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Department of CIVIL, CSE, ECE, EEE, MECHNICAL Engg. and S&H of Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

Vehicular Traffic Re-Routing For Avoid the Traffic Congestion in VANET

N.Kirthiga,Dr.S.Karthik

PG Scholar, Dept. of CSE, SNS College of Technology, Coimbatore, India
Professor and Dean, Dept. of CSE, SNS College of Technology, Coimbatore, India

ABSTRACT

A Vehicular Ad-Hoc Networks (VANETs) is the technology that uses moving cars as nodes in a network to create a mobile network. VANETs turn every participating car into a wireless router, allowing cars of each other to connect and create a network with a wide range. VANETs are developed for enhancing the driving safety and comfort of automotive users. The VANETs can provide wide variety of service such as Intelligent Transportation System (ITS), Intelligent Vehicular ad-hoc network(InVANET), Dedicated short-range(DSRC), Roadside-to-vehicle communicaton(RVC)e.g. safety applications. Many of safety applications built in VANETs are required real-time communication with high reliability. One of the main challenges is to avoid degradation of communication channels in dense traffic network. Many of the studies had suggested that appropriate congestion control algorithms are essential to provide efficient operation of the network. However, most of congestion control algorithms are not really applicable to event-driven safety messages. In this work, the congestion control algorithm as solution to prevent congestion in VANETs environment. A complete validation method is used of analyse the performance of our congestion control algorithms for event-driven safety messages in different congested scenarios.

1. INTRODUCTION

VANET belongs to wireless communication networks area. VANET is the emerging area of MANETs in which vehicles act as the mobile nodes within the network. The basic target of VANET is to increase safety of road users and comfort of passengers. VANET is the wireless network in which communication takes place through wireless links mounted on each node (vehicle).Each node within VANET act as both, the participant and router of the network as the nodes communicates through other intermediate node that lies within their own transmission range.

2. COMMUNICATIONS

2.1 Vehicle-to-Vehicle Communication

Vehicle-to-Vehicle Communications for Safety is the dynamic wireless exchange of data between nearby vehicles that offers the opportunity for significant safety improvements. V2V communications will enable active safety systems that can assist drivers in preventing 76 percent of the crashes on the roadway, thereby reducing fatalities and injuries that occur each year.

2.2Vehicle-to-Infrastructure Communication

Vehicle-to-infrastructure communications for safety is the wireless exchange of critical safety and operational data between vehicles and highway infrastructure, intended primarily to avoid or mitigate motor vehicle crashes but also to enable a wide range of other safety, mobility, and environmental benefits. The vision of V2I Communications is that a minimum level of infrastructure will be deployed to provide the maximum level of safety and mobility benefits for highway safety and operational efficiency nationwide.

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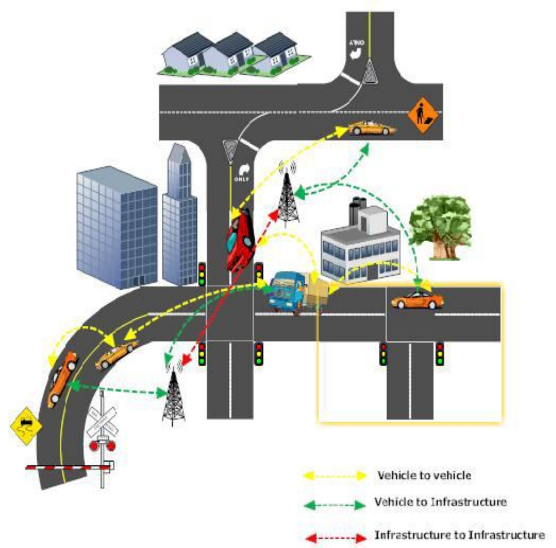
2.3Infrastructure-to-Infrastructure Communication

Infrastructure-to-infrastructure communication is the wireless exchange of data between the two base stations. The base station will collect data from vehicle and processing will be done.

