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INCREASE THE RELIABILITY AND ROBUST NESS USING HIGHLY CONNECTIVITY MOBILE NODES

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ABSTRACT:

In MANET protocols the identification and maintenance of a single routing path or multi routing path between source node to destination node. Greedy Perimeter Stateless Routing is uses greedy forwarding directions to take away of routes neighbors in the Mantes. Mantes are existing for limited period of time based on demands. GPSR measures best state than shortest path. We propose Position-based opportunistic petal routing protocol (OPR) which takes the advantage of stateless property of Geographical routing and broadcast nature of wireless medium. In the case of Communication hole a virtual destination based void handling (VDVH) scheme is further proposed to work together with OPR. When a data packet is sent out from the source node, some of the neighbor nodes will forward the packet if it is not forwarded by the best forwarder in a particular period of time. Compare to the existing the proposed routing gives the best results.

INDEX TERMS: Geographical routing, Opportunistic Forwarding, Petal Routing, node mobility, Reliable Data Delivery, Void Handling, Update and Clear Operations implementation, Secured Routing, through put, Packet drop, and Packet Delivery ratio.

I.INTRODUCTION

Mobile ad-hoc network is a collection of wireless mobile nodes which forms a temporary network without using any network infrastructure and multi-hop. Due to node mobility in traditional topology-based manet routing protocols, Position-based opportunistic routing protocols are achieved , The dynamic Topology and the unpredictable wireless environment are great challenges for routing the data over MANET's. Since the network is highly dynamic. Maintaining a route is difficult in fatly changing network topology. If the path breaks data packets will get lost and discovery procedures will be time consuming. Generally Ad hoc routing protocols make forwarding directions based

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on geographical position of a packets destination. Rather than Destination nodes position, each node have to know only its own position and the position of its neighbors to forward the packets. When the network is highly dynamic Position-based opportunistic petal routing is used.

In Position based routing a sender can know the present position of the destination. In Mobile ad-hoc networks geographical routing allows stateless routing. A Geographical routing protocol uses the location information of mobile nodes it has high scalability. The Virtual destination based void handling scheme uses the advantage of greedy forwarding and opportunistic routing.

The main contributions of this paper can be summarizes as follows:

- ✓ Proposed a position based opportunistic petal routing protocol.
- ✓ Proposed a virtual destination based void handling scheme to improve the performance of POPR in case of communication voids.
- ✓ Finally, the performance of POPR has been evaluated through extensive simulations and it has been proved simulations and it has been proved that POPR achieves excellent performance in the face of high node mobility.

In existing routing protocols whenever we establish the new nodes it takes more time for prediction. These prediction nodes are not efficient with position based opportunistic routing. A main feature of a MANET is its self organizing ability over a network that is assumed by temparary linking each node with other nodes within wireless coverage. A geographical routing protocol uses the location information of mobile nodes. Without complex modification to MAC protocol, a position based opportunistic petal routing is achieved. IEEE802.11 provides collision avoidance. Communication environment is handled by Virtual Destination-based Void Handling (VDVH) Scheme.

II.RELATED WORK

Opportunistic routing belongs to a general class of wireless algorithms that ex- ploit multi-user diversity. These techniques use receptions at multiple nodes to increase wireless throughput. They either optimize the choice of forwarder from those nodes that received a transmission, or combine the bits received at different nodes to correct for wireless errors, or allow all nodes that overheard a transmission to simultaneously forward the signal acting as a multi-antenna system. Our work builds on this foundation but adopts a fundamentally different approach; it combines random network coding with opportunistic routing to address

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its current limitations. The resulting protocol is practical, allows spatial reuse, and supports both unicast and multicast traffic. Multicast traffic, linear codes achieve the maximum capacity bounds, and coding and decoding can be done in polynomial time. Additionally, Hoet algorithm, show that the above is true even when the routers pick random coefficients. Researchers have extended the above results to a variety of areas including content distribution, secrecy, and distributed storage.

