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RESEARCH ARTICLE

DISTRIBUTIVE ADAPTIVE POSITION UPDATE FOR GEOROUTING PROTOCOL IN MANET

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Abstract - A mobile ad hoc network (MANET) is a self-configuring infrastructureless network of mobile devices connected by wireless. Each device in a mobile adhoc network is free to move independently in any direction, and will therefore change its connections to other devices very frequently. In geographic routing, nodes need to maintain up-to-date positions of their immediate neighbours for making effective forwarding decisions. Continuous monitoring of beacon packets that contain the geographic location coordinates of the nodes is a popular method used by most geographic routing protocols to maintain neighbour positions. We estimate that periodic beaconing regardless of the node mobility and traffic patterns in the network is not attractive from both update cost and routing performance points of view along network delay and degradation in network lifetime.

Keywords –GPSR; LAR; DREAM; SOGR; SOHR; APU

I. INTRODUCTION

With the growing popularity of positioning devices (e.g., GPS) and other location based schemes, geographic routing protocols are becoming an attractive choice for use in mobile ad hoc networks. The underlying principle used in these protocols involves selecting the next routing hop from among a node's neighbors, which is closest to the destination geographically.

The forwarding strategy employed in the geographic routing protocols requires the following information: 1) the position of the final destination of the packet and 2) the position of a node's neighbors. The first one can be obtained by querying a location service such as the Grid Location System (GLS) or Quorum. To obtain the second, each node exchanges its own location information with its neighboring nodes. This allows each node to build a map of the nodes within its vicinity locally, often referred to as the local topology.

However, in situations where nodes are mobile or when nodes often switch off and on, the local topology rarely remains static. Hence, it is necessary for each node that broadcasts its updated location information to all of its neighbors. Those location update packets are usually referred to as beacons. Many Techniques are defined to solve these problems.

II. LITERARY SURVEY

A) GPRS

Greedy Perimeter Stateless Routing Protocol (GPSR, wireless datagram's novel routing protocol that make use of position of routers and a packet's destination o create forwarding decisions**.** Another impressing feature is Small Routing message complexity .Creates less number of routing messages as mobility increases is another attracting feature. In most geographic routing protocol beacons are broadcast periodically for maintaining an accurate neighbor list at each node.

Major advantages of GPSR is that it generates routing protocol traffic in a quantity independent of the length of the routes through the network, and therefore creates a constant as well as low volume of routing protocol messages as mobility increases, so doesn't suffer from decreased robustness in finding routes. GPSR represents another powerful lever for scaling routing.

Main problems with GPRS are position updation usually is a cost consuming process. Node energy and wireless bandwidth are consumed by each updation. Also increases the risk of packet collision at the medium access control (MAC) layer. Packet loss may happen due to packet collisions which in turn affects the routing performance due to decreased accuracy in determining the correct local topology (a lost beacon broadcast is not transmitted again). A lost data packet does get transmitted again(i.e. retransmission), but at the expense of increased end-to-end delay.

B). LAR

Location Aided Routing is a Reactive category of protocol. It uses shortest path metric. Allows multiple path. This protocol makes use of nodes's position information to reduce the flooding range. Here flooding of routing messages restricted to a request zone which covers the expected zone of the destination. Location Aided Routing (LAR) protocols limit the search for a new route to a smaller "request zone" of the ad hoc network using location information.

Location information can be used to reduce overhead here. These limits the search the for a route to the so-called requested zone. Fewer route discovery messages are another important advantage due to limiting search space. Medium communication overhead is another advantage as well as disadvantage. No need of hello message is another important feature .Reduces traffic overhead.

Main disadvantage of this protocol is that it experiences variable delay with variable node density. Uses only prediction scheme to compute the current position of neighbours and still employed periodic update of beacons. And so further optimizations are needed on basic LAR scheme to improve performance..Certain mechanisms must be there to evaluate efficiency of those optimizations.

C). DREAM

Distance Routing Effect Algorithm For Mobility. This is one of the first protocols that incorporated position information within a routing protocol. Each node maintains a position database that stores information about all other nodes in the network. Here it involves a distance effect that uses the fact that the greater the distance between two nodes, the slower they appear to be moving with respect to each other. Accordingly, location information in routing table can be updated as a function of the distances separating nodes without compromising the routing accuracy.

Main advantage of this approach is that the algorithm is fully distributed, provides loop-free paths, and is robust, since it supplies multiple routes**.** Minimize amount of bandwidth and transmission power needed to maintain routing tables without penalizing the accuracy of the routing tables. Lowers end-end delay, Also robust in providing multiple routes to a given destination.

Problems of this approach is that it is not scalable. Requires large number of beacon updates.

D). SOGR-SOHR

Self-adaptive On-demand Geographic Routing (SOGR) and SOGR With Hybrid Reactive Mechanism (SOGR-HR) Schemes. Both Protocols incorporate routing parameter adaptations where each node can determine and adjust it's protocol parameter values independently as per node mobility, node distribution and data traffic conditions. In both schemes, assumption is that all mobile nodes are aware of their position. This information is available either through GPS or other in-door localization techniques. Also destination position can be obtained by source by some location services. Routing performance is further improved by broadcast feature of wireless network and assume mobile nodes enable the promiscuous mode on their network interfaces.

