International Journal of Modern Agriculture
ISSN: 2305-7246
Volume 9 Issue 3, 2020

Vehicle Control System Using VANET

J.Roselin Suganthi#1,J.Swapna#2

[1]*Assistant Professor, Department of ECE, K.Ramakrishnan College of Engineering, Samayapuram, Trichy, Tamilnadu, India*

[2]*Assistant Professor, Department of CSE,Vel Tech RangarajanDr.Sagunthala R&D Institute of Science and Technology, Chennai,Tamilnadu, India*

1rose0889@gmail.com

2jswaapna@gmail.com

***Abstract*—**In recent days, the usage of automobiles is increasing. The rules of the traffic have to be followed compulsorily. The violation of traffic rules has to be monitored by the government. Traffic accidents are met by people due to violation of traffic rules. This problem is solved by VANET which has the great potential to improve road safety and thereby reduce road congestion. The traffic authority has monitored the traffic rules with the help of wireless technology system which is another growing industry. Intelligent Transportation System (ITS) introduced VANET to create safer road transportation. The paper proposed Vehicular Ad-hoc Networks (VANET) to reduce traffic problems with low delay and high reliability. Secondly it covers the secured authentication over the networks. This paper gives solution t the fraudulent users of traffic rules and the victim has been given proper punishment by the law and the order. The crime rate due to traffic violation can be reduced by this effort

Keywords: Intelligent Transportation System, Vehicular Ad Hoc networks (VANET),On Board

I. INTRODUCTION

Vehicles are one of the transportations by means. Intelligent Transportation System (ITS) is one of the most efficient management of transport and thereby minimizing the traffic problems. Vehicles exchange traffic information through wireless communication. ITS is diverse and developing applications such as service related to transport and traffic management connected by the works of Machine-to-Machine communication, Vehicular ad-hoc networks (VANET), Internet of Things (IOT) etc. The aim of ITS is to provide safety and enhance traffic flow. VANET is one of the types of Mobile Ad-hoc networks (MANET) and they are used to participate in vehicles in wireless connection by networks[5]. VANET provide security services such as curved speed warnings, emergency vehicle warnings, traffic violation warnings and road condition warnings. VANET communication is a transmission of information from Vehicle-to-Vehicle(V2V), Vehicle-to Infrastructure(V2I) and Infrastructure-to-Infrastructure(I2I). VANET consists of three types of units are On-Board Unit (OBU), Roadside Unit (RSU) and Trusted Authority (TA). On-Board Unit (OBU) in the vehicle is used to transmit the data to each vehicle. It measures the physical parameters such as speed, acceleration, moving direction and distance between the surrounding vehicles. It detects the violation of the traffic rule such as vehicle crossing the red-light traffic signal.RSU are movable communicate to the infrastructure, which uses a DSRC protocol[1]. VANET has high mobility and volatility, so thereby occur a security attack internally and externally. The main objective of this paper to design the VANET by security challenges in traffic violation in vehicles provided low delay performance and high reliability and secured communication throughput the networks. VANET routing protocols are needed to be designed for the purpose of security, reliability and mobility of

vehicular communication. In this paper simulation is done by NS2 simulator for simulation of routing protocols over wired and wireless communication.

II. RELATED TECHNIQUES AND TECHNOLOGIES

In this section, Existing System on preventing accidents, vehicle controlling has been reviewed to summarize the existing system.

A. *Traffic patrols*

The number of traffic accidents are firstly reduced by the approach of human participation. They limitedthetrafficviolationsbythetrafficpatrols.Traffic patrols are the police created to monitor the road safety functions like traffic enforcement, emergency responses and rules ofthe roads. Exactness in verifying the number plate is not authorized.[2]

B. *Automatic traffic monitoring system using computer vision*

The Surveillance cameras are used to check the number of vehicles count and speed violation detection The Surveillance cameras are used to check the number of vehicles count and speed violation detection. They cover only a small fraction of roads.

C. *RADAR System*

In this case cameras are installed over the roads by radar-based system to avoid the collision and to improve reliability and security on roads[3]. They used the transponder which is fixed over every vehicle and checks the transmitting and receiving signals. They are very expensive and very large network structure which is collected by central server.

