Detection and prevention of packets through receiver based multicast algorithm in Manet

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Abstract: VANET is a developing technology to achieve inter-vehicle communications, which improves the road safety, alert messages, accessing and sharing information's and entertainment. Vehicular Adhoc Networks (VANETs) is from mobile Adhoc Networks (MANETs) is a challenging approach for the intelligent transportation system (ITS). The design of routing protocols in VANET is important and necessary issue for support the smart ITS. Even though rich literature in adhoc network exists, the scale, availability of realistic traffic data and vehicle equipment's inspire the researchers to study the unique characteristics of VANET. The aim of the paper is to compare the characterization and existing routing protocols of VANET.

Keywords: VANET, Routing Protocol.

I. INTRODUCTION

In VANET, vehicles can communicate with each other (V2V, Vehicle-to-Vehicle communications) additionally they will connect to an infrastructure (V2I, Vehicle-To-Infrastructure) to urge some service. This infrastructure is found on the roads. Network nodes in VANETs are highly movable, so the topology is changing.

Consequently, the communication link condition between two vehicles suffers from quick difference and it affects the disconnection owing to the vehicular movements. VANETs are created by applying the principles of mobile adhoc network (MANETs), which is the spontaneous creation of wireless network for data exchange to the domain of vehicles.

The common tern to define VANET is inter-vehicle communication (IVC). The vehicles with sensors, the sensors interact with other sensors in some other vehicle or infrastructure present outside. A mobile network whose node are vehicle (i.e., car, trucks, etc.) considered an extension of a MANET because they will not work in a fixed infrastructure. The characteristic of the network can affect the routing strategy. Existing protocols are designed for the characteristics of MANET, but further studies are necessary to evaluate the appropriateness of existing protocols for VANET. Existing routing protocols are generally categorized in topological-based and position based routing. Topological based routing makes use of global path information and link information to forward packets. Position-based routing does not keep global network information but needs information on physical locations of the node.

A routing protocol controls the approach of two communication entities that exchange information. They includes the procedure which initiates a route, by taking the action for routing failure or maintaining the route. This section explains about the recent unicast routing protocols proposed in a literature wherever single data packet is transported to the destination node with no duplication because of overhead concern. Some of the routing protocols have been introduced in MANET but have been used for comparing VANETs distinctive characteristics. Owing to the excess of MANET routing protocols and surveys written on them, we only limit our attention to MANET routing protocols used in the VANET context.

II. LITERATURE REVIEW

Maram Bani Younes at[1] Introduced intelligent path recommendation protocol(ICOD), aim of this protocol to find best path towards each destination in grid based layout area. It can be handle centralized behavior problem. Three different variants are focused in ICOD congestion avoidance, economical, and context aware. Congestion avoidance variant recommends the least congestion path towards the destination. Economical variant recommends the best economical path, fuel consumption and gas emission parameters of each path. Context aware variant consider the road segments and condition of

the road analyzing the desire path. ICOD protocol and different variants are using in same distributed manner and reducing centralized behavior problem, making the fast communication between the vehicles. This paper implemented by NS2, it shown to exhibit a good performance and ability to recommend the best path with decreases the delay of each vehicles. Path recommendation protocol introduced to find the best path based on distributed manner which can be consider road side unit(RSU). RSU present at each road intersection based on grid based layout. It can be solving the congestion problem.

Sheng-Shih Wang, Yi-Shiun Lin at[2] Passive clustering mechanism can be used in this paper for constructing the stable and reliable cluster structure during the route discovery phase. When compared with the traditional clustering mechanisms, PC mechanism is validated and more efficient rather than others. Each candidate nodes self determines its own priority and proposed multi metric election strategy based on metric such as node degree, expected link lifetime. It not only increases the probability of route discovery and also selectedsuitable nodes to create the cluster structure. Cluster structure used to improve the packet delivery ratio and achieves the higher network throughput due to its performance for stable, reliable, and durable routing path. Passive clustering aided mechanism, to construct a reliable and stable cluster structure enhancing the routing performance in VANETs.First declaration wins mechanism based on the contention. When cluster the nodes, head of the node dominate the other nodes within its communication range. Gateway Selection Heuristic mechanism determines the minimal number of gateway node maintain the connectivity between cluster. Route metrics, Node degree, expected transmission count, Link lifetime these to construct an efficient structure for reliable and durable routing.

