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Priority Based Congestion Control for VANET: Review

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Abstract: A Vehicular Ad-Hoc systems (VANETs) are know-how that advantages moving vehicles as nodes in a mesh to conceive a mobile network. VANET turns every taking part vehicle into a wireless router, allowing vehicles of each other to attach and conceive a network with a very wide kind. VANETs are developed for enhancing the driving security and solace of automotive users. The VANETs can supply broad kind of services such as Intelligent Transport System (ITS) e.g. security submissions. Numerous of security applications constructed in VANETs are needed real-time attachment with high reliability. One of the major trials is to bypass degradation of communication passages in dense traffic network. Many of enquiries proposed that befitting congestion control algorithms are wholeheartedly vital to supply efficient operation of a network. Whereas, most of congestion control algorithms are not actually applicable in VANET. In this paper we suggest priority based congestion control algorithm as answer to avert congestion in VANETs natural environment. We also study the production of proposed priority based congestion control algorithm for VANET in difference congested scenarios. The effectiveness of the proposed priority based congestion control algorithm is considered through the hardware and conclusions will be shown on .net. This new conceive is alleviated congestion in network, increases the throughput and package consignment ratio and furthermore minimize delay. This scheme is furthermore sophisticated network effectiveness founded on consignment of packets.

Keywords: Vehicular Ad Hoc Network (VANET) Microcontroller, Bluetooth IEEE 802.11, .net, packet delivery ratio.

I. INTRODUCTION

A vehicular ad hoc Network (VANET) may well be a technology that uses moving cars as nodes throughout a network to create a mobile network. VANET turns every collaborating automobile into a wireless router or node, allowing cars around a hundred to a few hundred meters of each totally different to connect and, in turn, manufacture a network with a decent vary. As cars fall out of the signal vary and drop out of the network, totally different cars can participate, connecting vehicles to a minimum of each other so as that a mobile web is created. It's numerable that the first systems which are able to integrate these technology ar police and hearth vehicles to talk with each other for safety perform.

A vehicular ad hoc Network (VANET) play an important role in future car-to-car communication systems and connected applications like self-organizing traffic information systems (SOTIS), that square measure supported broadcast transmission schemes. Congestion management for VANETs has not been studied all to this point - but this feature is awfully necessary for VANET applications and network performance. As a result of the top quality and so the following very dynamic constellation, congestion management should be performed terribly very localized and self-organized manner, domestically in each VANET node.

VANET is nothing but a Wireless sensor network (WSN) consists of spatially distributed autonomous sensors nodes handy and glove monitor physical or environmental conditions, like temperature, sound, pressure, light. The detector nodes of a WSN

sense the physical phenomena and transmit the information to base stations. At a lower place ancient load condition the knowledge traffic among the network is light-weight. Once an occurrence happens, the load becomes serious and so the data traffic conjointly can increase. This might presumably cause congestion. There square measure primarily two causes for congestion in WSNs. the first case is Node level congestion is occurred at particular node when the packet inter arrival rate is greater than the scheduling rate, this result in packet loss, increasing queuing delay and requires retransmission of packets. The second case Link level congestion is occurred due to channel contention, interference, packet collision due to accessing transmission medium simultaneously by multiple active sensor nodes. There square measure such plenty of other techniques to manage the congestion. In this paper we've an inclination to square measure giving priority to the nodes supported the time and data parameters.

This paper aims to develop priority based congestion control algorithm to provide reliability and to minimize packet drop ratio and long delay. Finally, the performance of priority based congestion control algorithm will evaluate through the hardware interface with software .net.

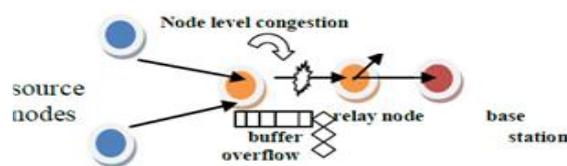


Fig.(1) Node level congestion

II. LITERATURE REVIEW

Dharmendra Sutariya(March 30, 31, 2012)[1] Vehicular ad hoc Network (V ANET) could be a new communication paradigm that permits the communication between vehicles on the road network that falls in a pair of categories: 1) Vehicle to Vehicle (V2V) Vehicle to Infrastructure (V2I). varied approaches of information dissemination in transport Network unit accustomed inform vehicles relating to dynamic road traffic condition for achieving safe and economical transportation. throughout this paper, He propose a routing protocol IAODV (Improved AODV) That ensures giving timely and proper data to drivers in V2V communication compare to AODV protocols in city eventualities of transport uncaused networks. planned IAODV is printed as restricted provide routing up to a pair of hops with backup route between provide node and destination node. The performance of the planned IAODV protocol is compared with basic AODV protocol in terms of Avg. End-to-End Delay, Packet magnitude relation, Packet Delivery relation and Normalized Routing Load.

