ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 5, Issue 4, April 2018

# Demand Multipath Routing Protocol with Network Lifetime Maximization in Wireless Sensor Network Fixed Routing Function

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**Abstract: Wireless sensor network are dynamic in nature and short-term network without the dependence of any infrastructure without central administration in general, in sensor network nodes are increased or added instantly due to that batteries can enhanced very fast as nodes moves with in, network not a problem, when outside communications it becomes a major problem. In Existing work, sensordemand multipath routing protocols, optimal routing protocols are consider to solve the above problem but energy consumption levels are measured at contain levels only. The Proposed work, The DOMR-NLM considered three performance metrics like, energy consumption with network life time, throughput, end to end delay and packet delivery ratio Fixed Function routing techniques to optimize the energy utilization in ad hoc networks demand multipath routing protocols like FRF-AOMDV. The proposed protocol is called AOMDV with the fixed fitness function (FRF-AOMDV). To find the shortest optimal path from sink node to final node to reduce the energy utilization in multipath routing in wireless sensor networks. The performance of the proposed FRF-AOMDV protocol has been evaluated by using OMNET ++ . where the performance was compared with AOMDV and other demand multipath routing protocol network maximization protocols, the most popular protocols proposed in this area the comparison was evaluated based on energy consumption, evaluating throughput , calculating packet delivery ratio, end to end delay ratio, network life time maximization and multipath routing over head ratio performance metrics, varying the movements of node speed, packet size, and simulation time the results clearly demonstrate that the proposed FRF-AOMDV out performed AOMDV and DOMR-NLM.**

**Index Terms - Motivational Work, AOMDV,DOMR-NLM, FRF-AOMDV,ADMDV**

## 1. INTRODUCTION

The proposed multipath distance routing protocol avoids the flood a route request whenever link failures , node failures occurs during transmission period of time, before transmission it estimates the link capacity to learn more than one paths to reach the destination to forward packets through them. The source will always find the optimal solution or the shortest distance available. Since the power source of the mobile nodes is limited, the power consumption by these nodes should be controlled to increase the network lifetime. Multipath distance routing protocols have many problems[2]. 1. finding an optimal path from the sources to the target. The problem raises more complicated with a large number of mobile nodes that are connected to each other for transferring the data. In this case, most of the energy consumed at the time of finding for shortest routes. consequently, the more energy is wasted at data transfer.[1]

The research in this paper presents an energy efficient multipath routing protocol called Ad-Hoc On demand Multipath Distance Victor with the Fixed fitness function (FF-AOMDV). The FF-AOMDV uses the fixed fitness routing function as an optimization method, in this optimization, we seek for two parameters in order to select the optimal route are, before transmitting itself the route calculates energy levels and route distance details in order to transfer the data to the destination more efficiently by consuming less energy and prolonging the network lifetime. Based on the results of the simulation, the FF-AOMDV routing protocol outperformed both Ad-Hoc On demand Multipath Distance Victor (AOMDV) and Ad-Hoc On demand Multipath Routing with Life Maximization [10]

(AOMR-LM) routing protocols in terms of calculation of throughput, end –to-end packet delivery ratio, end-to-end packet delay, energy consumption, network lifetime and routing overhead ratio except the AOMR-LM when comparing with energy consumption and network lifetime where it has better performance than FF-AOMDV with these two metrics. This application purpose is energy utilization between sensors by applying the fixed routing fitness function technique to set the optimal utilization of

 

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ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
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the energy between sensor nodes on demand multipath distance vector (ADMDV) routing protocol can be used . [4][5]

## II MOTIVATION WORK

The fixed routing fitness function is used to find the optimum path from source node to target node to reduce the energy utilization in multipath routing. Where the performance was compared with Advanced OMDV and ad hoc on demand multipath routing with life maximization (Advanced OMR-LM) protocols, the two most popular protocols proposed in this area. The comparative study was evaluated based on energy utilization, calculating throughput, end-to-end packet delivery ratio, end-to-end delay, approximation of network lifetime and multipath routing overhead ratio performance metrics, varying the node movement speed, transmitting packet size, and simulation time. The final results clearly shows that the proposed Fixed routing Function AOMDV performs better than Advanced OMDV and Advanced OMR-LM.[8][9]

## III EXISTING WORK

The existing work wireless sensor network is a group of wireless sensor nodes that follows dynamic structure network without the dependence of any infrastructure or central supervision. Energy consumption is one of the current issue in WSN, as the sensor nodes do not possess permanent power supply and have to rely on batteries, thus reducing network lifetime as batteries get exhausted very quickly as nodes move and change their positions rapidly across networks. [6][7]

***Limitations***

1. Energy consumption is one of the globalized issue considered as one of the major limitations in WSN, as the sensor nodes possess permanent power supply.
2. Reduces the network lifetime.
3. Batteries get exhausted very quickly.