James Bernsen, D.Manivannan at [3] Reliable Inter –Vehicular Routing (RIVER) protocol is an efficient routing protocol for VANETs. This protocol represents surrounding street layout where the vertices of the graph are pointed in street curve. RIVER utilizes an undirected graph will be represented. RIVER performs period of time, active traffic observance and uses these information and alternative information gathe red through passive mechanisms to assign reliability rating to every street edge. Control messages to identify node's neighbors, determine the dependability of street edges, and to share street edge dependability data with alternative nodes. Known edge list- The known-edge list identifies edges by their end point geolocations and communicates responsibility data about every edge. Weighted routers- Every RIVER routing packet contains a listing of anchor points for the route, known by their geolocation. Any two consecutive route anchor points within the list represent an edge within the street graph of the sender node and has an edge weight related to it.

III.INTELLIGENT TRANSPORTATION SYSTEM (ITSs)

In intelligent transportation system, receiver and router takes each vehicle. In On Board Unit (OBU), the short range wireless adhoc networks to be formed. For communication, Road Side Unit (RSUs) and vehicles should be equipped with sort of ratio interface.in ITS, vehicles received location insistence for Global Positioning System (GPS) or a Differential Global Positioning system (RGPS) provided by ITS. Fixed RSUs, to communicate and connected to the backbone network. For example, the whole road network is evenly distributed to Road Side Unit required by some protocols. Some protocols require road side unit only at intersections and other protocols require road side unit only at region borders. Access the vehicles periodically and exists on infrastructure which are assumed for safety purpose, it should be unrealistic to require the vehicles always access to roadside units. Inter vehicles, vehicles to roadside and routing based communications depends on very accurate and collect upto date information about the surrounding environment, which requires to exchange information by accurate positioning system and smart communication protocols.

IV. ARCHITECTURE OF THE VEHICULAR NETWORK

The architecture of VANETs has three main categories:

Inter-vehicle communication: This is also known as vehicle- to-vehicle (V2V) communication on adhoc networking. In this, vehicles communicate with each other without the infrastructure support. Any important data collected from sensors on a vehicle is sent to near vehicles.

Vehicle-to-road side communication: This is also known as Vehicle-to-Infrastructure (V2I) communication. In this category, the vehicles use cellular gateways and wireless local area network that access network points to connect the internet and facilitate vehicular applications.

Inter- road side communication: This is also known as Vehicles-to-roadside communication. Vehicles use the infrastructure to communicate

with each other and share the received information from the infrastructure with other vehicles in an exceeding peer0to-peer mode through adhoc communication

V. SPECIAL CHARACTERISTICS OF VANET

The feature of VANET are similar to the operation technology of MANET , means the method of self-organization, low bandwidth and shared radio transmission criteria remains same. But the key difficulty in operation of VANET are from the high speed and uncertain mobility of the mobile nodes (vehicles) along the paths. Moreover, VANETs have unique features over MANETs, they are:

High transmission power and storage: The network nodes (vehicles) in VANETs are usually equipped with high power and storage compared to MANETs.

Higher computational capability: Operational vehicles can afford communication and sensing capabilities than MANETs.

Predictable Mobility: unlike MANETs, the network nodes moved on a VANET can be predicted because they moved on a road network. Then the future position of the vehicle can be predicted based on the current velocity and road trajectory.