MANETs are subject of intensive research and many works have been devoted to research their properties and operation. Some of the principal works that have explicitly addressed MANET reliability, or are in close relation to this discussion, are mentioned below. The list is not intended to be exhaustive, but representative of the related work previously done. A possibility that have been explored by various authors is on the selection of the longest- lived links to create stable paths. These works are based on the observation that most randomly moving nodes are likely to drift apart from one another over time , so that their main assumption is that a link between two nodes that had survived for a significant long time would be unlikely to change any time soon and so, the link could be classified as stable. In fact, even in static networks wireless links may fail . In the Associativity Based Routing (ABR) , a link lifetime is measured by counting the number of beacons received from neighboring nodes and the links associated with the highest beacon counts are preferred. In the Route Lifetime Assessment Based Routing (RABR), the average change in received signal strength is calculated and used to predict the time when a link would fail . A similar approach is used to define link affinity and path stability metrics from the received signal strength . In conventional opportunistic forwarding, to have a packet received by multiple candidates, either IP broadcast or an integration of routing and MAC protocol is adopted. The former is susceptible to MAC collision because of the lack of collision avoidance support for broadcast packet in current 802.11, while the latter requires complex coordination and is not easy to be implemented. In POR, we use similar scheme as the MAC multicast mode described in. The packet is transmitted as unicast (the best forwarder which makes the largest positive progress toward the destination is set as the next hop) in IP layer and multiple reception is achieved in interception.

As the data packets are transmitted in a multicast like form, each of them is identified with a unique tuple (src_ ip, seq_no) where src_ ip is the IP address of the source node and seq_no is the corresponding sequence number. Every node maintains a monotonically increasing

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sequence number, and an ID_Cache to record the ID (src_ip, seq_no) of the packets that have been recently received. If a packet with the same ID is received again, it will be discarded. The basic routing scenario of POR can be simply illustrated in Fig. 1. In normal situation without link break, the packet is forwarded by the next hop node (e.g., nodes A, D) and the forwarding candidates (e.g., nodes B, C; nodes D, E) will be suppressed (i.e., the same packet in the Packet List will be dropped) by the next hop node's transmission. In case node A fails to deliver the packet (e.g., node A has moved out and cannot receive the packet), node B, the forwarding candidate with the highest priority, will relay the packet and suppress the lower priority candidate's forwarding (e.g., node C) as well as node S. (From Fig 3.4)

Next some protocols we are going to introduce as a priority based route selection. Priority based route selection. Priority based route selection everything possible based on optimized link state routing protocol . Once select the optimized route remaining next priority routes maintain as backup routes. Any failures are occur in optimized route select next optimized routes for data transmission It is impractical under process of selection routes. Lastly this protocol also generates less measurement data transmission results.

The proposed method is based on topology formation, position-based opportunistic routing, Operation of OPR when next forwarder fails to receive the packets. In the Position based opportunistic routing, geographical routing and opportunistic forwarding is achieved. The nodes will know their own location and the position of its neighbors. When a source node wants to send a packet, it finds the location of the destination node first.

$$K \int_{12}^{24} Kc$$

The operation of OPR is achieved when the link failure happens in the simulation. In the case of communication voids, there is need of voidhandling mechanism in network nodes that are created. The area of nodes that cannot be routed through is called void. The QOS parameters such as Throughput, Packet Drop, Packet Delivery Ratio are achieved.

3. PROBLEM STATEMENT

Previously in MANET introduces the position based opportunistic routing for reliable data delivery. In data transmission stage whenever energy levels are not sufficient it may chance to get the link

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failures. Whenever link failures are present, failures information forwards to all neighbor nodes. Exchanges message overhead problems are available. Using best forwarder techniques also it not possible to gets the accurate results. Here more amount of energy levels utilization in casting of messages in link failures. Casting environment is not gives the 100% packet delivery ratio results in destination. These are not reliable and synchronization result.

Overcome the above routing problems we introduce Opportunistic pedal routing with void handling to maintain the properties of route like Route Erasure and Height of the Route.

4. Proposed Method: 4.1 Position-Based Opportunistic Routing:

Opportunistic routing (OR) takes advantages of the spatial diversity and broadcast nature of wireless networks to combat the time-varying links by involving multiple neighboring nodes (forwarding candidates) for each packet relay. Firstly, we study geographic opportunistic routing (GOR), a variant of OR which makes use of nodes' location information. We identify and prove three important properties of GOR. The first one is on prioritizing the forwarding candidates according to their geographic advancements to the destination. The second one is on choosing the forwarding candidates based on their advancements and link qualities in order to maximize the expected packet advancement (EPA) with different number of forwarding candidates.

