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Rescue System Identification by a Position Based Routing Protocol

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Abstract— In mobile ad hoc network there are several routing algorithms, which utilize topology information to make routingdecisions at each node. aim of this paper is to utilize position information to provide more reliable as well as efficient routing for certain applications. Thus extensions to existing position based routing algorithm have been described to work more efficiently even in cases where they are not working at present. In this paper an algorithm is proposed, which removes some of the drawbacks of the existing GPSR (Greedy perimeter stateless routing) position based routing algorithm. In proposed algorithm different algorithm has been used to planarize the graph so that it will not disconnect the route in case of location inaccuracy in perimeter mode whereas in GPSR in certain cases of location inaccuracy it will disconnect the graph and hence the packets will not be routed thereby decreasing packet delivery ratio.

Keywords— Adhoc Networks, Ad hoc on demand DVR, DSDV, Zone Routing Protocol.

I. INTRODUCTION

Mobile ad-hoc networks (MANETs) are infrastructure free networks of mobile nodes that communicate with each other in wireless mode. There are several routing schemes that have been proposed and several of these have been already extensively simulated or implemented as well [1]. The primary applications of such networks have been in disaster relief operations, military use, conferencing and environment sensing. There are several ad hoc routing algorithms at present that utilize topology information to make routing decisions at each node in the network [2]. The aim of this work is to utilize position information to provide more reliable as well as efficient routing for certain applications. Thus extensions to existing position based routing algorithm have been described to work more efficiently even in cases where they are not working in presently implemented algorithms for implemented applications. In this work an algorithm is proposed, which removes some of the drawbacks of the existing GPSR (Greedy perimeter stateless routing) position based routing algorithm [5]. In proposed algorithm different algorithms have been used to planarize the graph so that it will not disconnect the route in case of location inaccuracy in perimeter mode.

II. LITERATURE SURVEY

Position Based Routing: Since mobile ad-hoc networks change their topology frequently and without prior notice, routing in such networks is a challenging task. Position-based routing algorithms eliminate some of the limitations of topology-based routing by using additional information. They require information about the physical position of the participating nodes in the network their availability. Commonly, each node determines its own position through the use of GPS or some other type of positioning service. Position based routing is mainly focused on two issues: one a location service is used by the sender of a packet to determine the position of the destination and to include it in the packet's destination address and two a forwarding strategy used to forward the packets. A location service can be any one of the four: a)Some for some b) Some for all c) All for all d) All for some.

A forwarding strategy can be like; a) Greedy forwarding b) Restricted directional flooding and c) Hierarchical routing. The routing decision at each node is then based on the destination's position contained in the packet and the position of the forwarding node's neighbours. Position-based routing does not require the establishment or maintenance of routes. The nodes neither have to store routing tables nor do they need to transmit messages to keep routing table's up-to date.

III. PROBLEM STATEMENT

This is a device that performing rescue activities. It uses a greedy packet forwarding by position based routing (with location service some for all). Since mobile ad-hoc networks change their topology frequently and without prior notice, routing in such networks is a challenging task. Position-based routing algorithms eliminate some of the limitations of topology-based routing by using additional information. They require information about the physical position of the participating nodes in the network their availability. Commonly, each node determines its own position through the use of GPS or some other type of positioning service. Position based routing is mainly focused on two issues: one; A location service is used by the sender of a packet to determine the position of the destination and to include it in the packet's

destination address and two; A forwarding strategy used to forward the packets. A location service can be any one of the four: a) Some for some b) Some for all c) All for all d) All for some.

For our work we have taken position identification by a location service some for some A forwarding strategy can be like; a) Greedy forwarding b) Restricted directional flooding and c) Hierarchical routing.

The routing decision at each node is then based on the destination's position contained in the packet and the position of the forwarding node's neighbours. Position-based routing does not require the establishment or maintenance of routes. The problem of identification of location of a node in this paper used a greedy packet forwarding for that defined an algorithm below.

IV. PROPOSED ALGORITHM

Based on the understanding developed through analysis of the above problems some fixes for the above problems have been proposed and the rationale for choosing those fixes. Not all the problems are equally likely to occur. Based on their cause, the probability of their occurrences is taken into account and the solution is provided for the one which is most likely to occur. Density is a factor that affects when problems happen. At high density, greedy forwarding is used most of the time and with reasonable inaccuracy range this is unlikely to change. Since the errors happen due to face routing, dense networks look robust to these errors.

The proposed algorithm is given below:

if P. Mode = Greedy using greedy forward packet using forwarding.
else set P. Mode = Perimeter and planarize the graph as below:
for all v ε N do
for all w ε N do
if (w !=N1) then
continue
else if d(u, v) > max[d(u, w), d(v, w)] then
eliminate edge (u,v)
break
end if
end for
end for
if P. Mode = Greedy then start Forwarding packet using greedy forwarding

This algorithm overcomes the drawback of existing RNG algorithm. This algorithm has to be run in distributive manner. In the GPSR algorithm the forwarding will start as greedy forwarding and when it fails the graph is to be planarized first using the above method. In this method the neighbors of both u and v are considered. In this algorithm a set of all the neighbors of v is taken and now when u sees any witness w in between u and v it will first check that whether w is a neighbor of v or not. If w is not a neighbor of v then no need to delete the edge between u and v and it can continue as normally but if w is a neighbor of v then the condition is to be checked as specified in the given algorithm. If the condition is true, w is in shaded line between u and v then the edge is deleted. Then after planarizing the graph it gets switch over to perimeter routing and the packets are forwarded in the perimeter mode till a point is reached where it can switch back to greedy forwarding, at this point packets will be forwarded in the greedy way.

V. METHODOLOGY USED

Here the focus is in evaluating the effects of location inaccuracy on position based routing without any interference from other layers such as MAC collisions or physical layer effects. Thus the routing behavior in an ideal wireless environment is considered in simulations for GPSR. In the simulations a static and stable network of 100 nodes having the same radio range of 80 meters is considered. In the simulations the density of the network is varied by changing the space size, where the density is presented as the number of nodes per radio range. Each simulation run, nodes are placed at random locations in the topology and results are computed as the average of 20 runs. In this only those topologies are considered where network is connected. The maximum localization error is presented as a fraction of the radio range. The estimated node location is picked uniformly from a random location around the node accurate position limited by the maximum localization error. The main metric that is used in the simulation is the success rate of packet delivery since this represents the correctness of the protocol in the face of inaccuracy.

VI. CONCLUSIONS

In this work a new algorithm has been proposed to fight with the problem of location accuracy in the existing GPSR algorithm. GPSR is causing failures in such location inaccuracy scenarios. The problem was mainly due to the flaw in the planarization algorithm used in the existing GPSR algorithm. Hence here that algorithm has been modified. Since in case of location inaccuracy due to RNG the graph is disconnected and the packets are not delivered thereby decreasing the packet delivery ratio.

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