NOVATEUR PUBLICATIONS
INTERNATIONAL JOURNAL OF INNOVATIONS IN ENGINEERING RESEARCH AND TECHNOLOGY [IJIERT]
ISSN: 2394-3696
VOLUME 4, ISSUE 12, Dec.-2017

ENERGY COMPETENCE ROUTING PROTOCOL IN UTILIZING AODV IN MANETS

TUSHAR SINGH RAJPUT
M.Tech CSE, Research Scholar, Vedica Institute of Technology, RKDF University, Bhopal, Madhya Pradesh-India, tusharrajput2010@gmail.com

RAJ KUMAR PAUL
Assistant Professor, Vedica Institute of Technology, RKDF University, Bhopal, Madhya Pradesh-India, rajkumar.rkp@gmail.com

ABSTRACT
In MANETs each hub can go about as the portal. In this exploration concentrate is laid on vitality productivity. There are many directing conventions in MANETs like DSDV, DSR and AODV and so forth and everyone has its own particular approach for dispersal of information bundles in MANETs. In any case, these directing conventions are less vitality proficient. The point of this exploration is to outline a steering convention which would be superior to the current ones regarding vitality usage and conveyance proportion. In this examination a vitality productive AODV steering convention in which Dijkstra calculation is upgraded to enhance the general execution of the system. Existing frameworks are not fit for finding the most limited and vitality based way among the hubs in the system if various hubs bomb all the while. Execution parameters are Packet conveyance proportion, Throughput, Energy utilization and directing overhead. The reproduction is finished utilizing system test system NS-2.

KEYWORDS: MANETs, AODV, Efficiency, Routing, Packets Delivery ratio, NS-2.

1. INTRODUCTION

It has been seen that, from most up-to-date number of decades remote development is obtaining noticeable quality within the correspondence world. within the times, singular sitting at one spot will expire and obtain to the benefits of elsewhere with the assistance of remote advancement. 2 philosophies to be explicit, cell framework and Ad-hoc framework square measure typically used for remote correspondence. Versatile impromptu systems (MANETs) square measure created out of a set of hubs which might move unreservedly and speak with one another employing a remote physical medium. Thusly, dynamic topology, unreliable associations square measure outstanding segments for MANET once stood out from wired frameworks. MANET haven't got united controllers, that makes it not constant as remote systems and remote LAN[1].

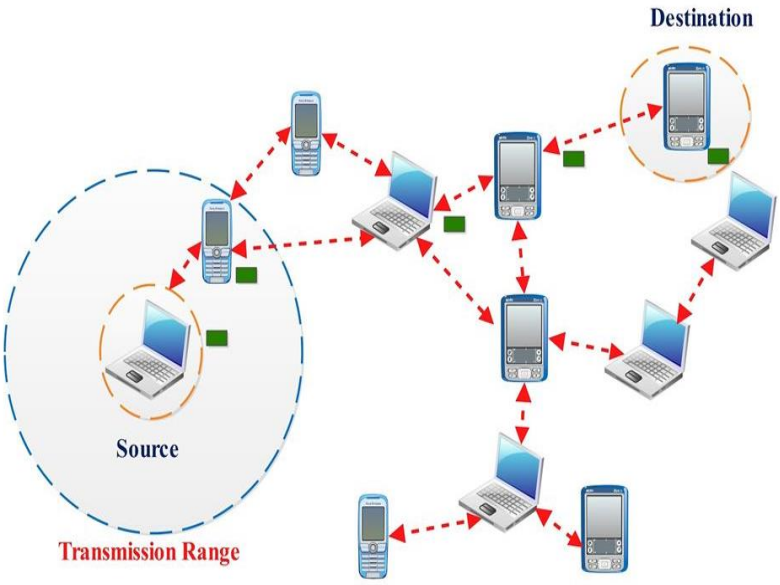


Figure 1: View of Mobile Ad-hoc Networks

- **RESEARCH MOTIVATION**

The nodes within the Mobile Ad-hoc Networks square measure ordinarily power curb as a result of their dependency on power. In wireless communication, particularly in MANETs, outstanding quantity of energy is consumed not solely in transmission among the nodes however conjointly in overhearing of the packets sent from alternative nodes [2]. As inexperienced computing is rising, so the main objectives of MANETs routing protocols square measure to maximise output (network), energy potency, network lifespan and to reduce the delay. The network output is sometimes measured by packet delivery magnitude relation whereas the foremost vital contribution to energy consumption is measured by routing overhead that is that the range or size of routing management packets.

