explore concerns akin to pattern publicizing, disclosure and upkeep are equally expedited by particularly agreed schemes unpaid headed for their multi-bounce scenery, deficiency as concern a preset basis and impromptu nurture near along with self-directing. There have been various propositions on various methodologies and conventions as there are different institutionalization attempts

I. INTRODUCTION

creature ended within the Internet Engineering chore strength as well as smooth as academic as well as contemporary attempts.



**FIGURE.1: Multipath Routing Protocols
in Wireless Ad-Hoc Networks**

For MANETs, a mobile node's limited battery power impacts network longevity because when the battery becomes depleted, connections are broken. A routing etiquette in view of the control as concern itinerant joins endure therefore important headed for maintain network connectivity as well as extend the lifespan of the complex.

II. RELATED WORK

Routing Protocol Performance Issues and Evaluation Considerations in MANET [1]

Versatile hubs in Wireless specially appointed system need to work as switches so as to keep up the data about system network as there is no brought together foundation. Routing protocols are therefore needed that could dynamically adapt at low data levels to the increasing topologies and functions. As a consequence, a thorough quality analysis of ad-doc routing protocols is expected in the same context to consider their comparative merits and suitability for implementation in different scenarios. The protocol suite chosen for comparison in this paper were ad-hoc routing protocols from AODV, DSR, TORA and OLSR, as they were the most effective of all other protocols. The performance of these protocols is tested by means of comprehensive simulations using the OPNET System Network Simulator under

various parameters such as head routing, latency, bandwidth and network load across different mobile phones.

The region of specially appointed systems administration has been accepting expanding consideration among scientists as of late, as the accessible remote systems administration and portable figuring equipment bases are currently fit for supporting the guarantee of this innovation. In the course of recent years, an assortment of new directing conventions focused on explicitly at the adhoc organizing condition have been proposed, yet little execution data on every convention and hub followed execution examination between the conventions has recently been accessible. We assess the exhibition of AODV, DSR, TORA and OLSR impromptu steering conventions under differing burden and number of clients. The product utilized is OPNET Modeler14.0 and recreations with changing traffic were run for 3600 sec.

Energy Efficient Cluster Based Routing Protocol for MANETs [4]

With respect to versatile specially appointed system attributes which every single portable hub of system interface with one another by means of remote, one of the significant parts of this sort of system is the restriction of measure of accessible vitality in the system hubs that is the most basic factor in the activity of these systems. What's more, the huge measure of utilizing the portable hubs in remote correspondence medium makes Energy Efficiency (EE) a key necessity for versatile specially appointed systems. Then again Cluster Based Routing Protocol (CBRP) is a vigorous/adaptable steering convention for Mobile Ad hoc Networks (MANETs) better than the current techniques (For instance it's overhead of is not exactly while it's throughput of is more than of AODV which is a standard convention for MANET. We added the asset the executives

convention to the CBRP for administration notice and administration disclosure. Despite the fact that this convention doesn't have noteworthy overhead on the system it needs more thought about expanding the existence time and particularly diminishing the vitality utilization. We are discussing the idea of sleeping the idle member nodes. The experimental results indicate that the suggested approach results in lower energy consumption in CBRP resulting in network stability.

CBRP is an ad hoc network efficient and flexible routing protocol. Similar with AODV, which is a standard protocol, CBRP's overhead is smaller and it's more than AODV's performance. We use sleep mechanisms for all participant nodes and gateway nodes in idle mode to reduce usage throughout the network. Our test shows that the average energy saving in the entire network with several population nodes during simulation period (900s) is about 2000mw, which is a significant energy saving. This approach helps optimize their service life, reliability, accessibility and energy consumption in ad hoc networks.

