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An Admission Control Algorithm of V2I Communication with Non-Classical Traffic

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Vehicular Ad-Hoc Network (VANET) has become a promising technology that are going to boost the future communication System. The existing protocols of ad-hoc networks are inappropriate for VANET due to its dynamic nature. Therefore more and more research is required to study and analyse the traffic and protocol should be developed for efficient utilization of system resource. This research work admission control algorithm derived from dynamic guard channel scheme has been proposed in V2I communication. The method reduced the probability of forced termination of handoff flows and the blocking probability of new flows as compared to the fixed guard channel allocation scheme.

Keywords : Non-Classical Traffic, Quality of Service (QoS), Roadside Unit (RSU), Vehicle to Infrastructure (V2I), Vehicular Node (VN).

1. INTRODUCTION

With the advancement of technology, Ad-hoc Network is becoming a latest mode of communication with anywhere anytime service. To cope up with the demand the future wireless networks will combine high speed vehicles for communications with the present Internet infrastructure to communicate, access information, transact business, and provide entertainment. The demand of Internet connectivity is increasing exponentially, multiple services (like internet, multimedia applications) as well as better Quality of Service (QoS) are on high demand but the resources are limited.

The future of wireless ad-hoc network will face the challenge to combine high-speed mobile vehicular communications with the present Internet infrastructure to provide multiple services when they are moving. V2V and V2I communications allow the development of a large number of applications and can provide a wide range of information to drivers and travelers. Integrating on-board devices with the network interface, different types of sensors and GPS receivers grant vehicles the ability to collect process and disseminate information about itself and its environment to other vehicles in close proximity to it. That has led to enhancement of road safety and the provision of passenger comfort. Hence, traffic engineering is required to support different applications as they have different service requirements. For optimum performance, researchers and engineers must devise efficient techniques for mobility management and resource allocation to meet next generation demand.

In VANET technology a vehicle can communicate other vehicles as well as with nearby RSU. Therefore when a vehicle moves from on RSU to another, an handoff occurs. During the handoff, the connection between the mobile vehicles and its access network may suffer if the channel is not available in the neighboring RSU at the exact time of handoff. This may forcefully terminate the ongoing link. Therefore to achieve better QoS the handoff requests are to be handled delicately enough to make it covert to the users.

Lot of work has been done on handoff process in wireless ad-hoc network [1-21]. Kuan-Lin Chiu *et al.,* developed a technique, termed WiMAX Mobile Multihop Relay (MMR)[1], to reduce the handover latency. Two antenna scheme has been proposed in [2], to achieve smooth handoff. This

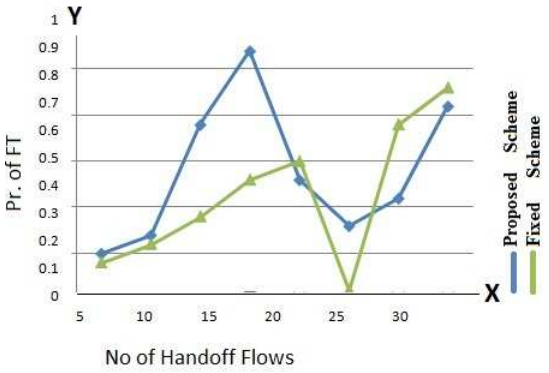

Figure 3. Plot of Handoff Drop Count with Fixed and Proposed Scheme

4. RESULT AND DISCUSSION

The parameters namely, probability of forceful termination of handoff flows, blocking probability of new flows and total drop are measured. Comparison has been drawn between static and dynamic guard channel scheme. Data collected from simulation are given in Figure 2, 4 and 6. Probability of forceful termination of hand off flows with static and proposed scheme are shown in Figure 2 and Figure 3. Number of new flows blocked with static and proposed scheme are shown in Figures 4 and 5. Total number of dropped flows with static and proposed scheme are shown in Figures 4 and 5.

5. CONCLUSIONS

This research paper, an admission control algorithm has been proposed with non-classical traffic. The arrival pattern of the data has been considered as Gamma distribution. The novelty of this method is dynamic guard channel for hand off flows. The generic value of C_{ga} based on real time availability of data, overcomes the conservative nature of fixed guard channel scheme. Thus achieving a better QoS. Empirical studies of the result shows a better outcome in terms of reduced probability of forced termination of handoff flows(P_B) as well as the blocking probability of new flows(P_{FT}). The method is easy to implement due to the availability of the information like number of ongoing flows, total number of channels and the status of the channels at any point of time.

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