2. RELATED WORK

JhunuDebbarma et al [3] Presents AN economical energy management protocol E-power. it's planned scale back|to scale back|to cut back} power consumption and reduce transmission latency on useless tasks. High node density considerably improves network performance with all 3 protocols. the rationale for higher performance is as a result of once a link breaks, it becomes easier and quicker to search out a brand new link. E-power performance is healthier. it's conjointly seen that the upper the node density, the higher is that the performance of the E-power algorithmic program.

Nidhi Sharma ,R.M. Sharma[4] examine AODV and DSR conventions and appearance at their outputs on NS-2 check system, during this paper, they need likewise assess the character of administration with some parameters incorporate packet delivery magnitude relation, traditional time delay , routing load overhead. These parameters were assessed upon varied system sizes and transmission scope of the separate hubs. For assessment authors has setup ten nodes. this provides AN outcome that DSR performs superior to something AODV in less dense things and AODV performs higher than DSR in additional dense situations. this provides a plan to assess these 2 protocols with varied totally different parameters and unsteady no. of nodes for future work.

Dr. Annapurna P Patil et al [5] planned a more moderen variation of the AODV routing protocol, that tackles major problems in MANETs like ability and energy potency. it's achieved by evaluating energy values of the nodes and forwarding packets on least drained nodes path, creating the network adaptative in nature.

Chandan Kumar Behera et al [6] proposes a brand new best energy preserving reverse reactive routing protocol has been planned that computes the shortest path in between any source-destination try on demand. The approach, in contrast to alternative energy preserving reactive protocols, finds loop-free, will increase in power consumption and best path between the top nodes.

3. AD-HOC NETWORKING PROTOCOLS

MANET uses various convention traditions that on a really basic level faces a great deal of challenges in survey advancing topology, low transmission management and awry connections. The conventions that we have a tendency to square measure discussing here square measure the amount coordinative conventions within which the convention info is circled to any or all partner centers while not the utilization of any structure between them[7].:

- Proactive (Table driven)
- Reactive (On-demand)

I. COMPARISON BETWEEN PROACTIVE ROUTING AND REACTIVE ROUTING PROTOCOLS

There are many routing classes. Comparison between these classes w.r.t. proactive routing protocols and reactive routing protocols is shown in Table 1 [14].

Table 1: Proactive Routing Protocol vs Reactive Routing Protocol

Routing Class	Proactive(Table- Driven)	Reactive(On-Demand)
Routing construction	Both Flat and hierarchical	Regularly Flat.
Accessibility of route Control Traffic volume	Always available Usually high	Determined when needed Lower than proactive routing protocols
Periodic updates	Yes, some may use uncertain.	Not required. Some nodes may require periodic beacons.
Control Overhead	High	Low
Route acquisition delay	Low	High
Packing Requirements	High	High Depends on the number of routes kept or required. Usually lower than proactive protocols
Bandwidthcondition	High	Low
Control requirement	High	Low
Delay level	Small since routes are predetermined	Higher than proactive
Scalability problem	Usually up to 100 nodes.	Source routing protocols up to few hundred nodes. Point-to-point may scale higher.
Handling effects of mobility	Occur at fixed intervals. DREAM alters periodic updates based on mobility	Usually updates ABR introduced LBQ AODV uses local route discovery

4. PROPOSED WORK

Nodes within an ad hoc network generally rely on batteries (or exhaustive energy sources) for control. Since these vitality sources have a restricted lifespan, management accessibility may be a standout amongst the foremost imperative limitations for the operation of the impromptu system. There square measure various wellsprings of energy utilization during a moveable hub. Correspondence is one among the principle wellsprings of vitality utilization.

