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Effective Prevention against DOS Attack in OLSR Protocol over MANET Environment

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ABSTRACT: Mobile Ad-Hoc Networks (MANET) a fast growing network scheme and it provides lots of features to communication strategies and routing protocols. These routing protocols are introduced to avoid the attacker nodes and provides the efficient communication between source and destination. The attacks in the network scenarios are: DOS, Wormhole attack and Blackhole attacks. In this system, a new routing protocol strategy is defined by means of Route Request and Route Response Strategies with the help of Optimized Link State Routing protocol (OLSR). Source Node sends Route Request to the nearby node. The nearby node checks the request and sends the Route Response to Source Node back within a proper interval. The proper and relevant response from the neighbor node indicates it as a proper node as well as the neighbor node sequence Number will get incremented by 1. The node is proper then only the count will be incremented otherwise it consists attack content. This kind of nodes are properly blocked from the present scenario and the source checks for the alternate or other neighbor nodes to proceed for further communications. As per the regular network strategies the node selection or path selection process is purely based on Shortest Path Routing methodology.

KEYWORDS: MANET, OLSR, Blackhole attack, DoS attack.

I. INTRODUCTION

Mobile Ad hoc network (MANET) is the most desired network that are under growing interest of research due to its benefits and development of an Intelligent Communication System (ICS). Appling a better communication in MANET is a question mark because of its high mobility and limited coverage. In this type pervasive networks high mobility generate frequent topology changes and network decentralization. Mobile ad hoc networks (MANET) are self-configuring network same as the Vehicle ad hoc network (VANET) where the devices are changed to mobile nodes[1],[2],[3],[4]. These networks are with changing topology and high mobility. MANET can provide comfort to routes, communication among mobile nodes and also route safety. A MANET network is interconnected with mobile nodes that are able to communicate each other and transfer the important information. The main objective of these networks is givento good and available services to nodes while on mobile environment. However mobile environment safety and traveling comfort applications are seeking many benefits. this paper deals with the communication and routing strategies in MANET.

A cluster based approach in the network using techniques of Optimized Link State Routing Protocol [OLSR] is proposed, which exchange the routing information also added a routing algorithm and it finds best route from the source to the destination based on the quality (QOS metrics). In this paper following metrics like Lifetime, Control

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Overhead, Packet Delivery Ratio, End-to- End Delay, Throughput are considered. By analyzing the performance and simulation results, it is identified that the method can improve the performance of routing in MANET by selecting the quality based route on QOS metrics.

The topology created by the vehicle is highly dynamic and is significantly non-uniformly distributed.To offer a real time application to mobile nodes, it is needed to give better routing not only that optimal path is also needed for a better communication. To obtain a quality assured path for communication the routing strategy needs to be excellent. The traditional algorithms that are used in MANET are not that possible in this network due to its high mobility.

The traditional routing protocols that are used for VANET shows its performance poor when it is used in MANET. The problems behind these protocols like ad hoc on demand distance vector (AODV) and dynamic source routing (DSR) when applied to MANET network the routes will be instable. An established route which is fixed to succession of nodes (traditional node-centric view of routes) between the source and destination will lead to the disconnection or breaking up of routes in the network. As MANET mobility is very higher so that it cannot maintain the routes also the packets are dropped. Due to the route failure which significantly happens increases the overhead and lead to low delivery ratio and high transmission delay.

The characteristics of MANET are more similar to the VANET some of the characteristics are high mobility, Rapidly Changing Network Topology, Unbounded Network Size, Frequent Exchange of Information, Wireless Communication, Time Critical, Sufficient Energy, Better Physical Protection[5].

The proactive routing protocol like OLSR which designed for VANET can be applied to MANET due to some of its features [7]. In this paper using the concept of OLSR and Optimized Routing Algorithm to create an optimal and quality based path for communication from node to node. The clustering technique is used in which there are cluster head election and selection of MPR that plays the role of communication gateways between the clusters. Optimized Routing algorithm is added because it presents the best route the source and the destination and comply the QOS metrics.

The paper is organized as follow in further section, briefly identified the related work. In section 3, a detailed description of the proposed system is added. In section 4, define the result and simulation work of the proposed system in detail with performance results and simulation experiments. In section 5, finally addthe conclusion with the advantage of the proposed system, its drawback and the future work for the future research.

II. LITERATURE SURVEY

The research studies over routing for MANET have been carried out in different field in general as well as cluster based technique in particular. The traditional algorithms are mostly not suitable in MANET due to its mobility need to satisfy the mobility of the network. In this section some existing studies that adopt the clustering technique reviewed.