VI. ROUTING PROTOCOLS OF VANET

The growth of the vehicles is equipped with wireless transceivers that helps to communicate with each other vehicles, to form a class of wireless networks, known as vehicular adhoc network. To increase driver's safety and to provide comfortable driving environment , messages that's needs to be send to vehicles for different purposes through the inter vehicle communications. Unicast routing vehicles construct a source to destination routing in a VANET.Multicast is defined as the delivering multicast members from a single packet by multihop communication. Geocast routing works to deliver the geocastpacket sent to a specific geographic region. Geocast packet will forward and receive the specific geographical region where the vehicle is located, otherwise the packet should be dropped as the broadcast protocol is utilized to send the broadcast messages to all other vehicles in the network.the recent survey for VANET routing mechanisms , shows the survey structure into three categories are unicast, multicast , geocast and broadcast approaches.

UNICAST ROUTING PROTOCOL

This section introduces the Unicast routing protocols in VANETs. In this technique, data is transmitted to single source to single destination through wireless multihop transmission technique and also carry and forward techniques. Wireless multihop transmission technique transmits the data from source to destination.in the carry and forward techniques, possible source vehicles carry data to reduce the number of data packets. The delivery delay time cost of carry and forward technique is normally longer than the wireless multihop transmission technique. Min-delay routing protocol and delay bounded routing protocol are the two categories of routing protocol design. The aim of min-delay routing protocol is to minimize the delivery delay time from source to destination. Delay-bounded routing protocol maintains low level of channel utilized within the delivery delay time .

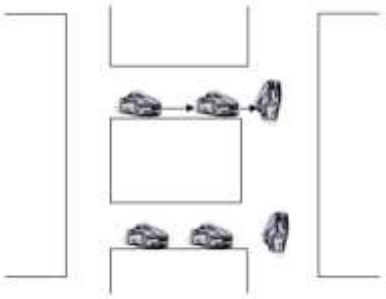

Fig 1a. Unicast Routing

MULTICAST AND GEOCAST ROUTING PROTOCOL

Multicast and geocast routing are important routing operations in VANET. The challenges is to develop the multicast geocast protocol placed over VANET with the highly changeable topology. Multicast and geocast protocol and spatio temporary multicast/geocast routing protocols are classified in existing results.

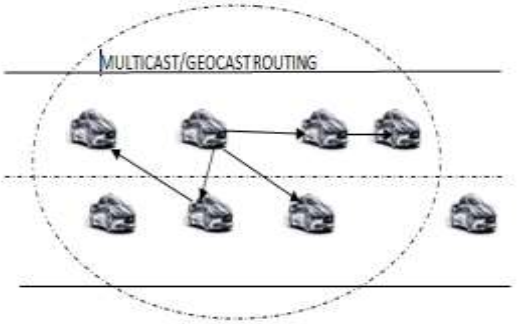

Fig 2. Multicast and Geocast routing

TOPOLOGY-BASED ROUTING PROTOCOLS

These routing protocols use links , information that exists in the network to perform packet forwarding.

It is further divided as proactive (table-driven) and reactive (on-demand) routing.

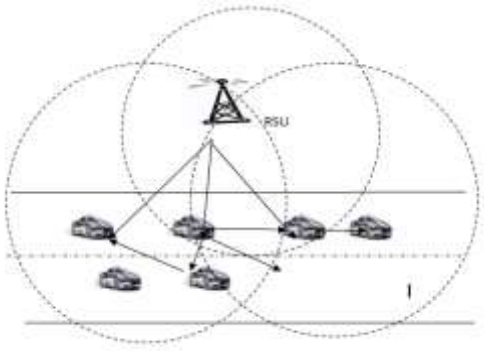

Fig 3. Broadcast routing

AODV

Adhoc on demand distance vector protocol is also known as reactive protocol which sends the data packets to nodes required. In AODV protocol , the route will be built for nodes to send the packet and could not updated until the route breaks or time out.

CONCLUSION

In summary, VANET routing has open issues whether it has a tools to evaluate these protocols. VANET routing are in research direction is advancing and matured level will be high and many technologies are needed to become matured , so the validity can be given for the benefits of these protocols. By comparing the protocols and its advantages will help to find the efficient routing protocols.

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