Following are the types of energy consumption that have been identified:

a) TRANSMISSION ENERGY: Energy needed for transmission of packets. It is denoted by T_E.

b) PROCESSING ENERGY: Energy needed for process of packets. It is denoted by P_E. conjointly transmission energy and process energy of every node would be same because the network is homogenous.

c) ENERGY UTILIZED: Whiletransmission of information packets energy used at every node = number of data packets each node can handle * (Transmission energy + processing energy) i.e.

d) REMAINING ENERGY: The remaining energy of every node would beR_E = Total energy – Energy utilized i.e.

It got to be noticed that the vitality gone amid causing a bundle is that the biggest wellspring of vitality utilization of all modes.

As inexperienced registering is rising, therefore it's needed to outline a steering convention that is vitalityproficient. In this part, another directing calculation has been verbalized which has been seen to be a vitality effective method. The examination work has been arranged into three cases in light of the quantity of hubs. at the point when number of hub n = 40,and reenactment time t =100ms.

I. PARAMETER IN AODV

In this scenario some parameters with a specific value are considered. Those are as shown in table 2.

Table 2: Parameter for implementation of AODV

Parameter	Value
Number of nodes	40
Simulation Time	100 sec
Pause Time	5ms
Environment Size	800x600
Transmission Range	250 m
Traffic Size	CBR (Constant Bit Rate)
Packet Size	512 bytes
Maximum Speed	35 m/s
Simulator	ns-2.31
Mobility Model	Random Waypoint
Routing Protocol	AODV
Antenna Type	Omni directional

II. PROPOSED ALGORITHM

Initially energy [T] = 100 and energy[e] = 0. Integers i, j, k and min are variables whose value changes while program gets executed.

Visited [i] is an integer array. Its value is either 0 or 1 depending upon whether the element has been visited or not. For example: Visited [i] =0 if i-th element has not been visited.

Path index [j] array stores the indices of the mobile nodes in increasing order of their energy utilization value after shortest path algorithm is called.

Path final [i] stores the shortest path from source to destination.

Edge [i][j] carries either value 1 or 0, 1 where there is an edge between the two vertices and 0 if there is no edge between them.

For reliable and energy efficient execution of routing in MANETs the technique proposed by us in this thesis is very effective.

III. SHORTEST PATH ALGORITHM

- Sortenergy [i]← insertion sort(fenergy [i]).
- k ← 0.
- Temp ← sort energy [0].
- For each i ← 0 to n - 1 do
- If !(temp == sort energy [i] &&i>0) do
- For each j ← 0 to n - 1 do
- If sort energy [i] == energy[j] do
- path index [k]← j.
- k ← k+1.

- End if.
- End for
- End if
- End for
- i ← 0 and k ← 1
- path index [i1] ← path final [i]
- n1 ← path index [i]
- i ← i+1
- n2 ← path index [i]
- while path index [i]!=path index [n]
- if edge [a][b]!=1 then
- path index[i1] ← n2
- i1 ← i1+1
- n1 ←n2
- i ← i+1
- n2 ← path index [i]
- else
- i ← i + 1
- n2 ← path index [i]
- End if else
- End while
- if edge[path final[i1-1]][path index[n-1]]==1 then
- path index [i1] = path [n-1]
- else do
- while(edge[path final[i1-1]][path index[n-1]]!=1)
- i1=i1-1
- End while.
- End if else.
- path final[i1]=path index[n-1]
- End.

5. SIMULATION RESULTS AND DISCUSSION

Help of Network Simulator 2.35 as a piece of a scope of size1000m x 1000m. The execution measurements, for instance, cost, end to end defer and Network Load are assessed against number of trades for both Normal AODV and NewAODV Routing conventions and are exhibited as takes after.

The Simulation Parameters are given as

Table 2: Overall summery for AODV

PARAMETER	VALUE
Send packet	7500
Receive packet	6450
Routing packet	1751
PDF	86
NRL	0.27
Average e-e delay(ms)	216.12
No. of dropped data (packets)	972

Figure 2: A Screenshot of AODV NAM window in different time

I. PACKET DELIVERY RATIO

It is outlined because the magnitude relation of range of packets with success delivered to destination to the quantity of packets transmitted by supply node.