4.2 Selection and Prioritization of Forwarding Candidates:

One of the key problems in POR is the selection and prioritization of forwarding candidates. Only the nodes located in the forwarding area would get the chance to be backup nodes. The forwarding area is determined by the sender and the next hop node. A node located in the forwarding area satisfies the following two conditions: 1) it makes positive progress toward the destination and

2) its distance to the next hop node should not exceed half of the transmission range of a wireless node (i.e., R/2)

Algorithm 1:

Candidate Selection

ListN : Neighbor List

ListC : Candidate List initialized as an empty list

ND : Destination Node

base : Distance between current node and ND

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if find(ListN,ND)

then

next_hop<-ND

return

end if

for i<- 0 to length(ListN) do

ListN[i]. dist<- dist (ListN[i], ND)

end for

ListN.sort() next hop<- ListN[0]

for i <-1 to length(List N) do

if dist(ListN[i],ND)>= base or length(List C)=N

then

break

else if

dist(listN[i], listN[0]) < R/2

then ListC.add(ListN[i])

end if

End for

4.3 Petal Routing:

When a source transmits a packet it encapsulates the payload with petal headers. We define a petal packet, called petalgram.

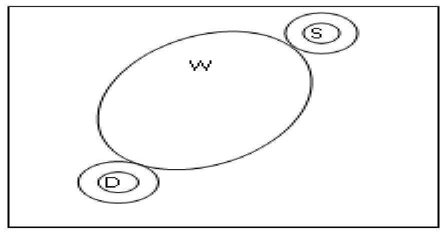

Fig:4.1 Visualization of pedal

ID	Sloc	Dloc	Tloc	W	Payload

The headers in a petal gram are as follows. Packet ID (ID): a number that uniquely identifies a packet. Source Location (Sloc): co-ordinates of the source. Destination Location (Dloc): co-ordinates of the destination.

Algorithm 2:

Schedule or drop packet

Obtain current node location as Ploc

if Ploc = Dloc then Destination has received packet.

exit

else if

Ploc is inside petal

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else

This packet was already transmitted by this node so drop packet.

exit

end if

end if

4.4 **Virtual Destination Based Void Handling Mechanism:**

In order to enhance the robustness of POR in the network where nodes are not uniformly distributed and large holes may exist, a complementary void handling mechanism based on virtual destination is proposed.

4.4.1 Trigger Node :

The first question is at which node should packet forwarding switch from greedy mode to void handling mode. In many existing geographic routing protocols, the mode change happens at the void node, e.g., Node B in Fig. 3.4.1 Then, Path 1 (A-B-E----) and/or Path 2 (A-B-C-D----) (in some cases, only Path 1 is available if Node C is outside Node B's transmission range) can be used to route around the communication hole. From Fig. 3.4.1, it is obvious that Path 3 (A-C-D----) is better than Path 2. If the mode switch is done at Node A, Path 3 will be tried instead of Path 2 while Path 1 still gets the chance to be used. A message called void warning, which is actually the data packet returned from Node B to Node A with some flag set in the packet header, is introduced to trigger the void handling mode. As soon as the void warning is received, Node A (referred to as trigger node) will switch the packet delivery from greedy mode to void handling mode and rechoose better next hops to forward the packet. Of course, if the void node happens to be the source node, packet forwarding mode will be set as void handling at that node without other choice (i.e., in this case, the source node is the trigger node).

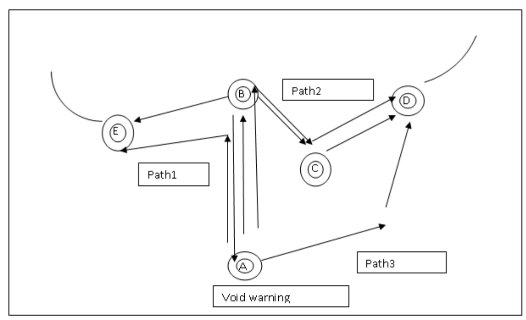

Fig: 4.4.Paths around the void

4.4.2 Virtual Destination:

To handle communication voids, almost all existing mechanisms try to find a route around. During the void handling process, the advantage of greedy forwarding cannot be achieved as the path that is used to go around the hole is usually not optimal (e.g.,

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with more hops compared to the possible optimal path). More importantly, the robustness of multicast-style routing cannot be exploited. In order to enable opportunistic forwarding in void handling, which means even in dealing with voids, we can still transmit the packet in an opportunistic routing like fashion, virtual destination is introduced, as the temporary target that the packets are forwarded to.

4.5. Operation of OPR:

Some of the nodes will be selected as forwarding candidates, only the nodes in the forwarding area will be the backup nodes. The sender and the next hop node select the area to be forwarded

4.5.1. Operation of OPR after link failure:

Suppose if a node fails to deliver a packet the nearby nodes in the forwarding candidate which has the highest priority will send the packet forward and the lower priority candidates that is forwarding. If a packet is pulled back from the Mac layer it will not be routed again.

