Reliable Service Provisioning In Vehicular Cloud Architecture

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ABSTRACT

Cloud computing is a type of Internet-based computing that provides shared computer processing resources. Cloud computing is a network access model that aims to transparently and ubiquitously share a large number of computing resources. In future high-end vehicles are expected to under-utilize the on-board computation, communication, and storage resources. Vehicles belonging to a Vehicular Ad hoc Network can form an ad hoc vehicular cloud in order to provide and to share services between the vehicles. VANET will become World's largest ad-hoc network. There is no solid architecture for cloud computing from VANET standpoint. VANET using delay tolerant and minimum time to sharing data in communication in V2V and V2I.

Keywords— Cloud Computing, VANET Cloud Architecture, Road Side Units

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1. INTRODUCTION

Cloud computing is type of Internet-based computing that is provides shared computer processing resources data to computers and other devices on demand and it's device and location independence. Vehicles using to a Vehicular Ad hoc Network can form an ad hoc vehicular cloud in order to provide and to share services between the vehicles. High-end vehicles are expected to under-utilize the on-board computation, communication as well as storage resources. VANET will become World's largest ad-hoc network. In VANET, Vehicles and RSUs (Road-Side Units), i.e. network nodes, will be equipped with on-board computation and communication modules to make sure communication possible to them.

Vehicular Ad hoc Network is sort of Mobile Ad hoc Network formed by mobile vehicles, also known as mobile nodes. These vehicles are appointed with a WLAN technology that permits the establishment of a wireless ad hoc communication between the vehicles in the network Vehicle-to-vehicle (V2V) communication, and installation of a wireless ad hoc communication with stationary gateways, known by Road Side Units (RSU), implanted in the network Vehicle-to-Infrastructure (V2I) communication.

