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VANET APPLICATION in ROUTING PROTOCOL

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Abstract : VANET or Vehicular Ad Hoc Network can be defined as a network technology that is used among vehicles to communicate with each other and with nearest fixed equipments. Routing protocols are used in VANETs to discover the route and store the data in the table.

Key words: VANET, Mobility of Sink, Topology.

INTRODUCTION

Vehicular Ad Hoc Networks (VANETs) are formed by applying the ideology of mobile ad hoc networks (MANETs) - the spontaneous conception of a wireless network for data exchange - to the domain of vehicles. They are a key element of intelligent transportation systems (ITS). Vehicular ad-hoc networks (VANETs) are self-organized networks built up from moving vehicles, and are part of the broader category of mobile ad-hoc networks (MANETs). Because of their unusual characteristics, VANETs require the definition of precise networking techniques, whose viability and performance are usually tested by means of simulation [1]. Participating cars become a wireless connection or router through vanet and it allows the cars about to connect 100 to 300 meters with each other and in order to create a wide range network, other vehicles and cars are associated with each other so the mobile internet is made. It is supposed that the first networks that will have this technology as a feature are fire and police mobiles to intermingle with one another for security reasons.

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REAL TIME APPLICATIONS OF VANET

It is emerging a new network of primary relevance for example proactive urban monitoring using sensors for sharing data. It aims services where vehicles continuously monitor events from urban streets, maintain data in their local storage, process them and a route message to their vicinity to achieve a common goal(e.g. to allow the police agents to find the specifies cars) this makes the collection, storage and retrieval of large amounts of sensed data[2].

It is a novel middleware that supports VSN based urban monitoring applications which performs event sensing, processing classification of sensed data and generates periodically with extracted and context information such as timestamps.

2) Data Consumer Applications

(a) Content Distribution: vehicles range from multi-media files to road condition data which updates of software installed in the vehicle [5][6]. Nanden etal proposed SPAWAN like Bit Torrent swarming protocol in a VANET which is divides into pieces and uploaded into an internet server. Each file has a unique ID (e.g. hash value of the content) and each piece has a unique sequence number passing by the Access points which downloads parts of file once out of range of AP which exchange missing pieces in the data.

(b) Location-aware advertisements: It is one of the most important sources of income for internet-based companies' cars with wireless communications which will be useful for advertisements. It includes simple text-based ads or multimedia ads .e.g. trailers of movies playing at the nearby theater.

3) Data Producer/Consumer Application

(a) Emergency video streaming: Vehicle to vehicle live video (v3) streaming architecture. V3 is composed of a video triggering sub-system and a video transmission sub-system. It supports video steaming so that users can watch videos originating from remote region [3]. It assumes that vehicles are enclosed with their locations, wireless communication devices and GPS devices to keep track of their devices.

VANETs support a broad range of applications - from simple one hop information propagation e.g., cooperative awareness messages (CAMs) to multi-hop propagation of messages over immense distances. Most of the concerns of interest to mobile ad hoc networks (MANETs) are of interest in VANETs, but the particulars differ. Rather than moving at random, vehicles tend to move in an organized manner. The interactions with roadside equipment can likewise be characterized quite accurately. And finally, most vehicles are constrained in their range of motion, for instance by being restricted to follow a paved highway [4].

Example applications of VANETs are: Electronic brake lights, which allow a driver (or an independent car or truck) to respond to vehicles braking even though they might be hidden (e.g., by other vehicles).

Platooning, which allows vehicles to closely (down to a few inches) go behind a foremost vehicle by wirelessly receiving acceleration and steering information, therefore forming electronically fixed "road trains".

Traffic information systems, which uses VANET communication to provide up-to-the minute barrier reports to a vehicle's satellite navigation system**.**

BASIC DIAGRAMETIC REPRESENTATION

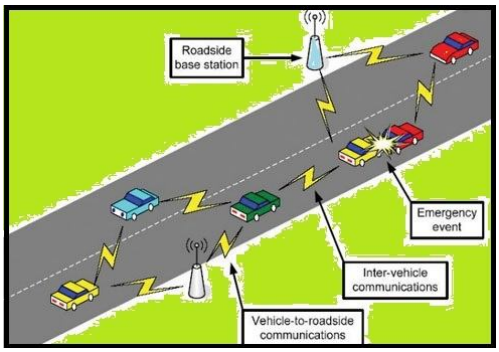

Figure 1: Basic for VANET

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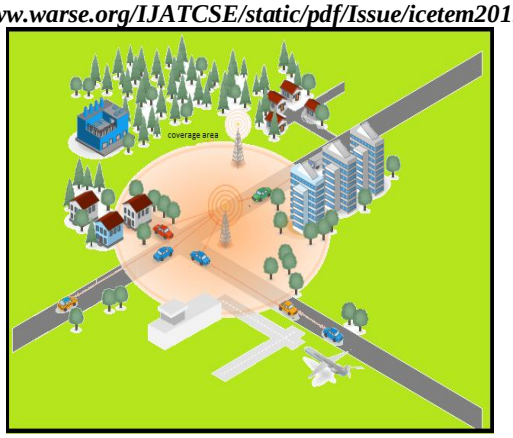

Figure 2: Basic for VANET in real world

MOBILITY CONTROL

Mobility control is the ability of wireless device to move and relocate themselves according to specific network objectives.

