ISSN:2229-6093



# Reliable and Efficient flooding Algorithm for Broadcasting in VANET

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**Abstract**

*In MANETs, each node is equipped with a wireless transmitter and receiver and is typically free to move around in an arbitrary fashion. The self-configuration ability of MANETs makes them suitable for a wide variety of applications. VANET research concentrates on roads, more so on roads with some reasonable node density. In This Paper the proposed algorithm has the concept of TTL through which it decreases the overhead and collision problem. The result of flooding can be improved by applying more optimized and intelligent algorithms.*

*Keywords—*
*MANET,VANET,IEEE802.11,TTL*

## I.INTRODTION

## WIRELESS NETWORKS

Most mobile devices are equipped with short-range radio transmitters allowing them to inter-communicate using radio frequencies to transmit data and communicate with other devices on the same network. Wireless LANs are standardized under the IEEE 802.11 series [1]. IEEE 802.11 standard defines two operational modes: infrastructure and infrastructure-less (known as the ad hoc mode). Infrastructure-oriented organization is realized through fixed (typically wired) gateways or access points (APs) [2, 3, 4] that act as bridges to a fixed infrastructure. A mobile unit in such a network connects to the nearest AP which is within its communication range in a single-hop communication technique. The AP can connect other wireless nodes within its range with an existing wired network where the infrastructure mode is commonly used to construct a hotspot which provides a wireless access to the Internet. In the ad hoc mode, wireless nodes can communicate directly with each other. Infrastructure-less networks are commonly known as MANETs [3, 5] when they include mobile nodes.

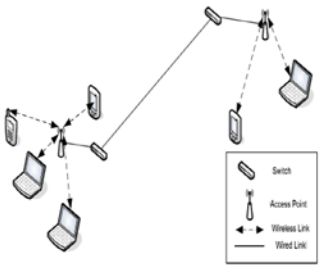



**Figure 1.1 Infrastructure wireless network**

### 1.1 Wireless technology

Over the last years, the technology for wireless communications has made tremendous advantages. It allows very high mobility, efficient working and is almost extreme economical. On one side we have large area technologies as GSM, GPRS or UMTS, which have moderate bandwidth. On the other side we have the local area technologies as WLAN (Wireless Local Area Network) with much higher bandwidth.

### 1.2. The IEEE 802.11

The IEEE 802.11 standard places the specifications for both the physical layer and for the medium access control layer. Many extensions have already been added to 802.11 either enhancing the MAC or PHY Layer. The MAC extensions are mainly thought to improve security or quality of service (QoS).

### 1.3 MANETs

In MANETs, each node is equipped with a wireless transmitter and receiver and is typically free to move around in an arbitrary fashion. The self-configuration ability of MANETs makes them suitable for a wide variety of applications i.e. communication within groups of people through laptops and other hand-held devices. MANETs require completely different protocols from those used for wired networks and infrastructure wireless networks [5]. MANET characteristics differ from infrastructure networks since nodes can join and leave the network at any time. There is no central management and topologies change frequently and dynamically.

### 1.4 Vanet Scenario

Fortunately, the less than satisfactory deployment of MANETs is not a dead end. From the original idea, a multitude of scientific and industrial spin-offs have emerged. Instead of focusing on transparent. One of these special Mobile Ad-Hoc Networks is called Vehicular Ad-Hoc Network, or VANET. As the name indicates, the typical node in a VANET is a car or a truck that is traveling on a road. While Internet connectivity is also an issue in these networks, the most likely mode of communication will be node-to-region rather than node-to-node or node-to-Internet, the basic focus being on Vehicular Safety. MANET protocols perform poorly in the presence of the movement behavior typical of vehicles, in particular their speed. Intuitively, knowledge about the “street topology” can be of use there. Thus, we propose different protocols for use in cities, with and without the assumption of having a digital street map. Some of the insights gained in the process of building a real vehicle-to-vehicle communication system have lead to the development of a rather (r)evolutionary manner of packet forwarding using geographic positions.

### 1.6 Mobility Characteristics

At least in first-world countries, vehicle traffic is mostly confined to roads. Whenever it is not, this is usually accompanied by a dramatic loss in node density, resulting in the lack of the possibility to communicate locally. Thus, VANET research concentrates on roads, more so on roads with some reasonable node density. From a birds-eye perspective, we identify two basic VANET mobility patterns: (a) highway movement and (b) city movement .

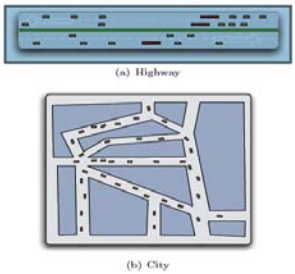



**Figure 1.2 Vehicular movement scenarios**

The main goal of VANET is providing safety and comfort for passengers. To this end a special electronic device will be placed inside each vehicle which will provide Ad-Hoc Network connectivity for the passengers. This network tends to operate without any infra-structure or legacy client and server communication. Each vehicle equipped with VANET device will be a node in the Ad-Hoc network and can receive and relay others messages through the wireless network. There are also multimedia and internet connectivity facilities for passengers, all provided within the wireless coverage of each car. Automatic payment for parking lots and toll collection are other examples of possibilities inside VANET. The interactions with roadside equipment can likewise be characterized fairly accurately. And finally, most vehicles are restricted in their range of motion, for example by being constrained to follow a paved highway.

