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SURVEY ON VEHICULAR CLOUD DATA COLLECTION FOR INTELLIGENT TRANSPORTATION SYSTEMS

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Abstract: The Internet of Things (IoT) imagine to connect billions of sensors to the Internet, in order to provide new applications and services for smart cities. IoT will allow the natural selection of the Internet of Vehicles (IoV)from existing Vehicular Ad hoc Networks (VANETs), in which the conveyance of several services will be offered to drivers by the integrating a vehicles, sensors, and mobile devices into a global network. Thise solutions involve applications and services for the benefit of Intelligent Transportation Systems (ITS), which represent an important part of Iot. of Vehicular Cloud. In this paper, we involve the new paradigm of VCC to propose a data collection model for the benefit of ITS. We show via simulation results that the participation of low percentage of vehicles in a dynamic VC is sufficient to provide significant data.

I. INTRODUCTION

The term ''Internet-of-Things'' (IoT) is used to refer to the global network interconnecting smart objects, along with the set of supporting technologies . IoT is anticipated to offer new applications and services for smart cities in several domains, by interconnecting billions of sensors to the Internet. IoT will allow the evolution of the Internet of Vehicles (IoV) from existing Vehicular Ad hoc Networks (VANETs).IoV features gathering, sharing, processing, computing, and secure release of information to enable the next generation of Intelligent Transportation Systems (ITS). These systems will offers the delivery of new applications and services to drivers by integrating vehicles sensors, and mobile devices into the global network. Vehicular Cloud Computing (VCC) is a new paradigm which takes advantage of cloud computing to serve VANETs with several computational services, in order to improve our daily driving by minimizing accidents, travel time and traffic congestion. Ultimately, the goal of VCC is to provide on demand solutions for unpredictable traffic events, where applications can adapt according to the dynamic Envinormental changes with the aid of a Vehicular Cloud (VC).What differences vehicles from standard nodes in a normal cloud is autonomy and mobility. Despite the fact that broadband communications and wireless technologies can provide Internet connectivity to the public on the road through roadside access points (APs).

II. RELATED WORK

Despite the fact that VANETs represent a significant component of Intelligent Transportation System (ITS); they are unable to allow a global network view for individual vehicles. Existing IoV research focuses on proposing models and frameworks for various applications and services. Generalized IoT models cannot be directly applied for vehicular networks, due to the specific properties that characterize these environments. For example, the sensing as service model proposed in [12] can be applied in several IoT scenarios. In [10], the authors propose an abstract network model especially for IoV, which integrates four basic components: humans, vehicles, things, and environment. The proposed model provides an abstract vision by focusing only on relations among the defined network components. More infrastructural and architectural specifications are required to propose a model that is convenient with an application scenario or a set of services with a common goal. rearranging and computational expenses. To decrease the rearranging cost, we propose two rough calculations to minimize the quantity of reproductions.

III. SCOPE OF THE PROJECT

Our main objective is to provide better connectivity and therefore better services for driver convenience. We follow the pull-based model in which an interested vehicle can send a query on demand to a faraway location within the city, and receive a reply through IoV within reasonable delay. Vehicles participating in IoV will cooperate in providing a meaningful response by sensing and processing data with the aid of vehicular cloud. Our model borrows the functions of SaaS and IaaS from mobile cloud computing :

Software as a service (SaaS): At SaaS level, real-time traffic information could be shared with the subscribed users. Travel convenience services and P2P applications are suitable to be used as SaaS [14].

At IaaS level, the potential services provided by VCs is Network as a Service (NaaS) where a vehicular node moving on the road might be used as a Wi-Fi access point gateway to the Internet

IV. SYSTEM DESIGN

Our model uses the architecture shown in Figure 3, which is a modified version of the VCC architecture described in [7]. Three basic layers are defined: The in-vehicle layer, the communication, and the cloud. For the in-vehicle layer, we assume that each vehicle is equipped with an On-Board Unit (OBU), which has a broadband wireless communication for transferring data through 3G or 4G cellular communication devices, Wi-Fi, WiMAX, and Wireless Access in Vehicular Environment (WAVE) [21]. and the cloud over wireless networks.

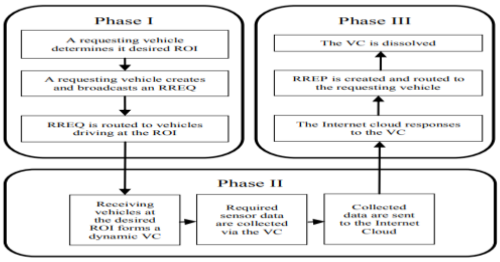

Fig : System Architecture

V. IMPLIMENTATION

Consider the urban road scenario where the vehicles provided with the communication interfaces would like to download the information while travelling with in the cities and along the highways. This will lead to some problems such as improper deployment of Access Points, reduction in the transfer rate, download rate keeps decreasing and so many other. In order to come over from the problems mentioned above, proposed system comes with the solutions such as, a technique/method called Carry & forward fashion, proper selection of carriers, Scheduling of data chunks. With the help of Carry & forward fashion download rate can be improved. This involves two important steps are as follows:
1)Production phase
2)Forward phase

5.1 METHODOLOGY

These issues include penetration rate, trust management, the interoperability of different clouds, and security.

A. Penetration Rate : Penetration rate in our proposed VC data collection can be defined as the percentage of vehicles equipped with the required OBUs and subscribed to the requested service.

B. Trust Management : In ITS applications, the VC sometimes requires to have local authority for taking actions or making decisions instead of a central authority.

C. The Interoperability of Different Clouds : Different types of clouds are anticipated to emerge in the near future. These clouds may interact with each other and connect on demand to the Internet cloud in real time scenarios.

D. Security : Since most of vehicular systems transfer on location information, it is essential to ensure the secure location and necessary.

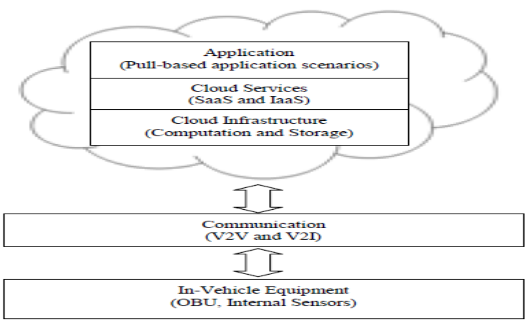

Fig : OverView of Vehicular cloud

VI. CONCLUSION AND FUTURE ENHANCEMENT

In this paper, we involve VCC to propose a model for data collection in ITS. Our model provides several benefits to drivers seeking traffic information for convenience purposes, by providing pull-based services on demand. In addition to design considerations, we describe a data collection service scenario that can involve our proposed model with low penetration rate. We also highlight the major issues and challenges correlated with data collection in VCs. In our future work, we are interested in designing efficient communication and data collection algorithm, with the consideration of data access issues in vehicular environments.

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