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Cloud Consistency Maintaining As A Service Model For Auditing

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Abstract- Cloud storage services have become commercially popular due to their overwhelming advantages. To provide ubiquitous always-on access, a cloud service provider (CSP) maintains multiple replicas for each piece of data on geographically distributed servers. A key problem of using the replication technique in clouds is that it is very expensive to achieve strong consistency on a worldwide scale. In this paper, we first present a novel consistency as a service (CaaS) model, which consists of a large data cloud and multiple small audit clouds. In the CaaS model, a data cloud is maintained by a CSP, and a group of users that constitute an audit cloud can verify whether the data cloud provides the promised level of consistency or not. We propose a two-level auditing architecture, which only requires a loosely synchronized clock in the audit cloud. Then, we design algorithms to quantify the severity of violations with two metrics: the commonality of violations, and the staleness of the value of a read. Finally, we devise a heuristic auditing strategy (HAS) to reveal as many violations as possible. Extensive experiments were performed using a combination of simulations and a real cloud deployment to validate HAS.

Keywords – cloud service provider, consistency as a service, heuristic auditing strategy (HAS), consistency as a service (CaaS) model, Platform-as-a-Service (PaaS), Scalability, Security, Local Consistency Auditing, Global Consistency Auditing, logical vector, and physical vector.

I. INTRODUCTION

The Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet). The name comes from the common use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation. Cloud computing consists of hardware and software resources made available on the Internet as managed third-party services. These services typically provide access to advanced software Applications and high-end networks of server computers.

How Cloud Computing Works-The goal of cloud computing is to apply traditional supercomputing, or high-performance computing power, normally used by military and research facilities, to perform tens of trillions of computations per second, in consumer-oriented applications such as financial portfolios, to deliver personalized information, to provide data storage or to power large, immersive computer games. The cloud computing uses networks of large groups of servers typically running low-cost consumer PC technology with specialized connections to spread data-processing chores across them. This shared IT infrastructure contains large pools of systems that are linked together. Often, virtualization techniques are used to maximize the power of cloud computing.

*Characteristics and Services Models***:** The salient characteristics of cloud computing based on the definitions provided by the National Institute of Standards and Terminology (NIST) are outlined below. **On-demand self-service**: A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service's provider. **Broad network access**: Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, laptops, and PDAs). **Resource pooling**: The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location-independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or data center). Examples of resources include storage, processing, memory, network bandwidth, and virtual machines.

Rapid elasticity: Capabilities can be rapidly and elastically provisioned, in some cases automatically, to quickly scale out and rapidly released to quickly scale in. To the consumer, the capabilities available for

provisioning often appear to be unlimited and can be purchased in any quantity at any time. **Measured service**: Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be managed, controlled, and reported providing transparency for both the provider and consumer of the utilized service.

Services Models: Cloud Computing comprises three different service models, namely Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS). The three service models or layer are completed by an end user layer that encapsulates the end user perspective on cloud services. The model is shown in figure below. If a cloud user accesses services on the infrastructure layer, for instance, she can run her own applications on the resources of a cloud infrastructure and remain responsible for the support, maintenance, and security of these applications herself. If she accesses a service on the application layer, these tasks are normally taken care of by the cloud service provider.

*Benefits of cloud computing***:** Achieve economies of scale – increase volume output or productivity with fewer people. Your cost per unit, project or product plummets. Reduce spending on technology infrastructure-Maintain easy access to your information with minimal upfront spending. Pay as you go (weekly, quarterly or yearly), based on demand. Globalize your workforce on the cheap-People worldwide can access the cloud, provided they have an Internet connection. Streamline processes-Get more work done in less time with less people.

Reduce capital costs- There's no need to spend big money on hardware, software or licensing fees. Improve accessibility-You have access anytime, anywhere, making your life so much easier. Monitor projects more effectively-Stay within budget and ahead of completion cycle times. Less personnel training is needed-It takes fewer people to do more work on a cloud, with a minimal learning curve on hardware and software issues. Minimize licensing new software-Stretch and grow without the need to buy expensive software licenses or programs. Improve flexibility.-You can change direction without serious "people" or "financial" issues at stake.

II. RELATED WORKS

Existing System By using the cloud storage services, the customers can access data stored in a cloud anytime and anywhere using any device, without caring about a large amount of capital investment when deploying the underlying hardware infrastructures. The cloud service provider (CSP) stores data replicas on multiple geographically distributed servers. Where a user can read stale data for a period of time. The domain name system (DNS) is one of the most popular applications that implement eventual consistency. Updates to a name will not be visible immediately, but all clients are ensured to see them eventually. Disadvantages Of Existing System-The replication technique in clouds is that it is very expensive to achieve strong consistency. Hard to verify replica in the data cloud is the latest one or not.