PDR= (Total number of packets successfully received)/(Total number of packets sent)

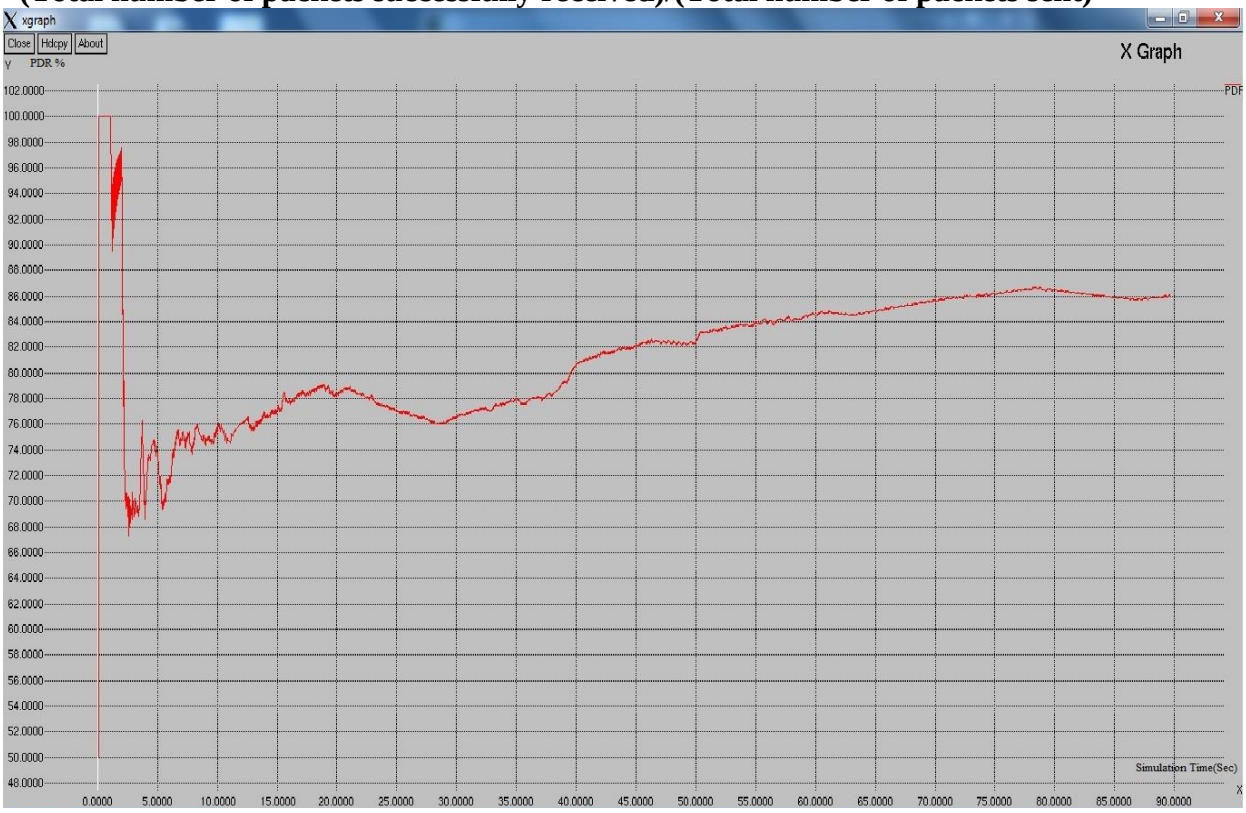


Figure 3: A Screenshot of AODV Packet delivery ratio vs. Simulation time

II. THROUGHPUT

It is the typical range of messages with success delivered per unit time or it's the typical range of bits delivered per second. This information could also be sanded over a physical or logical link, or undergo a assured network node. This is the measure of how rapidly an end user is able to receive data.