III. FRAMEWORK

In this article, we projected a latest multi-path routing etiquette named the FF-AOMDV routing protocol, a variation as concern the exercise utility as well as the protocol of the AOMDV. In a typical situation, when a RREQ be transmitted by an origin node, additional than solitary path will be identified to the destination and the information sachets resolve be transmitted during these ways devoid of accepting the value of the routes. The path choice will be totally different if the suggested algorithm is applied on the same situation. The reference nodule resolve encompass three (3) types as concern in sequence whilst a RREQ is transmitted and retrieved within sort to discover the through as

well as best route alleyway amid compact energy expenditure. This in order includes:

1. Network data is the energy level
2. Each node. Will route's duration
3. The money spent during the discovery of the route.

A performance function is a specific type of objective feature used to describe how close a specified development approach is to meeting the set goals as a single figure of merit. Through genetic programming and genetic algorithms, exercise functions are used to direct models towards optimal design solutions.

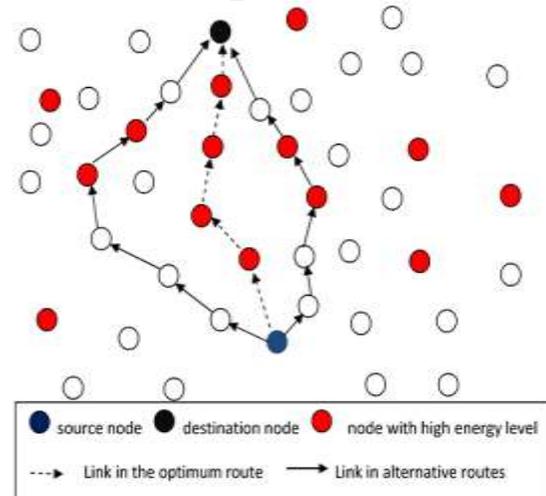


FIGURE.2: Optimum route selection in FF-AOMDV

The exercise pseudo-code is given as follows:

Step-1: Select the Source and Destination.

Step-2: Source Initialize the route Discovery.

Step-3: Broadcast the Routing Packet to direct nodes.

Step-4: Update the routing information in the Source Routing Table.

Step-5: Source Initialize the Beacon.

Step-6: Broadcast the Routing Packet to direct nodes.

Step-7: Update the Energy and location information in the Source Energy Table for all the nodes in the entire network.

Step-8: check If(ene \geq High &&dist \leq Low &&hop Count \leq Low)

Select that route for Communication.

Else if (ene \geq High &&dist \geq high &&hop Count \leq Low)

Select that route for Communication.

Else if (ene \leq Low&&dist \leq Low &&hop Count \leq Low t)

Select that route for Communication

Step-9: Send the periodic route discovery.

Step-10: Send the periodic beacon message.

EXPERIMENTAL RESULTS

In this paper we portrayed idea to pick course which is having most extreme vitality accessible utilizing AOMDV convention. AOMDV discovers different courses from same source to goal and afterward pick one best way from various ways, yet when same way use over and over then hub vitality will be depleted and

system will kick the bucket. To address this question in the proposal paper author suggests the idea of choosing the best short route with maximum energy usable and because of this strategy the origin will always use different routes to reach the destination and the use of energy will be constant throughout the network and the lifespan would increase. Here routes are determined using the exercise feature in which all routes are checked and then only the route with less range and total energy available is chosen.

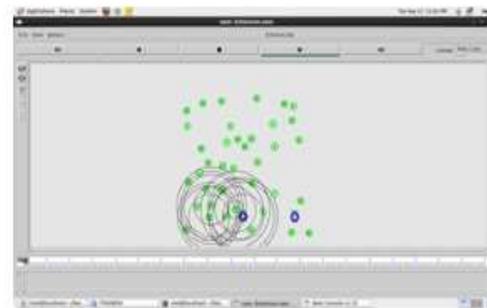


FIGURE.3: Simulation Screen



FIGURE.4: Multipath routing energy Screen

Packet I d is depicted in the above monitor x-axis and y-axis reflects energy consumption. Red line for AOMDV and green line for FFAOMDV and FFAOMDV wake up.

