Vehicular Cloud System Using WSN

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Abstract- *Vehicular ad-hoc network is a signifying research area, because of its specific features and applications such as efficiency in traffic management, road safety. Vehicles are the extension of mans ambulatory system, in the improvement of advanced technologies in communications, control and embedded systems have changed this model and evolved intelligent transport system (VANET CLOUD or vehicular cloud). In this paper we propose a model called vehicular cloud system using wireless sensor networks, used for authentication of the vehicle and automatic toll payment system of the vehicle.*

Keywords- pollution causing vehicles, pollution vehicle, vehicular cloud, vanet pollution vehicle

I. INTRODUCTION

Vehicular Ad Hoc Networks (VANETs) are created by applying the principles of mobile ad hoc networks (MANETs) - the spontaneous creation of a wireless network for data exchange - to the domain of vehicles. They are a key component of intelligent transportation systems (ITS). VANET is particularly a challenging case of MANET, [1] Mobile Ad Hoc Networks is an autonomous collection of mobile users that communicate over relatively bandwidth constrained wireless links. The development of communication technologies evolves the cloud vanet, it provides the information to the driver (Ex: GPS location, time stamp and road condition, hospitals, police station, entertainment, parking places) from the cloud through road side units (RSU's). Here in this paper we propose a model of cloud VANET architecture that integrate the concept of MANET, VANET and cloud computing technology to establish the authentication for tracing heigh pollution emitting vehicles.

II. VANET AND CLOUD COMPUTING

Vehicular ad hoc network: are different from other ad hoc networks because VANETs are of their hybrid architecture, dynamic in nature and node movement. Vanet is the integration of ad hoc networks, wirelesses LAN, cellular technology for intelligent transport system –all work together in VANET, address routing is the most important of all. VANET can employ vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications for advanced notification of traffic events. In support of traffic-related communications, short-range communications [2].

Features of VANET: Highly dynamic topology: The high speed of the vehicles along with the availability of choices of Multiple Paths defines the dynamic topology of VANETs.

Frequent disconnected network: The high speed of the vehicles in one way defines the dynamic topology whereas on other hand necessitates the frequent requirements of the roadside unit lack of which results a frequent disconnections.

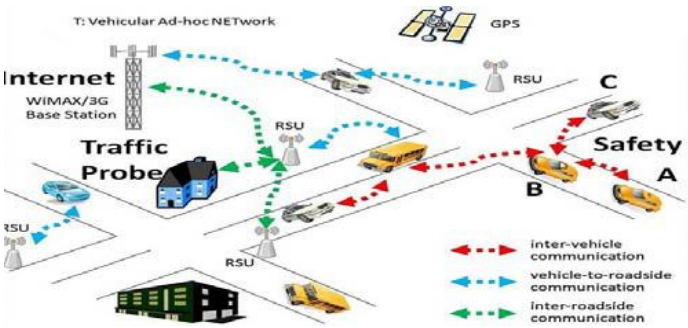

Fig 1: Vehicular Ad-Hoc Networks

Cloud Computing: Cloud computing is the pool of resources , notion of cloud computing started from the realization of the fact that instead of investing in infrastructure, businesses may find it useful to rent the infrastructure and sometimes the needed software to run their applications. One major advantage of cloud computing is its scalable access to computing resources. With cloud computing developers do not need large capital outlays in hardware to deploy their service for internet applications and services. Keeping the noble benefit of cloud computing, the idea of Vehicular Cloud (V-Cloud) comes into focus[3] Modern cars are equipped permanently connected with internet, featuring substantial on-board unit computational, storage, and sensing capabilities which can be thought as a huge farm of computers while their substantial amount of stay on the road. As on the road most of these facilities remain idle, if we can able to use these computational facilities it will benefits the user(vehicle user).

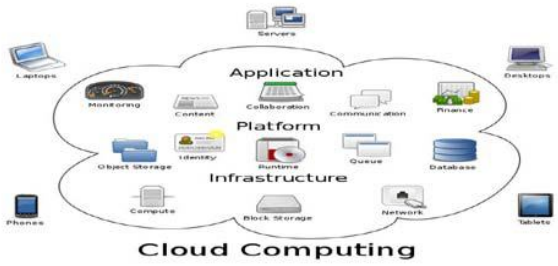

Fig 2: Cloud computing

Attributes of trusted vanet using cloud computing:

In vanet the cloud computing can be used as a governance as a service (GaaS), having access to internet and stay connected on road Here it is clear that node is stay connected with VANET cloud(GaaS) with internet as a medium to establish authenticity on road for secure communication[4]. In this paper we mainly are focusing upon the security of the nodes or vehicles and establishment of communication authentic.

Using Wsn for automatic toll payment system

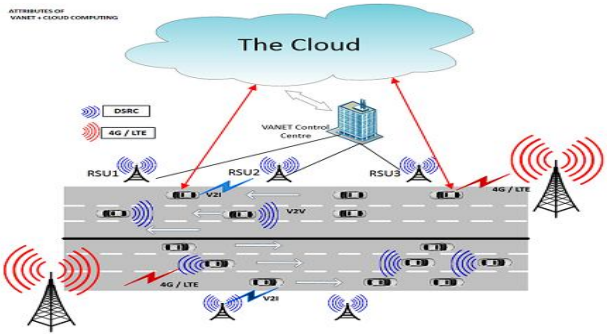

Fig 3: VANET + CLOUD COMPUTING = CVANET

III. PROPOSED MODEL FOR VEHICULAR CLOUD SYSTEM USING WSN

Developing Authenticity(Ex: Authenticity of the Vehicle or Node):

Initially node or vehicle are will register in cloud VANET(GaaS) with their engines number and car number, GaaS will generate private key called GaaSPK, this GaaSPK is a sensing device ,that installed on the vehicle, For updating location and time stamp, act as a sensing mode to every (RSU) Road side unit. Vehicle or node enters into the range of road side unit (RSU1) , RSU1 will broad cast the concern information located within the range of RSU1, for example: the major information like speed limit, speed breakers, frequent accident occurring zone, curves, speed limit one School zones, hospitals, parking places, police station etc…. likewise this thing happens in when the Node or Vehicle enters in to "RSU2" range. On broad casting authenticated information from Cloud Vanet through RSU's authenticity is established.

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- Every node is enabled with internet connection and wireless sensors connected to the nodes
- Vehicle user bank account is linked with governance as a service database
- If any user crosses the toll plaza without stopping the car or vehicle automatically the amount is deducted from the concern vehicle user bank account.
- All the information automatically updated into the Cloud VANET that monitors and controlled by traffic controlled authority(GaaS),[11][12]

IV. CONCLUSION

In this paper we proposed an idea and there is lots of work needs to be done on this mode by implementing this concept more practically, managed by Government pollution control authority, they can generate income using this model. The vehicle will be in secure mode it cannot be stolen by any one, if it happens tracing will be in fraction of seconds, and fast moment of nodes will be traced and action will be taken by concern traffic governing authority,automatic toll payment is done. Due to incorporation of cloud computing technology the infrastructure cost will be reduced.

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