Published by :
http://www.ijert.org

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 10 Issue 05, May-2021

V2V Communication using fog Computing for Safe Commute

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Abstract:- **In this real-world, there will be a huge necessity to satisfy the demands in all the communication systems to experience the best ever convenience and flexibility. Development in the IoT concept in the form of IoV has been a method to overcome all the difficulties experienced during driving vehicles. Today. The potential of IoV addresses many challenges of traffic monitoring and road safety measures by forming a distributed network of vehicles and collaborate between heterogeneous vehicular systems. In this project what IoV refers means the integration of networks that transmit information time to time between vehicles to vehicles, vehicles to roadside units and it is designed to play an essential role in this? The prevailing solutions like VANET, Vehicular Cloud Computing (VFC), and Mobile Cloud Computing are not at all ideal as there is high latency and delay in responsiveness. The collaboration of vehicular networks and fog computing forms a promising paradigm called Vehicular Fog Computing (VFC) which serves as a effective yet alternative method for VANETS's. This paradigm consists of multiple near-end devices to carry out communication and computation of every vehicle. This application presents few scenarios of moving and idle state of vehicles by adapting VFC methods, wherein as a result of this communication and computation infrastructure, it showcases the capabilities of VFC. The motive here is to gift four totally different scenarios of a vehicle in motion and in idle state, which brings out a stimulating relationship between the communication capability and property of the vehicles.**

Keywords: Internet of Things (IoT),Internet of Vehicle (IoV) ,Vehicular Cloud Computing(VCC), Vehicular Fog Computing(VFC)

I. INTRODUCTION

One-day traffic accidents have been a leading cause of unnatural and premature deaths around the world today. This can be one of the most important life problems around the world. With the advent of good technology, there is a risk of providing timely and better medical or emergency services that can help the American nation save the lives of people affected by accidents. In fact, there are many incidents where the driver has health problems while driving, such as: B. Health ups and downs that can lead to death. The concept of cloud computing was developed by Cisco in 2015. Fog can be a low-power communication medium that expand the services provided by the cloud the stitch of the web. In relation to the way in which the cloud manages information computing, storage and application services for end customers; fog also does the same [3]. In fog computing, design, storage and application information is distributed geographically, not as in the cloud [2]. The main purpose of Fog Computing is to extend the cloud closer in IoT devices to provide quality of service and assistive technology that require high mobility, responsiveness and lower latency. Therefore, you reduce the information traffic that is sent to the cloud server during processing. This framework uses peripheral devices to perform a generous amount of processing, storage, and communication that is relayed across the country. than the spread of cloud computing. The fog layer is made up of tons of different edge nodes that are instantly connected to user devices. In Figure 1, all fog nodes are much closer to the end devices than to the cloud [2]. This is often why Fog Nodes provide instant connections for faster processing. faster computing for more data. The purpose here is to support intensive IoT applications that require lower latency. In addition, it acts as an intercessor between remote servers and hardware and regulates which knowledge is sent to a central server and which knowledge is processed nationally within the near edge nodes. The computation is that the user devices that are in close proximity to the fog nodes send their data over the direct link, which is the D2D (device-to-device) interaction on a network. In this way, the fog acts as an intelligent gate that decides Data processing mode and also offers efficient storage and analysis of information.

II. LITERATURE SURVEY

Literature survey in a really very mission document is that phase that suggests the diverse analyses and evaluation created in the sphere of your hobby and thus the effects already published, taking into concept the diverse parameters of the mission and consequently the volume of the mission. Thus, the foremost crucial segment of report because it provides an insight to our researchIt allows you put a intention in your analysis - for this reason deliver you collectively with your disadvantage statement. When you write a literature evaluate in recognize of your project, you've got got should jot the researches created with the aid of using numerous analysts - their methodology (which is essentially their abstract) and consequently the conclusions they have got arrived at. you want to at the same time provide Associate in Nursing account of however this evaluation has stimulated your thesis. Literature review is a form of writing of a studious test, that has this data in conjunction with substantive findings, additionally as theoretical and technique donates to a selected topic. Literature searches are secondary sources and do not report new or original experimental work. When it comes to academically oriented literature, such reviews are mostly found in professional journals and do not seem to be confused with book reviews, which also appear identical. The literature research is a basis for analysis in almost all academic fields. In addition to preparing a thesis or a dissertation, the creation of a literature review can also be the work of district graduates and doctoral students.

