Indian J.Sci.Res. 17(2): 353-357, 2018

ISSN: 0976-2876 (Print)
ISSN: 2250-0138(Online)

A NOVEL TECHNIQUE BASED ON DYNAMIC LOCATION AND REMOTE SENSING PROTOCOLS FOR MANET

[1]Shakeela Begum Syed, [2]Nikhitha Thakur
[1,2] Department of Computer Science, Gitanjali Degree College for Women, Hanamkonda

Abstract-A Mobile Ad hoc Network (MANET) is an autonomous system of mobile stations connected by wireless link to form a network. It does not rely on predefined infrastructure to keep the network connected therefore it is also known as infrastructure less network. A designed protocol must provide scalable routing with better security. In this paper, we proposes the location based protocols of Dynamic Remote Routing (DFR) and Dynamic Location Routing (DLR) schemes, considering location information and distance between the nodes as the routing metric. DLR uses the anchored methods that square measure discovered and managed by sources, using one among two low overhead protocols: Friend Aided Path Discovery and Geographical Map-based Path Discovery. Performance of these protocols will be compared with God domain protocol of Ad hoc on demand Distance Vector Routing (AODV) protocol by using simulation software NS2.

***keywords*:**MANET, Location-based routing, Adhocon Demand Distance Vector Routing, scalable routing, Path discovery, routing overhead.

I. Introduction

Mobile circumstantial networks include wireless hosts that communicate with one another within the absence of a hard and fast infrastructure. They are utilized in disaster relief, conference and parcel environments, and received important attention in recent years [1,2,3].Many existing routing protocols (DSDV, OLSR, DSR, AODV, TORA) projected among the MANETsocial unit of IETF, are designed to scale in networks of a couple of hundred nodes. They consider state regarding all links within the network or links on a route between a supply and a destination. This might lead to poor scaling properties in larger mobile circumstantial networks. In additional recently, there has been a growing specialize in a category of routing algorithms that bank for the most part or fully, on location information.[2] This idea is to use the situationsmanagement messages, packet delay, to create simplified forwarding selections (GPSR).

A.Issues

LAR is an on-demand routing protocol wherever location data is employed to reduce the search house for a desired route. The source uses the last far-famed destination location so as to estimate the zone during which the destination is predicted to be found. [7] This is used to determine a request zone, as a set of nodes that should forward route requests. GPSR use solely neighbor location data for forwarding knowledge packet to a neighbor nearer to the physical location of the destination. This native optimum alternative repeats at every intermediate node till the destination is reached.[6]AODV may be a reactive routing protocol, it minimizes the amount of broadcasts by making routes primarily based on demand.[4] Once any supply node desires to send a packet to a destination, it broadcasts a route request (RREQ) packet. The neighboring nodes in flip broadcast the packet to their neighbors and the method continues till the packet reaches the destination. It will increase the overhead as a result of the exaggerated quantity of management messages.

B. Our Proposed Approach

We proposed a routing protocol, referred to as Dynamic routing, that aims at keeping the measurability edges of location-based routing, whereas addressing the two problems with irregular topology and node quality. we tend to conjointly found that our routing methodology will perform higher than the present AODV protocol we tend to compared it to. Dynamic routing uses the subsequent ingredients to realize its goal. First, it combines a location-based routing methodology with a link state-based mechanism. Second, it uses a special variety of restricted search mode (Restricted Native Search, RNS). These first two ingredients solve problems due to the inaccuracy of location information, in particular for control packets. Third, it introduces the concept of anchors, which are geographical points imagined by sources for routing to specific destinations. This helps efficiently route around connectivity holes.An overview of dynamic routing is given in Section 2, and a detailed description in Sections 3 and in the form of protocol walkthrough. We tend to evaluate the performance of our protocol by elaborated simulations and its measurability by analysis in Section 4.In all cases, dynamic routing is characterized by low routing overhead, even when we include the overhead of location management.

