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# Dispense Traffic information by merging VANET with Cloud computing

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**Abstract:** Vehicular Ad-hoc Network (VANET) is research field of wireless networks providing different applications such as traffic information for on road vehicles and related authorities. VANET are a long term solution contributing significantly towards Intelligent Transport Systems (ITS).Significant research efforts from both automotive industry andacademia have been underway to accelerate the deploymentof a wireless network based on short-range communicationsamong moving vehicles. In this paper, we propose a new 3-layer approach for count of traffic volume in a road segment based on actual no of wireless-equipped vehicles. For this propose, we first collect the traffic information for different groups of vehicles using a new clustering algorithm. Then, by using chaining technique between the clusters transmits this information to a nearest cloud. Finally, we employ a generalization method to extension of the total traffic volume from the collected data.We also highlight the unique security and privacy issues and research challenges inVANET clouds.

Keywords – VANET, ITS, clustering algorithm, chaining technique, clusters, cloud, security, privacy.

## 1. INTRODUCTION

Traffic management is the great issuenow a day in all metropolitan cities throughout the world. millions of hours and gallons of fuel are wasted everyday by vehicles stuck in traffic. One of themany goals of VANET is to support traffic safety and make the driving experience more safe and comfortable. With emerging Vehicular Ad-hoc Networks, plenty of applications' have been created for vehicles on the roads. Two main communication types are presented in ad-hoc domain of VANETs [1]which is Vehicle-to-Vehicle(V2V) and Vehicle-to-Infrastructure(V2I).According to statistics from US Department of Transportation (Dot) in 2008, a staggering amount of roughly $75billion are lost in worker productivity and around 8.4 billion gallons of fuel is wasted [2].Intelligent Transport Systems (ITS) will entail the global deployment ofVANETs. For this purpose it is not only imperative to have a proper infrastructure with several RSUs being placed in a resourceful and cost-effective manner but also to serve the main purpose of ITS in order to have seamless connectivityfor optimum coverage with ideal channel utilization wherevehicles are able to access applications and services quickly[3]
The contributions of this paper are as follows.

1. Analysis to Provide a real time information about traffic through VANET
2. Analyze to take advantage of both Vehicle-to-Vehicle(V2V) and Vehicle-to-Infrastructure(V2I)

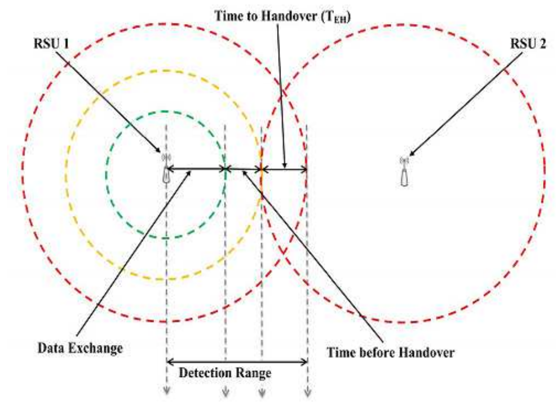
3.To investigate future solution for Intelligent Transport Systems (ITS)

## 2. ROAD-SIDE-UNIT(V2I)

Road side unit which is known by RSU's is like a network station situated near roadside. In the next couple of years, it is evident that Intelligent Transport Systems (ITS) will entail the global deployment of VANETs. For this purpose it is not only imperative to have a proper infrastructure with several RSUs being placed in a resourceful and cost-effective manner but also to serve the main purpose of ITS in order to have seamless connectivity for optimum coverage with ideal channel utilization where vehicles are able to access applications and services quickly [3]. Unfortunately, in order to have ideal channel conditions and complete coverage, the infrastructure design brings new insight with regard to the placement of the RSUs. The paradox of deployment issues are, that on one hand Intelligent Transport Systems (ITS) demand the deployment of the infrastructure in such a way that it supports seamless connectivity but on the other hand, this comes at the cost of having many RSUs placed along the road-side leading to interference issues.

The fig (1) demonstrates:-
-Detection range: is the region where both the vehicle's receiver sensitivity threshold and the SINR 2013 13th International Conference on ITS Telecommunications (ITST) 75 are met for thepayload. Vehicles within this range of the transmitting RSU are able to decode packets.
- Data Exchange range: is the region where the actual data transmission takes place.