S.Sridevi(Jan.10–12,2012,)[2] Congestion happens once too many sources unit of measurement inflicting an excessive quantity of data for network to handle. Congestion in Associate in nursing extremely wireless detector network can cause missing packets, low energy efficiency and long delay. A detector node may need multiple sensors like light-weight, temperature etc., with fully completely different transmission characteristics. Each application has fully completely different characteristics and wishes in terms of transmission rate, bandwidth, delay, and packet loss. Differing types of data generated in heterogeneous wireless detector networks have fully completely different priorities. In multi path wireless detector networks, the data flow is forwarded in multiple ways in which to the sink node. it is vital to appreciate weighted fairness for many WSN applications. Throughout this paper she proposes a priority based congestion management for heterogeneous traffic in multi path wireless detector network.

Chonggang Wang1 (May-June 2006)[3] In this paper they have gift a top level view for transport protocols for Wireless detector Networks (WSNs). They initial highlight the distinctive aspects in WSNs, and describe the elemental customary and challenges of transport protocols moreover as energy-efficiency, quality of service, trustiness, and congestion management. They then provides a define and comparison of existing transport protocols for WSNs. Finally, they discuss several open problems

Bhagwat, P. (May/June 2001) [4] Bluetooth, a technology named once a 10th-Century king who brought belligerent Viking tribes below a standard rule. The Bluetooth specifications (currently in version one.1) define a radiofrequency (RF) wireless communication interface and thus the associated set of communication protocols and usage profiles. The link speed, communication vary and transmission power level for Bluetooth were chosen to support low cost, power-efficient, single-chip implementations of this technology. In fact, Bluetooth is that the initial strive at making a single-chip radio which is able to operate inside the combine of 2.4-GHz ism (industrial, scientific and medical) RF band. Whereas most early Bluetooth solutions are dual-chip, vendors have recently declared single-chip versions likewise. Throughout this outline of the technology, I initial describe the lower layers of the Bluetooth protocol stack.

III. AIM OF THE PAPER

This paper aims to develop priority based congestion control for much real time application especially in wireless communication such as in VANET. For overcoming the problems occurring due to congestion in a network .such as delay minimization, packet loss minimization, congestion avoidance.

IV. WORKING METHODOLOGY

Based on the on top literature review it's clear that a congestion occurring throughout the information transfer in an exceedingly specific network inflicting a packet loss and long delay. Therefore we have a tendency to attempting to improvise this on mistreatment priority based mostly technique and management the congestion supported priority. Vehicular ad hoc Network (VANET) permits the communication between vehicles on the road network that falls in a pair of categories: 1) Vehicle to Vehicle (V2V) Vehicle to Infrastructure (V2I). Varied approaches of information dissemination in transport Network. In this paper we are using vehicle to infrastructure category. In which there is one master node which is connected to the personal computer (PC) while other nodes will act as a slave which is shown in fig.(2).Here Bluetooth (IEEE 802.11) is use as wireless module for communication purpose in localised network, and for sending data we have to take data from some where so we are using temp sensor. Here temp sensor, microcontroller, wireless module and battery showing one single wireless node.

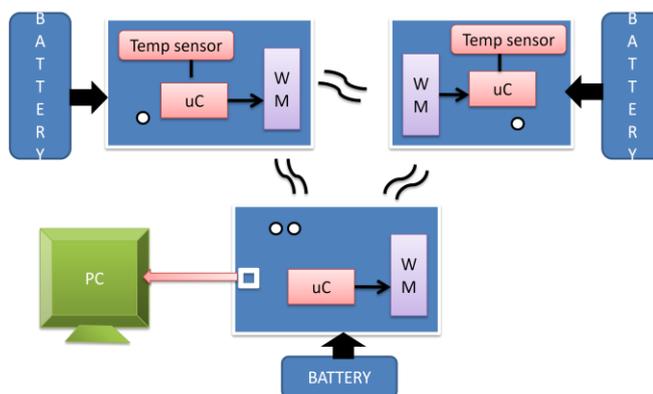


Fig.(2) Basic block diagram of Wireless sensor network

First we have a tendency to don't seem to be victimisation any protocol for congestion management simply to indicate however congestion happens .in which at a time two or additional devices hiring one single device .because of that there's a loss of packet and time delay. if one device causing knowledge to a different device which device isn't causing acknowledgment at intervals the edge price that what we've set before then it shows that there's delay. Hence to boost this we have a tendency to area unit victimization the priority primarily based congestion control protocol within which we are going to set the priority in line with there importance so packet loss ratio are minimize and time delay ratio also will minimize.

System Architecture:-

Fig.(3) represents the system architecture of the proposed work. The Congestion Detection Unit (CDU) calculates the packet service ratio. When the worth of package service ratio is less than 1, it shows congestion. With the help of Rate adjustment Unit (RAU), each parent node allocates the bandwidth to the child nodes according to the source traffic main concern and transit traffic main concern. The Congestion Notification Unit (CNU) benefits an implicit congestion notification by piggybacking the rate data in its package header. All the progeny nodes of a parent node overhear the congestion notification information.

