Infrastructure Less Adoptive Data Transfer In Geographical Location Using Mobile Ad-Hoc Network

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Abstract

In mobile ad hoc networks that use the wireless ad hoc networks and infrastructure networks are the communication properties, protocols and data formats in a rising technology computing. There are many protocols used and the emerged ricochet protocol which used to proficiently retain the information at specific multi locations in multicast networks. To hold on the information around the location is kept as base and each mobile device passing that location will carry the information for a short duration. As point to this concern to conquer the problem for multi locations around the nodes transient strategy. The ricochet protocol, which follow the parallel delay-tolerant communication, that first hold the packets away from their location of origin and periodically returns them to the secure location. The self withstanding feature of this protocol is that which records the spatial trail that moves away from the origin and exploit the recorded trail to optimize the return path. The performance evaluation can be made more significant when the road map is less connected. Finally, the evaluation is made on the criteria of AODV protocol which return the information within certain time limits.

Keywords— *GPS Anchor Location, GPS, Geocasting.*

1. Introduction

Wireless ad hoc networks have developed to support applications, in which it is required/ desired to have wireless communications among a variety of devices without relying on any infrastructure or central administration. In ad hoc networks, wireless devices, simply called nodes, have limited broadcast range. Therefore, each node can directly connect with only those within its transmission range and requires other nodes to act as routers in order to communicate with out-of-range terminuses [1] [2] [3]. One of the important operations in wireless ad hoc networks is distribution, where a node disseminates a message to all other nodes in the network. This can be achieved through overflowing, in which every node transmits the message after receiving it for the first time. However, overflowing can impose a large number of redundant broadcasts, which can result in significant waste of constrained resources such as bandwidth and power. Mobile computing technology offers you a quick and easy way to increase efficiency, productivity and profitability while gaining better control of your operations. The power and data storage capacity of today's handheld PCs and Personal Digital Assistants (PDAs) has made low-cost mobile computing a practical reality [4] [5].

The reimbursement on asset is in months, not years, and performance improvements are

measured in tens of percent for an effective project. All nodes are capable of movement and can be connected animatedly in arbitrary manner. The errands for organizing and controlling the network are distributed among the stations themselves. The entire network is mobile, and the individual stations are allowed to move at will relative to each other. In this type of network, some pairs of terminals may not be able to connect directly to with each other and communicating of some messages is obligatory so that they are brought to their terminuses. The nodes of these networks also function as routers, which discover and maintain routes to other nodes in the networks. Ricochet protocol to efficiently retain data at a particular geographic location in a sparse network of extremely mobile nodes without using substructure networks. To retain data around certain physical site, each mobile device transitory that location will carry the data for a short while. Richochet protocol mainly used to automotive traffic trace and particular mobile vehicular networks gather direction-finding information.

The Geographic Routing Method (GEO) uses the triangular geographic terminus information in the geographic message shot straight for routing. Geographic routing is going to be implemented in the Internet Protocol (IP) Network layer and the Application layer in a manner similar to the way multicast direction-finding was first applied [6]. That is, a virtual network which uses physical addresses for routing will be the current IP internetwork. We would accomplish this by creating our own geographic address routers. These routers would use IP tunnels to transportation data packets through areas which do not support geographic routing.

2. Related Work

We reflect an ad hoc network as undirected graph G = (V, E) is a sub set of v', where V' is an head-to-head of some node v. In wireless ad hoc network the nodes are dispersed in a two-dimensional flat. Every node has a unique ID and each node consist of list of data about its neighbors. In one hop distribution, each node u can broadcast its position information in all reachable transmission regions [7]. In a wireless ad hoc network apply local topology data and broadcasting state data.

Vehicular Ad hoc Networks (VANET) is the subset of Mobile Ad Hoc Networks (MANETs). VANET is one of the swaying zones for the development of Brainy Transportation System (ITS) in order to deliver safety and comfort to the road users. VANET assists vehicle drivers to connect and to organize among themselves in order to avoid any critical situation through Vehicle to Vehicle communication e.g. road side accidents, traffic jams, speed control, free passage of spare vehicles and hidden obstacles etc. Besides safety applications VANET also provide comfort requests to the road users. For example, weather data, mobile e-commerce, internet access and other hypermedia applications [8] [9]. VANET belongs to wireless message networks area. VANET is the developing area of MANETs in which automobiles act as the mobile nodes within the network. The basic target of VANET is to upsurge safety of road users and comfort of customers.