Main advantages are reduces unnecessary control of overhead. Both protocol distribute topology information and search for routing path only when there is traffic. More efficient position distribution mechanisms are included to elliviate negative effects of outdated topology information. Updates local topology in time and adaptively. Optimization schemes are applied. So a forwarding node can collaborate to adapt the path to both topology change and traffic demand and thus improve transmission path opportunistically. High accuracy of destination position. And Robustness and can efficiently adapt to different scenarios and perform better than existing geographic routing protocols and conventional on-demand protocols under various environments, including different mobility and node densities. Both proposed routing protocols could achieve about 98 percent delivery ratios, avoid occurring unnecessary control overhead, and possess very low forwarding overhead and transmission delay in all test scenarios.

Main problem here is that cost factors are not considered much. The next-hop relay selection method used here is not much efficient. This can be improved by incorporating geographic information scheme and also channel selection mechanisms.

E). DB

Distance Based Beaconing is an important approach to adapt beacon interval. A node transmits a beacon when it has moved a distance d. Node removes an neighbor that is outdated if the node does not hear any beacon from the neighbor while the node has moved more than k times the distance d.

Adapt beacon interval to node mobility or traffic load. Therefore is adaptive to node mobility.ie faster moving nodes sends beacons more frequently and vice versa.

Problems arise if neighbor list of a slow node possess many outdated neighbors in it since the neighbor time out interval at the slow node is longer. Also when a fast moved node passes by a slow node, then corresponding slow node may not be detected by fast node due the infrequent beaconing of the slow node, thus reduces the perceived network connectivity.

F).APU

This is one of the important geographic routing strategy. Adaptive Position Update Strategy.This is mainly intended to solve the redundant Position Update Problem faced in geographical Routing.Based on mobility prediction APU enables nodes to update their position adaptively to the node mobility and traffic pattern.All the nodes are aware of their position and velocity. Apart from periodic beaconing APU adapts beacon update interval to that of node mobility dynamics and amount of data forwarded in the neighbouring nodes.

Main Property of this scheme is that it avoids drawbacks of periodic beaconing by adapting to system variations.Uses simple mobility prediction scheme and an on-demand learning strategy. Reduces power and bandwidth utilizations, scarse use of resources is another important feature.Reduces chances of link-layer collisions with the data packets and consequently reduces end-end delay and compatible with any geographic routing protocol.

APU adapt beacon update intervals to the mobility dynamics of the node and amount of date being forwarded in the neighborhood of nodes

Position updates are costly. Node energy and wireless bandwidth are consumed by each updation. Also increases the risk of packet collision at the medium access control layer.

III. COMPARISON

PROTOCOL	MESSAGE OVERHEAD	DELAY	COST	OTHERS
1)GPRS	LESS	MEDIUM	HIGH	PACKET COLLISION, PACKET LOSS
2)LAR	REDUCES OVERHEAD BY LIMITING SEARCH TO REQUESTED ZONE ONLY, REDUCE TRAFFIC, NO NEED OF HELLO MSG	VARIABLE DELAY WITH VARYING NODES	NOT MUCH	USES ONLY PREDICTION SCHEME

3)DREAM	LESS	LESS	-------------	NOT SCALABLE, NEED MANY BEACON UPDATES
4)SOGR-SOHR	REDUCES UNNECESSARY CONTROL OVERHEAD	LESS TRANSMISSION DELAY	NO COST CONSIDERATION	NEXT-HOP RELAY SELECTION MECHANISM IS COMPLEX
5)DB	LESS	MEDIUM	MEDIUM	PRESENCE OF OUTDATED NEIGHBOURS
6)APU	LESS	VERY LESS	NO COST FACTOR CONSIDERED	LOAD BALANCING PROBLEMS

IV. CONCLUSION

Here I have compared many previously existing schemes and found APU as one among the better one. It still possess some problems. Main problem is that it has problem of load balancing. And also shows performance problems in TCP connections. So address such problems a new scheme was introduced. In geographic routing, nodes need to maintain up-to-date positions of their immediate neighbours for making effective forwarding decisions. Continuous monitoring of beacon packets that contain the geographic location coordinates of the nodes is a popular method used by most geographic routing protocols to maintain neighbour positions. We estimate that periodic beaconing regardless of the node mobility and traffic patterns in the network is not attractive from both update cost and routing performance points of view along network delay and degradation in network lifetime. We propose heuristics and provable optimal algorithms remain unknown. Here we build a discrete framework for analyzing this joint sink mobility, bandwidth, node density, data dissemination frequency ,routing, delay, and by utilizing Adaptive Position Update (APU) strategy for geographic routing as alternate process, which dynamically adjusts the frequency of position updates based on the mobility dynamics of the nodes and the forwarding patterns in the network. APU is based on two simple concepts: 1) nodes whose movements are harder to predict update their positions more frequently (and vice versa), and (ii) nodes closer to forwarding paths update their positions more frequently (and vice versa). Greedy Perimeter Stateless Routing Protocol (GPSR), shows that APU can significantly reduce the update cost and improve the routing performance in terms of packet delivery ratio and average end-to-end delay in comparison with periodic beaconing and other recently proposed updating schemes. The benefits of our framework are further confirmed by undertaking evaluations in realistic network scenarios, which concentrates on localization error, realistic radio propagation, and sparse network.

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