## IV PROPOSED WORK – ADVANTAGES

The proposed protocol is called AOMDV with the fixed routing fitness function (FF-AOMDV). The fixed routing fitness function is finds the optimum path from sink node target node to reduce the energy utilization in multipath routing.

By using Glosim simulator the performance metrics can be evaluated by the proposed protocol along with other protocol suites like compared with AOMDV and on demand multipath routing with life maximization.

The comparison was evaluated based on energy utilization, calculation throughput, end to end packet delivery ratio, end-to-end delay, network lifetime and routing overhead ratio performance metrics, varying the node movement speed, transmission packet size, and simulation time.

***Advantages***

1.Reducing the energy consumption.
2.Incresing the network life time.
3.Incresing the performance, packet delivery and reduces routing overhead.

## V PROPOSED WORKING METHODS

***i. Fixed routing fitness function***

The fixed routing fitness function is an optimization technique that comes as a part of many optimization algorithms such as genetic algorithm. The fixed routing fitness function finds the most important factor in the optimization process, which could be many factors depending on the aim of the research. In WSN, the fitness factor is usually energy, distance, delay, and bandwidth. This matches the reasons for designing any routing protocol, as they aim to enhance the network resources. The factors that affect the choice of the optimum route are:

- The remaining energy functions for each node
- The distance functions of the links connecting the neighboring nodes
- Energy consumption of the nodes
- Communication delay of the nodes
- Simulation Model
- Fixed Routing fitness function
- FF-AOMDV

***ii Simulation Model***

In this simulation model, we utilized the Constant Bit Rate (CBR) as a traffic source with 36 sensor nodes that are distributed randomly in a 1500 m* 1500 m network area, the network topology may therefore, undergo random change since the nodes distribution and its movement are random. The transmission range of the nodes was set to 250 m, while, for each node, the initial energy level was set to 100 joules. Three different

ISSN (Online) 2394-2320

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Vol 5, Issue 4, April 2018

scenarios were chosen to see how they are affecting the performance of the proposed FF-AOMDV protocol. In the first scenario, we varied the packet size as (64, 128, 256, 512, 1024) bytes and kept both the node speed and simulation time fixed as (2.5 meter/second and for 50 seconds) respectively. All other network parameters are the same for all runs and for all simulated protocols. In the n second scenario, we varied the node speed as (0, 2.5, 5, 7.5, 10) seconds and kept the packet size and simulation time fixed as (256 bytes and 50 seconds) respectively. Finally, in the third scenario, we varied the simulation time as (10, 20, 30, 40, 50) seconds and kept the both the node speed and packet size fixed as (2.5 meters/second and 256 bytes) respectively.

***iii FF-AOMDV***

In a normal scenario, when a RREQ is broadcasted by a source node, more than one route to the destination will be found and the data packets will be forwarded through these routes without knowing the routes' quality. By implementing the proposed algorithm on the same scenario, the route selection will be totally different. When a RREQ is broadcast and received, the source node will have three (3) types of information in order to find the shortest and optimized route path with minimized energy consumption. This information includes:

1. Information about network's each node's energy level
2. The distance of every route
3. The energy consumed in the process of route discovery.

The route, which consumes less energy, could possibly be (a) the route that has the shortest distance; (b) the route with the highest level of energy, or (c) both. The source node will then sends the data packets via the route with highest energy level, after which it will calculate its energy consumption. Alike to other multipath routing protocols, this protocol will also initiates new route discovery process when all routes to the destination are failed. In the event when the selected route fails, the source node will then selects an alternative route from its routing table, which represents the shortest route with minimum energy consumption. The optimal route with less distance to destination will consume less energy.

## VI RESULTS

The following software and Hardware requirements can be used to develop this paper.

