Performance Improvement of WSN by using AODV in wireless mesh network

Manish S Kimmatkar[1] Dr. Sanjay M Asutkar[2]

Research scholar Professor

MIET,Gondia MIET, Gondia

Abstract

Wireless sensor network has been design by many researchers as per the demand of the time and conditions. Time to time many enhancement and improvement has been suggested and different protocol also comes in the designing issues. And mobile ad hoc network find tremendous growth in this era of wireless network. Many people work in DSR or Hybrid Protocol for energy efficient clustering but that was the time bound solution. Hence for the improvement in performance and lifetime of wireless sensor network we design a new scheme that is AODV protocol in mesh networking and best results with hundred percent throughput and gitter with improvement in lifetime of wsn are reached.

Keywords:- DSR : dynamic source routing ; AODV : ad hoc on demand distance vector; MANET : mobile ad hoc network

1 Introduction

DSR the dynamic source routing this protocol is more favorable for the researcher where they put their efforts in wireless network for limited area. proactive protocol is compatible with DSR it will continuously searching the path to establish the network and this is the reason that the lifetime of the network is not much longer. Reactive protocol is much more favorite than proactive because it will work on demand logic. Hence the AODV protocol with reactive logic has been consider in my research area. The network topology is also important during the design of network, maximum work has been done by the researcher on the basic topology star but here the mesh topology has been adopted and we get a another combination to work on wireless area to improve the lifetime and performance of the network, when we got the results it is much more better and network responding well to every environmental conditions and Throughput, delay lifetime of network all the parameter are improved.

2. Protocols

Designing protocols are the important during the establishment of the network topology in this research work we used reactive protocols that is AODV Basically Reactive are the On-demand protocols which will be active only when it will find out the rout when require or the Source will take the first step for route discovery But exactly opposite function has been performed by the Proactive protocols, It is traditionally a The shortest path is basically depends upon the periodic updates which is based on protocols. The High or maximum routing overhead that is 1. Tradeoff as well as the State repair or maintenance flow of traffic verses the route discovery of the flow of traffic Route through maintained route. While describing the delay for the given route discovery Keys our main aim is to design it for the Reduction or minimization of the system in routing overhead which is very much Useful when the number of traffic sessions is very less than the number of nodes in the given network. Priori is never been created by any design routing structure. The protocol structure which is going to in a response which will require basic two keys or simply two keys method that is source routing and second is backward learning method. it introduced some kind of Inserting or merging a delay Reactive which is a on-demand type of routing. This type of Routing only when it is required or needed this is having some Advantages just like it will reject the periodic updates as well as adaptive to the design network dynamics but there are some Disadvantages in this particular there is a very high food or a traffic search with the mobility of network. And it will going to distributed the traffic with very much high routing acceptance latency. Hence AODV Routing

Protocol is used in our research work. AODV means Ad Hoc network which will work when there is a demand this will produces the request for the flood route in given network for source. when this condition will get occurs it will offer a reverse path when the node will receive the request for rout. Each node in a network will going to forwards the request just once during the time of pure flooding condition. Then there will be a formation of Reverse paths are formed on request. Then the Route will put the reply forwarded through the reverse path formed. Then the forward path of the appropriate node will be used for routing data packets. And the path which is not in used will get expire in network. In Aodv optimization we have to consider some important facts just like Useful or required optimization the node which is intermediate along with a route to the node D can be reply for the received request for routing. For increasing the speed of operation as well as Quenches for the received route request flood condition. The mention optimization may be a cause loops in era of the link failure in the establish network. And very important that one route per destination should get maintained at every node After the failure of link or break, then automatically all routes which are using this failure link will get erased. It will going to recovers the Expiration which is basically based on timeouts in the system . the sequence numbers which is given are used to prevent loops. Optimizations of the given Routing tables rather stored complete routes. For Contorting the flooding incrementally increase region

3 Protocol Architecture.

In protocol architecture it will follow some important steps.

