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Analysis of Routing Protocols in MANET

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Abstract- Mobile Ad hoc Networks (MANET) use anonymous routing protocols that hide node identities and routes from outside observers in order to provide anonymity protection. Existing anonymous routing protocols relay on hop by hop encryption or redundant traffic by generation high cost. The high cost exacerbates the inherent resource constraint problem in MANETs. Existing anonymous routing protocols provides full anonymity for the data sources, destinations, routing path with increased cost, delay .It consumes the bandwidth of the network. In proposed multicast routing scheme, the network field is partitioned into multicast zones and each zone has a zone head. The data packets will be transferred through the nodes which satisfies the position verification test and the zones through with the packet is transferred is dynamic. Routing misbehavior is mitigated using witness nodes. The proposed system is evaluated in terms of delay, packet delivery ratio and energy consumption.
Keywords- MANET, Packet delivery ratio, delay, protocols, ad, hoc, review, routing, mobile, networks.

I. INTRODUCTION

A mobile ad hoc network is a self-configuring infrastructure less network of mobile devices connected by wireless. Ad hoc is Latin and means "for this purpose". MANET is an autonomous collection of mobile users that communicate over relatively bandwidth constrained wireless links. Network topology changes rapidly and unpredictably over time due to the mobility of the nodes. There arises the need of incorporating the routing functionality into nodes. MANETs are vulnerable to malicious entities that aim to tamper and analyze data and traffic analysis by communication eavesdropping or attacking routing protocols. Anonymous routing protocols are crucial in MANETs to provide secure communications by hiding node identities and preventing traffic analysis attacks from outside observers. An ideal anonymous routing protocol for MANETs should have the following properties:
We should not assume the knowledge of topological information about the network as accessing the topological information renders the system vulnerable to attacks.
The identities and locations of the nodes in the route, and in particular, those of the source and the destination, should be hidden and protected.
Multiple paths should be established to increase the difficulty of traffic analysis and avoid broken links due to node mobility.
Anonymous protocols provide full anonymity for the data sources, destinations, and routes. An anonymous routing protocol does not consider the delay involved in the transfer of packets and bandwidth consumption. Limited resource is an inherent problem in MANETs, in which each node labors under an energy constraint. In order to reduce the delay in the transfer of packets, the routing path with minimum number of hops must be selected. Verification test are done to verify whether the selected hops are not malicious nodes. When the packet is transmitted through the shortest path, delay is reduced and the bandwidth of the other nodes will be save

II. ROUTING LOGRITHMS

A. Destination-Sequenced Distance Vector (DSDV)

The DSDV is a modification of DBF [3, 10], which guarantees loop free routes. It provides a single path to a destination, which is selected using the distance vector shortest path routing algorithm. In order to reduce the amount of overhead transmitted through the network, two types of update packets are used. These are referred to as a “full dump” and “incremental” packets.

B. Wireless Routing Protocol (WRP)

The WRP also guarantees loops freedom and it avoids temporary routing loops by using the predecessor information. However, WRP requires each node to maintain four routing tables. This introduces a significant amount of memory overhead at each node as the size of the network increases. Another disadvantage of WRP is that it ensures connectivity through the use of hello messages

C. Global State Routing (GSR)

The GSR protocol [5] is based on the traditional Link State algorithm. However, GSR has improved the way information is disseminated in Link State algorithm by restricting the update messages between intermediate nodes only. In GSR, each node maintains a link state table based on the up-to-date information received from neighbouring nodes, and periodically exchanges its link state information with neighbouring nodes only.

D. Fisheye State Routing (FSR)

The FSR protocol [12] is the descendent of GSR. FSR reduces the size of the update messages in GSR by updating the network information for nearby nodes at a higher frequency than for the remote nodes, which lie outside the fisheye scope

E. Source-Tree Adaptive Routing (STAR)

The STAR protocol [11] is also based on the link state algorithm. Each router maintains a source tree, which is a set of links containing the preferred paths to destinations. This protocol has significantly reduced the amount of routing overhead disseminated into the network by using a least overhead routing approach (LORA), to exchange routing information. It also supports optimum routing approach (ORA) if required. This approach eliminated the periodic updating procedure present in the Link State algorithm by making update dissemination conditional.

F. Distance Routing Effect Algorithm For Mobility (DREAM)

The DREAM routing protocol [2] employs a different approach to routing when compared to the routing protocols described so far. In DREAM, each node knows its geographical coordinates through a GPS. These coordinates are periodically exchanged between each node and stored in a routing table (called a location table). The advantage ofexchanging location information is that it consumes significantly less bandwidth than exchanging complete link state or distance vector information, which means that it is more scalable.

