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Enabling Smart Cloud Services Through Remote Sensing: An Internet of Everything Enabler

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Abstract
Cloud-assisted remote sensing (CARS) enables distributed sensory collecting the data, data sharing and global resource, remote sensing and access real-time data, elastic resource provisioning and scaling, and pay-as- you-go pricing models. Smart Cloud computing is a model for enabling convenient and on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service-provider interaction. It divides into three types of 1. Application as a service 2. Infrastructure as a service 3. Platform as a service. we discuss some popular commercial cloud platforms that have already been developed and deployed in recent years.

Key words
CARS, Smart Cloud, Cloud Service Provider, Sensing the Data

I. Introduction
Cloud computing is the delivery of computing services over the Internet. Examples of cloud services include online file storage, social networking sites, webmail, and online business applications. The characteristics of cloud computing include on-demand self service, broad network access, resource pooling, rapid elasticity and measured service. On-demand self service means that customers (usually organizations) can request and manage their own computing resources. Broad network access allows services to be offered over the Internet or private networks. Pooled resources means that customers draw from a pool of computing resources, usually in remote data centre.
Remote sensing plays a key role in the acquisition of data about and from everything without needing physical field visits. Instead, it relies on sensory things or objects to sense and collect data remotely and in real time. With the recent emergence of cloud computing, remote sensing has been empowered and made possible even more than ever before. Unlike conventional ways of collecting and processing sensory data, cloud-assisted remote sensing (CARS) now enables in smart cloud.

II. Cloud Computing
The cloud computing model allows access to information and computer resources from anywhere that a network connection is available. Cloud computing provides a shared pool of resources, including data storage space,

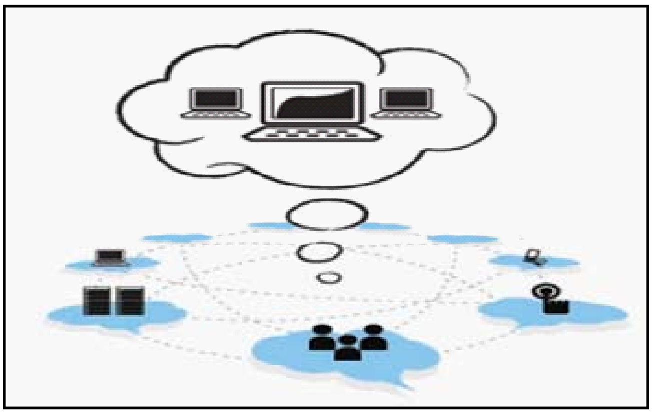

Fig.1: Cloud Computing

networks, computer processing power, and specialized corporate and user applications. In cloud computing having different cloud services. These services using collect the data and sensing the data On-demand network access in smart cloud service .

A. Cloud Service models
The cloud computing service models are Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). In a Software as a Service model, a pre-made application, along with any required software, operating system, hardware, and network are provided. In PaaS, an operating system, hardware, and network are provided, and the customer installs or develops its own software and applications. The IaaS model provides just the hardware and network; the customer installs or develops its own operating systems, software and applications.

III. Related Work
The recent emergence and success of cloud-based services has empowered remote sensing and made it very possible. Cloud-assisted remote sensing (CARS) enables distributed sensory data collection, global resource and data sharing, remote and real-time data access, elastic resource provisioning and scaling, and pay-as-you-go pricing models. CARS have great potentials for enabling the so-called Internet of Everything (IoE), thereby promoting smart cloud services.
When coupled with IoE, CARS gives birth to what we call Everything as a Service or Sensing as a Service (SenaaS) . For example, a radio station can rely on CARS to lease a set of driverless cars which it can use to cover road accidents and broadcast traffic information . This is becoming a commercially viable solution, especially after states such as Nevada, Florida, and California legalized driverless cars to operate in public roads . Another example is to have traffic lights communicate with and control approaching vehicles upon sensing the presence of pedestrians and bikes . Smart phones, which are typically (or can be) equipped with specialized sensors, can also be used to provide sensing and monitoring services for environment, healthcare, and transportation.

IV. System Design

A. Existing System

Existing models for cloud computing are mostly on a per-reservation basis, where cloud service customers reserve resources for some time, and pay for them regardless of whether they have or have not been used fully. Although this pricing approach may not the best option for cloud service customers, it eases resource dimensioning and pricing logistics for cloud providers. In a network constituted of billions of sensory devices, finding and locating the right sensors and/or SANs to perform specific sensing tasks is very challenging. Search, selection, and ranking algorithms that locates and design appropriate SANs need to be developed. Different algorithms are to be developed for different cloud layers, which depend on the functionalities that are specific to the layers (e.g., an alto-cumulus cloud needs to search for suitable stratus clouds while a stratus cloud needs to search for physical SANs) develop models that capture the impact of stochastic and correlated failures on cloud reliability. These models can be used to develop dynamic task re-allocation policies while maximizing reliability of data cloud centers in the context of (SANs).