3.1 Source and destination node identification

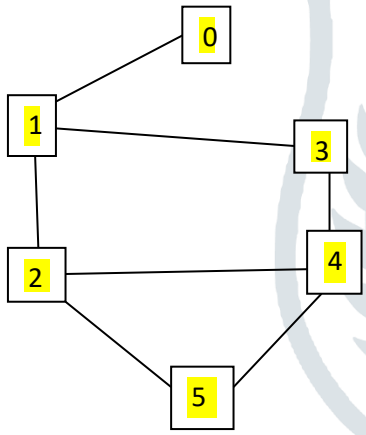

Fig 3.1 Different node structure established

Sr. No.	Destination	Next Hop	Distance
1	0	2	3
2	1	2	2
3	--------	--------	-------

In the first step of AODV protocol we have to decide the destination node first where exactly the packets or data to be delivered. This is also called as a target node. then in second step or phase the source node or supply node has been decided from where the packets to be send. That is also called as a transmitting node. Then in final work it will try to find out the smallest path from source to destination by including intermediate node it will calculate the distance and then it will select the smallest path by PERT method of shortest distance. In this way the different hops are getting forms then the second step of link state routing will start.

3.2 Link State Routing

the basic limitations of the conventional routing that is wired routing Distance Vector for example Bellman-Ford and DSDV routing which will control over head linearly will get increasing along with the the problem like net size converge which will be count to infinity; the potential loops in the Link State for example like OSPF . the updates of link for the flooding overhead are caused by frequent changes occures in topology. And the Conventional routing is not going to scale for size as well as mobility at the node 5 shown in figure, which is based on the link state mention in the network topology , the table for the topology table has been design by using Dijkstra's Algorithm which can be specially design for shortest path and the table has been mention bellow

	0	1	2	3	4	5
0	1	1	0	0	0	0
1	1	1	1	1	0	0
2	0	1	1	0	1	1
3	0	1	0	1	1	0
4	0	0	1	1	1	1
5	0	0	1	0	1	1

3 Use of Sequence Numbers in AODV

Destination sequence Has to rout D with Sequence no 15

No. 10 sequence no 7

In above sequence s node indicates the source node or transmitting node, D node indicates the destination node where the packets has to be delivered, Y is a intermediate node which will going to connect other node to form a shortest distance path or hops.

freedom of loop for the Intermediate node will get the reply with a route rather than forwarding the request only if it is going to route with a higher number of sequences which are associated with it.

3.3 Path maintenance

The path maintenance issue is important in the wireless mesh network because the Movement which is not on the active path so that it will not triggers the any action even though source is moving. The second reinitiate route discovery it will comes into picture only When the destination intermediate node will get moves towards the upstream node for the break broadcasting of the error of the route (RERR) this RERR always having the contains index for all the destinations which are not possible to reach or simply which will be no longer reachable because of the link break RERR transmitted unti and unless the desire node with no precursors of destination is to be reached the one route can be maintain for a single destination even though the link is break. And it will delete the link which are failure. Even all routes which are using the failed link will get deleted which is based on Expiration timeouts. Prevention of the loops are

depends upon the Use of sequence. It will going to optimize the table for routing rather than storing full routs. Which will controlled the network during rush or flooding time.

4 Results and conclusions

The simulation scenario has been given bellow, where 70 nodes has been placed in mesh order