D. *SAHER System*

In this system video cameras are installed over the common place on the pole of the pavement or inside the vehicle to recognize and tabulate the traffic violation. Even though there are a large number of roads and streets which are unable to monitor full networks.[4]

III. SYSTEM ARCHITECTURE

In this system proposes a hardware unit and the simulation for analyzing the network infrastructure. The hardware system consists of embedded unit such as On-BoardUnitwhichisfixed onthevehicle. On-Board Unit consists of wireless transmitter and receiver for sending the information about the traffic violation to the Intelligent Transportation System (ITS). OBU can communicate their information to RSU and other OBUs. ITS receive the messages of surrounding vehicles using VANET protocols in adhoc fashion which calculates speed, acceleration and position[9]. Road Side Unit (RSU) is computational devices placed alongside the road or in particular location for the purpose of connecting to passing vehicles based on Dedicated Short-Range Communication (DSRC) of IEEE802. 11p.Trusted Authority will enhance the entire VANET architecture by providing registration of RSUs, OBUs and eachvehicleuser.Trafficinformationarecollectedthrough the RSU and vehicle information through the Hybrid ITS and this information are transmitted to the server. Route manager route the information to the vehicles through hybrid Intelligent Transportation system (ITS).

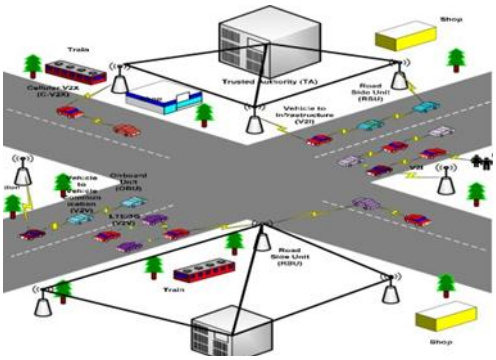

Fig 1 System Architecture of VANET Communication

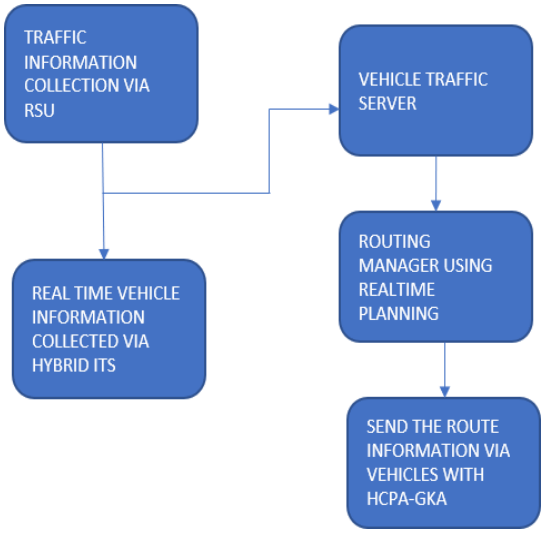

Fig 2 Block diagram of VANET Architecture

IV. SYSTEM ALGORITHM

Our system proposed with Data Encryption Standard (DES) algorithm is a complete description of mathematical algorithms for encrypting and decrypting the information. Data to be encrypted is converted into unintelligible form called cipher. Decrypting cipher converts the data back to the original form called plain text. The Algorithm specifies both enciphering and deciphering on a binary number called a Key.DES algorithm consisting of 64 bits ("0" s or "1" s) where the 56bitsarerandomlygenerated other8bitsareusedfor error detection. Authorized user of encrypted computer data must have a key that can be used for enciphering the data in order to decipher it[7]. Security of the data is used to provide for the key by using encipher and decipher the data. Data can be recovered from cipher only by using exactly the same key used to encipher it. If one who knows the key alone decipher the cipher and gets the original data. Unauthorized user cannot easily drive the original data.

The DES operation, single key algorithm is used for encryption and decryption process using symmetric private key. The data to be encrypted(plaintext)consistof64bitsandafterinitial permutation, they splitted into R0 and L0 of each 32bits of length. After 16 rounds of processing R16 and L16 as outputs for the final permutation's is based on Feistel cipher, Round function, Key Schedule, Initial and Final permutation.[8]

The algorithm consists of 16 rounds of encryption, each round has different keys. Therefore,16 keys are generated. Encrypting the plaintext to cipher text and finally decrypting a cipher text to obtain a plain text.

A. *Steps for proposed DES design*

Steps for designing an algorithm that takes a 64bits of parity bit into cipher56bits.

The cipher text is divided into two equal halves right shift and left shift circularly where 1,2,9,16 round is shifted by 1 and others are shifted by2.