5. Geographical Routing:

For routing, the geographical adhoc networks use position information. Position-based routing is used to handle networks that have many nodes. It uses location information to forward data packets, in hop by hop manner. This protocol tracks the mobile node locations. It has high scalability. The source node should know the location of the destination node, before routing a packet using a geographic routing.

5.1. GREEDY PERIMETER STATELESS ROUTING:

GPSR is a routing protocol used for wireless network to find the positions of routers and a packet's destination for packet forwarding directions. In GPSR, Geographic routing is a location based routing protocol for wireless network. The data generates a packet that has the co-ordinates of the destination node.

5.2. Operation of OPPORTUNISTIC FORWARDING

A method by which the data is relied to its neighbor-based on network information. The neighboring nodes receives the packet successfully respond with CTS packets that has the signal to noise ratio of the RTS. Based on the routing layer, the source node chooses the forwarder. The candidate forwarding nodes will send the CTS frames continuously by causing collisions. In the link layer, the path delivery is an improvement in the protocol so that the forwarders respond in a priority order. The neighbor which is away from the sender is

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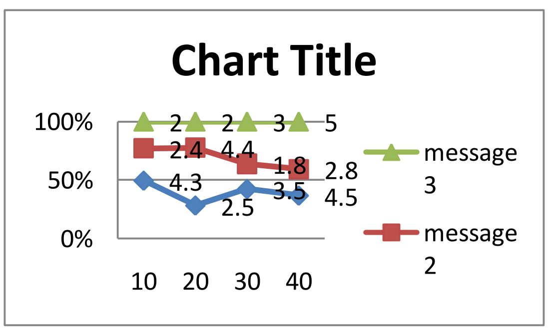
choosen as the next hop, in the operation of greedy forwarding.

5.3. MAC MODIFICATION

Due to collisions, packet loss will dominate the performance of multicast-like routing protocols. Some modification has been made in the packet transmission. The packet is sent through unicast in the network layer to the best forwarder that is selected by greedy forwarding as the next hop.

5.4. Throughput

Over a communication channel, the average rate of successful message delivery is the throughput.



5.5. Packet Drop & Delivery Ratio

The total number of packets dropped during the transmission is said to be packet drop. As the number of node increases the number of packet drop will also increase. The ratio of the number of data packets received at the destinations to the number of the data packets sent by the source is the packet delivery ratio.

5.6. Clear and Update operations

Previous link failures or route failures erase with clear operation. All unnecessary links are removed here, and only show the necessary links of content distribution. New nodes position update in GPS, remove the exiting node location information. All nodes updated location information periodically monitored by OPR protocol. Update nodes are gives the good data transmission and destination users are gets the reliable results.

6. Experimental results:

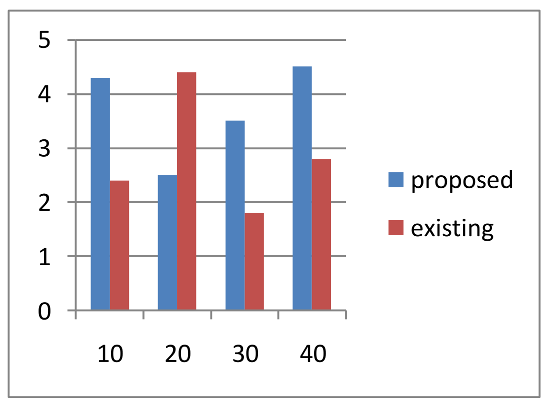


Fig 5 . Idle related performance graph

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This graph explains about the idle time in choosing forwarder nodes. Multi routing takes more amount of time for choosing best forwarder node compare to OPR. That's why OPR is best performance protocol in protocol in position update. Position updates operation is gives the best synchronization results in data transmission.

7. CONCLUSION:

IN large scale networks observe the performance in highly dynamic mobile adhoc networks environment. Already existing topology based routing protocols have node mobility. This issue is solved by an efficient position based opportunistic petal routing protocol which takes the stateless property of geographic routing.If communication hole is there it is avoided by Virtual Destination Based Void Handling. Here vdvh is needed since there is no void between the nodes that is created. The problem in this approach is secured or it has the trust value or not. In future work, the nodes which have the higher trust value is considered as the best forwarder. These forwarders are gives the best performance and reliable solutions in data transmission.

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