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A Framework for Secure Data Acquisition In VANET

Dr. B. Balakumar[1], S. Rajaram[2]
[1]*Assistant Professor,* [2]*Research Scholar, CITE, Manonmaniam Sundaranar University*

Abstract: ***Recent advances in software, hardware communication technologies are enabling the design and implementation of whole range of different type of network that are various environments. Vehicular Ad-Hoc network is received a lot of interest in the couple years in the one of the networks. A Vehicular Ad-Hoc Network or VANET is a technology that uses moving cars as nodes in a network to create a mobile network. In VANET improving the driving comfort and safety information message are broadcasted regularly. VANET turns every participating car approximately 100 to 300 meters to connect and turn create network with a wide range. In enable vehicle to communicate which other with roadside units (RSUs). Vehicular network are special types of VANET that supported infrastructure based real time traffic management, including internet access, video streaming and content distribution. Privacy - preserving data Acquisition and forwarding scheme by introducing the novel cryptographic algorithm for key generation and powerful encryption. This paper introduces system that takes Advantages of the RSUs that are the connected to the internet provide various types of information to VANET users.***

Keywords: VANET, RSU, Ad-Hoc Network, URE, ITS

I. INTRODUCTION

The development and wide utilization of wireless communication technologies have transformed human lives by providing the most convenience and flexibility ever in accessing internet services and various applications.[1] Recent advances in communication technologies enabled wide range of networks. Vehicular Ad-Hoc network is one of the network received lot of the interest in last couples of years. The innovative service and application development for vehicular society shows the importance of VANET based ITS. The concept of enhancing the performance of the running vehicles on the RE with such service and application based on environmental safety, production of vehicles on the road [2].

II. DATA ACQUISITION

It is a process of measuring an electrical or physical phenomenon such as voltage, current, temperature, pressure, and sound with a computer. The components of data acquisition system include: Sensors that convert physical parameters to electric signal.Signal conditioning circuitry to convert sensor signals into a form that can be converted sensor signals into a form that can be converted to digital values.



Fig. 1 Example of an VANET Architecture

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A. VANET

The VANET network is enable the vehicles running on to road to communicate with the RE subsystems to access or deliver activity specific services and application. There are three basic essential components of VANET vehicles, RSUs and ITS.VANET is the key component of ITS, and the operations of VANET are based on the support of IFS.

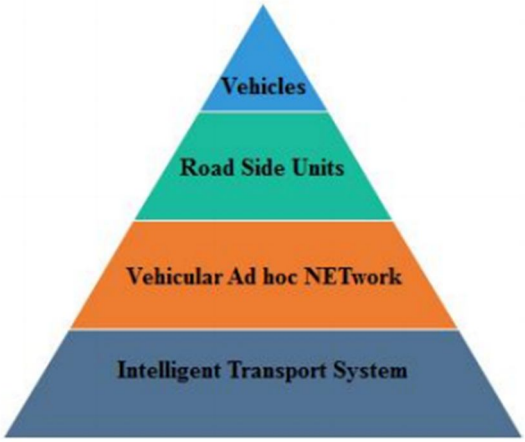


Fig. 2 VANET Protocol

B. The Role of Vehicles

The vehicles are the subsystem in VANET equipped RE, where the place and applications are relatively focusing on them to provide betterment with respect to time and quality. The development of the vehicles has contributed to changes in employment distribution, shopping patterns, social interaction, manufacturing priories and city planning.

C. Road Side Units

The RSU is a communication device for vehicular that provides vehicle to infrastructure connectivity to nearby vehicles.

III. VEHICULAR AD HOC NETWORK

VANET have been quite a hot research area in the last few years. Due to their unique characters such as highly dynamic topology and predictable mobility, it attracts so much attention of both industries.[2] The network is composed of individual device communicating with each other directly.

