IJREAT International Journal of Research in Engineering & Advanced Technology, Volume 5, Issue 3, June - July, 2017
ISSN: 2320 – 8791 (Impact Factor: 2.317)
www.ijreat.org

Shortest Path For Mobile Traffic Optimization

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Abstract

Mobile traffic is a Network in which contains nodes that are dynamic, which means their positions are not fixed or they are can move. Since the positions are not fixed they do not have a permanent infrastructure. So the communication between the mobile nodes should be taken cares of very well for the efficient communication between the nodes. The main challenge that is being faced in the mobile traffic is the dynamicity of the nodes, because of which the positions are changing. The routing between the nodes in the mobile traffic should be based on the current status of the nodes. The routing protocols should adapt in such a way that optimum route between the source and destination is being obtained. The routing task in the mobile traffic has become very challenging due to the mobility of nodes. The conventional routing strategies for the wired networks cannot be adopted for these highly mobile networks. Geographic routing is one of the efficient routing strategies for routing. Geographic routing has greedy forwarding and recovery forwarding. In this paper the proposal is that among the paths found, the shortest path is being selected using the distance formula.

Keywords-*:* Mobile traffic, Geographic Routing, Greedy Forwarding, Recovery Forwarding.

1. INTRODUCTION

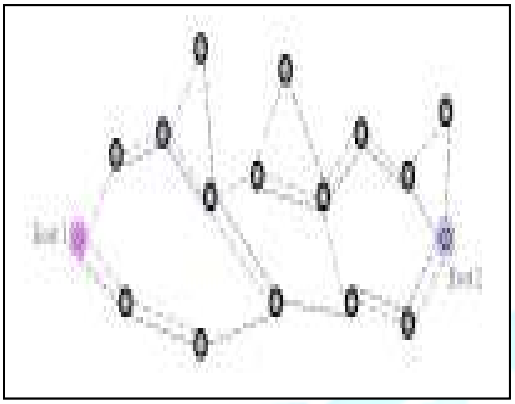
Mobile traffics can be described as self organizing networks which do not have a predefined infrastructure. The mobile traffics contains nodes which act as both router and hosts. The nodes communicate between each other using multi hop links. The nodes in the Mobile traffic self organize themselves such that the communications between the nodes happen in an efficient manner.

A number of routing protocols was proposed for efficient routing. The routing protocols were mainly categorized into two categories which are topology based routing and position based routing. Link information was used for topology based routing, that is path information is maintained and based on the links that exist in the network routes are established. The topology based routing is further classified into proactive, reactive and hybrid. Proactive protocols which are very much similar to the classical routing strategies constantly discover routes and maintain them in routing tables. High bandwidth usage was the main overhead that was incurred by this approach, which will affect the performance.

Position based also known as geographic routing [1, 2, 3] was introduced to overcome the limitations of
topology based protocols. The nodes physical location information was in geographic routing. Thus it was necessary to get the position information of the nodes using some kind of location service. The rest of this paper is organized as follows. Section 2 gives an idea of Geographic routing protocol. Section 3 give an idea about self adaptive on demand geographic routing. Related works are explained in section 4. Proposal for improvement is discussed in section 5 and a conclusion is made in section 6.

1. INTRODUCTION TO GEOGRAPHC ROUTING

Geographic routing is a routing principle that relies on geographic position information. It is mainly proposed for wireless networks and based on the idea that the source sends a message to the geographic location of the destination instead of using the network address. The idea of using position information for routing was first proposed in the 1980s in the area of packet radio networks and interconnection networks Geographic routing requires that each node can determine its own location and that the source is aware of the location of the destination. With this information a message can be routed to the destination without knowledge of the network topology or a prior route discovery.