VANET is the wireless network in which message takes place through wireless links equestrian on each node (vehicle). Each node inside VANET act as both, the contributor and router of the linkage as the nodes connects through other middle node that lies within their own broadcast range. VANET are self-organizing grid. It does not rely on any fixed linkage infrastructure. Although

some fixed nodes act as the edge units to simplify the vehicular networks for Serving physical data or a entry to internet etc. Higher node flexibility, speed and rapid shape drive are the main physiognomies of VANET. This also causes rapid changes in system topology. Since the challenges faced in a city location, a new location-based routing scheme called A-STAR. Related to GSR, A-STAR adopts the anchor-based routing approach with street attentiveness. That is, by the street map to compute the preparation of connections (anchors) over which a packet must pass to reach its terminus. But unlike GSR, A-STAR computes the anchor paths with traffic consciousness. "Road traffic" herein refers to vehicular traffic, counting cars, automobiles, and other roadway vehicles. It is experiential that in a urban area, some streets are wider and accommodate more vehicular circulation than others.

2.1 GPS Working Principle:

A Global Positioning System (GPS) tracking is a gadget that uses to decide the site of a vehicle, person or other asset which is attached and to record the position of the advantage at regular intervals. The recorder site data can be stored in internal memory or it may be transmitted to a mid site database via cellular (GPRS), radio or satellite modem. The GPS is radio direction-finding system. It's actually a group of 24 earth orbiting satellites. The US military first developed and implemented this satellite network as a military navigation system after that it opened to everyone.

The working principle behind GPS is the dimension of space (or "range") between the satellites and the receiver. The satellites tell us precisely where they are in their orbits by broad casting data the receiver uses to work out their positions. It works something like this: If we know our exact space from a satellite in space, we know we are wherever on the surface of a pretend orb with a radius equal to the distance to the satellite radius.

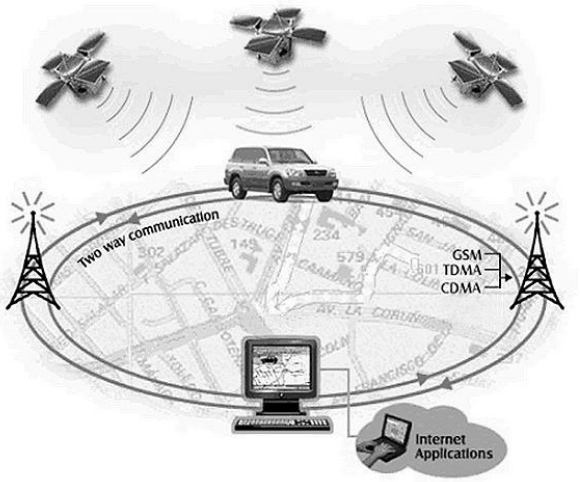

Figure 1. Vehicle communication system

If we know our exact space from two satellites, we know that we are located wherever on the line where the two spheres intersect. And, if we take a third and a fourth extent from two more satellites, we can find our location. The GPS receiver processes the satellite range capacity and produces its position.

3. Proposed Concept

This paper proposed the route based ricochet protocol to periodically make existing data at positive geographic locations in a highly mobile vehicular network. Richochet protocol to competently retain data at a particular geographic location in a light network of highly mobile nodes without using infrastructure networks. To remember information around certain objective position, each mobile device passing that location will carry the data for a short while. Richochet protocol mainly used to mechanical flow trace and particular mobile vehicular networks fold routing data. The below algorithm will clearly define our proposed route based method.

3.1 Algorithm

Physical addressing of packets within mobile ad hoc networks [5] enables unique applications, including hard real-time appointment simulation in military exercise systems, geographic knowledge and control purposes in training and emergency transportations, and commercial messaging applications as well. Which is widely used for Motorized traffic traces system, Richochet protocol can reduce communication overhead. Number transmission will be high Data wastage will be minimized and easy to find and update the carrier node.

Considering the challenges faced in a city location, a new position-based routing scheme called A-STAR [5] is proposed. Similar to GSR, A-STAR adopts the anchor-based routing approach with *street awareness.* The term "street awareness" is preferred over "spatial awareness" to describe more exactly the use of street map information in our routing scheme for anchor path division. That is, using the street map to compute the chain of junctions (anchors) through which a packet must pass to reach its destination. But unlike GSR, A-STAR computes the anchor paths with *traffic awareness.* "Traffic" herein refers to vehicular traffic, including cars, buses, and other roadway vehicles. It is observed that in a metropolitan area, some streets are wider and accommodate more vehicular traffic than others. These are the major streets, served by a regular fleet of city buses. Connectivity on such streets can be higher due to higher density of vehicular nodes and more stable due to regular presence of city buses. With this observation, weight can be assigned to each street based on the number of bus lines by which it is served, i.e. the more bus lines by which a street is served, the less weight it is assigned, and vice-versa. The street map in use by the vehicle is assumed to be loaded with bus route in order. An anchor path can thus be computed using AODV PROTOCOL (like Dijkstra's least-weight path algorithm). For such a map with pre-configured information, it is called a statistically rated map**.**

Anchor Location Based Street Traffic Algorithm

Initialize broadcasting nodes path ***v***

If *(anchor path= null)*

Then

Discard the message

End if

If *(anchor path=1)*

Then

Discover the nodes id and make forward the message

Else

Anchor location= null

Discard message

Return

Update the nodes id

If *(destination node D is out of region)*

Then send the message to nearest node

End if

End

4. Performance Analysis And Simulations

The final but most important step in our experiment is to analyze the output from the simulation. After the simulation we obtain the trace file which contains the packet dump from the simulation. It may consume less overhead of routing protocol when it gets the route to destination information before reaching at the end and generally third party route reply follows this principle toget the information about the route.