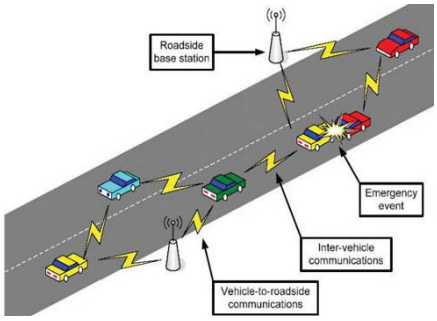



**Figure 1.3 Schematic Representation of a Vehicular Adhoc Network**

## II.LITERATURE SURVEY

**Akira Takano Japan Nov 2008** VANET is an application of a mobile ad hoc network to inter-vehicle communication. Each vehicle is aware of its position information by GPS or other methods. Position-Based routing is a useful approach in VANET. The Position-Based routing protocol can be classified roughly into a Next-Hop Forwarding method and a Directed Flooding method.

**Victor Cabrera Murcia, Spain 2007** Many routing protocols have been proposed for such kind of networks. Most of them try to exploit the information which may be available at the vehicle by the time that a routing decision must be made. In addition, some solutions are designed taking into account the particular, highly partitioned, network connectivity in vehicular settings.

**Sandhaya kohli , Bandanjot Kaur** Vehicular adhoc networks is a subclass of mobile adhoc networks which provides a distinguish approach for intelligent transport system. The survey of routing protocols in vanet is important and necessary issue for smart ITS. The proposed work discusses the

advantages and disadvantages of these routing protocols.

**Pagani and Rossi** described a broadcasting protocol for ad hoc networks. It is based on Clustered organization of nodes. Nodes are divided into clusters, with one of them serving as Cluster head in each cluster. Each cluster head has direct link to any of the nodes in its cluster. Thus two nodes in the same cluster have hop distance at most two.

**Lin and Gerla [8]** The distributed clustering algorithm is initiated by all nodes whose id is Lowest among all their neighbors (local lowest id nodes). They broadcast their decision to create Clusters (with them as CHs) to all their neighbors. Each node may hear the broadcasts by its neighbors and select the lowest id among neighboring CHs, if any.

## III. PROBLEM FORMULATION

Most of the concerns of interest to Manets are of interest in Vanets, but the details differ. And finally, most vehicles are restricted in their range of motion, for example by being constrained to follow a paved highway. In addition, the term Manet mostly describes an academic area of research, and the term Vanet perhaps its most promising area of application. In Vanet it is easy to do communication between vehciles which is not possible in Manets. Flooding ensures the full coverage of all the network, that is ,the broadcast packet is guaranteed to be sent to every node in the network providing the network is static. This flooding generates many redundant transmissions. Every neighbor pair will send copies of the same flooded message.The simple flooding algorithm with respect to MAC load, have power consumption and collision. The steps are as follows:

**Simple flooding algorithm**

- The algorithm for simple flooding starts with a source node broadcasting a packet to all neighbors.
- Each of those neighbours in turn rebroadcast the packet exactly one time.
- This continues until all reachable network nodes have received the packet.

**Proposed flooding algorithm:- Blind Flooding algorithm**

1 If a node U has d(u) neighbors it will take d(u) time slot for node u to (send) broadcast message m.

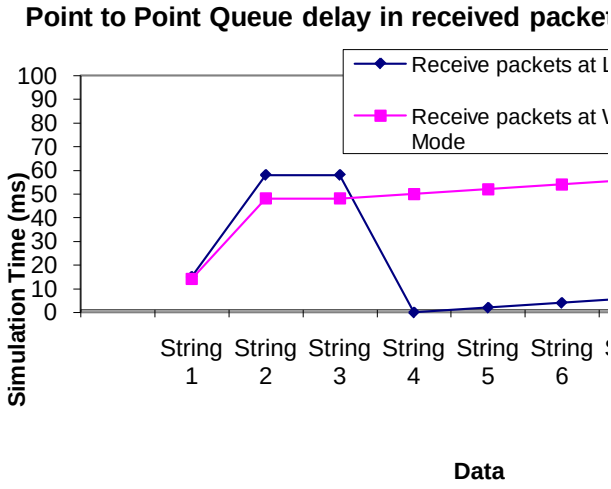
2 The only one neighbor received m message, if Dest id = our id gives true.

3 At d(u) node Dest id = our id gives false then TTL= -1.

4 Check if TTL>0 then The value of TTL gives True & the message is rebroadcast to d(u) neighbors.

5 The packet is discarded if the value of TTL gives false.

**Result:-**




## IV. Conclusion & Future Work

### Conclusion

The implementation of flooding algorithm has been implemented successfully. This proposed algorithm has the concept of TTL through which it decreases the overhead and collision problem. With the help of some constraints we solve the problem of rebroadcasting like using cluster based routing scheme in which the nodes act as a cell and a node which communicates with other cluster act as a gateway.

### Future work

Below are the points which we would like to augment in our current implemented flooding algorithm:

1. The result of flooding can be improved by applying more optimized and intelligent algorithms.

2. The flooding algorithm can also be further optimized by applying other techniques such as probability based methods or location based methods.

3. We would also like to do simulation with different parameters such as more nodes in the network, higher mobility, increasing pause time. We believe that under different situations , the effectiveness of this technique will be different.

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