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Hybrid Location Based Forward Routing in Manet's

Arjun sankar.J[1], Ramar.C.K[2], Venkatesan.N[3]

PG Student, Department of ECE, PSR Engineering College, Sivakasi, Tamilnadu, India[1]

Associate Professor, Department of ECE, PSR Engineering College, Sivakasi, Tamilnadu, India[2]

Assistant Professor, Department of IT, Sri Vidya College of Engineering & Technology, Virudhunagar, Tamilnadu, India[3]

ABSTRACT: In mobile ad hoc networks (MANETs), the network topology changes frequently and unpredictably due to the arbitrary mobility of nodes. One of the fundamental challenges of MANETs is the design of dynamic routing protocols with good performance and less overhead. Neighbor Coverage-based Probabilistic Rebroadcast protocol (NCPR) is proposed for reducing routing overhead in MANETs. Due to large mobility of nodes in mobile ad hoc networks, NCPR algorithm used to decrease the number of retransmissions so that the routing overhead is reduced and can also improve the routing performance. Connectivity factor is defined to provide the node density adaptation. By combining the additional coverage ratio and connectivity factor reasonable rebroadcast probability is set. Simulation results show that the proposed protocol generates less rebroadcast traffic than the flooding as well as increase the packet delivery ratio and decrease the average end-to-end delay.

Keywords: Mobile ad-hoc networks, Neighbor coverage, Routing overhead, network connectivity factor

I. INTRODUCTION

A wireless ad-hoc network is a collection of mobile/semi-mobile nodes with no pre-established infrastructure, forming a temporary network. Each of the nodes has a wireless interface and communicates with each other over either radio or infrared. Laptop computers and personal digital assistants that communicate directly with each other are some examples of nodes in an ad-hoc network. Nodes in the ad- hoc network are often mobile, but can also consist of stationary nodes, such as access points to the Internet. Semi mobile nodes can be used to deploy relay points in areas where relay Fig.1. show a simple ad-hoc network with three nodes. The outermost nodes are not within transmitter range of each other. However the middle node can be used to forward packets between the outermost nodes. The middle node is acting as a router and the three nodes have formed an ad-hoc network.

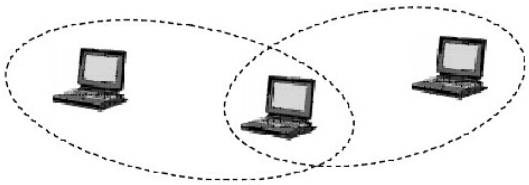

Fig. 1.Simple ad-hoc network with three nodes

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A mobile ad hoc network (MANET) is a self-configuring network that is formed automatically by a collection of mobile nodes without the help of a fixed infrastructure or centralized management. Each node is equipped with a wireless transmitter and receiver, which allow it to communicate with other nodes in its radio communication range. In order for a node to forward a packet to a node that is out of its radio range, the cooperation of other nodes in the network is needed this is known as multi-hop communication .Therefore, each node must act as both a host and a router at the same time .The network topology frequently changes due to the mobility of mobile nodes as they move within, move into, or move out of the network.

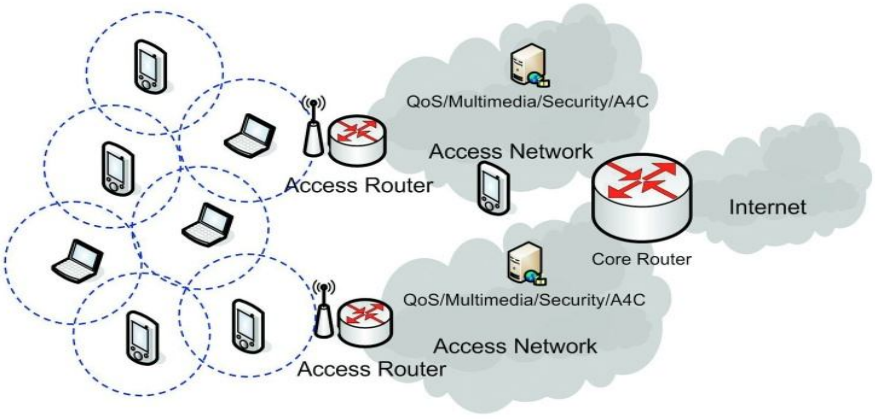

Fig.2. 1MANET

II. PROPOSED WORK

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. 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.