System Module: In the first module, we develop the System Module with User Module, Admin Module, and Auditor Module. In user module, user should register their details and get the secret key for login and user can upload the file regarding the auditing. In user module, the user uploaded files can be stored in cloud database. Auditor can view the file from the database it can be much secured. In admin module admin can view all the user details; user uploads details, and TPA activities regarding the auditing strategy. In auditor module, auditor can do the auditing based on the heuristic auditing strategy. It relates with document verification. Auditor can check the auditing file he can reject or accept the file he can revise the report and check whether it's good or bad. And auditor can give revision report like accept or waiting. If status in accept means user can view the file else status is waiting means user cant view the file.

*Quality-of-service for consistency of data geo-replication in cloud computing***-**Today we are increasingly more dependent on critical data stored in cloud data centers across the world. To deliver high-availability and augmented performance, different replication schemes are used to maintain consistency among replicas. With classical consistency models, performance is necessarily degraded, and thus most highly-scalable cloud data centers sacrifice to some extent consistency in exchange of lower latencies to end-users. More so, those cloud systems blindly allow stale data to exist for some constant period of time and disregard the semantics and importance data might have, which undoubtedly can be used to gear consistency more wisely, combining stronger and weaker levels of consistency. To tackle this inherent and well-studied trade-off between availability and consistency, we propose the use of VFC 3, a novel consistency model for replicated data across data centers with framework and library support to enforce increasing degrees of consistency for different types of data (based on their semantics). It targets cloud tabular data stores, offering rationalization of resources (especially bandwidth) and improvement of QoS (performance, latency and availability), by providing strong consistency where it matters most and relaxing on less critical classes or items of data.

Data consistency properties and the trade-offs in commercial cloud storages-The consumers' perspective-A new class of data storage systems, called NoSQL (Not Only SQL), have emerged to complement traditional database systems, with rejection of general ACID transactions as one common feature. Different platforms, and indeed different primitives within one NoSQL platform, can offer various consistency properties, from Eventual Consistency to single-entity ACID.

III. SYSTEM ARCHITECTURE

In System Architecture the System Module with User Module, Admin Module, and Auditor Module. In user module, user should register their details and get the secret key for login and user can upload the file regarding the auditing.

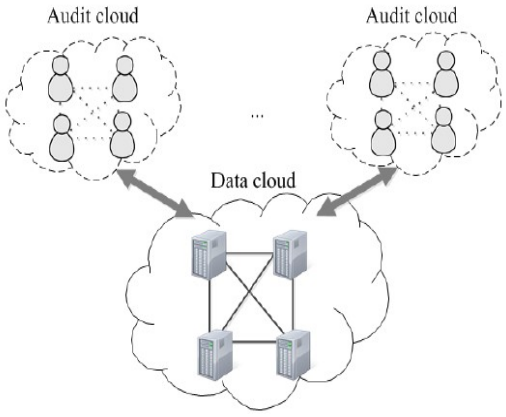

Figure 1. System Architecture

In user module, the user uploaded files can be stored in cloud database. Auditor can view the file from the database it can be much secured. In admin module admin can view all the user details; user uploads details, and TPA activities regarding the auditing strategy. In auditor module, auditor can do the auditing based on the heuristic auditing strategy. It relates with document verification. Auditor can check the auditing file he can reject or accept the file he can revise the report and check whether it's good or bad..If status in accept means user can view the file else status is waiting means user cant view the file. Provide extendibility and specialization mechanisms to extend the core concepts. Be independent of particular programming languages and development process. Provide a formal basis for understanding the modeling language. Encourage the growth of Object Oriented tools market. Support higher level development concepts such as collaborations, frameworks, patterns and components. Integrate best practices. **Image Classification:** In use case diagram, its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted .Class diagram in a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among the classes. It explains which class contains information. Sequence diagram is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. Sequence diagrams are sometimes called event and timing diagrams, event scenarios.