II. OverviewOf Dynamic Routing

A. Combination of Local and Far Routing

Dynamic routing uses a combination of location-based

[1]Corresponding Author

routing (Dynamic Far(Remote) Routing, DFR), used when the destination is far, and link state routing (Dynamic Local Routing, DLR), used when the destination is close. DLR uses location independent addresses only. DFR uses a combination of direct paths, perimeter mode, and anchors, as described in the rest of this section.

A direct path is an approximation of the straight line, and is built as follows: Assume that the source S knows an approximate location of the destination D.S sends the packet to a neighbor that brings the packet closer to the assumed location of D, and this is repeated by inter mediate nodes, as long as it works. Fig. 1a shows an example of where the direct path works well.

DLR: When a packet has arrived up to two hops away from the destination, a link state approach is used, which does not use location. In Fig. 1a, some intermediate node on the direct path finds that D is one or two hops away, using its DLR reach ability information (which is based on permanent addresses, not location).The combination of DLR and DFR is able to keep the scalability benefits of location-based routing, while avoiding problems due to mobility. However, combining DLR and DRR in one protocol poses a number of design challenges (in particular, avoiding loops), which we solved by using the mechanisms described in Section 3.

Perimeter Mode: Fig. 1b shows a case where the direct path does not work well: The packet may be "stuck" at a node that does not have a neighbor closer to the destination than self. Here, DFR uses perimeter mode to circumvent the topology hole, similar to GPSR [3]. Perimeter mode may give very long suboptimal paths. Furthermore, it can cause frequent routing loops in mobile ad hoc networks. Thus, we restrict the use of perimeter mode to discovery phases, when a better mode is not available to the source.

B. Anchored Paths in DFR

In order to avoid perimeter mode, we introduce the conceptof anchors, which are imaginary locations used to assist inrouting. In Fig. 1c, source S uses three anchors to route thepacket to D[5]. The anchors are geographical locations, notnodes. The list of anchors is written by the source into the packet header, similar to IP loose source routing information. The packet is sent by intermediate nodes in the direction ofthe next anchor in the list until it reaches a node close to an anchor, at which point the nextanchor becomes the following in list.

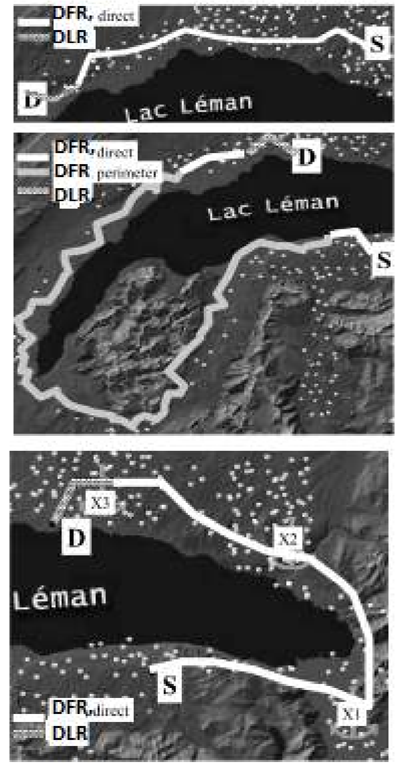

Fig. 1 (a) Packet forwarding from S to D with DFR and DLR along a direct path, no anchors . (b) Direct path does not work, perimeter mode is used instead.Fig.1(c) Direct path does not work, anchors X1 to X3 are used, thus avoiding perimeter mode

The location of the final destination takes the role of the last anchor.DLR is used when the packet comes close to the final destination, as previously shown. Second, even when perimeter and anchored paths use similar directions, perimeter modepaths tend to be more contorted and use more hops. The source decides that anchors areneeded if the packet path is significantly longer thanestimated from the distribution of the number of hops along the greedy path.

