Implementation of Accumulative Bit Error Based Adaptive AODV Routing Protocol

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Abstract— *In the existing routing methodology the routes are selected based upon the shortest route between the source and destination which is not an efficient way to select the routes because of the reasons explained above in the drawbacks. Therefore, to keep this in mind we have developed a new routing protocol that uses the bit error rate information of a link to decide whether to include or not the current link in the route discovery process. The results obtained from various simulations shows the effectiveness of our proposed approach. The our goal is to "Develop a routing algorithm based on accumulative Bit Error Rate which calculated using SNR and change the underneath route discovery phase of AODV algorithm make to use the best BER route for communication (which may have more hop count) instead of hop count, hence we name our approach as Accumulative Bit Error Based Adaptive AODV (ABERA-AODV) routing protocol (RP)."*

Keywords— ABERA, AODV, BER, RP, SNR

I. INTRODUCTION

We exhibit the working philosophy of our proposed *Accumulative Bit Error Based Adaptive AODV(ABERA-AODV) routing protocol* by describing the working and implementation details of our proposed algorithm for reliable route discovery process from the source to destination node. Our approach is implemented on reactive routing protocol ad-hoc on demand distance vector (AODV) routing Protocol commonly used for MANET communication. The key challenge which faced When we design any new approach is to provide high quality link between source to destination so that data can easily transferred from source to destination nodes . The link quality from source to destination can be a key parameter to decide a stable link between source and destination so we select routes that are consists of good quality overall links that are selected at the time of forwarding of RREQ messages towards the destination node among the all available links. Each node check the quality of link before forwarding RREQ message to destination node as they have to select high quality stable link once RREQ message reaches to the destination from all available different routes it select the route which had overall high stability after calculating overall accumulative BER as compare to all available other link based on SNR. Each node that takes part into the route discovery will only select the high stability links from the available set of links on this node at that instant of time. As all intermediate node forward RREQ with high quality of link towards the destination and at destination the destination accumulate all available good quality of links in order to finalize on best route which can sustained for long period as the all intermediate node selected are had good stable route and also the destination selected best out of them. So the overall implementation based on the selecting overall best path which can last long and had high link stability.

II. PROPOSED ALGORITHM OVERVIEW

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Variable used in the Algorithm
'S':: Source node
'D':: Destination node
'Int_node':: Intermediate node
'R_buf':: RREQ message buffer
'BER_rreq':: BER of received RREQ message
'ACC_BER':: Accumulative BER of all node from source to current node
'RT ':: Routing table of a node
'Tx':: Timer of R_buf at node x
 Algorithm
if S got data packet for D then
    if S not have route for D in its RT then
        S starts the ABERA-AODV protocols route discovery process;
    else
        S send packet to next-hop towards destination node D;
        if Receive a fresh RREQ or duplicate message then
            Physical layer of Int_node calculates the BER and add it in the
            INFO field of RREQ message and update BER_rreq ;
            Update ACC_BER based on BER_rreq of RREQ Message;
            Int_node store the RREQ message in its R_buf and set the
            timer if it's fresh RREQ;
            When Ti expire node Int_node extract the RREQ with the
            highest BER;
            Node Int_node rebroadcast the extracted RREQ and discard
            the R_buf;
        end
        if D receives the RREQ message then
            check ACC_BER for each route which is updated based on
            BER_rreq of all intermediate nodes;
            if ACC_BER is lowest amongs all other route then
                Int_node store the RREQ message in its R_buf and set the
                timer if it's fresh RREQ;
                When Ti expire node Int_node extract the RREQ with the
                highest SNR ;
                D gets the pervious hop address of the extracted RREQ
                message;
                D creates a RREP message and sends it towards S using the
                previous hop selected in last step;
                Notify the source about the new Path and use it for
                communication;
            end
            else
                Discard the current RREQ and its path;
                Request source S to re Broadcast the RREQ
            end
        end
        if S receives the RREP message then
            S updates its RT and sends the buffered data packet to D;
        end
    end
end
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III. EXPERIMENTAL RESULT

