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ENERGY EFFICIENT MULTIPATH ROUTING PROTOCOL FOR MANET USING THE ADAPTIVE NEIGHBORHOOD SELECTION

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ABSTRACT
The Mobile Ad-hoc Network (MANET), also known as wireless ad hoc network, where we can't configure permanent transmitter and receiver node, which is connected wirelessly. In MANET, energy consumption is one of the main problems. The proposed technique used in our project is termed as Adaptive Neighborhood Selection to extend the lifetime of the network by consuming energy in MANET. By using the AOMDV, the ANS at normalized condition should satisfy the considerations and performs well than FF-AOMDV. The parameters like throughput, delay, overhead has been analyzed.

INDEX TERMS: MANET, AOMDV, FF-AOMDV, ANS.

INTRODUCTION

The future development in wireless technologies will involve the utilization of the IP suite. Ad–hoc network is a LAN that is built spontaneously. MANET has no centralized administration mechanism. MANET has routable network property and each node act as "router" to send the data packets to other node within the network.

Nodes can be linked to internet or operate by themselves. They contain different transreceiver across the source node and destination node. In MANET devices are free to move independently and frequently change its link. The growth of wireless network made MANET popular and researches have been done by considering various angle of mobility in a MANET using all the nodes.

In MANET, a major issue is sustainability in the mobility of the node, their load and insufficient energy this leads in dynamic change in topology. Improving the lifetime of network, energy consumption is an important consideration in MANET. Many researches like AOMR-LM, AOMDV and FF-AOMDV are worked out to overcome this concern.

FF-AOMDV is an existing technique, when a RREQ is send by a source terminal to destination terminal multiple routes are discovered to send the data packets. Without knowing the strength of the route the transmission of data packet takes place. By implementing the FF- AOMDV algorithm, choosing of route will be totally different.

When a RREQ is send and received, the source have three (3) types of information to choose the shortest

and optimized route path with minimized energy consumption. This information includes Information about network's each node's energy level, Distance of the routes and Energy consumed during route discovery. The route which consumes less energy could possibly be (a) the route that has the shortest energy, or (c) both. distance; (b) the route that has high

The source will send the data packets via the route with high energy level, after which it will calculate its energy consumption. If route fails the source will select an alternative route. In FF-AOMDV after the node lost its energy the route can be changed but in ANS the route is frequently changing by considering the required condition at that instant such as Maximum energy level of the node, Minimum delay and Minimum drop.

BACKGROUND AND RELATED WORK

AD-HOC ON DEMAND DISTANCE VECTOR (AODV)

AODV is a routing protocol for ad hoc mobile networks, where there is two or more number of mobile nodes is present. This algorithm creates routes between nodes only when the request has been given by the source, this allows the nodes to transmit and receive data packets from transmitter to receiver node. This makes the route to be active.

The transmission in AODV supports both unicast and multicast because it will not select shortest route rather it select least congested route. This allows topological changes where the active routes are affected. Even during more traffic AODV is more efficient. When node's life time is available, the network expires due to exhaustion of energy.

The rate of data packet sending may vary which leads in increasing network size and decreasing the efficiency of the design metrics. AODV, in which when the nodes are co-ordinate to perform the operation, route can be made available. This made the nodes to sense the next nodes in the broadcasting area. So AODV may be affected by some attacks.

There is a possibility of termination of active routes and it is hard to choose the termination time. This is due to high mobility and the data rate of the nodes.

AOMDV ROUTING PROTOCOL

An on-demand routing protocol, AOMDV has its roots in the AODV, a popular protocol called single- path routing protocol. This provides two key services: finding the route and maintenance.

Since this is dependent on the route information of AODV, AOMDV has less overhead than AODV by finding multiple routes. Compared to AODV, AOMDV's have extra route reply and error occurs in the route for multiple route discovery and maintenance along with several extra fields to route the control packets (that is RREQs, RERRs and RREPs). Adding some fields and changing others modified the topology of AOMDV's routing table.