C.Computing Anchors

Anchored paths, however, come at the price of computing good anchors. We propose two methods. They are alwaysimplemented at sources:

- Friend Aided Path Discovery (FAPD, Section 3.1)assumes that some nodes (FAPD responders) are able to provide assistance to others, typically because they have a stable view of the network density.[4] FAPD responders help find anchors, but are not used in the data path.
- Geographical Map-based Path Discovery (GMPD,Section 3.2) assumes that network density maps are available to a source node. This is for an ad hocnetwork where all nodes are individually mobile,

but the node density can still be predicted acommon assumption for car networks.[3] We find thatGMPD performs better, but requires the overhead ofmap distribution; methods for distribution of density maps are left outside the scope of this paper.

D. Restricted Native Search

We tend to account for things wherever the accuracy of location management is low and DLR alone is not comfortable to deal with it. Our novel methodology, referred to as Restricted Native Search (RNS), sends four to six packet duplicates within the region wherever the destination is anticipated to be, therefore increasing the likelihood of reaching the destination. RNS recovers from location inaccuracies when the destination is within several transmission ranges from the node that starts RNS. In massive networks, causing duplicates invariably has significantly less overhead than flooding. RNS is employed for two kinds of discoveries: 1) search a restricted space for a given node or for a node sort (FAPD respondent, (Section 3.1.2) and 2) establish long distance relations.

E. Assumptions on Addressing and Location Services

Dynamic routing assumes that each node has permanent address or End-system Unique Identifier (EUI) and a temporary, location information called Location Dependent Address (LDA). The LDA is a triplet of geographic coordinates (longitude, latitude, altitude) obtained, for example, by means of the Global Positioning System (GPS)can be used. We assume that there exists a location management that enables nodes in the network to determine approximate locations of other nodes. First, a location tracking algorithm is assumed to exist between nodes when they have successfully established communication; this allows communicating nodes to continuously update their correspondent LDAs.[4] Second, allocation discovery service is used at the source to obtain a probable location of the destination D (LDAd) that S is not tracking by the previous method. In Section 4, we present the location management scheme that we used in simulations to evaluate the performance of dynamic routing.

IIIProtocol Walkthrough:Anchored Path Discovery

Anchored path discovery is triggered by a source node when it estimates that a non anchored path does not perform well or the current anchored path becomes stale. There are two methods for anchored path discovery: Friend Assisted Path Discovery (FAPD) and Geographic Map-based Path Discovery (GMPD).

A. Friend Aided Path Discovery (FAPD)

FAPD uses nodes, called FAPD responders, which provide assistance to other nodes to discover anchored paths. We assume that some percentages of nodes in the network are configured to act as FAPD responders.[]8 FAPD responders maintain “friendship” connections to a number of other FAPD responders in the network. When a responder receives from some source node a request to assist in anchored path discovery, and it does not know a path to the destination, it contacts its friend FAPD responders. Several FAPD responders can participate in an anchored path discovery. We present the main FAPD operations invoked in typical phases at source and FAPD responders.[7]

B. Geographical Map Based Path Discovery

- Source S determines from its own location LDAs the town area (ST) in which S is situated (or, the nearest town to LDAs if it is not in the town area). In addition, since S knows the location of destination D (LDAd), it can determine from the LDAd the town area DT, where D is situated (or, the nearest town toLDAd if it is not in the town area).
- Then, S accesses the network map in order to find the anchored path from S to D.Wecallthisoperation a map lookup. An anchored path is the list of the geographical points: The points correspond tocenters of the towns that the packet has to visit fromST in order to reach DT.[5] One possible realization ofthe map lookup operation, which is used in our simulation, is to find a list of townsthat are on the shortest path from ST to DT in thegraph of towns; the length of a path can be giveneither as the number of towns between ST and DT,or the length of the topological (Euclidean) shortestpath connecting ST and DT in a graph of towns.