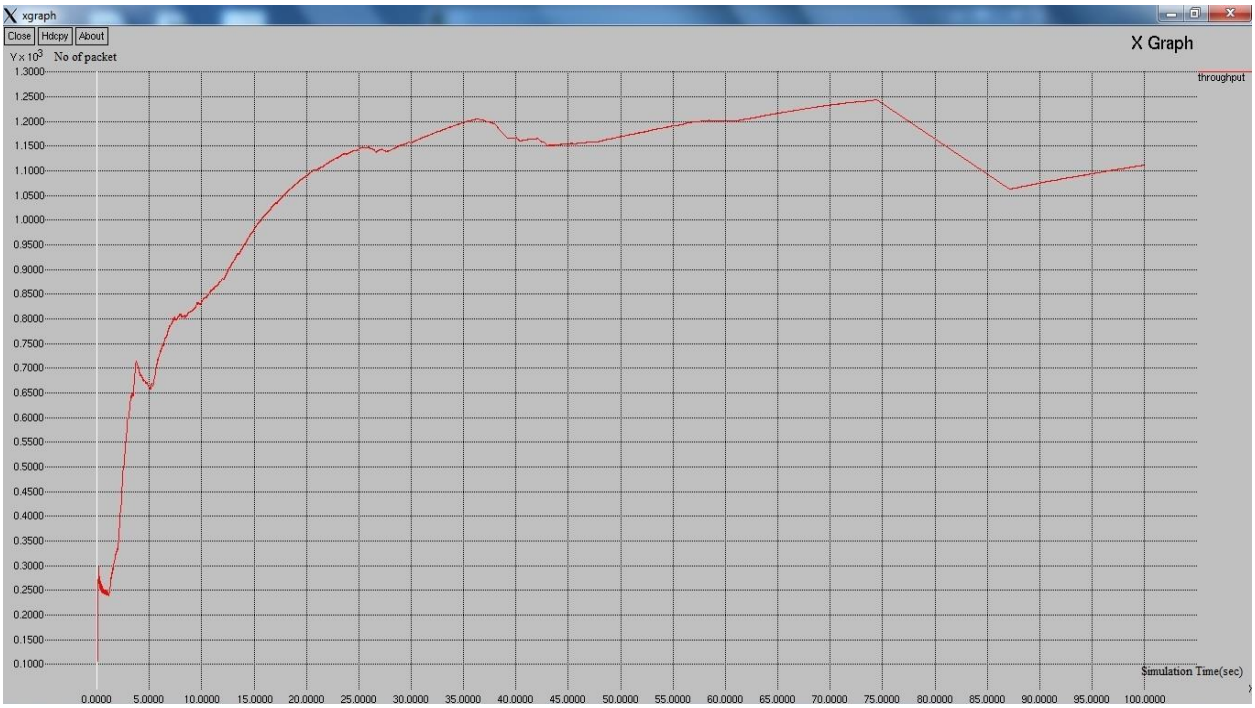


Figure 4: A Screenshot of AODV Throughput graph in AODV

ROUTING OVERHEAD

This metric describes what percentage routing packets for route discovery and route maintenance ought to be sent therefore on propagate the information packets. The lower price of routing load square measure represents the higher network performance.