The format of this trace file for ad hoc wireless networks is as follows:

- N: Node Property
- I: IP Level Packet Information
- H: Next Hop Information
- M: MAC Level Packet Information
- P: Packet Specific Information

Depending on the packet type, the trace may log additional information. More detailed trace file format may be found at [9]. The java program to analyze the trace files is attached with the appendix. This file is used to record the packets and compute the following metrics

- Number of data packets sent
- Number of data packets received by the destination host
- Total number of routing packets
- Normalized routing load – ratio of routing packets over data packets received.
- Packet delivery fraction – ratio of received packets over sent packets in percentage.
- End to end delay – average time for a data packet delivered from host to destination.

The performance of the network is studied by analyzing packet delivery ratio(PDR), network throughput(NTh), Latency Delay ratio and energy loss.

4.1 Network Throughput

The network throughput (NTh) represents the numbers of data packets generated by the source

node to the number of data packets received in the destination

4.2 Packet Delivery Ratio

Packet Delivery Ratio(PDR) is defined as the ratio of the total number of data packets received by the destination node to the number of data packets sent by the source node

4.3 Latency Delay Ratio

Latency Delay Ratio(LDR) is the average number of packets dropped by the network to number of packets generated by the network

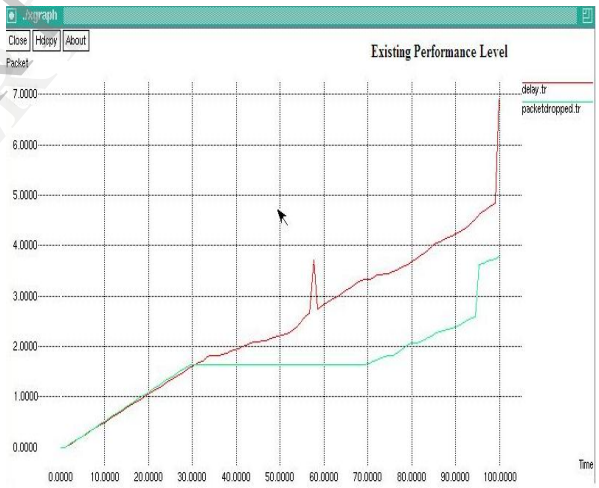

Figure 2.Flooding based performance

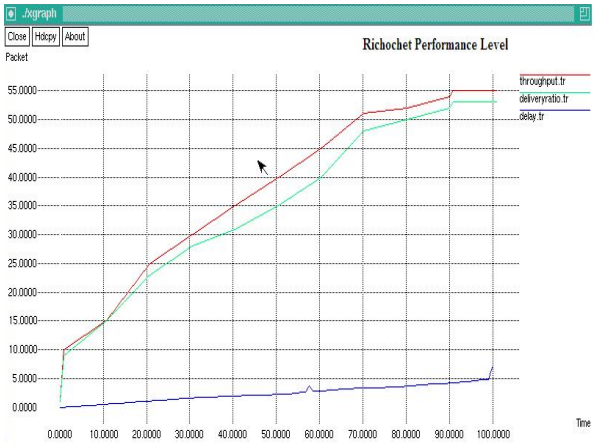

Figure 3.Ricochet Performance level

5. Conclusion:

In this paper, we have presented the ricochet concept based Geocast routing enhanced AODV protocol to periodically make available data at certain geographic locations in a highly mobile vehicular network. The ricochet protocol returns the Geocache through nodes traveling toward the anchor location. To increase the probability of successful return, it records a node's trajectory while moving away from the anchor location then select nodes to return the Geocache based on the trajectory (Rev-Traj). We compared this scheme with a shortest distance geo-routing scheme Max-Progress, and demonstrated that our scheme significantly outperforms its counterpart in realistic traffic simulation, with a return probability improvement of up to 70 percent. We also extend the ricochet concept based Geocast routing enchanced AODVprotocol to satisfy more stringent anchoring requirements using Acchor location based street traffic Algotithm such as returning the Geocache within specified time limits. This is achieved through adapting the initial handoff time based on the return time history.

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