G. Multimedia Support In Mobile Wireless Networks (MMWN)

In MMWN routing protocol [20] the network is maintained using a clustering hierarchy. Each cluster has two types of mobile nodes: switches and endpoints. Each cluster also has location manager (LM), which performs the location management for each cluster (see Fig. 1). All information in MMWN is stored in a dynamically distributed database. The advantage of MMWN is that only LMs perform location updating and location finding, which means that routing overhead is significantly reduced when compared to the traditional table driven algorithms (such as DSDV and WRP).

H. Cluster-Head Gateway Switch Routing (CGSR)

CGSR [6] is another hierarchical routing protocol where the nodes are grouped into cluster. Howe scheme used here is simpler than MMWN. In CGSR, there is no need to maintain a cluster hierarchy (which is required in MMWN)

I. Hierarchical State Routing (HSR)

HSR [26] is also based on the traditional Link State algorithm. However, unlike the other link state based described so far, HSR maintains a hierarchical addressing and topology map. Clustering algorithm such as CGSR can be used to organise the nodes with close proximity into clusters. Each cluster has three types of nodes: a clusternode which acts as a local coordinator for each node, Gateway nodes which are nodes that lie in two different cluster

J. Optimised Link State Routing (OLSR)

OLSR [16] is a point-to-point routing protocol based on the traditional link-state algorithm. In this strategy, each node maintains topology information about the network by periodically exchanging link-state messages. The novelty of OLSR is that it minimises the size of each control message and the number of rebroadcasting nodes during each route update by employing multipoint replaying (MPR) strategy

K. Topology Broadcast Reverse Path Forwarding (TBRPF)

TBRPF [4] is another link-state based routing protocol, which performs hop-by-hop routing. The protocol uses the concept of reverse-path forwarding (RPF) to disseminate its update packets in the reverse direction along the spanning tree, which is made up

of the minimum-hop path from the nodes leading to the source of the update message

III. REACTING PROTOCOLS

A. Ad Hoc On-Demand Distance Vector (AODV)

The AODV [8] routing protocol is based on DSDV and DSR [19] algorithm. It uses the periodic beaconing and sequence numbering procedure of DSDV and a similar route discovery procedure as in DSR. However, there are two major differences between DSR and AODV. The most distinguishing difference is that in DSR each packet carries full routing information, whereas in AODV the packets carry the destination address. This means that AODV has potentially less routing overheads than DSR.

B. Dynamic Source Routing (DSR)

As stated earlier, the DSR protocol requires each packet to carry the full address (every hop in the route), from source to the destination. This means that the protocol will not be very effective in large networks, as the amount of overhead carried in the packet will continue to increase as the network diameter increases. Therefore in highly dynamic and large networks the overhead may consume most of the bandwidth. However, this protocol has a number of advantages over routing protocols such as AODV, LMR [7] and TORA [25], and in small to moderately size networks (perhaps up to a few hundred nodes), this protocol may perform better.

C. Routing On-Demand Acyclic Multi-Path (ROAM)

The ROAM routing protocol uses internodal coordination along directed acyclic subgraphs, which is derived from the routers' distance to destination. This operation is referred to as a "diffusing computation".

D. Light-Weight Mobile Routing (LMR)

The LMR protocol is another on-demand routing protocol, which uses a flooding technique to determine its routes.The nodes in LMR maintain multiple routes to each required destination. This increases the reliability of the protocol by allowing nodes to select the next available route to a particular destination without initiating a route discovery procedure. Another advantage of this protocol is that each node only maintains routing information to their neighbours.

E. Temporally Ordered Routing Algorithm (TORA)

The TORA routing protocol is based on the LMR protocol. It uses similar link reversal and route repair procedure as in LMR, and also the creation of a DAGs, which is similar to the query/reply process used in LMR [30]. Therefore, it also has the same benefits as LMR. The advantage of TORA is that it has reduced the far-reaching control messages to a set of neighbouring nodes, where the topology change has occurred.