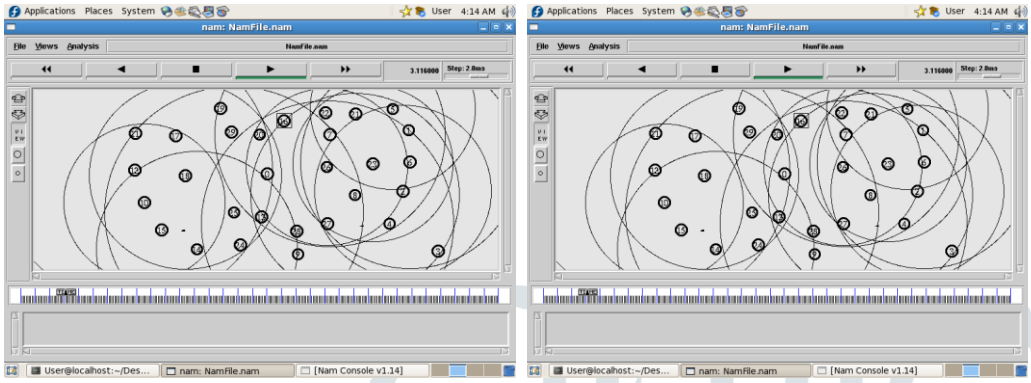

Fig 4.1 simulation scenario in wireless mesh network

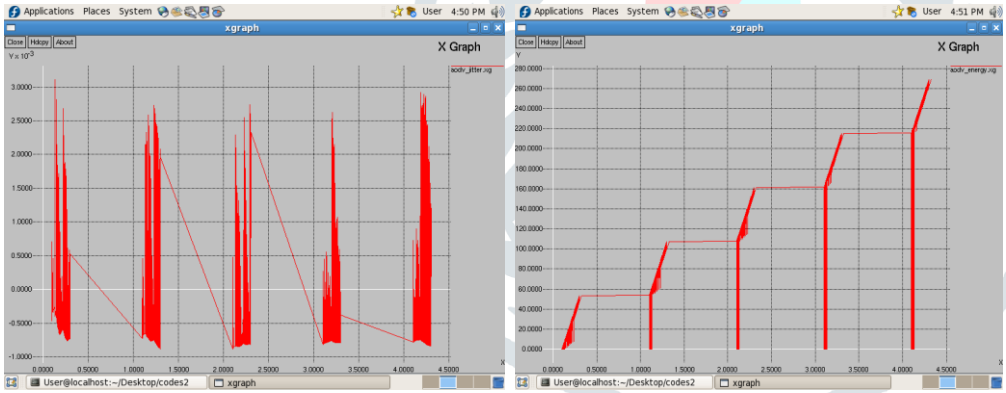

Fig 4.2 Analysis of Energy Vs Time The Energy of AODV is good than all other protocols. By making communication between source and target. AODV protocol is reduced the energy. This Energy vs time graph is shown in figure

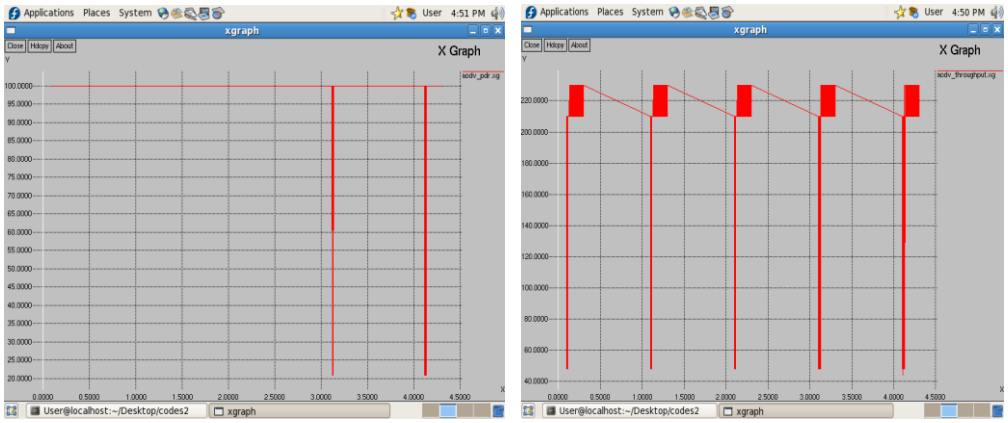

Fig 4.3 PDR vs Time The PDR or packet delivery ratio of AODV is good than all other protocols. It is usually 100% for all the communications which take place. This PDR graph is shown in figure

Conclusion: The AODV protocol is most suitable to improve the life of wireless mesh network during environmental monitoring.