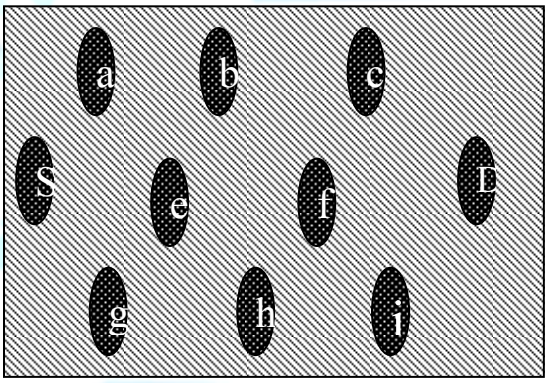
There are various approaches, such as single-path, multi-path and flooding-based strategies (see [3] for a survey). Most single-path strategies rely on two techniques: **greedy forwarding** and **face routing**. Greedy forwarding tries to bring the message closer to the destination in each step using only local information. Thus, each node forwards the message to the neighbor that is most suitable from a local point of view. The most suitable neighbor can be the one who minimizes the distance to the destination in each step (Greedy). Alternatively, one can consider another notion of progress, namely the projected distance on the source-destination-line (MFR, NFP), or the minimum angle between neighbor and destination (Compass Routing). Not all of these strategies are loop-free, i.e. a message can circulate among nodes in a certain constellation. It is known that the basic greedy strategy and MFR are loop free, while NFP and Compass Routing are not Greedy forwarding can lead into a dead end, where there is no neighbor closer to the destination. Then, face routing helps to recover from that situation and find a path to another node, where greedy forwarding can be resumed. A recovery strategy such as face routing is necessary to assure that a message can be delivered to the destination. The combination of greedy forwarding and face routing was first proposed in 1999 under the name GFG (Greedy-Face-Greedy).[5] It guarantees delivery in the so-called unit disk graph network model. Various variants, which were proposed later [6], also for non-unit disk graphs, are based on the principles of GFG

I.SCHEME FOR IMPROVEMENT

Several paths are found between the source and destination using greedy forwarding and recovery forwarding.. So among the several paths obtained, the best path need be found. In this proposal, choose the best path according to the distance., i.e, the shortest path using the distance formula,

$$d = \sqrt{(\Delta x)^2 + (\Delta y)^2} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}.$$

Where d is the distance, x1, x2, y1 and y2 are the coordinate positions of the source and destination



Let S and D be the source and destination, there are various paths from S to D. Some of the possible paths are S-a-b-c-d, S-e-f-D, S-g-h-i-D etc.

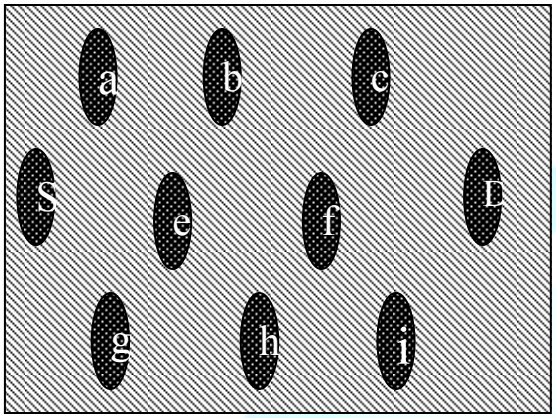
To find the shortest path the distance of each path is calculated. For example, the distance of path S-e-f-D can be calculated as first the distance of S to e is calculated, then e to f is calculated, and then f to D is calculated.

Then all these will be added to get the total distance of the path .

$$\text{Total distance} = \sum_{i=0}^{n} di$$

I. RESULTS AND DISCUSSION

The following network is created with the nodes.



The distances of the various paths available were calculated using the distance formula as described in the proposal and the distance was obtained using the distance formula. Then all the distances were compared and the shortest distance was taken as the path. Since the shortest path was found time delay was reduced and a significant increase in performance was obtained.

V. CONCLUSION

In the geographic routing path from source to destination is found. In this paper among the paths found, the shortest path is found using the distance formula which will be giving the best path among the available paths. Thus the delay for data transmission is being reduced.

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