IV. Simulation Results And Performance Comparison

This section presents a comparative analysis of the performance metrics generated with the employment of the use of Network Simulator 2.34. Performance metrics that have been proposed for the performance evaluation of an ad-hoc network protocol. The following metrics are applied to comparing the protocol performance. Some of thesemetrics are suggested by the MANET working group for routing protocol evaluation.

Table 1: Simulation parameters

Simulation Parameters	
Tested Protocol	DFR,DLR
Propagation Model	Drop Tail
Type of Antenna	Omni directional
Power Threshold	-95dBm

Time	100seconds
Area (m x m)	500*500
Number of Nodes	50
Number of Packets	30
Data rate	11 Mbps

A. Performance Based on Packet Delivery Fraction Ratio (PDR):

The ratio between the number of data packets originated by the "application layer" CBR sources and the number of data packets received by the CBR sink at the final destination.[6]The packet delivery ratio between DLR and AODV protocols are shown in figure 2. It gives the packet delivery ratio of 48% than the AODV protocol.

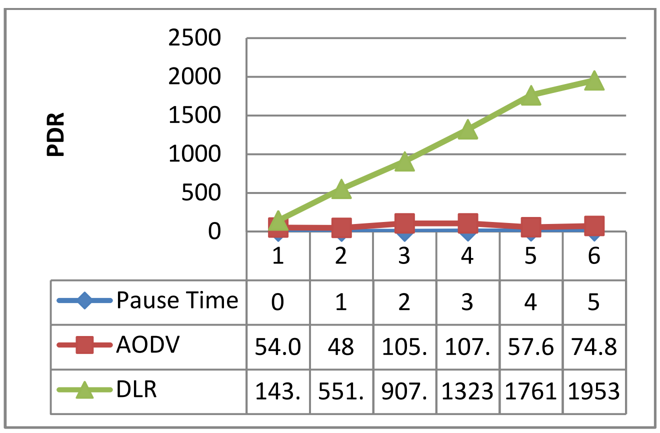

Fig2. Comparison result of PDR with DLR Vs AODV protocol.

B. Performance Based on Packet Routing Control Overhead (RCO):

Routing management overhead is that the total range of transmissions routing management packets transmittedthroughout the simulation. For packets sent over multiple hops, everytransmission of the packet (each hop) counts together transmission.[6] The performance of the RCO between DLR and AODV protocols are shown in figure3. In AODV, we have to the send the control messages to all the nodes even if it is not responding because of its flooding nature. So the overhead of the network get increased.Figure3 shows that the DRR protocol offersthe less management overhead of 30% than theAODV protocol. So, that the throughput ofthe network will get increased.

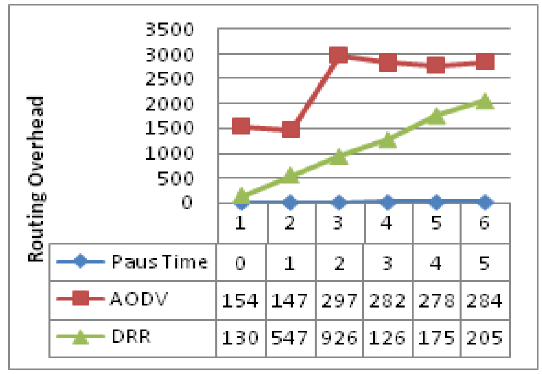

Fig 3.Comparison result of RCO with DRR Vs AODV protocol.

C.Performance Based on Packet Delay:

Delay is outlinedas however long it takes for a packet to travel across the network from supply to destination [6].The performance of the delay between DLR and AODV protocols are shown in figure4.It shows that DLR protocol offers 20% of delay less than the AODV.