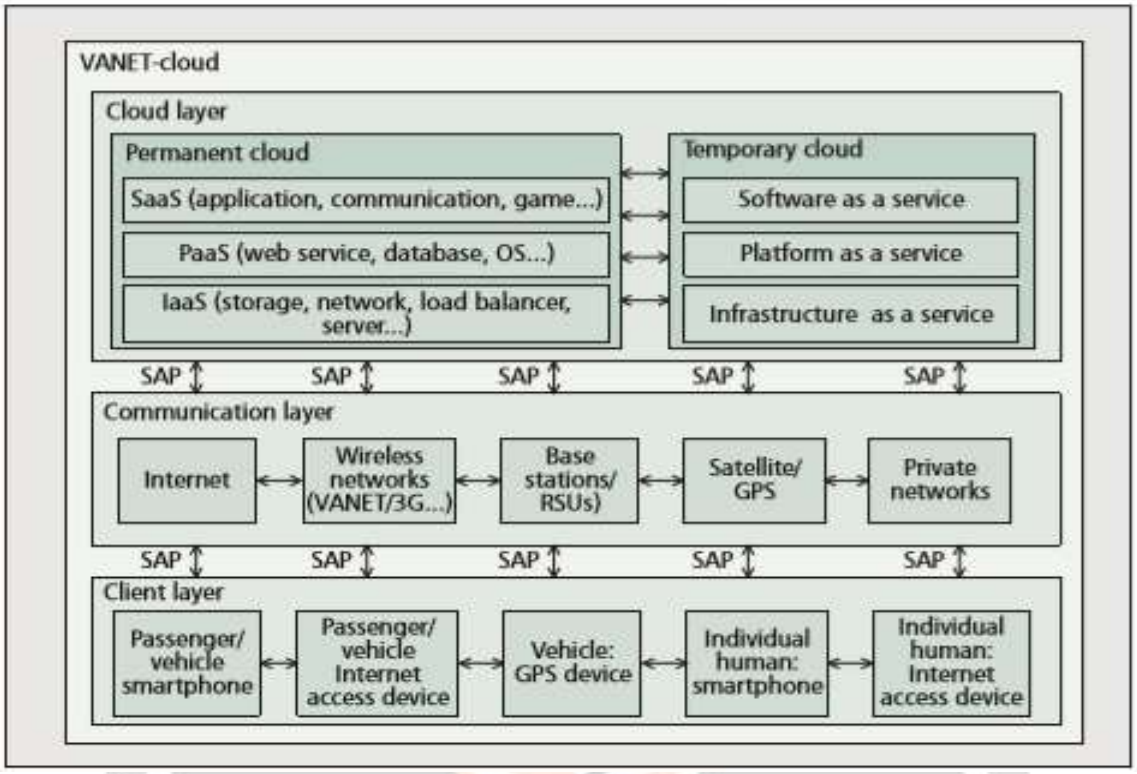

Fig. 1: VANET-CLOUD ARCHITECTURE

2. RELATED WORK

In[1] author proposed The basic idea of VANET is to take the widely adopted and inexpensive Wireless Local Area Network technology and install it on vehicles. VANET Clouds Taxonomy using this paper divide VANET clouds into three major architectures namely Vehicular Clouds (VC), Vehicles using Clouds (VuC), and Hybrid Clouds (HC).VC is further divided into two scenarios from movement standpoint. Static clouds refer to the stationary vehicles providing cloud services. IaaS and data storages services are feasible for such arrangements. On the other hand, dynamic clouds are formed on demand in ad hoc manner. VuC connects the VANET to traditional clouds where VANET users can use cloud services on the move such as infotainment, traffic information, and CAA.. First, the vehicles initiate a protocol to select broker(s) among them and identify the boundaries of the clouds following by electing an Authorized Entity (AE) among the brokers to ask for authorization in order to form a cloud. After brokers and AE are elected, then AE invites the vehicular nodes in the premises of the cloud boundary to take cloud Note that the job in hand can be handed over to the cloud by higher authorities in exchange of some incentives to the participants. AE dissolves the cloud after the job is done. The most appropriate example for dynamic clouds is dynamic traffic lights scheduling. But also the effect of changing one traffic light would affect many others thereby demanding re-scheduling the traffic lights on a large scale. In the aforementioned scenario, AE sends the traffic signals rescheduling plan to the municipality and hence the traffic jams issues can be resolved in a timely manner.

In [2] author proposed a gateway discovery mechanism for getting stable connection to the Internet. Related performance, namely, signaling overhead, packet delivery rate, and end-to-end delay, of gateways are investigated. V2V communications enable road safety and avoidance applications. V2I communications are essential to support applications, including entertainment and infotainment, location-based services, mobile advertising, and Internet access, for VANET user.

- The elements involved in the system include:-

Gateway: Gateway is the entity which is able to connect to the Internet directly via WiFi, WiMAX, or cellular networks. Two types of gateways are considered in this paper, namely the stationary gateway and the mobile gateway, according to the mobility of the gateways. Stationary Gateway (SG) is part of the roadside infrastructure such as access points (APs) of WiFi or WiMAX, or base stations (BSs) of cellular networks. Mobile Gateway (MG) is the vehicles which can directly connect to the Internet.

Client Vehicle: Client Vehicle (CV) is the vehicle which wants to connect to the Internet via a SG or a MG.

In [3] author proposed is Distributed strategy for reliable real time streaming in vehicular cloud-fog networks and reliability of the real time streaming can be effectively maintained. And it's used cloud fog computing networks and focus on the design that mobile device m reserves resources for obtaining content to support of real time streaming. devices want to access their resources within time interval [t0 +1,t0 + T].Vehicular network is deployed to support mobile devices in a fixed geographic area. The integration of computing service providers, Clouds and Fogs, and the vehicular network forms a vehicular cloud-fog computing network to support content delivery for mobile devices. At every time instance, each computing service provider, Cloud and Fog, announces the number of tokens required to access their resources individually.

In[4] author proposed utilizing vehicles as the infrastructures for communication and computation, named vehicular fog computing (VFC), which is an architecture that utilizes a collaborative multitude of end-user clients or near-user edge devices to carry out communication and computation, based on better utilization of individual communication and computational resources of each vehicle. The fog application with low-latency communication, video streaming, gaming, etc. With the concept of fog computing, researchers have studied some useful and interesting applications based on it.fog computing, the VFC has a lot of common features with fog computing, such as the low-latency communication.

In [5] the proposed solution is based on successful service provision in highly dynamic and decentralized network such as VANET. Vehicles belonging to a Vehicular Ad hoc Network (VANET) can form an ad hoc vehicular cloud in order to provide and to share services between the vehicles. Vehicular Ad hoc Network (VANET) is a kind of Mobile Ad hoc NETwork (MANET) formed by mobile vehicles, also known by mobile nodes. These vehicles are equipped with a WLAN technology that permits the establishment of a wireless ad hoc communication between the vehicles in the network i.e. Vehicle-to-vehicle communication.The establishment of a wireless ad hoc communication with stationary gateways, known by Road Side Units,i.e. Vehicle-to-Infrastructure communication. number of aggregated data is high, the overall decision taken may be more accurate reflecting the real situation. However, when it comes to computation, network or storage services, it becomes mandatory to reach a high service delivery ratio.

3. PROPOSED WORK

In this section we have described proposed model for In hybrid vanet cloud architecture and Cloud-Fog Computing is used to support reliable service provisioning. In introduced Indexing by means of Distributed Hash Table at various **Rsu's** for providing **fast** retrival of data which indirectly enhances service delivery ratio.