5 References

1. G Kortuem, F Kawsar, V Sundramoorthy, D Fitton. Smart objects as building blocks for the internet of things. IEEE Internet Computing. 2010; 14(1), 44-51.

2. K Ashton. That 'internet of things' thing. RFiD Journal. 2009; 22(7), 97-114.

3. A Whitmore, A Agarwal, L Da Xu. The Internet of Things—A survey of topics and trends. Information Systems Frontiers. 2015; 17(2), 261-74.

4. K Zhao, L Ge. A survey on the internet of things security. InComputational Intelligence and Security (CIS). 2013 ; 663-667.

5. K Rose, S Eldridge, L Chapin. The internet of things: An overview. The Internet Society (ISOC). 2015; 1-50.

6.Lewis, F.L. Wireless Sensor Networks. Automation and Robotics Research Institute, The University of Texas at Arlington: Ft. Worth, Texas, USA, 2004; pp. 1-18.

7.Younis, M.; Youssef, M.; Arisha, K. Energy-aware routing in cluster-based sensor networks. In Proceedings of the 10th IEEE/ACM International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS2002), Fort Worth, TX, USA, October 2002.

8. Yogeesh A C, Dr. Shantakumar B Patil, Dr. Premajyothi Patil, —A Survey on Energy Efficient, Secure Routing Protocols for Wireless Sensor Networks, in International Journal of Engineering and Computer Science, vol. 5, Issue 8, pp. 17702-17709, August 2016.

9. K Machado, D Rosário, E Cerqueira, AA Loureiro, A Neto, JN de Souza. A routing protocol based on energy and link quality for internet of things applications. sensors. 2013; 13(2), 1942-64.

10. C Kharkongor, T Chithralekha, R Varghese. A SDN Controller with Energy Efficient Routing in the Internet of Things (IoT). Procedia Computer Science. 2016; 89, 218-27.

11. C Perkins, E Belding-Royer, S Das. Ad hoc on-demand distance vector (AODV) routing. 2003; 1-37.

12. B Bellur, RG Ogier. A reliable, efficient topology broadcast protocol for dynamic networks. InINFOCOM'99. Eighteenth Annual Joint Conference of the IEEE Computer and Communications Societies. Proceedings. 1999; 1, 178-186.

13. GP Hancke, CJ Leuschner. SEER: a simple energy efficient routing protocol for wireless sensor networks. South African Computer Journal. 2007; 2007(39), 17-24

14. P Jacquet, P Muhlethaler, T Clausen, A Laouiti, A Qayyum, L Viennot. Optimized link state routing protocol for ad hoc

15. networks. InMulti Topic Conference. 2001; 62-68. B Karp, HT Kung. GPSR: Greedy

16. perimeter stateless routing for wireless networks. InProceedings of the 6th annual international conference on Mobile computing and networking. 2000; 243-254.

17. Stephan Haller,‖The Things in the Internet of Things‖, Internet of Things Conference 2010, Tokyo, Japan. http://www.iot2010.org

18.Yicong TIAN, Rui HOU, —An Improved AOMDV Routing Protocol for Internet of Things‖, 2010 IEEE.

19. Poonam Thakur, Rahul Pethe, GM Asutkar, SA Chaturvedi,"Analysis of Routing Protocol for Different Packet Size Data Transfer over WSN" IJERECE,March 2017.

20. DP Mishra ,SS Dorale,G M Asutkar," An application of Wireless sensor Network in Intelligent Transportation System" ICETET,2013.

21. MS Masurkar,GM Asutkar KD Kulat ," Lifetime maximization in wireless sensor network using cross layer design: A design Review,ICETET 2008.