1] Anusha, Syed Musthak suggests explaining the vehicle detection and towing system using advanced technology and explaining how to view vehicles moving from one place to another to confirm safety. Technology using the embedded C language communication form and jointly developed entity via LPC2148 and its super database storage options. Here the work

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
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includes the Global Positioning System (GPS) and the Global Mobile Communication System (GSM) for vehicle tracking and searching. SIM800 victimization module. The GPS reports in relation to this electronic vehicle computer. GPRS sends the tracking details to the server and thus a generated notification message is sent to the vehicle owner. This content is implemented in the vehicle, the location of which is projected onto the cyber website and monitored in real time. If the device drives the vehicle in the wrong lane, the notification message will be sent from the projected system to the vehicle owner's mobile phone. If the driver feels drowsy or drunk,The buzzer also generates the warning tone. The projected technique examines the traveler's safety through victimization. The alcohol device detects the position of the driving force and the temperature sensor detects the temperature of the vehicle engine to avoid sparks from the vehicle and prevent a disaster.

2]. Mohammad Ahmar Khan Sarfraz Fayaz Khan says the Associate Degree Automatic Vehicle Examination intended to be an Associate Degree, a terribly stressful condition in gift years. You will increase the likelihood by implementing the following application methods. Vehicles first of all an explicit regulation and immediately inform individual authorities.The number of accidents has increased, so there is a need to develop a system that recognizes the degree of speed associated with vehicle speed. It can record, store and exchange information about the speed of the vehicle. The system includes GPS module, radar, Google Maps and IoT module.Safe regions are known for the automatic misuse of GPS and IoT technologies. The electronic tracking device is powered by twelve V Li batteries with a GPS detection network and an IoT implementation. The battery life of this device is 5 to 10 hours. combined with IoT to slow down vehicle speeds in certain places, e.g. B. with accident prone.

3] Dr. Sasi Kumar, Soumyalatha and Shruti G Hegde talk about many of us who lose our necessary lives in car accidents every day due to traffic, road conditions and speed. Completely different parts or positions of the vehicle. With the victimization GPS antenna and the latest Internet of Things technological considerations, accidents are generally reported quickly, reduced, and lives are generally saved. Connecting completely different types ofSensors in the hospital or in the car are usually made available to the person injured in the accident. During this work, we connected completely different sensors to the vehicle that notify registered members of every accident. During this planned system, the tilt device is used to observe the accident caused by the tilt, and the vibration device is used to detect the accident when there is strong vibrationDue to the road conditions from the car, the infrared device is used to notify if the vehicle is simply preparing too much for another vehicle or obstacles.

4] Dr. Sasi Kumar, Soumyalatha and Shruti G Hegde talk about different people who lose their lives every day in car accidents because traffic, road conditions and speed, elements or positions of the vehicle are completely different. By using the GPS antenna and the latest technological thinking of the IoT, accidents are immediately reported, reduced and human lives are saved. connect completely different types of sensors for hospital or immediate treatment are often administered to people with concussions during the accident. During this work we designed and implemented by connecting completely different sensors to the vehicle that notify registered members of any accident. The location is sent to a registered user. In this projected system, the tilt detector is used to observe the accident caused by the tilt, and the vibration detector is used to detect the accident when there is a problematic vibration of the vehicle. Based on the road condition and the infrared detector, a report is made as to whether the vehicle is intended exclusively for another vehicle or obstacles.

5] Nikhil Kumar and Anurag Barthwal say that the traffic accidents in most countries will require inexpensive and reliable technology that fits every vehicle type and is illustrative and reported in traffic accident incidents. The work aims to provide an IoT system that uses built-in sensors from a smartphone to correctly record traffic accidents. NHTSA (National Highway Traffic Safety Administration). In addition, these data sets are used to train citizens and take a look at our accident prediction models. This predictive performance turned out to be very correct with a MAPE of 2.34p. And 3.49 percent for the data sets used.and not as an independent document. Please do not revise any of the current designations.

III. PROBLEM DEFINITION

In the current system, vehicle detection takes place through the installation of systems that are mainly based on Mobile Cloud Computing (MCC). The storage and calculation processes of the mobile nodes are assigned to alternative units. They can be placed on the net. allows any alternate mobile node to access and enjoy the information, including data retention and calculations performed by a central entity similar to an RSU for transportation applications. low memory and low machine capacity. MCC enables mobile devices to access powerful machine resources.

IV. PROBLEM STAEMENT

We often see the people closing down have to volunteer to call emergency services if there is an accident with a nurse or a health problem for the driver of the vehicle. Hence, there is a delay for the emergency services to come to fruition in the accident and provide the necessary medical care that can even result in the death of elderly people found through accidents or health problems. In addition, there is currently no technology to immediately detect the vehicle's flames or smoke when the prime mover is driving the vehicle.

V. OBJECTIVE

The objective here is to gift four completely different eventualities of a vehicle in motion and in idle state that brings out a motivating relationship between the communication capability and property of the vehicles.