B. Proposed System

A subscriber choose document and download the data's from service providers. Subscribers pay the amount to service provider. Service provider provides that data key to subscriber. So subscribers download the data using data key.

A cloud computing service provider serves users' service requests by using a multiserver system, which is constructed and maintained by an infrastructure vendor and rented by the service provider. The architecture detail of the multi-server system can be quite flexible.

Distributed data collection and sensing, where sensory information can be sensed and collected from everywhere.Global data and resource sharing, where sensory information and resources can be shared globally;

Pay-as-you-go pricing, where cloud users can request, release, and pay for resources whenever needed.

- Searching a Particular place depend upon an Presence Server
- Click to Find Particular location for identified Exact latitude and longitude and to identified Particular Place visited Through an Smart Cloud Enabler.

C. Methods

1. Admin

In this module is used to help the server to view details and upload files with the security. Admin upload the data's to database. Also view the subscriber details and user details. Admin find the redistribute details. Also who send the data and receive the data's.

2. User

In this module, Users are having authentication and security to access the detail which is presented in the ontology system. Before accessing or searching the details user should have the account in that otherwise they should register first user can register their details like name, password, gender, age, and then. We develop this module, where the cloud storage can be made secure.

3. Smart Clouds

Smart Cloud computing is a model for enabling convenient, ondemand network access to a shared pool of configurable computing resources (for example, networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service-provider interaction. . It divides into three types of

1. Application as a service.
2. Infrastructure as a service.
3. Platform as a service.

4. Cars Architecture

We present the proposed CARS architecture. Such architecture can be viewed as a geographically distributed platform that connects many billions of sensors and things, and provides multitier layers of abstraction of sensors and sensor networks. Fig. 1 shows the proposed CARS architecture, which has four main layers: 1) fog layer; 2) stratus layer; 3) alto-cumulus layer; and 4) cirrus layer. Layer roles and inter-layer interactions.

CARS are to provide cloud customers with flexible access to data and sensing services, allow them to develop their own domain-specific applications, and allow clouds to share physical resources. We classify the services offered by CARS into three smart service models, analogous to cloud computing's cloud service models: 1) IaaS; 2) PaaS; and 3) SaaS. The models are Sensing and Actuating Infrastructure as a Service (SAIaaS), Sensing and Actuating Platform as a Service (SAPaaS), and Sensing Data and Analytics as a Service (SDAaaS).

5. Remote Tracking and Monitoring

CARS enable remote tracking and monitoring of things of interest in real time, thereby allowing alerts to be raised and appropriate actions to be taken in a timely manner whenever needed. CARS can potentially be used for tracking and monitoring animal behaviors, moving-object locations (e.g., vehicles), environmental conditions, building surveillance and security, patient-health conditions, smart-grid operations, aviation and aerospace safety, and vegetation production quality.

6. Real-Time Resource Optimization:

Cloud computing and IoE industry has been gaining some momentum in recent years, and we have been witnessing the emergence of many cloud-based commercial services. The service offered so far by these commercial clouds is mainly twofold. First, it consists of allowing cloud service customers to attach their sensors to the platform. These sensors can then collect data and send it to the cloud. Then, it consists of allowing these customers to develop and install their own custom-made software to make use of their sensed data in anyway they see fit. Based on their supported functionalities, these commercial clouds can essentially be viewed as stratus clouds, when categorized according to the proposed layered architecture.

V. Methodology

Remote sensing plays a key role in the acquisition of data about and from everything without needing physical field visits. Instead, it relies on sensory things or objects to sense and collect data remotely and in real time. With the recent emergence of cloud computing, remote sensing has been empowered and made possible even more than ever before. Unlike conventional ways of collecting and processing sensory data, cloud-assisted

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remote sensing (CARS) now enables: 1) decentralization of data sensing and collection, where sensory data can now be sensed and collected from everywhere instead of being restricted to limited areas; 2) sharing of information and cloud resources, where data and resources can be shared and used globally by all users; 3) remote access to global sensed information and its analytics, where sensed data can easily be accessed and analyzed online from everywhere; 4) elastic provisioning of cloud resources, where users can scale up and down their requested resources in real time based on demand; and 5) pay-as-you-go pricing models, where users can request (and hence pay for) only resources that they need based on their demand. CARS can then be viewed and foreseen as an emerging technology that has great potential for enabling the so-called Internet of Everything (IoE), thereby enabling smart cloud services. IoE is a new Internet concept that tries to connect everything that can be connected to the Internet, where everything refers to people, cars, televisions (TVs), smart cameras, microwaves, sensors, and basically anything that has Internet-connection capability. A recent study by Cisco predicts that IoE is projected to create $14 trillion net-profit value, a combination of increased revenues and lowered costs, to private sector from2013 to 2022 [1]. IoE is not seen as an individual stand-alone system, but as a globally integrated infrastructure with many applications and services.