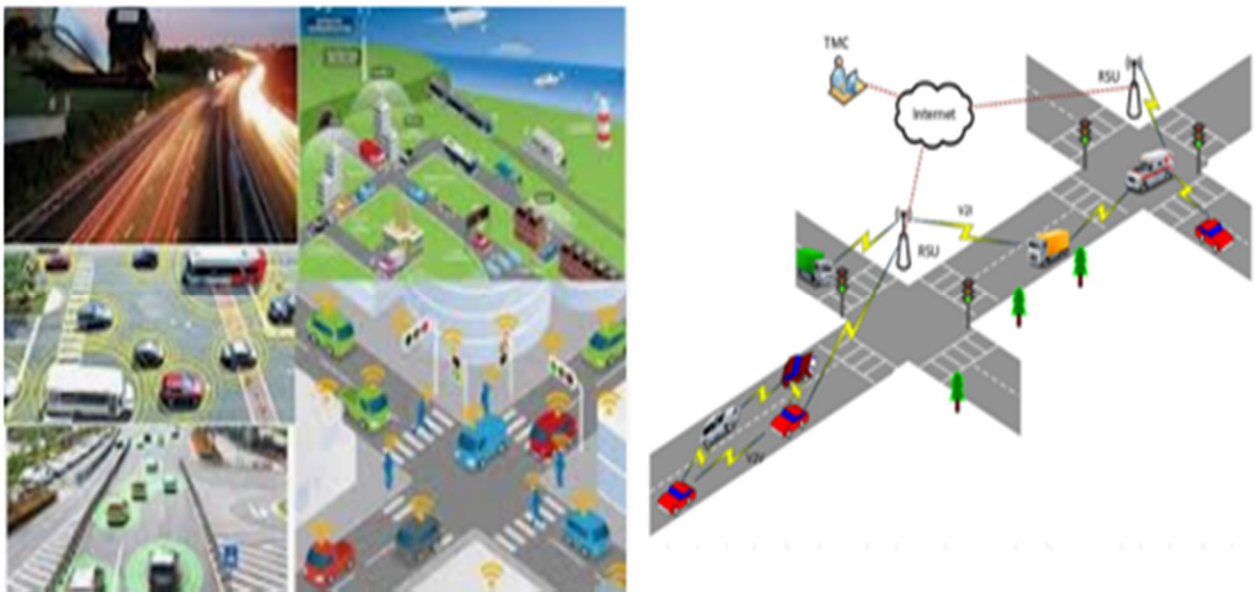


Fig. 3 Model of intelligent Transport Systems

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A. Intelligent Transport system

In fig 3 show the ITS model.An ITS is an advanced application which aims to provide innovate service relating to different modes of transport and traffic management and enable users to be better informed and make safer.

1) ITS Characteristics

a) Predictable mobility
b) Mobility and rapid changing topology
c) Geographic position available
d) Variable network density
e) High consumption ability.

The characteristics of VANET are self-organizing, self-managing, connectivity with fastest reliable performance on RE, highly scalable based on the capability of its components and DSRC. Two following classes in develop in VANET application.

- Improving the safety level on the road.
- To provide commercial and entertainment services.

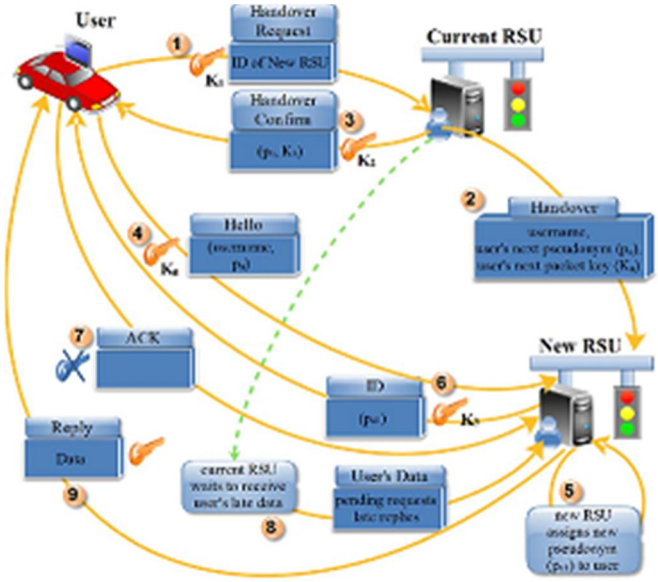


Fig. 4 RSU based intelligent Transport Systems Architecture

In this paper, the security of data message, exchanged between users and RSU location of privacy VANET users can changes the message. Fig 4 shows the architecture of RSU based ITS