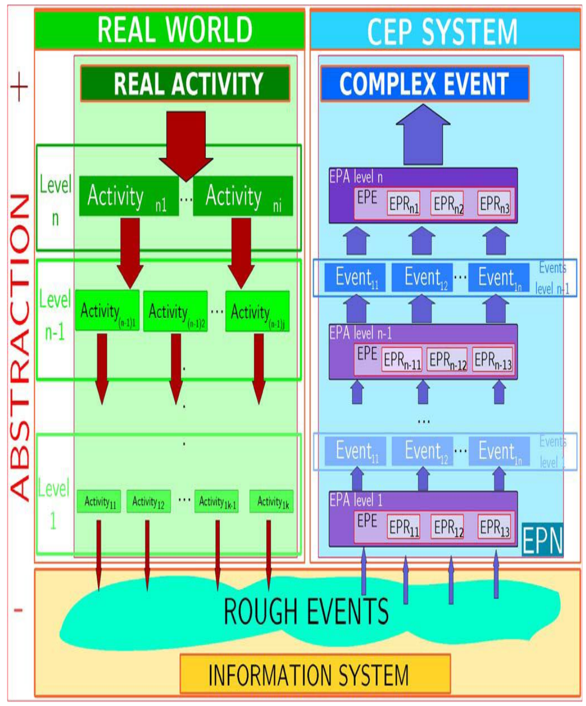


3. VANET SECURITY

These applications imply different security and privacy requirements with respect to the protection goals integrity, confidentiality and availability. Nevertheless, there is a common need for a security infrastructure establishing mutual trust and enabling cryptography. Simply using digital signatures and a public key infrastructure (PKI) to protect message integrity is insufficient taking into account multilateral security and performance requirements.

4. COMPLEX EVENT PROCESSING

The main goal of a CPE system is used to detect real-world situations, called activities. CEP is based on an idea that an activity is split into smaller ones. Each activity can split into a smaller subactivity with lower level of abstraction.



the lowest level activities are provided by each one of the surrounding slow vehicles, and the *events* reflected in the IS by these activities are, in fact, the beacon messages broadcast along the VANET. A beacon message can be viewed as a position and speed change *event*, given that it informs about the most recent speed and location of its sender. The CEP system takes as input the rough events and makes up a layered hierarchy of events with different levels of abstraction to compose one or more complex events that represent the initial real-world activity. Then, these complex events could be sent to a back-end system so that it performs some kind of action or procedure.

4.1 Operation Modes

Two different operation Modes are used:

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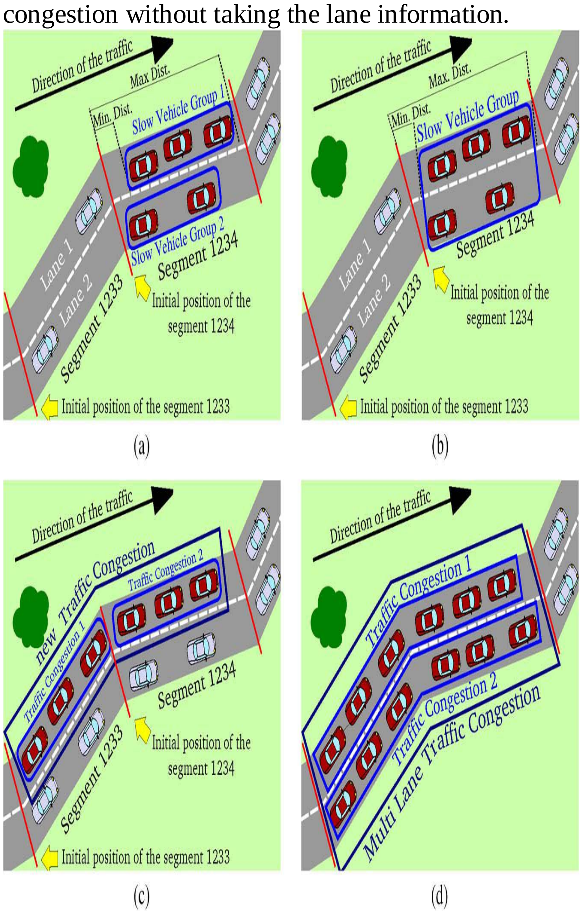
Lane Mode: The EDA takes into account the lane information of the beacons is used to detect the traffic jams at different lane level.

Raw Mode: In this mode, the EDA will detect traffic congestion without taking the lane information.



4.2 EPA Goals:

Event Filter Agent which reads the Location Event and it is in charge of discarding events.

Slow Traffic Agent is used to monitor the traffic along a motorway. It creates a slow traffic congestion group which contains a number of vehicle driving in a low speed.

Traffic Congestion Agent continuously reads the slow vehicle group events.

Traffic Alarm Agent is used to categorize the event into three different levels.

Event Source Agent is in charge of dealing with the external data providers.

Adaptation Agent is in charge of deciding the operation modes.

5. CONCLUSION

This approach is based on a traffic guidance system that monitors traffic and proactively pushes individually-tailored re-routing guidance to vehicles when there are signs of congestion. The system is responsible for several functions such as traffic data representation, congestion prediction, and selection of the vehicles to be re-routed. The rerouting strategies is proposed to compute alternative routes for vehicles. In addition, the traffic guidance system remains useful even with low compliance rate and moderate penetration rate. It shows that how the performance can be tuned by varying parameters such as re-routing method, number of alternative paths, and density threshold.

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