COOPERATIVE DATA DISSEMINATION SCHEME USING VEHICULAR ADHOC NETWORKS

J.Santhiya,
Department of CSE,
Francis Xavier Engineering College,
jsanthiyarajam@gmail.com

S.Dahira Sharin,
Department of CSE,
Francis Xavier Engineering College,
dahira.samadh@gmail.com

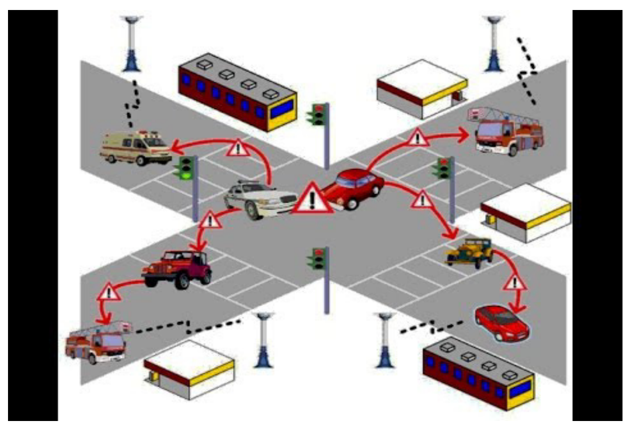
M.Sharon Nisha,
Assistant Professor(CSE),
Francis Xavier Engineering College,
sharonnishafxec@gmail.com

ABSTRACT:

Vehicular ad hoc networks (VANETs) have been attracting interest in recent years for their potential role in intelligent transport systems. Due to node movement and the lossy wireless channels, providing efficient multi hop communication between a source node and a destination node is a well known challenging problem. In addition, it is desirable to enhance data dissemination performance by further exploiting the capacity of V2V communication. The existing system used a distributed TDMA MAC based protocol which provides high energy consumption for delivering warning messages, collision between packet scheduling. So that, the Cooperative data dissemination based scheduling and hybrid location based adhoc routing protocol is proposed in a hybrid infrastructure-to-vehicle (I2V) and vehicle-to-vehicle (V2V) communication environment. The protocol can provide better scheduling for emergency messages. The location of each vehicle can be updated periodically and thus improving the V2V and I2V communications. Here the simulations are done by network simulator2 that provides realistic traffic and communication characteristics and demonstrates the superiority and scalability of the proposed solution.

INTRODUCTION:

Vehicular ad hoc networks (VANETs) are expected to support a large spectrum of mobile distributed applications that range from collision warning and traffic alert dissemination (safety applications), to file-sharing and location-aware advertisements (infotainment). To support such diverse applications, a VANET consists of a set of vehicles, each equipped with one or more application units (AUs) for running applications and an on-board unit (OBU) for wireless communication, and a set of stationary units along the road called road side units (RSUs). The development and operations of VANETs demand reliable and efficient communication protocols to support the wide range of applications. Although communication nodes (vehicles) are organized in an ad hoc manner to form a vehicular network, directly applying existing communication protocols designed for legacy mobile ad hoc networks may not be reliable and efficient. The special characteristics of VANETs, such as the highly dynamic network topology (high node mobility with frequent link breakage) and stringent quality of service (QoS) requirements (for high priority delay sensitive safety messages) result in significant challenges in the design of an efficient medium access control (MAC) protocol. In node cooperation schemes with distributed cooperation decisions are presented. In helper nodes perform dynamic cooperative retransmission to transmit packets to the target receivers during the source node's time slot. In the absence of helper nodes, the source node retransmits the same packet. On the other hand, in helper nodes use their own time slots to relay the failed packets. Application of such cooperative retransmission to VANETs is not straightforward as each node with a time slot must broadcast its neighborhood information to its nearby nodes in every frame, in order to continue using its time slot in the next frame.



EXISTING WORK:

S. Bharati, L. Thanayankizil, F. Bai, and W. Zhuang et al.,2013 "Effects of time slot reservation in cooperative ADHOC

MAC for vehicular networks,"2013. Cooperative ADHOC MAC (CAHMAC) has been proposed to increase the network throughput by reducing the wastage of time slots under a static network scenario.Reserves unused time slots.High delay

X. Liu, C. Chen, A. Huang, and Q. Zhou et al,. "A new TDMA-based cooperative MAC scheme," 2015. This paper proposes a new TDMA-based cooperative MAC scheme for a two-hop relay network in which there are several helpers besides a default relay node. Here, a helper has lower obligation than the default relay to help packet forwarding. It Achieves high throughput performance.It suffer from Rayleigh fading

H. Omar, W. Zhuang, and L. Li et al., "VeMAC: A TDMA-based MAC protocol for reliable broadcast in VANETs," 2013. This paper introduces VeMAC, a novel multichannel TDMA MAC protocol proposed specifically for a VANET scenario. The VeMAC supports efficient one-hop and multihop broadcast services on the control channel by using implicit acknowledgments and eliminating the hidden terminal problem. It reduces transmission collision. The wastage of time slots occurs when there are not enough nodes in a neighborhood to use all the time slots of a frame.