B. VANET with URE

A typical VANET in an URE and ITS given is given the pictorial representation. The running vehicles are connected with RSU for services and application need the RSU tied with services base station of the ITS support. In expert systems, the decision making for problem of specific situation is domain act of selecting feasible efficient solution from alternatives, and is accomplished with its strong knowledge base (KB) and strong experience level in the specific domain.

IV. SECURITY ISSUES IN VANET

The VANET is the priority of security was major drawback. It shares general ad-hoc network security concerns and faces attack such as eavesdropping, traffic analysis and brute-force attacks. The unique nature of VANET also raises new security issues in position detection, illegal tracking and jamming.[3] The VANET is can be used to road safety, reduce road safety, save interest users and provide emergency services. In this paper diverse types of security challenges and requirements of VANET will be discussed, the security problems and attacks will be presented be analyzed. We provide first section an overview of VANET security requirements, their challenges and attacks. Then a classification of attacks in VANET due to the different network layers.

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A. Security And Privacy

It issues many approaches have been proposed over the past few years. Two main aspects: Communication and architecture of VANET. Some security requirements should be following:

1) Authentication
2) Availability
3) Non-reputation
4) Privacy
5) Data verification

B. Topology Based Routing

To develop VANET is important design for efficient, secure and reliable routing protocol[4]. The main objective of the routing protocol is find an optimal way of communication between nodes (vehicle).

C. Types of Routing Protocol

1) Proactive
2) Reactive
3) Hybrid

V. RESULT ANALYSIS

In the simulation scenario we have taken number of mobile nodes to measure the throughput parameter of QoS for VANET. In this paper we have calculated the average throughput by taking received packet and its size with respect time for VANET. The number of nodes with their correspond generated throughput for VANET are summarized in table and the result is shown. In Table 1.

TABLE I
Input Parameters

Number of nodes	Throughput
20	9218
30	9238
40	9504
50	9680
60	9735

The figure 5a,b c shows depicted the comparison diagram of convergence timings . The network capacity between discrete, KWSA comparison is depicted as below. Various comparison methods are used for determining the efficient topology control.