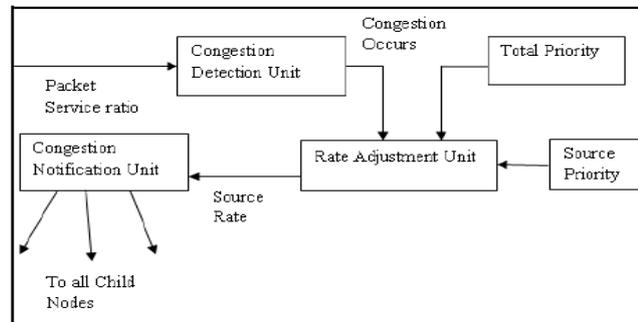


Fig.(3) System architecture

We have proposed following modules for priority based congestion control:-

1. Discovery Phase (sustaining database of every node in the network).
2. Priority Decision Module to conclude the priority of the incoming packets founded on delivery time, delivery position, of packets(i.e , urgency of packets).
3. Congestion Control Module to avoid congestion on a multi route of data.

1. Discovery Phase:-

In this stage, Node 0 finds closest friends and makes a handshaking with those neighbours, and maintains Database of those associates. These associates find their nearest associates, make handshaking with them and sustain database. This method wills recurring until all the nodes discovered out in the network. Eventually node 0 sustain database of all nodes in the mesh, and circulate this database to all nodes. This innovation procedure helps all nodes renowned to each other (contemplating position of each other).

2. Priority Decision Module:-

Base station has granted priorities to heterogeneous traffic. Each queue has its own priority. It is called inter queue priority. Scheduler agenda the line according to inter queue priority. It decides the service order of the data packets from the lines and organise the line according to their priority. Facts and figures with higher priority to get higher service rate. Path data (transit traffic) has higher priority than originating data (source traffic). Because route facts and figures have currently crossed from multiple jumps, if route data decrease determinants more wastage of network resources than that of source data. Classifier in mesh level allotted priority to these traffic founded on source address in the package header.

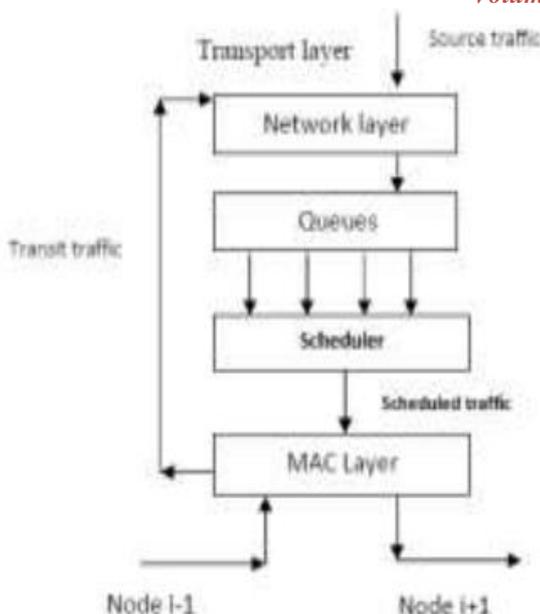


Fig.(4)Priority Decision Module

3. Congestion Control Module:-

Congestion control Module comprise of three constituents: Congestion detection phase , if Scheduling rate is greater than the mean package service rate i.e. package service ratio is less than 1, it indicate congestion. Rate adaptment stage, PBCCP protocol adapt rate at source node by controlling arranging rate of node. Congestion notification stage, piggybacking rate data in its package header and send to all child nodes.

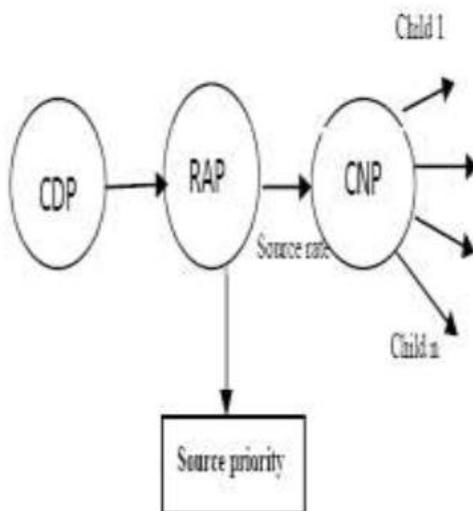


Fig.(5) Congestion control module.

Here we used packet service ratio for detecting the congestion and perform multipath routing. Our proposed work is evaluated performance of mesh through metrics: throughput, delay, packet delivery ratio. Packet delivery ratio: Number of packet without decrease of information (without packet corruption) obtained to destination node.

Delay – Delay should be calculated as

Delay = Current time – send time.

Throughput: Total Number of packets send from source and total number of packets received to destination .

V. CONCLUSION

In our proposed system Priority Based Congestion Control Protocol (PBCCP) will improve network throughput as well as packet delivery ratio and minimize delay. We have calculated delay using parameter current time at which the receiver received packets and send time of the sender and assigned the random priority to packets. We will evaluate performance of network through metrics: throughput, delay, packet delivery ratio.

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