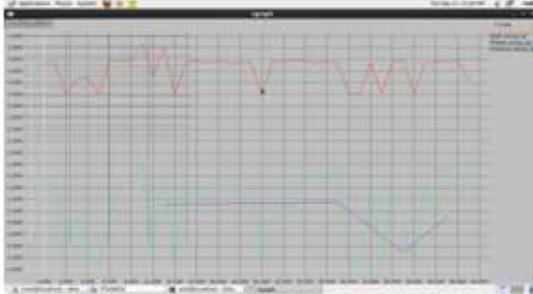


FIGURE.5: Aomdv and FFAomdv Energy Graph



FIGURE.6: Aomdv and FFAomdv packet delay screen

Figure 6 reveals that the packet latency is 0.130ms for AOMDV and 0.030ms for FFAOMDV.

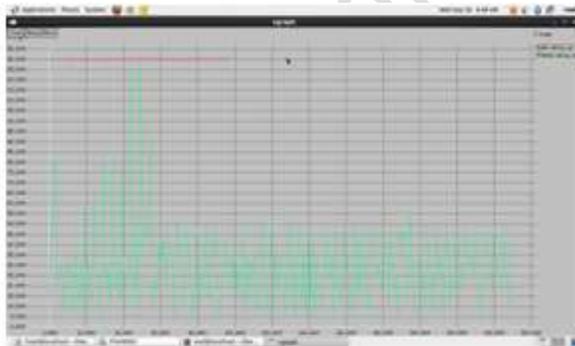


FIGURE.7: Aomdv and FFAomdv packet delay Graph

Red lines for FFAOMDV reflect AOMDV and Blue. The x axis is the packet I d and the y dimension is the lag.



FIGURE.8: Aomdv and FFAomdv packet delivery ratio screen

Fig 8 reveals that the packet distribution rate is 67% for AOMDV and 100% for FFAOMDV.

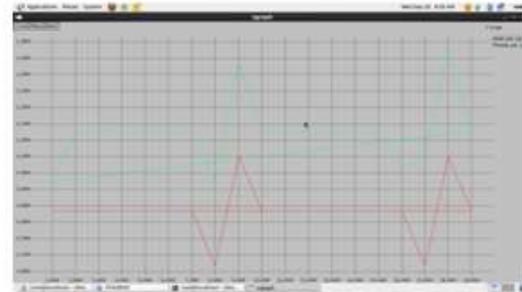


FIGURE.9: Aomdv and FFAomdv packet delivery ratio graph

It is obvious from the chart above that a FFAOMDV's packet transmission ratio is higher than the AOMDV.

The table below contrasts the related AOMDV and FFAOMDV performance metrics.

Table: comparison of AOMDV and FFAOMDV

PARAMETERS	AOMDV	FFAOMDV
Time Delay	0.129 ms	0.027 ms
Energy Consumed While Transmitting Data From Source To Destination	323.42 J	76.098 J
Average Packet Delivery Ratio	0.65	1.00

IV. CONCLUSION

In this venture, we proposed another vitality productive multipath steering calculation called FF-AOMDV mimicked utilizing NS-2. The presentation measurements Packet conveyance proportion, End-to end-delay, Energy utilization as well as complex existence. Reproduction effects indicated to facilitate the planned FF-AOMDV calculation has performed evidently better to together accessible AOMDV within vitality utilization, bundle transference quantity and start to finish wait. It likewise performed glowing adjacent to AOMDV in favor of preserving further vigor as well as improved scheme existence. In this task we likewise presented rest and wakeup procedure all together lessens the vitality utilization of the system. On the reenactment it demonstrated that the vitality utilization has been diminished.

V. FUTURE SCOPE

As a future effort, there endure a few situations to facilitate can be executed through this venture to improve the vitality utilization as well as

structure existence. For example, it is conceivable to consider another system asset which is the data transfer capacity as wellness esteem. For this situation the estimations for choosing courses towards the goal resolve are as indicated by vitality, separation and bandwidth. This will essentially find various association sources that will protract the lifespan of the system with improve the QoS. Another idea is to check the health feature with a separate multipath routing protocol than AOMDV and compare the results with the FF-AOMDV suggested.

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