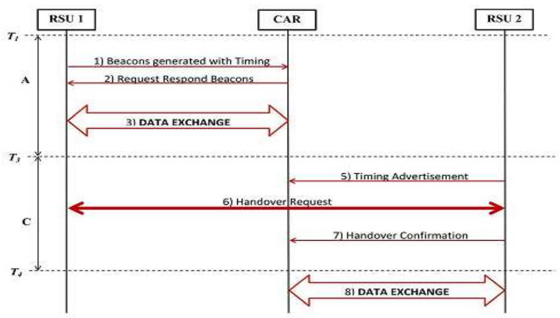
- Time before Handover: is the region where the OBU gets ready for handover.
- Time to Handover: is the region where the actual handover takes place.



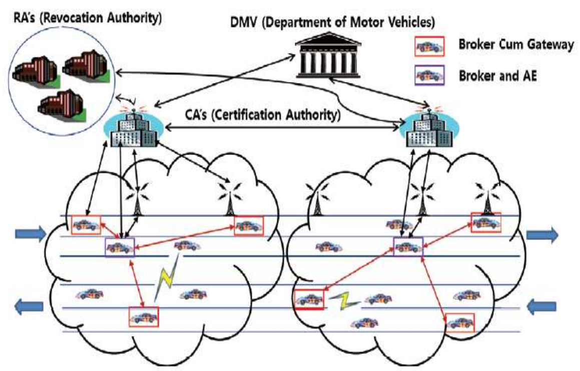

Fig(1).RSU's Ranges

### 3.HANDOVER PROCEDURE

The handover procedures and messages exhibits:
1) When the car enters the detection range of RSU1 i.e. T1, it receives a beacon with timing advertisement.
2) The car then sends a Respond Beacon back to RSU1.
3) Consequently, the connection between RSU1 and car is established and Data Exchange takes place.
4) As the car move along it receives timing advertisements from RSU2 after entering the Time to Handover region i.e. T3 to T4.
5) Further in this region the car sends Handover request to both the RSUs.
6) Handover confirmation is sent from RSU2.
7) Finally Data Exchange starts with RSU2 as soon as the handover is finished.
Vehicle using cloud:
Vehicular Clouds (VC): The main players in VC include VANET infrastructure itself, gateways, and brokers[4] as shownin fig 3.




Fig(2) Fig.handover process[8]




Fig(3).Vehicular Cloud

Note that the vehicular nodes serve as service providers in this paradigm. VC is formed in the following manner. First, the vehicles initiate a protocol to select broker(s) among them and identify the boundaries of the clouds following by electing an Authorized Entity (AE) among the brokers to ask for authorization in order to form a cloud. After brokers and AE are elected, then AE invites the vehicular nodes in the premises of the cloud boundary to take part in cloud. Interested vehicles will reply with an ack. If the number of interested vehicles is above certain threshold, then AE will ask higher authorities about permission to form a cloud and provide the potential resources. Upon getting permission, the participants of the cloud will pool their resources to form a rich virtual environment. AE sends the schedule plan to higher authorities and gets implementation authorization. Note that the job in hand can be handed over to the cloud by higher authorities in exchange of some incentives to the participants. AE dissolves the cloud after the job is done. It is worth noting that this strategy is different in some sense from that of Solarium et alas [5] scheme in the way that, it is better practice to first look for the volunteers before asking authorities for permission. It would save the bandwidth and communication if the number of volunteers for dynamic cloud formation was not enough and in case if it was not possible to form a cloud.

### 4. PROPOSED APPROACH

In our proposed scheme we assume a highway environment with predefined segments. According to [9]we consider two types of vehicles: equipped vehicles and normal vehicles. We assume that equipped vehicles are equipped with a positioning system (e.g. a GPS), through which it can acquire information about its current location, and an IEEE 802.11p-compliant radio transceiver, through which it can communicate with the other vehicles or RSUs.

From a communications point-of-view, this paper extends the work done in [6] & [7] by analyzing the effects of Network Dwell Time, Time Before Handover and Exit Times in the context of VANET to provide ubiquitous communication.

## CONCLUSION

In this paper we have presented a hybrid co-operative process to handle the traffic data to minimize the traffic problem in metropolitan. as per the paper the no of equipped vehicle moving on road can helps to identify the density of traffic. The RSU's can perform the great roll to maintain the traffic data ,the RSU's can handover the information from one RSU's to another as vehicle moving on road. In this paper we have normalize Two main communication types are presented in ad-hoc domain of VANETs [1]which is Vehicle-to-Vehicle(V2V) and Vehicle-to Infrastructure(V2I).

Some of the additional research issues that can be investigated for future extension of the work are as follows(1)Handover process from one RSU's to another (2) cluster-based detecting congestion and monitoring end-of-queue situations (3) the location of theRoadside Units (RSUs)

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