K. Liu, V. C. S. Lee, J.-Y. Ng, J. Chen, and S. H. Son et al "Temporal data dissemination in vehicular cyber-physical systems," 2014. The roadside-to-vehicle communication system in VCPS (vehicular cyber–physical system) is proposed and investigated newly arising challenges of data dissemination. The temporal data dissemination problem called TDD is investigated. Reduces the delay. Maximizes the collision between vehicle to vehicle and roadside-to-vehicle communications

G. M. N. Ali et al., "Admission control-based multichannel data broadcasting for real-time multi-item queries," 2014. The problem of admission control and channel allocation is discussed for real-time multi-item queries in on demand data broadcast environments. Firstly, an admission control scheme ILAC(Item Level Admission Control) is used. Secondly, a bipartite weighted matching model is used for channel allocation. Improving the bandwidth efficiency. Batch slot size increases, the real-time performance of all the algorithms declines

PROPOSED SYSTEM:

Hybrid Location based Adhoc Routing Protocol with Cooperative Data scheduling. Centralized RSU controlled data dissemination over I2V and V2V channels. The RSU delivers scheduling decisions to vehicles, instructing them which channel to tune to and which data to transmit/receive, which enables cooperative data dissemination. Scheduling period is divided into three phases. In the first phase, all the vehicles are set to the V2V mode and broadcast their heartbeat messages, so that each vehicle is able to identify a list of its neighbors. In the second phase, all the vehicles switch to the I2V mode. Each vehicle informs the RSU the list of its current neighbors, and the identifiers of its retrieved and newly requested data items. In the third phase, each vehicle participates into either I2V or V2V communication based on the scheduling decision. Figure-1 shows the system architecture.

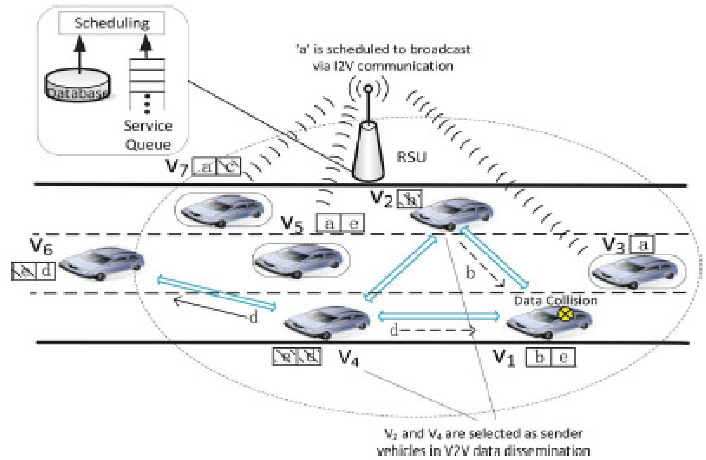


Figure-1

Modules:

The **vehicular adhoc network** consists of vehicles, infrastructure and trusted authority.A vehicle in VANET is considered to be an intelligent mobile node capable of communicating with its neighbours and other vehicles in the network**.** The **neighbor information** will be transmitted between nearby vehicle to transfer the emergency information**.HLAR** combines a modified AODV protocol with a greedy forwarding geographic routing protocol.In HLAR, It uses AODV which is modified with the expected transmission count (ETX) metric to find the best quality route. In AODVETX, vehicles report the broken routes to their source vehicles. The vehicles are allowed to repair broken routes is the aditional functionality. It has cost less power consumption which reestablishes a new source-to-destination route. To calculate the quality (ETX) of their shared links, vehicles need to broadcast small beacon packets periodically. These beacon packets include the vehicle's ID and the current location coordinates. This beacon packet allows vehicles to build their neighbor tables.the neighbour tables include both the neighbor vehicle ID and its current location coordinates. The data dissemination system in the hybrid vehicular communication environment is presented in above figure.The VANET architecture have one control channel and two service channels in the system.The control channel is used for disseminating management information, service advertisements, and control messages. One of the service channels is used for I2V data dissemination, while the other one is used for V2V data dissemination. Single radio OBUs as they are commonly adopted in VANETs due to both deployment and economic concerns. Therefore, vehicles can tune in to only one of the channels at a time.

REFERENCES :

[1] S. Bharati, L. Thanayankizil, F. Bai, and W. Zhuang, "Effects of time slot reservation in cooperative ADHOC MAC for vehicular networks," in Proc. IEEE ICC, June 2013

[2] X. Liu, C. Chen, A. Huang, and Q. Zhou, "A new TDMA-based cooperative MAC scheme," in Proc. Int. Conf. Telecomm., Apr. 2015.

[3] H. Omar, W. Zhuang, and L. Li, "VeMAC: A TDMA-based MAC protocol for reliable broadcast in VANETs," IEEE Trans. Mobile Comput., vol. 12, no. 9, pp. 1724–1736, Sept. 2013.

[4] K. Liu, V. C. S. Lee, J.-Y. Ng, J. Chen, and S. H. Son, "Temporal data dissemination in vehicular cyber-physical systems," IEEE Trans. Intell. Transport. Syst., vol. 15, no. 6, pp. 2419–2431, Dec. 2014

[5] G. M. N. Ali et al., "Admission control-based multichannel data broadcasting for real-time multi-item queries," IEEE Trans. Broadcast., vol. 60, no. 4, pp. 589–605, Dec. 2014

CONCLUSION:

Node cooperation for TDMA MAC, such as CAHMAC, suffers from cooperation collisions, thus disrupting the normal operations of the TDMA MAC. A collision avoidance scheme for the CAHMAC protocol, is referred to enhance Cooperative data dissemination scheme using vehicular ADHOC Network , for vehicular communication network. In Cooperative Data Dissemmination Scheme , the cooperative relay transmission phase is delayed, so that cooperation collisions can be avoided. It uses available bandwidth resource efficiently in the presence of time slot reservation attempts, which is a consequence of vehicular network dynamics, improving the performance of node cooperation at the MAC layer protocol. Our analysis shows that effectiveness of node cooperation decreases with an increase in the number of nodes mainly due to increase in the number of reservation attempts. However, as contending nodes are allowed to reserve time slot despite of the scheduling of cooperative relay transmission, this project does not disrupt the normal operations of the TDMA MAC.