Optimization is a techniquethat tends to improve maximum results[5]. In this paper they have consider MANET to play and vital role for mobile environment side safety and to solve the emergency situation. Communication between mobile nodes is done by using routing protocol in this paper they have introduce a cluster based routing protocol i.e. CBLR and HCR [5]. Also they apply Bee Colony Optimization techniques on this protocol to achieve maximum results.

A new intelligent algorithm to perform the vehicle to vehicle communication. Each vehicle can pass the information to other regarding the path, speed etc [6] and also includes the information of accidentstatus. In this proposed work, it is said that if a vehicle is met with a collision it will inform all other mobile nodes to take a better decision. In this proposed work [6], as a vehicle get some collisions or accident it will inform to othermobile nodes about its status so that they can perform the decision regarding the route change at earlier stage.

This scheme [7], they aim at defining and solving an offline optimization problem to efficiently and automatically tune OLSR, which used by many authors for MANET as it present many features for it.In [7] more details about the use of OLSR in MANETs are provided by defining an optimization problem to tune the OLSR protocol. This done by obtaining the best fits configuration automatically, optimization issues are defined by quality or fitness function.

In [8] work they are comparing the performance of ABC algorithm with that of differential evolution (DE), particle swarm optimization (PSO) and evolutionary algorithm (EA) for multi-dimensional numeric problems. The simulation results of this paper show that the ABC algorithm performance is comparatively efficient and the performance of ABC is analyzed under the change of control parameter values[8] and it is mentioned by honey bee behavior.

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In paper [9], they have addressed the problem of clustering in VANETs using Quality of Service Optimized Link State Routing (QoS-OLSR) protocol. There are several clustering algorithms wheremobility-based algorithms avoid the Quality of Service requirements that are important for MANET safety. In [9] paper the solution is a new QoS-based clustering algorithm that considers QoS requirements and high speed mobility constraints. The aim of this paper [9] is to form a stable cluster and maintain the stability during communications and link failures which are achieved by using Ant Colony Optimization for MPRs selection.The algorithm offers reduction of control overhead and also the stability of the network.

III. PROPOSED SYSTEM

In our proposed work the Cluster based Routing mechanisms form the communications. With this cluster based routing mechanisms to elect a set of optimal cluster-heads with the help of Cluster Head Selection procedures and dividing the networks into clusters as well as form the nodes with the clusters and provide the vehicular specialization to all nodes to move around all locations around the regions. In this approach use the MPR Cluster Selection Process, in which MPR nodes play the role of communication gateways between different clusters. All communication between clusters must transit through corresponding MPRs. One cluster consists of one or many MPRs. When clusters are formed and cluster heads are selected for each one of them, the algorithm of determining MPRs kicks off. Apart from this add to the Routing Provision called Optimized RoutingAlgorithm, which is presented here to find the best route between given source and destination and which complies with given QoS metrics. Routing operation is inspired by the behavior of bees in their search for food and by their strategy for pinpointing various routes from their hive to various locations.

A. CLUSTER HEAD ELECTION

In this model used by nodes (mobile nodes) for electing the cluster head. To improve the quality of service of the clusters, CB-OLSR use several QoS metric. The cluster head knows the other nodes in the cluster with all its details obtained through the Hello message. Nodes give an attention to link expiration as it leads to the cluster stability.

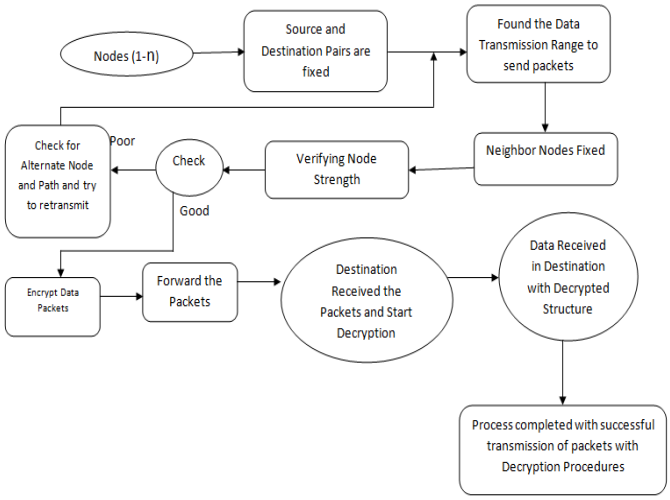

Fig 1: System Architecture

B. ROUTING TABLE

The routing table in CB-OLSR is situated at the cluster head, which is responsible for discovering the network and exchanging the data. The entry of the routing table represents a route from a destination, which is evaluated according to the quality. Multiple routes to a destination can be there in the routing table which is evaluated by quality therefore the route with best quality to transmit the data packets.