***Hardware Requirements***

Processor : Core2duo
Hard Disk : 160GB
RAM : 1GB

***Software Requirements***

Operating system : Windows XP/7.
Coding Language : C#.NET


***Fig 1: loading myeclipse software***

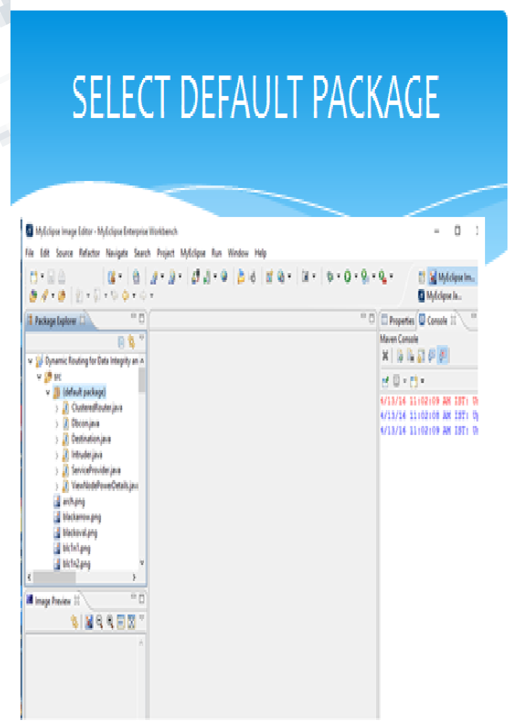


***Fig 2 select default package***

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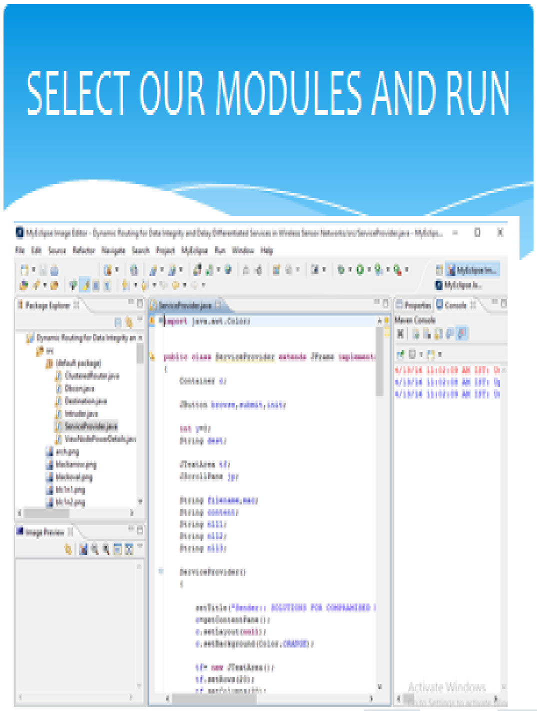