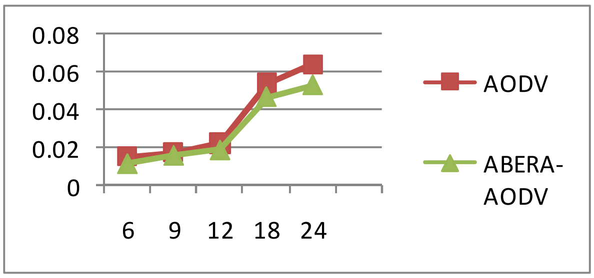

Fig. 1 End To End Delay N/W Mobility

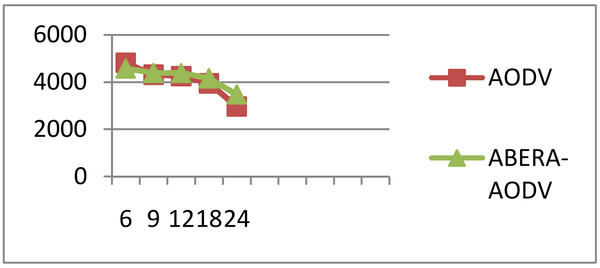

Fig. 2 Average Packet Delivery Ratio with Increase in Network Mobility

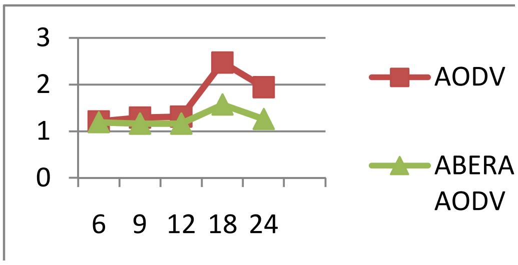

Fig.3 Network Layer Control Overhead With Network Mobility

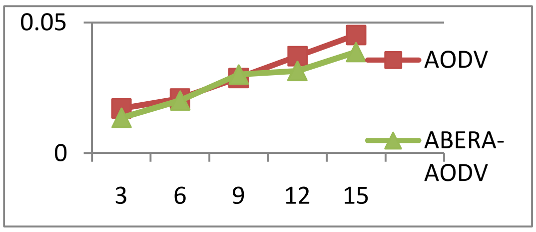

Fig. 4 Average End-To-End Delay (EED) With Increase in Network Load

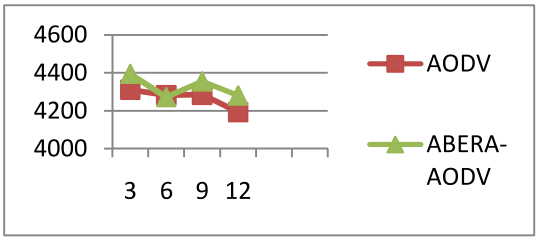

Fig.5 Average Packet delivery ratio with increase in network load

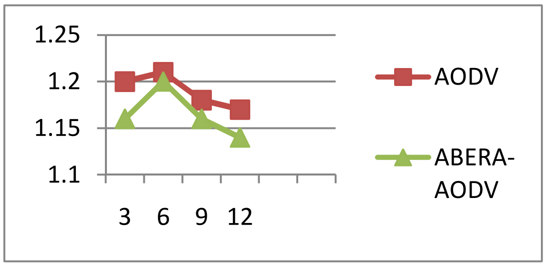

Fig.6 Network layer control overhead with Network Load

IV. CONCLUSION

I have proposed a route discovery process that uses the link quality under consideration at each step during its route discovery process. My proposed AODV protocol shows that it is more effective for data transmission in moderate mobility and congested network than the traditional routing protocols in MANETs. my proposed routing protocol uses the received signal power, interfering signal power and noise over a link to identify whether it is a stable radio link or not during the route discovery process. i have analyzed my proposed work with the help of simulation results that are generated using the well-known network simulator called Exata.

I have analyzed and simulated my proposed algorithm to measure its ability in further improvement of performance in AODV and also compared its performance with existing mechanisms using simulation. So, I can conclude that strength of a secured protocol for AODV not only depend on the strength of the cryptographic mechanism but also on the routing performance metrics. The work is also open for a way to provide intermediate hop authenticity verification which still lack in existing literatures .

I. In this thesis, I have implemented Efficient AODV routing protocols, based on their respective underlying protocols, AODV, in the eaxta simulation environment. I have also simulated popular network models that exploit the weakness of the protocols.. The goal of a routing protocol is to efficiently deliver the network data to the destinations; therefore, two metrics, Packet Delivery and End to End Delay, are used to evaluate the protocols. In order to get the accurate experimental results, each scenario is run 2 times in order to calculate the average value for the two evaluation metrics. Through the collected evaluation metrics from the various scenarios, the impacts of attacks upon the routing protocols are then studied.

V. REFERENCES

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