After entering into expansion permutation box they are done by XOR function to get the round 1 output with 48bits.[4]

This output will be the next input and progressively up to 16 rounds. Here substitution box involves 8S boxes, each with 8 bit input and 6 bit as output.

v)Key generator creates sixteen 48 bitkeys.To produce a 56bit cipher key.

vi). Dual authentication and key management techniques provide security over the vehicular as hoc network.[5]

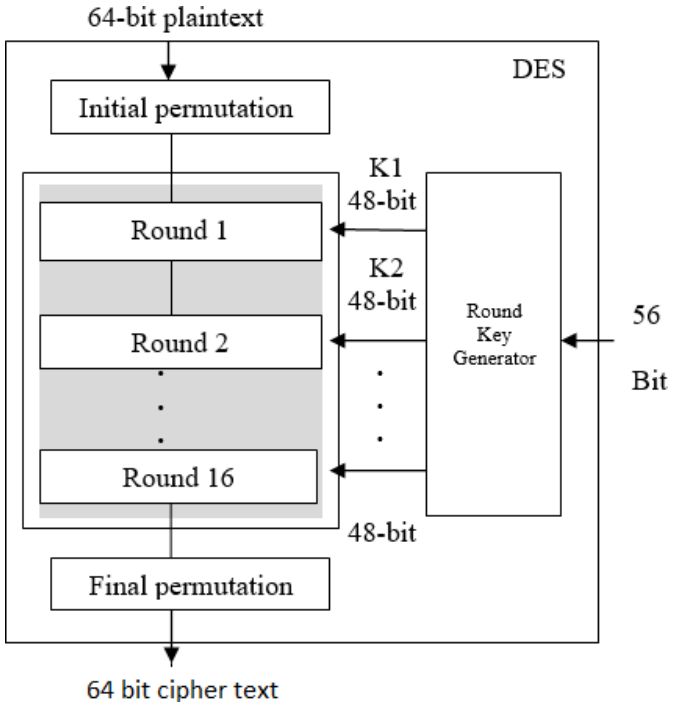

Fig 3 Proposed DES design

B.Round Function

The heart of this cipher is the DES function, f. The DES function applies a 48-bit key to the rightmost 32 bits to produce a 32-bit output.

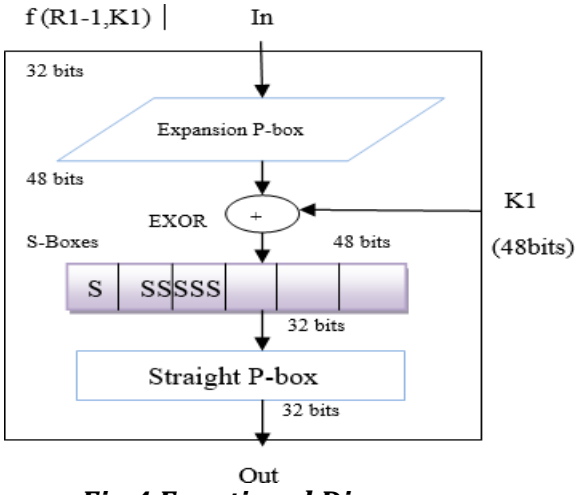

Fig 4 Functional Diagram

VI .SIMULATION AND RESULTS

Simulation is the technique used to analysis for wired and wireless communication. Network simulator version2(NS2) is uses two different language as C++ and Object-oriented Tool command language C++ issued as internal structure and OTCL is external environment and configure the objects

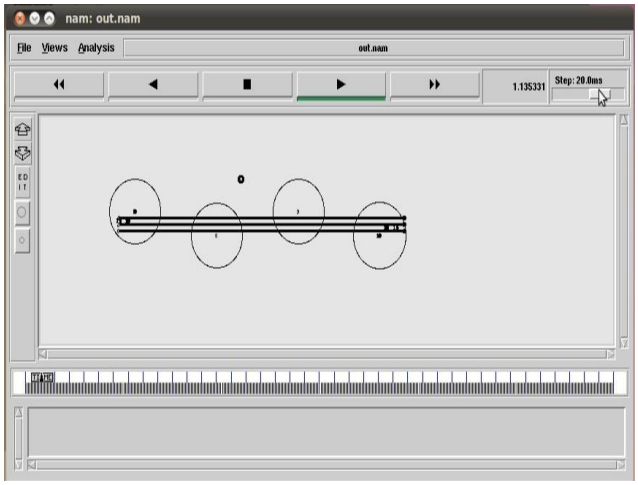

Fig 5 NAM window

Network animator is used for tracing the packet transmission and reception. It shows how the topology of nodes is used, packet transmission. It has a graphical interface, which gives the details of the drop put packets. Here this outputs how lines are considered as road path and inside the line path dot is represented as vehicle is mobile and outside the line dot is considered as base station. The rounded wave is considered as communication between the vehicles and to base station.[9]