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C.ROUTE DISCOVERY

When the node wants to send the data to other cluster then the source node send the request to the cluster head. If didn't find any route in the table then the cluster head releases a scout to discover the route to destination.In this the scout moves from cluster head to MPRs and reaches the destination, and the routing table is updated.

IV. RESULT AND SIMULATION WORK

The experiment is done using network simulator to show the efficiency of the proposed system. The performance of the protocol in MANET was simulated and succeeded to find the best route.

The proposed result shows that the protocol can increase the

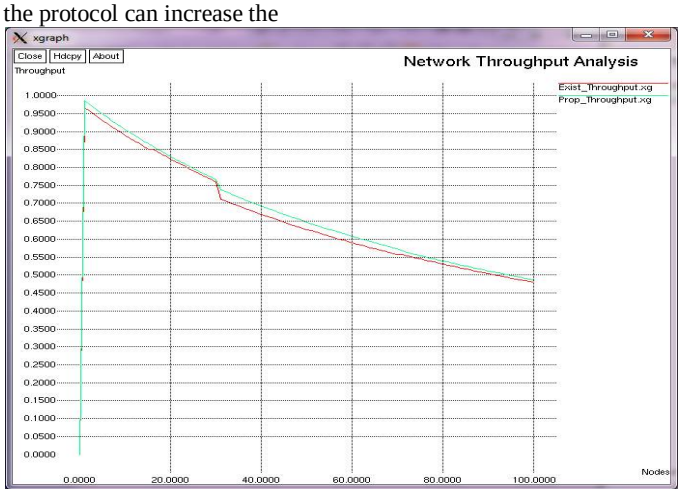

Fig 2: Network Throughput

Throughput of the network. The figure 2 represent the Network Throughput analysis which shows some improvement.

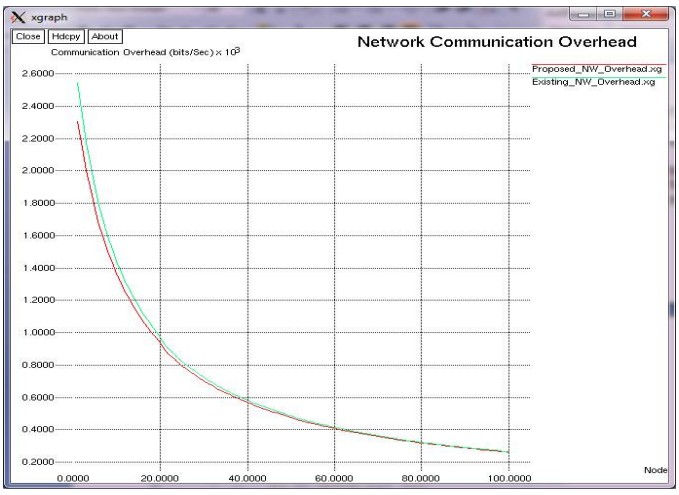

Fig 3: Network Communication Overhead

The proposed result shows the Network Communication Overhead in figure 3 it is shown that the Overhead is comparatively less in or proposed system.

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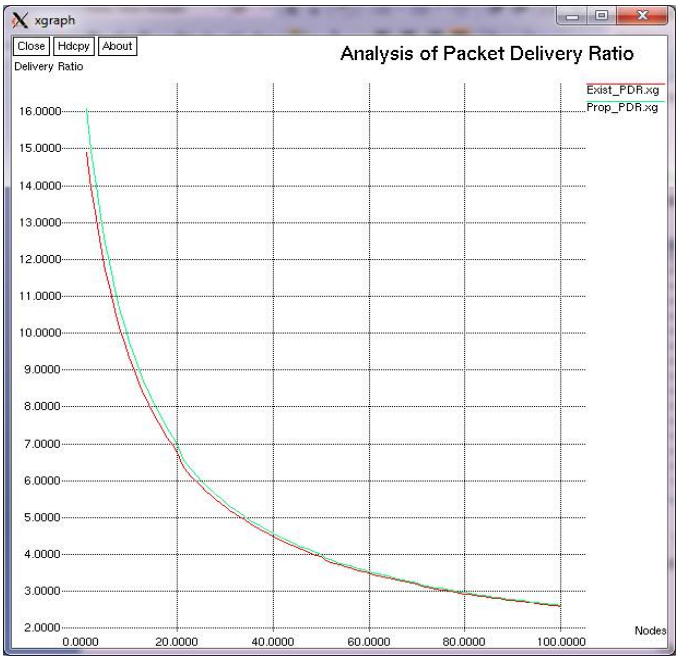

Fig 4: Analysis of Packet Delivery Ratio

This figure 4 shows the proposed result and Analysis of Packet Delivery Ratio analysis of the proposed architecture.