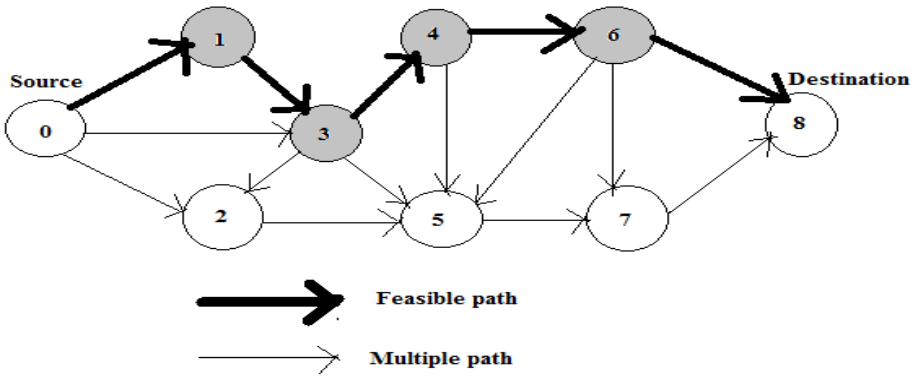

Figure 1 AOMDV

The result from simulation shows the AOMDV is better than AODV by which 40% of loss in packet has been reduced, delay has been improved and overhead has been reduced to about 30% by decreasing route discovery operations' frequency hence improving the performance of MANET compare to AODV algorithm.

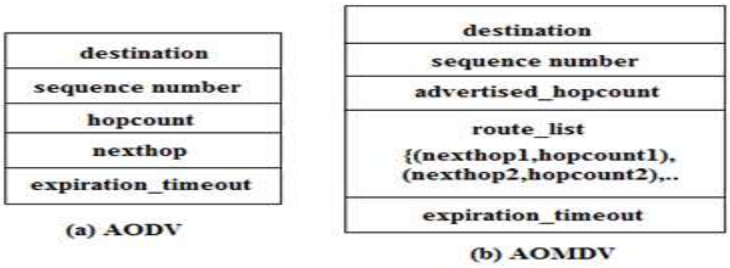

Figure 2 Structure of routing table

ADAPTIVE NEIGHBORHOOD SELECTION

Adaptive neighborhood selection is a technique which has some considerations at normalized condition they are node energy should be high, delay and drop should be low.

These three conditions will be satisfied only in rare cases, so in unbalanced nature any two conditions can be satisfied by a node for transmission. The route may change frequently thus energy has been consumed and lifetime has been increases for the network.

SIMULATION OUTPUTS

OVERHEAD RATIO

The ratio of total number of packets that are routed to the overall data packet delivered to destination. This study analyzed that to deliver a single data packet the average routing packets are required.

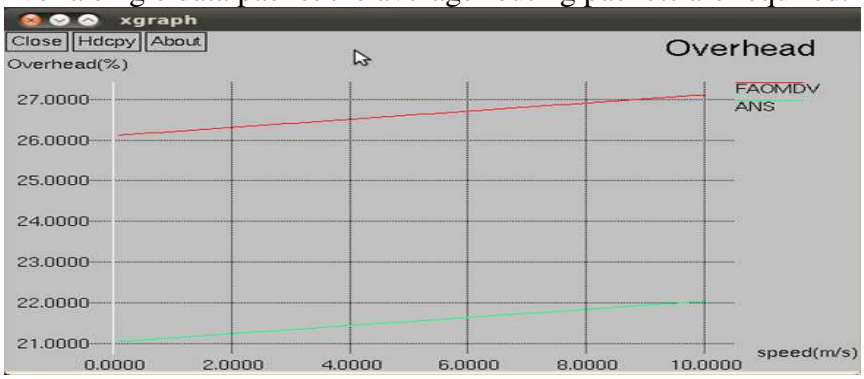

Figure 3 Overhead

The graph shows the overhead ratio on which ANS is compared with FF-AOMDV technique. In x-axis, speed in meter per second and in y- axis, overhead in percentage has been mentioned. In ANS the overhead ratio is decreased when compared to FF-AOMDV.

The ANS protocol has performed well than FF-AOMDV. In the path discovery the suitable route is selected to send the data with least time of initiation from source terminal to destination terminal.

THROUGHPUT

Number of bits that are successfully received at the destination per unit time.