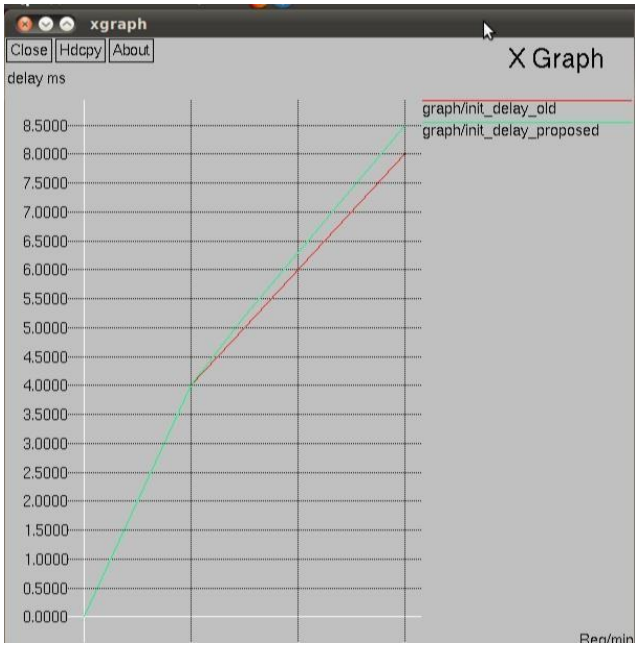

Fig 6 XGraph

Fig 6 denotes the Graph .X coordinates denote the distance and the y coordinate s denote the time which was measured by delay in graph. Old delay is denoted by red line and new delay is denoted by blue line. By comparing the old with new delay, delay is decreased in this VANET. Delay is the difference between the time at which the sender generated the packet and the time at which receiver received the packet. Thus, delay helps to communicate within the vehicles effectively.

VII CONCLUSION

Here the proposed system provides the complete VANET communication with vehicles and traffic delay with cryptography security. A symmetric level security provides us unauthorized to enable the key function. Thus, the traffic violation can be eliminated and we have analyzed through this system by simulation.

VIII REFERENCES

[1] World Health Organization, Department Of Violence &Injury Prevention &Disability (VIP), "World Report On Road Traffic Injury Prevention(2004)"(Http://Whqlibdoc.Who.Int/Publications/2004/9241562609.Pdf)
[2] World Health Organization, Department Of Violence &Injury Prevention &Disability (VIP), "Global Status Report On Road Safety(2009)"(Http://Whqlibdoc.Who.Int/Publications/2009/9789241563840_Eng.Pdf).
[3] Car Insurance List.Http://Www.Carinsurancelist.Com/Caraccidentstatistics.Html
[4] GeorgiaCitiesNewspaper,"AutomatedTrafficCameraEnforcement Saves Lives", September 2, 2008, Source: Http://Www.Gmanet.Com/Paper.Aspx?CNID=28861
[5] Yong-KulKi;Dong-Young Lee;"ATrafficAccidentRecordingAndReporting Model At Intersections". IEEE Transactions On Intelligent TransportationSystems.Volume8,Issue2,June2007,Pp:188–194.
[6] Shaaban, K. Pande, A. Evaluation Of Red-Light Camera Enforcement Using Traffic Violations, Journal Of Traffic And Transportation Engineering, Elsevier, Vol. 5, No. 1, 2018, Pp:66-72.
[7] K. Harinessha, J. RoselinSuganthi," Comparison Between Spectrum Sensing In Cognitive Radio

Systems", International Journal Of Electronics, Communication & Instrumentation Engineering Research And Development (IJECIERD) Issn(P): 2249-684x; Issn(E): 2249-7951 Vol. 4, Issue 3, Jun 2014, 73-78

[8]J RoselinSuganthi,Efficient Channel Utilization In Ultra Dense Networks, International Journal Of Latest Technology In Engineering, Management &Applied Science (IJLTEMAS) Volume Vii, Issue V, May 2018 | ISSN 2278-2540

[9] S Shabina, Smart Helmet Using RF And WSN Technology For Underground Mines Safety, Proceedings Of International Conference On Intelligent Computing Applications, Pp.305-309,2014.