VI. MOTIVATION

The main motive of developing this application of fog computing is that the user devices that are in the closest proximity of the fog nodes send their data using the direct link which is Device to Device (D2D) interaction in a network. In this way, fog acts an intelligent gateway which decides the mode of data processing and also provides efficient information storage and analysis.

VII. DRAWBACK OF THE EXISTING SYSTEM

- Existing system is not practical. This process is not very much efficient.

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
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- Time consuming
- Less reliable because it relies on the performance of the communication infrastructure.

VIII. METHODOLOGY

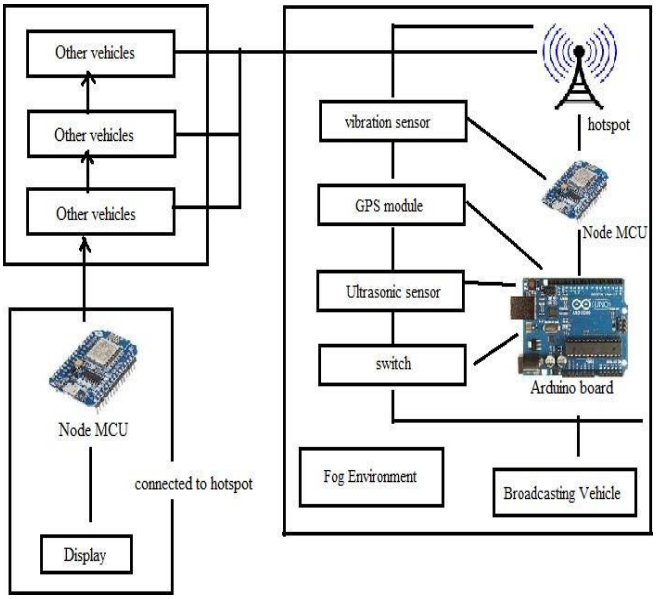
In this application we are using Arduino, 3 Node MCUs, GPS Module, GPS Antenna, Vibration sensor, Ultrasonic sensor, Switch and LCD Display. Here Arduino along with Node MCU is the main component of this system. All the sensors here used for following purposes: and GPS Module to test the idle state of the vehicle in case of any emergency, Vibration and Ultrasonic sensor are used to detect the hump and pot holes, whereas the switch button is used here to press if there is any kind of emergency, LCD show that is employed to show the information that is already returning from the sensors.

Arduino will create its own hotspot and hence it acts as an infrastructure less network Infrastructure less network is nothing but they must be capable to creating their own network and must allow other devices to connect to it. To make every device to connect to the network. The network must serve as the access point, whereas other devices must start connecting to the network and also it will start to exchange data between them. In order to exchange the sensor data from one Node MCU to other Node MCU here the protocol used is Message Queuing Telemetry Transport MQTT protocol is very easy, lightweight an instant message delivery protocol used for exchange of information between the device and the clients. It is the most widely protocol in machine to machine for communication. MQTT will make wearable, cars and all most of the devices to publish/send information about a topic to another and the information are already subscribed to the topic. Here, topic can be any message/command or anything for that matter. In order to transfer data, machine has to subscribe the topic.

Here, Arduino itself acts as a server and data is communicated to all nearby connected devices. In addition to this IoV system itself creates a MQTT queue and must start publishing it by maintaining its own queue. Their also should be other subscribers which are connected to the same queue. A unique name is given so that the other subscriber devices are connected to it.

Here,

- IoV system connected with all the sensors acts as its own access point.
- Node MCU creates its own self hotspot where other devices can connect and within the hotspot it should publish MQTT queue.
- IoV system creates MQTT queue and wait for subscribers to access that queue.
- Subscribers subscribes to the topic and access data from the queue.



IX. HARDWARE AND SOFTWARE REQUIREMENTS

SOFTWARE REQUIREMENTS:

- Visual studio.net
- C#, Java language
- Windows OS
- Internet
- Arduino IDE
- Android Studio

HARDWARE REQUIREMENTS:

- Camera
- Node MCU
- GPS Module
- RF Module
- LCD

X. EXPECTED RESULTS

Here, Arduino itself acts as a server and data is communicated to all nearly connected devices. IoV system will only create a MQTT queue and it will start publishing it by maintaining its own queue. In additional to this there will also be other subscribers too, which are connected to the same queue. And also, a unique name is given so that the other subscriber devices are connected to it. Here, IoV system connected with all the sensors acts as its own access point. In addition to this Node MCU should create its own self hotspot that independent hot spot where other devices can connect and within the hotspot it should publish MQTT queue. And also, IoV system creates MQTT queue and wait for subscribers to access that queue subscribes to the topic and access data from the queue.

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International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 10 Issue 05, May-2021

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