We present the proposed CARS architecture. Such an architecture can be viewed as a geographically distributed platform that connects many billions of sensors and things, and provides multitier layers of abstraction of sensors and sensor networks. Fig. 1 shows the proposed CARS architecture, which has four main layers: 1) fog layer; 2) stratus layer; 3) alto-cumulus layer; and 4) cirrus layer. Layer roles and inter-layer interactions are described in detail as follows

A. Fog Layer

Fog layer encapsulates all physical objects, machines, and anything that is equipped with computing, storage, networking, sensing, and/or actuating resources, and that can connect to and be part of the Internet. The sensory elements of this layer are those that collect and send raw sensed data to stratus layer, by either being pulled by stratus layer or being pushed by fog layer to stratus layer. Major functions of fog layer are to provide:

1) heterogeneous networking and communication infrastructures to connect billions of things;
2) unique identification of all things through Internet Protocol Version 6 (IPv6);
3) data aggregation points to serve as sensing clusters.

B. Stratus Layer

Stratus layer is a mid, tier-2 layer that consists of thousands of clouds whose main resources are sensory devices and SANs. Each stratus cloud manages and acts as a liaison for a different group of SANs that share similar features, context, or properties.

The functions of stratus layer include:

1) abstracting and virtualizing physical SANs through virtual network embedding (VNE) techniques;
2) handling and managing virtual SAN migration and portability across different clouds;
3) managing and ensuring operations and functionalities of virtual SAN instances;
4) enabling and managing (physical or virtual) SAN configurations to ensure network connectivity and coverage;
5) controlling the layer's operations and functionalities to ensure that customers' service level agreements (SLAs) communicated from higher layers (as detailed later) are met.

C. Alto-Cumulus Layer

Alto-cumulus is a middle layer that serves as a point of liaison between stratus and cirrus layers. Major functions of alto-cumulus are as follows:

1) serving as a point of liaison between cirrus and stratus layers by translating policy and regulation requirements expressed by cirrus layer into domain-specific requirements understood by stratus;
2) enabling business and payment transactions between cirrus and stratus layers by providing two-way brokerage services;
3) enabling and facilitating SLA negotiations between cirrus and stratus, and monitoring and ensuring that these SLAs are met; i.e., playing the role of a policy enforcement agent;
4) co-ordinating and facilitating inter-cloud interactions, data exchange, task migration, and resource sharing across different stratus clouds.

D. Cirrus Layer

Cirrus layer is the highest layer in the CARS architecture, and its main role is to interact with CARS service customers and satisfy their requests with the aid of lower layers. The major functions of this layer are as follows:

1) acting as the customers' entry point to CARS systems by allowing them to specify their required services via SLAs and to select their desired service models;
2) allowing CARS customers to set up their sensing task requirements and do whatever their chosen service model allows them to do (e.g., software configuration/deployment);
3) negotiating SLAs with customers and communicating them to alto-cumulus layer;
4) providing online applications for remote data analysis to be used by customers to visualize their data in real time.

VI. Conclusion And Future Enhancement

A. Conclusion

This paper surveys CARS applications and services. The survey starts off by describing the potentials and capabilities of remote sensing when empowered via cloud services. It supports these CARS' capabilities and benefits through applications taken from real-world scenarios. The survey then presents four-layer architecture for CARS by describing the functionalities, responsibilities, and inter-layer interactions of each layer. The survey then describes three different CARS services models and presents commercial platforms.

First, it eases data deployment and migration across different clouds by making it easy to move consumer data in and out of the cloud. Second, it provides customers with the flexibility of selecting, mixing, and/or changing cloud service providers with minimal input and intervention. Third, it adds elasticity to service outsourcing by allowing customers and enterprises to easily move to and from the cloud only some parts of their applications and services while hosting other parts locally. This also allows customers to spread their outsourced applications and software across multiple cloud providers, not forcing them to necessarily use just one provider. Finally, it facilitates adoption of new elements to the clouds and makes it possible for various different platforms, protocols, or technologies to use each other's functionalities.

B. Future Enhancement

Cloud-assisted remote sensing techniques for enabling distributed consensus estimation of unknown parameters in a given geographic area. We first propose a distributed sensor network virtualization algorithm that searches for, selects, and coordinates Internet-accessible sensors to perform a sensing task in a specific region. The algorithm converges in line arithmic time for large-scale networks, and requires exchanging a number of messages that is at most linear in the number of sensors. Second, we design an uncoordinated, distributed algorithm that relies on the selected sensors to estimate a set of parameters without requiring synchronization among the sensors. Our simulation results show that the proposed algorithm, when compared to conventional ADMM (Alternating Direction Method of Multipliers), reduces communication overhead significantly without compromising the estimation error. In addition, the convergence time, though increases slightly, is still linear as in the case of conventional ADMM.

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