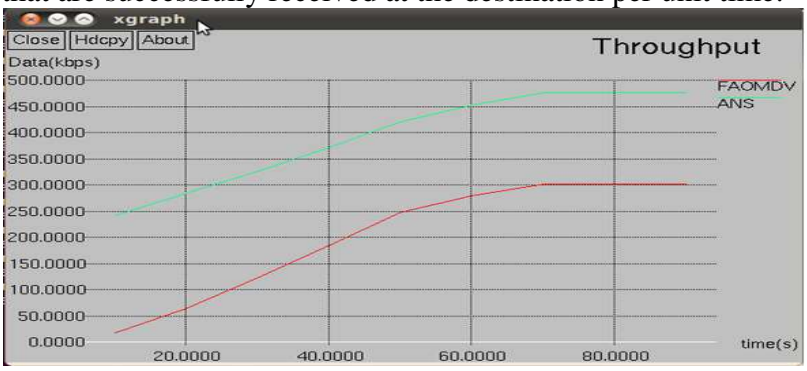

Figure 4 Throughput

The graph shows the throughput on which ANS is compared with FF- AOMDV technique. In x-axis, time in seconds and in y-axis, data in kilo bits per second has been mentioned. In ANS the throughput is increased

when compared to FF- AOMDV. If there is loss in energy there will be no more transmission by node. The ANS routing protocol has higher throughput.

ANS routing protocol selects better route with weight priority and its throughput scenario is highly impressive. The route with high energy and short distance is selected. Packet loss will be less due to stable connection. The throughput is increased.

DELAY

Average time taken to transmit data packets successfully from source terminal to terminal of destination node.

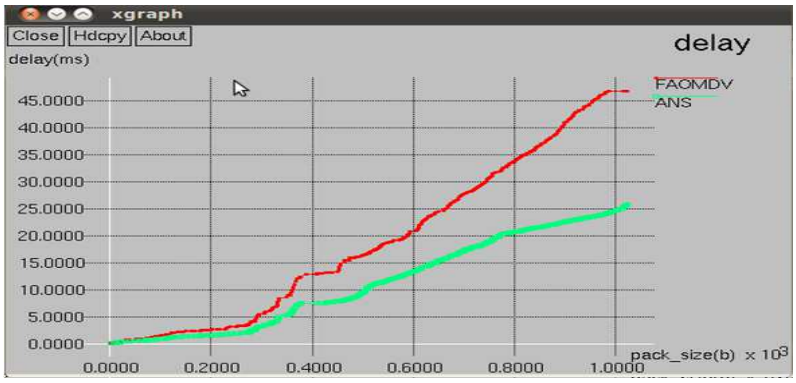

Figure 5 Delay

The graph shows delay on which ANS is compared with FF- AOMDV technique. In x- axis, packet size in kilo bits per second and in y-axis, delay in milliseconds has been mentioned. In ANS the delay is decreased when compared to FF- AOMDV.

COMPARISON OF FF-AOMDV AND ANS OUTPUTS

ANS is better than FF-AOMDV in decreasing the Overhead about 5%, Delay about 41.17%, and increasing the Throughput about 40%.

S.NO.	PARAMETER	FF-AOMDV	ANS
1.	Overhead	High	Low
2.	Delay	High	Low
3.	Throughput	Low	High

CONCLUSION

In this paper, simulation of ANS is done by using Network Simulator version- 2. Different condition like delay, drop and energy capacity of the node has been considered to perform the operation and the output for throughput, delay and overhead has been compared with the FF-AOMDV. Result shows that ANS, performed better than FF- AOMDV in throughput, delay and overhead.

REFERENCE

I. Gatani, L., Re, G. L., & Gaglio, S. (2005, June). Notice of Violation of IEEE Publication Principles An adaptive routing protocol for ad hoc peer-to-peer networks. In Sixth IEEE international symposium on a world of wireless mobile and multimedia networks (pp. 44-50). IEEE.

II. Marina, M. K., & Das, S. R. (2006). Ad hoc on-demand multipath distance vector routing. Wireless communications and mobile computing, 6(7), 9

III. Tekaya, M., Tabbane, N., & Tabbane, S. (2010, November). Multipath routing mechanism with load balancing in ad hoc network. In Computer Engineering and Systems (ICCES), 2010 International Conference on (pp. 67-72). IEEE.

IV. Zheng, S., Weiqiang, W. U., & Zhang, Q. (2011). Energy and link-state based routing protocol for MANET. IEICE TRANSACTIONS on Information and Systems, 94(5), 1026-1034.

V. Yogesh Chaba, Patel, R. B., and Rajesh Gargi (2012). Issues and challenges involved in multipath routing with DYMO protocol. International Journal of Information Technology and Knowledge Management, January-June 2012, 5(1), pp. 21-25.