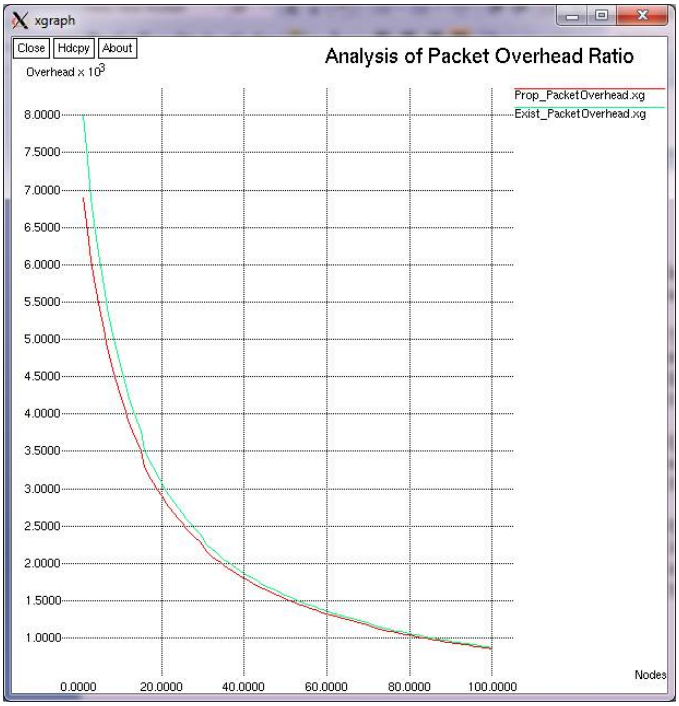

Fig 5: Analysis of Packet Overhead Ratio

This figure 5 shows the Analysis of Packet Overhead Ratioof the proposed architecture.

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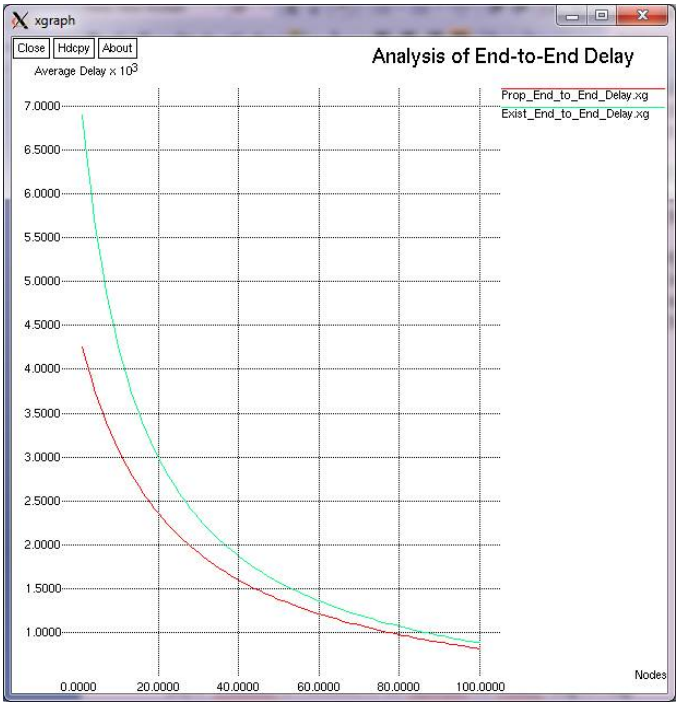

Fig 6: Analysis of End-to-End Delay

This figure 6 shows the Analysis of End-to-End Delay Ratio of the proposed architecture.

V. CONCLUSION

The result shows the proposed system performs a better routing and communication system by delivering maximum number of data packets. The proposed system has decreased the end-to-end delay increased the lifetime of the network. In future, we can give some more security system to get far better network as MANET is also affected by attacks.

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