Review paper on Adaptive Position Update for efficient routing in mobile ad hoc networks

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***Abstract*— Mobile Ad hoc network is a collection of mobile nodes. In Mobile Ad hoc network, nodes can communicate with each other by forming an infrastructure less network. Data transfer from source to destination is performed by intermediate nodes through routing process. In geographic routing, nodes need to maintain up-to-date positions of their immediate neighbors for making effective forwarding decisions. Periodic broadcasting of beacon packets that contain the geographic location coordinates of the nodes is a popular method used by most geographic routing protocols to maintain neighbor positions. This paper is review on geographical routing in Mobile Ad hoc networks with the help of routing protocols and beacon update strategies.**

***Index Terms*— beacon, geographic routing, routing protocols.**

I. INTRODUCTION

Geographical routing is a routing principle which works on geographical position information. In this technique source sends message to geographic location of destination instead of using the network address. It requires that each node can determine its own location and that the source is aware of the location of the destination node. Beacon packets are used for the node updating. Node updating is done by periodically broadcasting beacon packets in the network.

In geographic routing, the forwarding decision at each node is based on the locations of node's one hop neighbors and destination. Different location sensing techniques are used to automatically locate the node. In Ad Hoc network nodes move dynamically so many techniques are used for dynamically adjusting the beacon broadcast to update a node. Adaptive position update techniques are used to get nodes current location and neighbor list is updated to obtain an efficient routing path.

II. LITRATURE REVIEW

In wireless network mobile nodes move randomly, so many localization schemes are introduced to know their positions. As popularity of mobile devices increased, many geographic routing protocols are proposed for routing the packets. Each node has to update their neighbor list for selecting the routing path. Periodic beacons are broadcasted to update the nodes neighbor information.

In geographic routing, forwarding nodes needs to maintain the locations of one hop neighbors and packet destination. J. Hightower and G. Borrirllo have discussed different location sensing technologies. They have developed a taxonomy[21] which is helpful for choosing a suitable location sensing technology according to the applications. They have given comparative information of different location systems which helps to choose a location system according to the applications.

In wireless mobile ad hoc network many routing protocols are used for significant routing of packets. Bard Karp and H. T. Kung presented a protocol called GPSR. GPSR[22] is Greedy Perimeter Stateless Routing protocol which gives scalability with increasing nodes in the network. GPSR beacon broadcasts MAC address with nodes IP and position. It consists of two methods namely Greedy forwarding and Perimeter forwarding. In Greedy forwarding nodes immediate neighbor is consider for the routing. If packet reaches the area where Greedy forwarding is impossible then packet forwarding is carried out by routing perimeter of the region. GPSR routes packet independent of the length of routes through the network, and therefore generates a constant, low volume of routing protocol messages as mobility increases.

Greedy forward routing is a memoryless and localized geographic routing algorithm. If all nodes have same transmission radii, the smallest transmission radius must be chosen to ensure the deliverability of packets. Peng-Jun Wan Chih-Wei Yi, Lixin Wang, Frances Yao and Xiaohua Jia provide asymptotic critical transmission radius[7] of dynamic wireless ad hoc networks. They provide tight a.a.s. bounds[7] for the critical transmission radius of wireless ad hoc networks in which nodes are represented by Poisson point process.

As mobile ad hoc network is a infrastructure less network, node mobility can cause frequent unpredictable topology changes. Different routing protocols have been proposed for efficient routing in mobile ad hoc network. Young-Bae Ko and Nitin H. Vaidya have proposed two Location Aided Routing protocols[19] for route discovery. As per these protocols search space is reduced for desired route. These protocols are used to reduce routing overhead as compared to other techniques or algorithms those do not consider the location information for routing. These protocols are helpful to increase routing performance and provide efficient routing.

In mobile ad hoc networks location information of mobile nodes is used for routing. In location based routing, routing is difficult when there are holes in the network topology and nodes are frequently disconnected to save battery. Ljubica Blazevic et

al. present terminode routing[13], which is a combination of location based routing and link state routing. It supports location based routing on irregular topologies with mobile nodes.

Xiaojing Xiang, Zehua Zhou and Xin Wang have proposed two self adaptive[3] on demand geographic routing protocols for Mobile Ad hoc Networks. First protocol uses node's one hop topology information for forwarding. The local topology is updated periodically according to network dynamics and traffic demands. Second protocol uses both geographic and topology based mechanism for more efficient routing. The two protocols are efficient and helps to reduce the packet delivery latency at high mobility.

Heissenbuttel et al. have shown that periodic beaconing technique is not efficient in Mobile ad hoc networks. As nodes are randomly moving there are slow moving nodes and fast moving nodes in the network. Periodic beaconing introduces number beacons, which may cause collision of packets and inconvenience in the routing. Author discussed some optimizations which will helps to vary beacon interval[10] according to the node mobility. According to the traffic speed based beaconing, distance based beaconing and reactive beaconing strategies are used to avoid the drawbacks of periodic beaconing.

In wireless ad hoc networks as nodes are mobile we need to track their positions, which can be done by a location management system. Goo Yeon Lee, Yong Lee, and Zygmunt J. Haas have proposed a hybrid location management scheme[10]. This scheme contains time based and location based schemes. In this scheme mobile users update their locations after crossing *n* cell boundaries and after time interval T completed. This scheme reduces unnecessary too many updates transmission which saves wireless bandwidth.

In geographic routing, on demand routing scheme is efficient to reduce the routing overhead in bandwidth restricted mobile ad hoc networks. But, routing control overhead increases exponentially with node density in a given network. Joo-Han Song et al. proposed LB-AODV protocol[15] without sacrificing the performance of on demand routing. Proposed Load Balancing technique helps to reduce end to end delay and routing overhead in a given geographic region.

Michele Zorzi and Ramesh R. Rao provide a geographical random forwarding technique based on geographical location of nodes and random selection of relaying node[17]. Energy conservation is important for communication in mobile ad hoc networks. They have described a collision avoidance protocol and discussed energy and analysis of latency performance using this protocol. The proposed protocol is efficient for low power networking.

Quanjun Chen, Salil Kanhere and Mahbub Hassan have proposed a position update technique i.e. adaptive position update technique[1]. Adaptive Position Update follows two rules: Mobility Prediction(MP)[1] and On-Demand Learning(ODL)[1]. Mobility Prediction rule is used for the beacon update process. In position estimate if predicted error is greater as compared to threshold then a beacon is broadcast. Thus beacon is generated dynamically using MP rule. As per On Demand Learning Rule a beacon is broadcast by the node when data is transmitted by the neighbor which is not in its list. Thus a neighbor list is updated after a new neighbor comes into vicinity of any node. APU technique is used for the efficient data forwarding process.

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