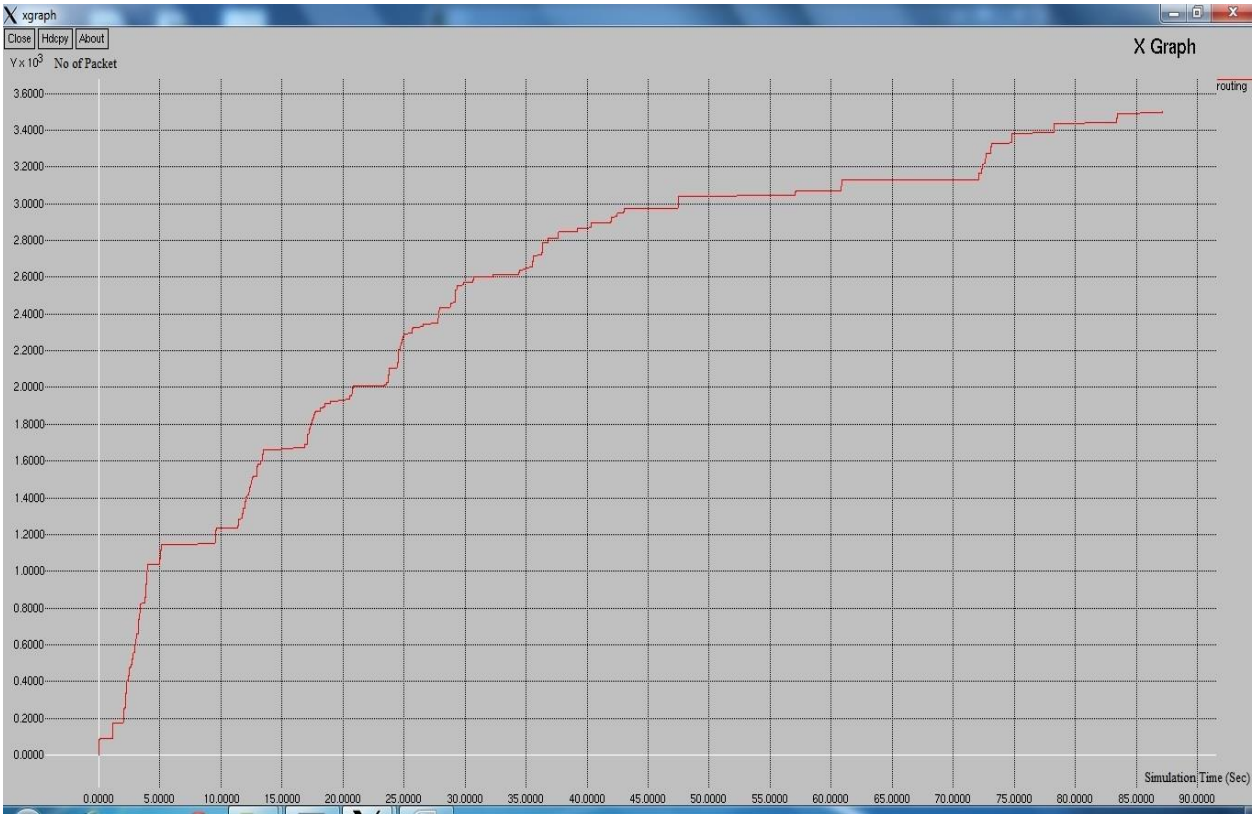


Figure 5: A Screenshot of AODV Routing overhead

III. ENERGY CONSUMPTION

It is measured as the total consumed energy divided by the total number of packets received.