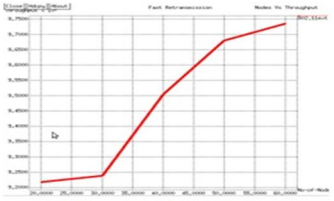


Fig 5.a Nodes vs Throughput in VANET

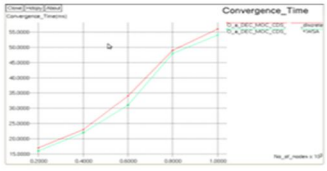


Fig 5.b Convergence Time

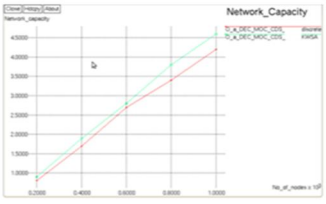


Fig 5 c Network capacity

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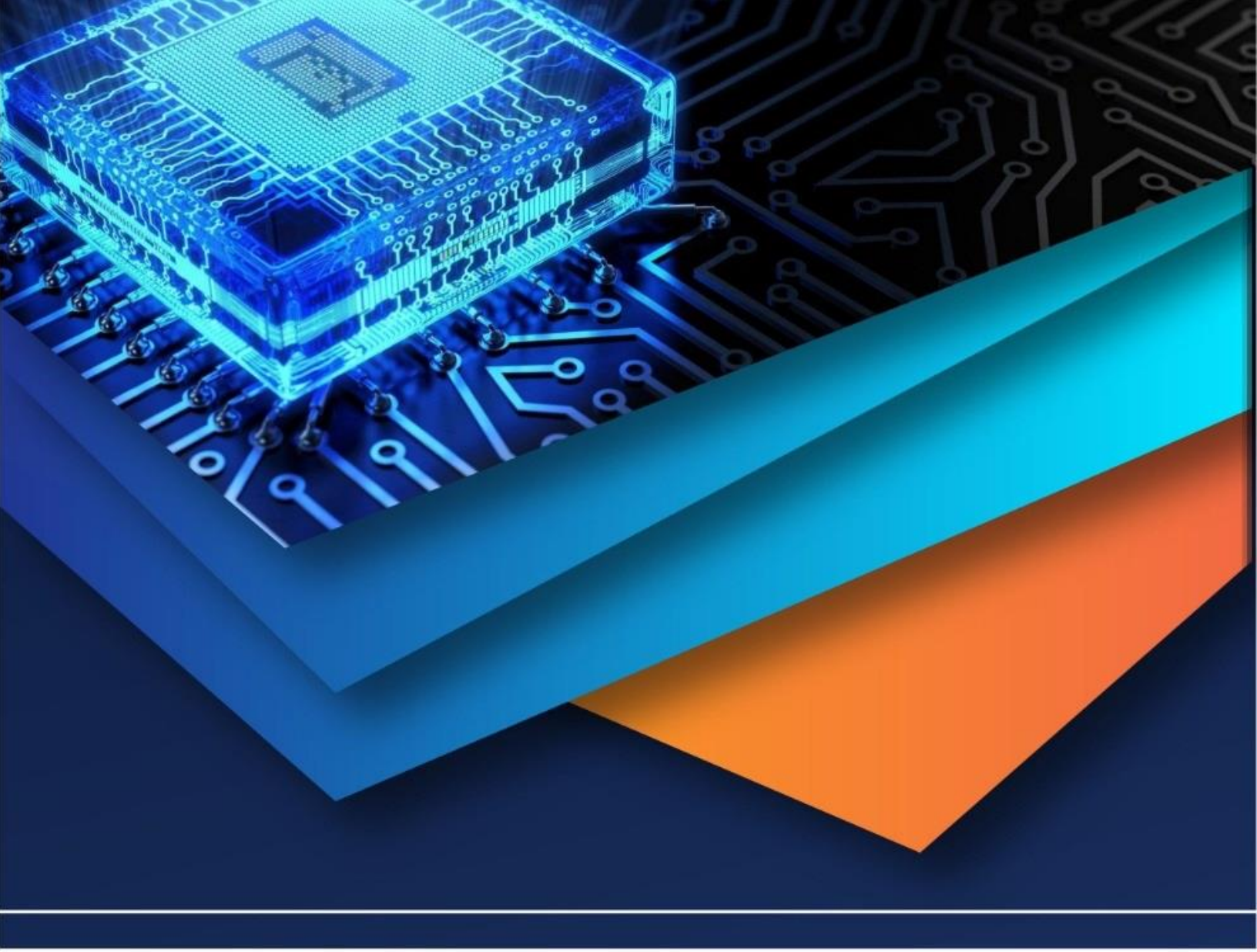
VI. CONCLUSION

Vehicular networks are become common feature of day today life. There are several research in technology. We discussed on VANET network RSU, URE and ITS also discussed on complex problem challenges and its application. Today the VANET has become promising field of research as the world advance the vision of intelligent transportation system. Future work will aim to advantage of the powerful computing capability to improve the data acquisition in VANET. A part from security needs there are other requirements to be considered with respect to specific ones. We have also listed several attacks that can be implemented on VANET network. Finally a mechanism that helps the achieving goals is also discussed.

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