*Fig 3: select our modules and run*

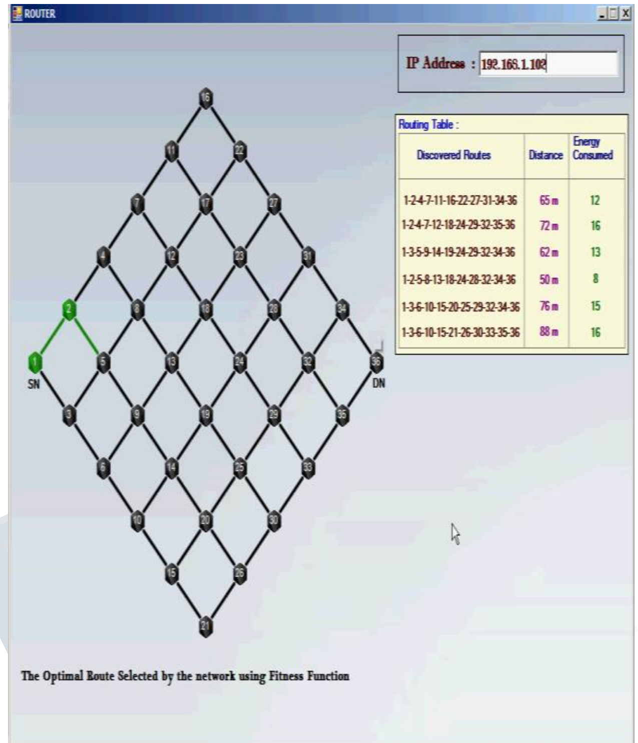


*Fig5: packet transmission between nodes*

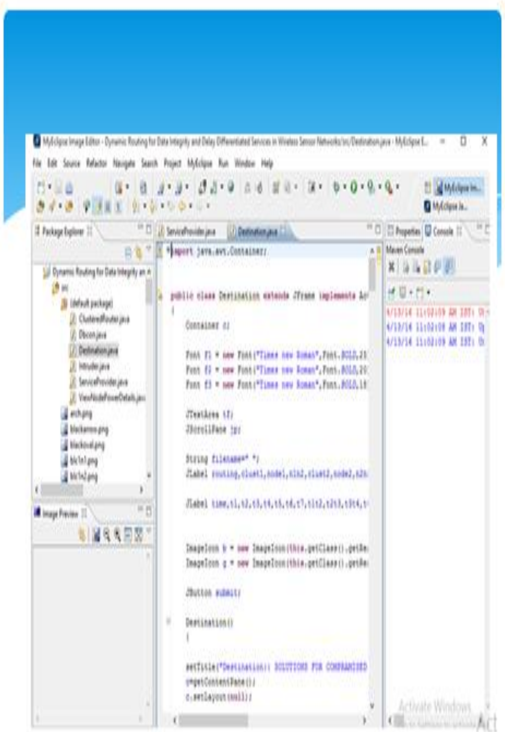

*Fig 4:select destination node thorugh java module*

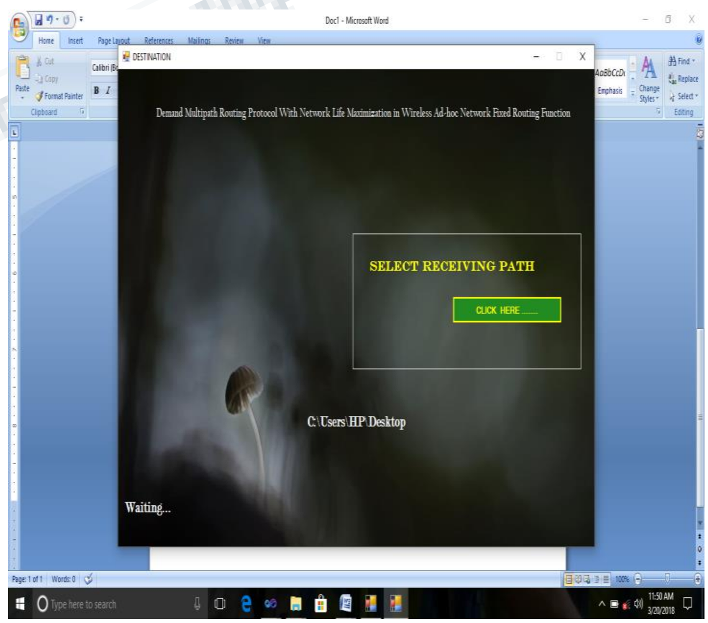


*Fig 6: selecting receiving path*

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 5, Issue 4, April 2018

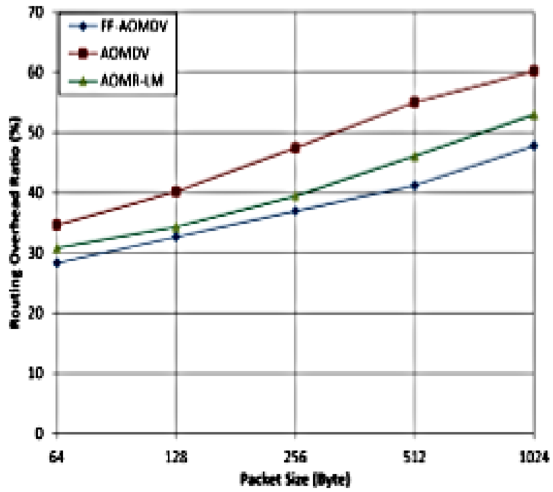


*Fig 7: shows the effect of varying the packet size on the routing overhead ratio for FF-AOMDV, AOMRLM and AOMDV*

## VI CONCLUSION

In this research, The proposed FF-AOMDV, three different scenarios, varying node movement speed, transmitting packet size and network simulation time. These scenarios were tested by five (5) performance metrics (Packet delivery ratio, Throughput, End-to-end-delay, Energy utilization and Network lifetime). Simulation results showed that the proposed FF-AOMDV algorithm has performed much better than both AOMR-LM and AOMDV in throughput, packet delivery ratio and end-to-end delay. It also performed well against AOMDV for conserving more energy and better network lifetime. As a future work, there are several scenarios that could be implemented with this study to enhance the energy utilization and network lifetime. For instance, it is possible to consider another network resource which is the bandwidth as another fitness value. In this case the calculations for selecting routes towards the target node will be according to energy, distance and bandwidth. Basically this will consider many network resources which will prolong the network lifetime and enhances the QoS. Another possibility is to test the fixed routing fitness function with another multipath routing protocol that has a different mechanism than AOMDV and compare the results with the proposed FF-AOMDV.

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