With the expansion of wireless sensor networks (WSNs) and the composite environment in which they are deployed, traditional static deployment of WSNs is not sufficient for many approaching applications, especially with the requirement of better energy effectiveness, improved exposure, improved target tracking, better channel capacity, and so on. More effective and capable technologies need to be investigated and introduced to meet these challenges. Mobility support is one of the most attractive technologies in difference to those with only static elements. Mobility support technologies are much more adaptable than traditional technologies as they can be applied to any situation and shared with other algorithms, models, and technologies. Usually, mobility related elements in WSNs are mobile sensor nodes, mobile anchor nodes, mobile data collectors, mobile sinks, and so on. The devices occupy mobile phones, tablets and laptop computers, vehicles for two dimensional gap, autonomous underwater vehicles, and unmanned underwater vehicles for three dimensional space.

By introducing mobility to a few or all the nodes in a WSN, we can improve its capability and flexibility to support multiple tasks and to handle the aforesaid problems. Although a WSN is typically considered as an ad hoc network in which nodes are comprehensive with sensing ability, a mobile WSN and a mobile ad hoc network (MANET) are basically different. Mobility in a MANET is repeatedly arbitrary, whereas mobility in a mobile WSN should be "intentional". We can control the movement of mobile sensors to manner unusual missions.

MOBILE WSNS CHALLENGES

In order to hub on the mobility phase of wireless sensor networks, it is important to first appreciate how the common assumptions about statically deployed WSNs modify when mobile entities are introduced.

Localization: In statically deployed networks, node location can be determined once during initialization. However, those nodes that are mobile must constantly obtain their location as they navigate the sensing region [12]. This requires additional time and energy, as well as the accessibility of a rapid localization service.

Dynamic Network Topology: Since nodes generally are mobile in MWSNs, the topology is active. New routing and Medium access control (MAC) protocols are wanted in MWSNs. Traditional WSN routing protocols, which explain how to pass post through the network so they will most likely reach their goal, typically rely on routing tables or new route histories. In active topologies, table data become outdated speedily [7][8], and route finding must regularly be performed at a large cost in terms of power, point, and bandwidth. Providentially, there is an active area of research committed to routing in mobile ad hoc networks (MANETs), and MWSNs can use from this work.

Power utilization: Power utilization models vary to a great extent between WSNs and MWSNs. For both types of networks, wireless communication incurs important energy expenditure and must be used resourcefully [9]. However, mobile entities need additional power for mobility, and are often ready with a much larger energy reserve, or have self-charging ability that enable them to plug into the power lattice to recharge their batteries.

Mobility of Sink: In centralized WSN applications, sensor data is forwarded to a base station, in which it can be processed using resource-intensive rule. Data routing and aggregation can incur significant overhead. Several MWSNs use mobile base stations which cross the sensing region to collect data, or location themselves so that the number of conduction hops is minimized for the sensor nodes.

ROUTING PROTOCOLS IN V2V INFRASTRUCTURE

VANET routing protocols classified into five categories: location based routing protocol, cluster based routing protocol, topology based routing protocol, Broadcast routing protocol, and Geo cast routing protocol. It is classified into basis area where they are suitable.

It shares the property of geographic position information in order to select the next forwarding hops. It consists of group of routing algorithm [9][10]. The packet is send without any map knowledge to the one hop neighbor, which is closest to the destination. It has no global routes from source node to destination node. Position based routing is broadly separated into two types: position based greedy V2V protocols, Delay Tolerant Protocols

1) Position Based Greedy V2V Protocols the goal of these protocols is to transmit data packets to destination as soon as possible that is why is called as main delay routing protocols .It requires that intermediate node should possessed position of itself, position of neighbor and destination position.

2) It does not involve external static street map for its operation .It is based upon the fact that city street from a natural planner graph. Its consists of two components: Restricted greedy forwarding algorithm It routes messages to the nodes at intersection since GPCR does not use any external static street map as a result of nodes at intersection are difficult to find GPCR. It uses heuristic method for finding nodes located at intersections and designations those nodes are coordinators.

3) Cluster Based Routing: Group of nodes i*dentify* themselves to be a part of cluster and a node is designated as a cluster will broadcast the packet to cluster. It is preferred in clusters. In cluster based routing virtual network infrastructure must be created during the clustering of nodes in order to provide scalability [11] [13]. The various clusters based routing protocols are COIN and LORA_CBF

4) Topology Based Routing Protocols

These protocols use links information that exists in the network to perform packet forwarding. They are auxiliary divided into Proactive and Reactive.

5) Proactive routing protocols

Means that the routing information, forwarding hop is maintained in the background irrespective of communication requests, the merit of Proactive routing protocol is that there is no route discovery the destination route is stored in the background, the demerit of proactive routing protocol is that it provides low latency or real time application

6) Reactive/ad hoc based routing

It maintains only the routes that are currently in use and opens the route only when it is required for the nodes to communicate with each other. As a result it reduces the burden in the network. It consists of route discovery phase in which the query packets are flooded into the network for path search and this phrase completes when route is found. The various types of reactive protocols are AODV, PGB, DSR and TORA.

7) Broadcast Routing: Broadcast routing is mostly used in VANET for sharing traffic weather and emergency road conditions among vehicles and delivering advertisements. The various Broadcast routing protocols are BROADCOMM, UMB, V-TRADE and DV-CAST.

8) Geo Cast routing

It is basically a position based multicast routing. Its main objective is to deliver the packet from source node to other node within a specified geographical region (Zone of Relevance ZOR) It is considered as an multicast service within a specific geographic region[13]. It is basically defines a forwarding zone where it directs the flooding of packets in order to reduce messages overhead and network congestion caused by simply flooding packets everywhere. The various geo cast routing protocols are IVG, DG-CASTOR and DRG.

CONCLUSION

Routing protocols are used in VANET for comfort applications. Apart from that they also help to reserve the network bandwidth for safety applications. It also requires less memory and has up-to-date path information.

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