A Survey: Routing Protocols In Mobile Ad hoc Networks

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Abstract- Topology-Based routing protocols become not suitable for MANETs when the nodes are highly mobile because of the excessive overhead of maintaining up-to-date network topology information. Now a days geographic routing algorithms are extensively studied because availability of various positioning services for example the global positioning system (GPS). Geographic routing is a promising candidate for large-scale wireless ad hoc networks due to its simplicity and scalability. Since route management process is not required in geographic routing, it carries a less overhead compared to other routing schemes, like topology based routing protocols. In this research paper is aiming to analyse the performance of various geographic routing protocols in mobile ad hoc networks.

Keywords- MANETs, routing protocols.

I. INTRODUCTION

MANET is a group of wireless nodes that are randomly located and forms a temporary network without using centralized administration typically multiple hops are required To establish a data transmission between two nodes, because of limited transmission range of nodes. Routing protocols for MANETs can be categorize as topology-based protocols and position-based protocols. Nodes In topology based routing protocol collect network topology information for making routing decisions.

A. Reactive : These types of protocols route is created only when the source requests a route to a destination .The route is create through a route discovery procedure. In which route request packets (RRP) are flooded in whole network starting from the immediate neighbors of the source. Once a route or multiple routes are found for the destination, the route discovery process ends .A route maintenance procedure used to maintains the continuity of the route. Examples of reactive routing protocols are AODV, DSR etc.

B. Proactive : These types of routing protocols always maintain up-to date information on routes from each node to every other node it means that a source node to every possible neighboring node in the network. In order to keep the routing information up to date, as the routing information of each node is stored in routing table, route update packets are propagate throughout the network. All protocols have the common goal of reducing route maintenance overhead. examples are DSDV, OLSR, and FSR etc.
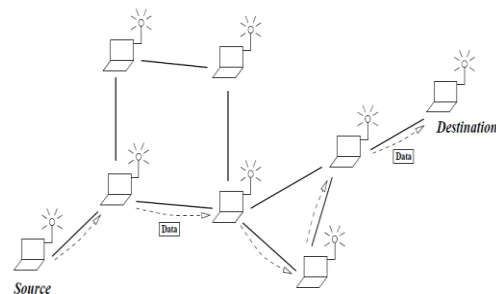

Figure 1.1: A mobile ad hoc network.

C. Hybrid : Hybrid protocols attempt to combine the advantage of proactive and reactive routing Protocols. zone routing protocol is one of the example of hybrid protocols. In position based routing protocols assume that the individual nodes are aware of the locations of all the nodes within the network .The best and easiest technique is the use of

the Global Positioning System (GPS) to determine exact coordinates of these nodes in any geographical location .then this location information is then utilized by the routing protocol to determine the routes. Examples are LAR, DREAM,GPSR, and LARDAR etc. The Location Aided Routing : It is a reactive unicast routing scheme. LAR take advantage of position information using any position service such as gps etc and this information is used to enhance the efficiency of the route discovery procedure by restrict the range of route request flooding. In route discovery phase, location information of source and destination is contained in route-request packets then this packet is broadcasted in the request zone where all node forwards these packets to neighboring nodes. Nodes which are outer side of the zone discard the message. As the route request packet arrive to the destination node, the destination replies with a route reply packet. Route request packet contains the current position of the destination node. nodes in the network forward the route request to their neighboring nodes, and this process goes on until route request arrive to the destination node.

II. MANETS CHARACTERISTICS

A) Distributed operation: The control of the network is distributed between the nodes.

B) Multi hop routing: when a node want to send information to other nodes which is not in transmission range of node then the packet can be forwarded via other intermediate nodes.

C) Autonomous terminal: In MANET each mobile node can be function as both a host and a router.

D) Dynamic topology: In mobile adhoc networks nodes are randomly move with different speeds so that the network topology may change randomly.

III. ADVANTAGES OF MANET

- MANETs are Self-configuring network.
- nodes are also act as routers.
- They are less expensive as compared to wired network.
- Improved Flexiblibility.
- mobile as hoc network is Robust

- The network can be set up at any place and time.

IV. MANETS CHALLENGES

1) Limited bandwidth

2) Dynamic topology

3) Routing Overhead

V. MANETS APPLICATIONS

Some of the typical applications include:

1) Military battlefield

2) Collaborative work

3) Personal area network and Bluetooth

VI. LITERATURE REVIEW

In this paper Gaurav Sachan et al have proposed that Mobile ad hoc networks are identified by multi-hop wireless links. One of the major issues in mobile ad-hoc networks is failures of link due to mobility of nodes. since nodes in Mobile ad hoc networks behave as routers for all ongoing packet communication and nodes have limited transmission ranges. So packet losses occurs as the communication links are broken. To increase in network lifespan. Energy balance is an significance issue in such networks. This paper explains basic concepts and functionalities of the energy constrained geographic routing based routing techniques and reviewed the work carried out in the areas of mobile ad-hoc networks. Geographic routing has been broadly regarded as efficient and scalable. In this paper Cong Liu and Jie Wu have proposed that Routing is the prime concern in mobile ad-hoc networks. A wireless environment is characterized by limited computational resources, small bandwidth and position based routing is attractive because it requires little communication and storage overhead. For improvement in performance and guarantee delivery ,in most position-based routing protocols, message is forward in greedy mode until the message is received at a node that has no neighbor closer to the destination, this is called a local minimum condition. They then redirected into face routing. In

face routing packet is move along the perimeter of the local minima or void. Atekeh Maghsoudlou et al have proposed that position based routing has become one of the most appropriate routing approach in mobile ad-hoc network usually due to its scalability. It is due to there is no need to maintain direct routes. The principle approach in position based routing is greedy forwarding. If the packet encounters a void node Greedy forwarding fails at this condition. In literature face routing and its variations have been proposed as recovery approach to handle voids.

VII. CONCLUSION

The paper introduces different categories of mobile ad-hoc routing protocols and reviewed several position based routing protocols. These position based routing protocols are differ from each other in a ways of finding and maintaining the routes from source to destination with aim of reducing control packet overhead increase throughput, minimize the power consumption and end-to end delay.

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