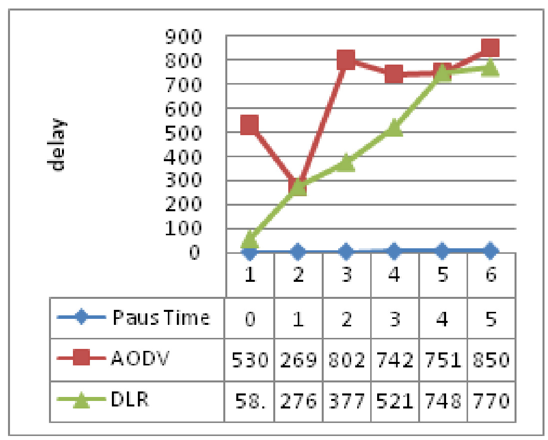

Fig4.Comparsion result of PDR with DLR Vs AODV protocol.

V.Conclusion

DynamicFar(Remote) and Local Routing aims to support location-based routingon irregular topologies with mobile nodes. It achieves itsgoal by combining a location-based routing method with alink state-based mechanism. Further, it introduces theconcept of anchors, which are geographical points imaginedby sources for routing to specific destinations, and proposeslow overhead methods for computing anchors. Last, aspecial form of restricted search mode, solves problems due to the inaccuracy oflocation information, in particular for control packets.The proposed protocol is simulated using the NS 2.32 simulator and the result shows that the proposed protocol outperforms the existing AODV protocol.

References

[1]. InduKashyap& R.K. Rathy,"An Efficient Location Based Multi-path Routing Protocol For MANET", International Journal Of Computer Applications (0975-8887), Vol 40, No 9-Feb 2012.

[2]. Neelesh Gupta and Roopam Gupta, "Estimated New Routing Scheme in MANETs", International Journal Of Computer Applications(0975-8887), Vol 17, No 5-Mar 2011.

[3]. RaedAlsaqour, MohamadShanudin, Mahamod Ismail, and MahaAbdelhaq (2011) "Analysis Of Mobility Parameters Effect On Position Information Inaccuracy Of Gpsr Position-Based Manet Routing Protocol", Journal of Theoretical and Applied Information Technology, Vol. 28 No.2, ISSN: 1992-8645.

[4]. Nivedita, N. and Radhika, D. (2011) "Variable Range Energy Efficient Location Aided Routing For Manet", Computer Science & Information Technology, Vol 2, Issue 1 pp. 321–33.

[5]. J. Li, J. Jannotti, D. De Couto, D. Karger, and R. Morris (2010) "A Scalable Location Service for Geographic Ad Hoc Routing", Proc.Mobicom '10.

[6]. MahboobehAbdoos, KarimFaez, and MasoudSabaei, "Position Based Routing protocol with More Reliability in MANET", World Academy of Science, Engineering and Technology 25 2009.

[7]. Charu Gandhi and Dr.ShuchitaUpadhyay, "Role Of Location Information To Achieve QOS Route Discovery In Ad hoc Networks-A Review", The Journal of Computer Science and Information Technology, ISSN 0973-4872, Vol. 6, No. 1, July-Dec. 2007 p.p. 63-68.

[8]. http//ica1www.epfl.ch/TNRouting,Simulation Source Code of Terminode Routing (in Glomosim) and Interactive Java applet, 2004.

[9]. LjubicaBlazevic, Jean-Yves Le Boudec, and Silvia Giordano, "A location Based routing Method For Mobile Adhoc Networks", IEEE Transactions on Mobile Computing, Vol 3, No 4, Oct-dec2004.

[10]. L. Blazevic, J.-Y. Le Boudec, and Silvia Giordano, "A Location Based Routing Method for Irregular Mobile Ad Hoc Networks, "Technical Report IC 200330, EPFL-DI-ICA, May 2003.

[11]. L. Blazevic, S. Giordano, and J.Y. Le Boudec, "Anchored Path Discovery in Terminode Routing," Proc. Second IFIP-TC6 Networking Conf. (Networking 2002), May 2002.

[12]. L. Blazevic, "Scalable Routing Protocols with Applications to Mobility," EPFL, PhD thesis no. 2517, 2002.