IV. CONCLUSION

This study makes five contributions. QoS-guaranteed neighbor selection algorithm. The algorithm selects qualified neighbors and employs deadline-driven scheduling mechanism to guarantee QoS routing- Distributed packet scheduling algorithm. After qualified neighbors are identified, this algorithm schedules packet routing. It assigns earlier generated packets to forward with higher queuing delays, while assigns more recently generated packets to forward with lower queuing delays to reduce total transmission delay. Mobility-based segment resizing algorithm is a source node adaptively resizes each packet in its packet stream for each neighbor node according to the neighbor's mobility in order to increase the scheduling feasibility of the packets from the source node. Soft-deadline based forwarding scheduling algorithm. In this algorithm, an intermediate node first forwards the packet with the least time allowed to wait before being forwarded out to achieve fairness in packet forwarding. Data redundancy elimination based transmission. Due to the broadcasting feature of the wireless networks, the APs and mobile nodes can overhear and cache packets. This algorithm eliminates the redundant data to improve the QoS of the packet transmissi

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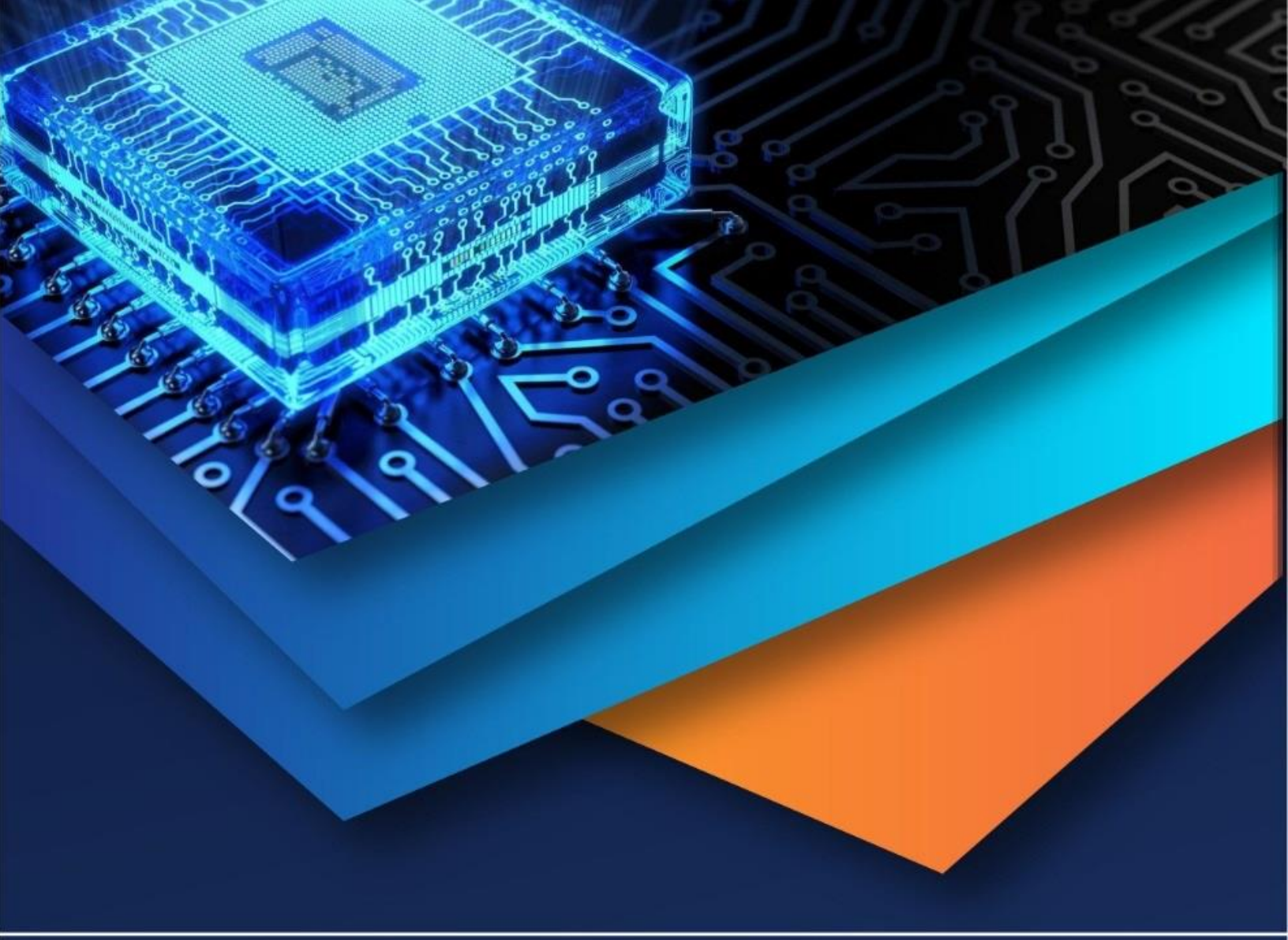

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