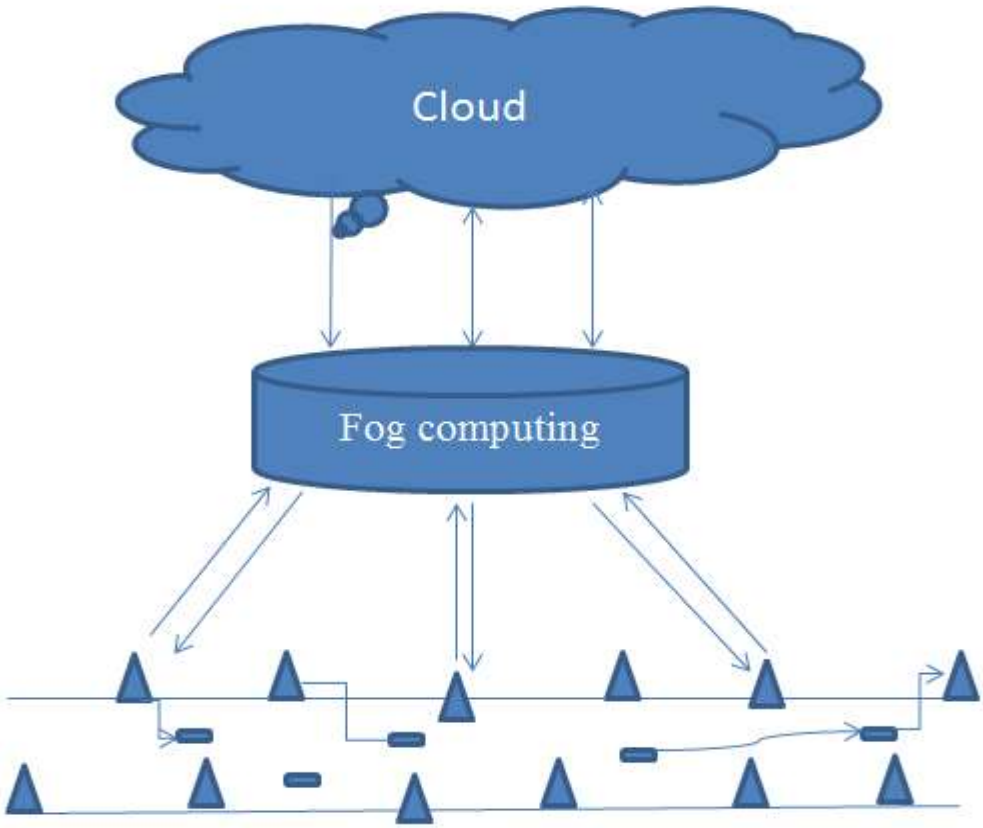

Fig. 2: Proposed System

Data duplication for specific duration and User request for service through RSU. If Vehicle does not found RSU Then send message to neighboring node like V2V communication.

4. RESULT ANALYSIS

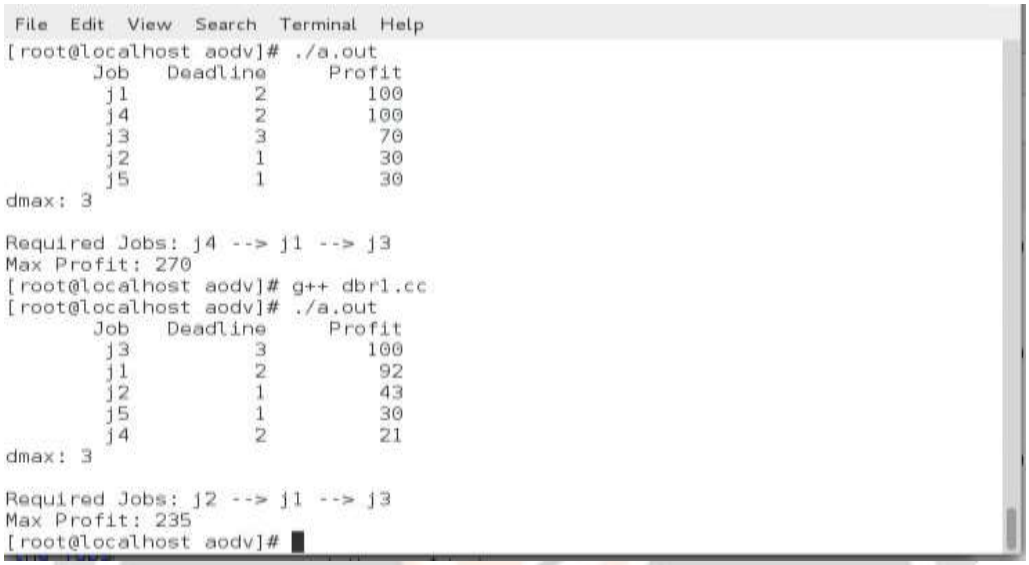

Fig. 3: Max profit according to required job

This problem consists of n jobs each associated with a deadline and profit and our objective is to earn maximum profit. Profit only when job is completed on or before deadline.

5. CONCLUSIONS

Nowadays trend of Vehicular Cloud allows a vehicle to request a set of data, such as photos, videos and text information, as a service. Thus, a vehicular cloud is formed to disseminate the request and aggregate the requested data. In our proposed mechanism, a vehicle may be potential to join the cloud, if it can provide the requested service and can communicate directly with the service consumer vehicle.

6. REFERENCES

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