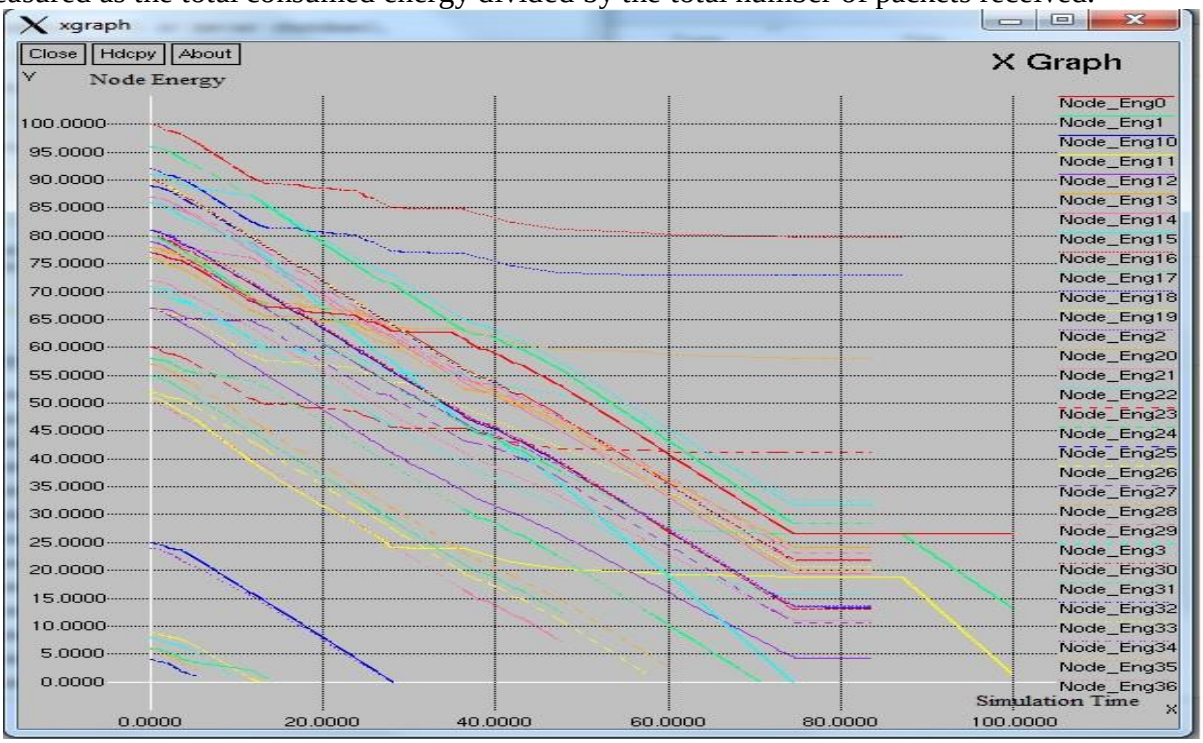
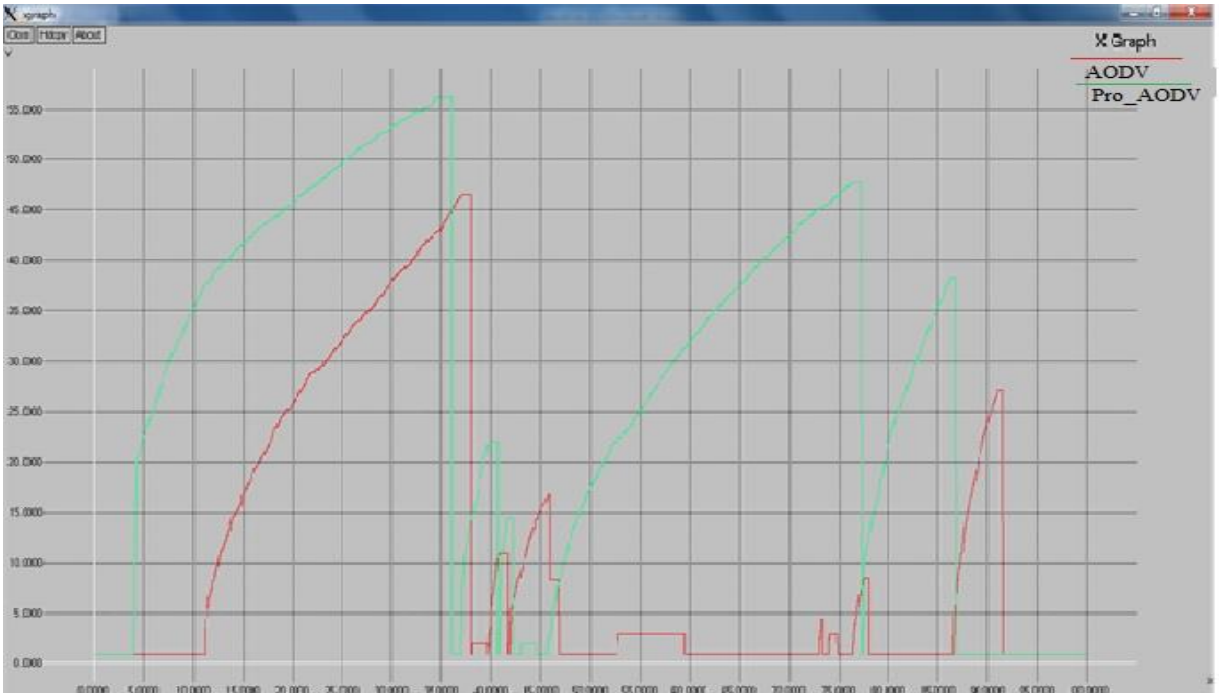


Figure 6: A Screenshot of AODVremaining energy Nodes

IV. COMPARISON GRAPH



6. CONCLUSION

In this research we have a tendency to provide an outline of mobile ad-hoc networks and discuss however energy is that the most significant constraints within the MANET. All the nodes square measure mobile in nature and having restricted battery charge thus it's necessary to save lots of the battery power of these nodes to extend the lifespan of the network. The Energy degradation may be a significant issue. therefore, we've enforced energy economical AODV routing protocol that finds the best path between supply and destination

and reduces the energy consumption of the nodes within the network with higher performance. The performance analysis was dispensed exploitation network machine NS-2.31 (NS2).

Hence, this any decreases routing overhead and proves it an energy economical routing technique. therefore we have a tendency to conclude that the routing algorithmic program planned of usually an energy saving and an economical technique for routing the information packets in MANET.

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