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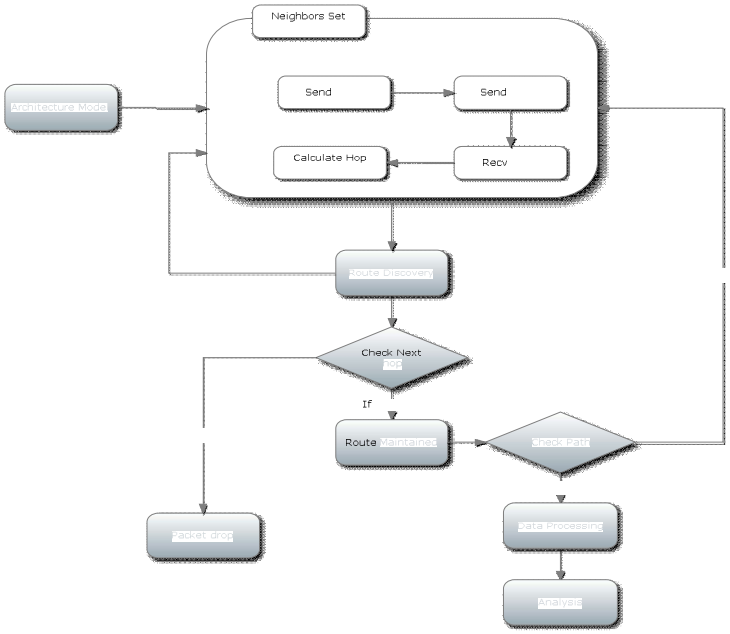

Fig.3. Proposed Diagram Hybrid Location based Forward Routing in MANET's

A. Architecture Design

We used ns2 simulator on Linux machine. Because, we focus on the link stability and route lifetime, no route overhead was considered in our simulation. In 870 X 870 m2area, mobile nodes exist. We used square area to increase average hop length of a route with relatively small nodes. Every mobile node is moving based on mobility data files that were generated by mobility generator module. The transmission range is fixed at 250 units. 20 nodes of them have destinations and try finding routes to their destination nodes. Maximum speed of node is set to 10 m/sec. All nodes do not stop moving, and the simulation time is 500 sec. The number of nodes is varying from 50 to 100.

B. Protocol Implementation

When greedy routing is used as a packet forwarding scheme, each relaying node dynamically computes the next-hop node for each in-coming packet. Since no state about flow paths is maintained, no node has the knowledge about the entire path. Hence, the issue of consistent forwarding does not exist in this The route request message records all the nodes it traverses. The destination returns a route reply message to the source after it receives the route request message. The route reply message carries the entire source to destination path recorded in the route request message. After learning the path from the route reply message, the source node can send its data packets using source routing and enclose the entire path in the header of each out-going packet. All relaying nodes only forward packets according to the path in these packet, automatically guarantees the consistency of routing. In addition, as long as the greedy-routing-based path discovery does not create loops while forwarding the route request messages, loop-freeness is automatically guaranteed by source routing.

C. Estimate Neighbor set

The node which has a larger rebroadcast delay may listen to RREQ packets from the nodes which have lower one. For example, if node ni receives a duplicate RREQ packet from its neighbor nj, it knows that how many its neighbors have been covered by the RREQ packet from nj. Thus, node ni could further adjust its UCN set according to the neighbor list in the

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RREQ packet from nj. After adjusting the Unit, the RREQ packet received from nj is discarded. We do not need to adjust the rebroadcast delay because the rebroadcast delay is used to determine the order of disseminating neighbor coverage knowledge to the nodes which receive the same RREQ packet from the upstream node. Thus, it is determined by the neighbors of upstream nodes and its own. When the timer of the rebroadcast delay of node ni expires, the node obtains the final UCN set. The nodes belonging to the final UCN set are the nodes that need to receive and process the RREQ packet. Note that, if a node does not sense any duplicate RREQ packets from its neighborhood, its UCN set is not changed, which is the initial UCN set. Now, we study how to use the final UCN set to set the rebroadcast probability.

D. Route Maintenance

Route Discovery To perform route discovery, the source node broadcasts a route request packet with a recorded source route listing only itself. Each node that hears the route request forwards the request (if appropriate), adding its own address to the recorded source route in the packet. The route request packet propagates hop-by-hop outward from the source node until either the destination node is found or until another node is found that can supply a route to thetarget.2. Route Maintenance If the status of a link or node changes, the periodic updates will eventually reflect the change to all other nodes, presumably resulting in the computation of new routes. However, using route discovery, there are no periodic messages of any kind from any of the mobile nodes. Instead, while a route is in use, the route maintenance procedure monitors the operation of the route and informs the sender of any routing errors. Route maintenance can also be performed using end-to-end acknowledgments rather than the hop-by-hop acknowledgments described above.

E. Analysis

In this proposed system analyzed the following parameters

i. Packet Delivery ratio

Many protocols in wireless sensor networks use packet delivery ratio (PDR) as a metric to select the best route, transmission rate or power. PDR is normally estimated either by counting the number of received hello/data messages in a small period of time, i.e., less than 1 second, or by taking the history of PDR into account. The first method is accurate but requires many packets to be sent, which costs too much energy. The second one is energy efficient, but fails to achieve good accuracy. Therefore in this paper we propose a novel estimation method which takes advantage of receiving signal strength. We show our proposed method is much more accurate than the second estimation method, while being simple and energy efficient at the same time

ii. Packet overhead

It takes to transmit data on a packet-switched network. Each packet requires extra bytes of format information that is stored in the packet header, which, combined with the assembly and disassembly of packets, reduces the overall transmission speed of the raw data.

iii. Routing cost

In packet switching networks, routing directs packet forwarding (the transit of logically addressed packets from their source toward their ultimate destination) through intermediate nodes. Intermediate nodes are typically network hardware devices such as routers, bridges, gateways, firewalls, or switches. General-purpose computers can also forward packets and perform routing, though they are not specialized hardware and may suffer from limited performance. The routing process usually directs forwarding on the basis of routing tables which maintain a record of the routes to various network destinations. Thus, constructing routing tables, which are held in the router's memory, is very important for efficient routing. Most routing algorithms use only one network path at a time. Multipath routing techniques enable the use of multiple alternative paths. Our proposed method, reduces the routing cost successfully.

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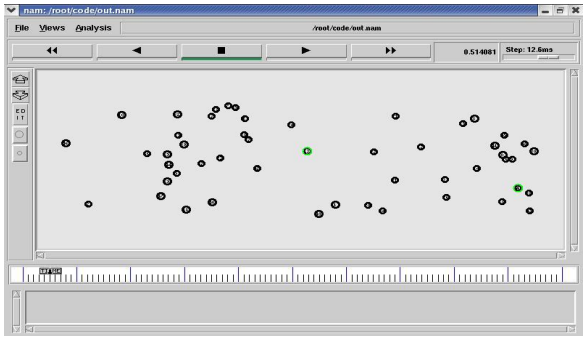
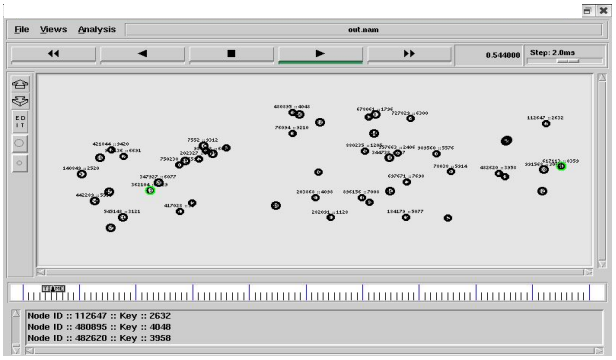
iv. Loss Ratio

Packet loss occurs when one or more packets of data travelling across a computer network fail to reach their destination. Packet loss is distinguished as one of the three main error types encountered in digital communications; the other two being bit error and spurious packets caused due to noise. It also reduces the packet loss ratio.

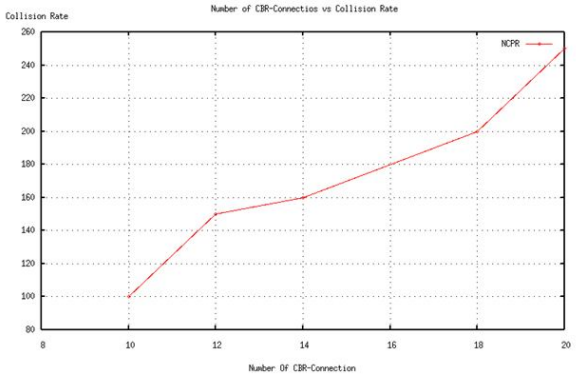
III. RESULTS



a) Initialize the Node list



b) Initialize the Nodes in MANET



c) Collision rate with varied number of CBR

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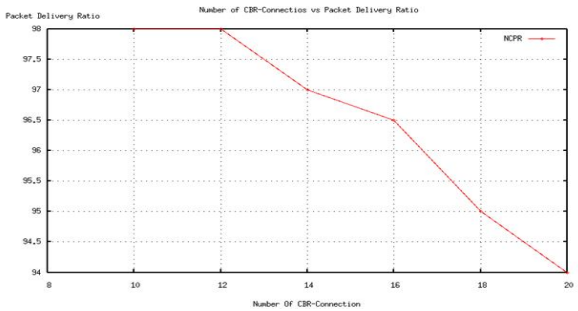

d) Packet delivery ratio with varied number

IV. CONCLUSION AND FUTURE WORK

In this paper, proposed a Probabilistic rebroadcast protocol based on neighbor coverage is implemented to reduce the routing overhead in MANETs. NCPR is applied to dynamically calculate rebroadcast delay and which is used to determine the forwarding order and more effectively exploit the neighbor coverage knowledge. Simulation results show that the NCPR protocol generates less rebroadcast traffic than the flooding.

Future work relates to the necessity of building a route in on demand manner in geographic routing is taken into account, then introduces the concept of loop-freeness, convergence and consistence to investigate the compatibility between routing metric, greedy routing and packet forwarding scheme. A forwarding strategy used to forward the packets. Hybrid Location-based Forward Routing (HLFR) algorithms will be implemented .In the HLFR algorithm the forwarding will start as greedy forwarding method.

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