IV. IMPLEMENTATION AND ANALYSIS

The consistency as a service (CaaS) model and a two-level auditing structure to help users verify whether the cloud service provider (CSP) is providing the promised consistency implemented using Microsoft .NET and C#.. To quantify the severity of the violations, if any. With the CaaS model, the users can assess the quality of cloud services and choose a right CSP among various candidates, e.g., the least expensive one that still provides adequate

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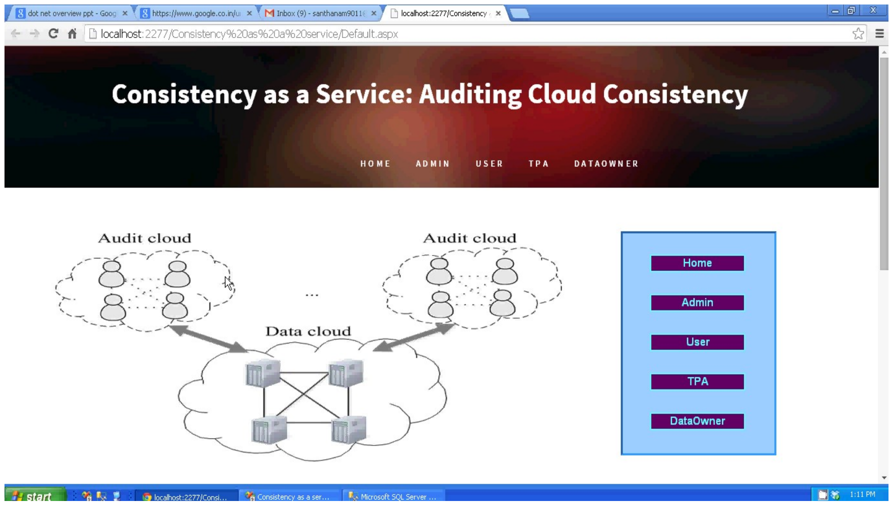
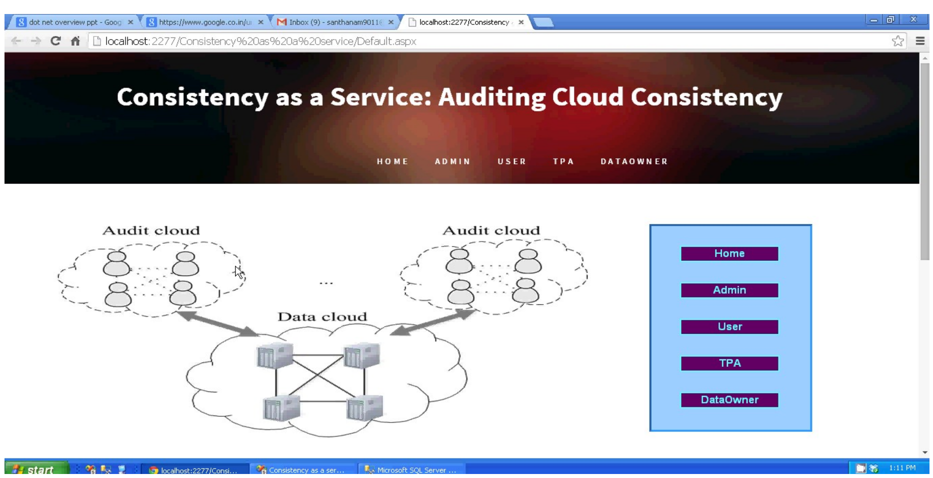
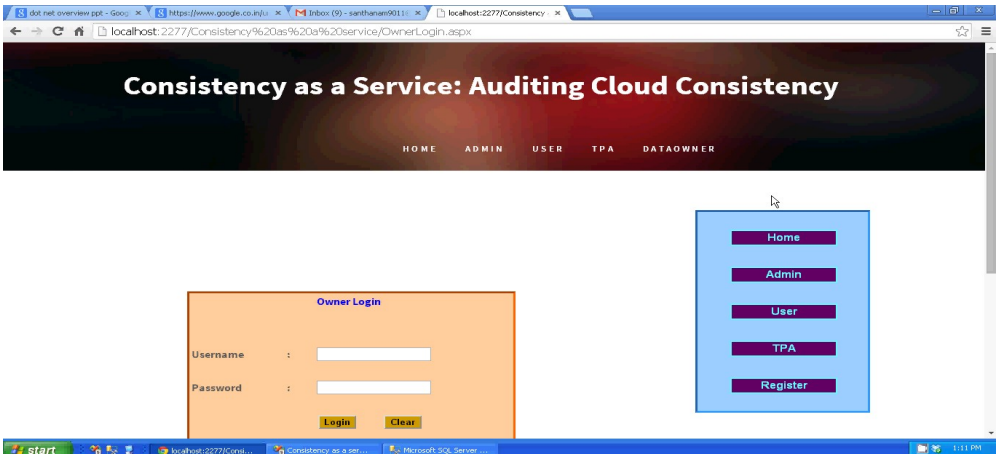
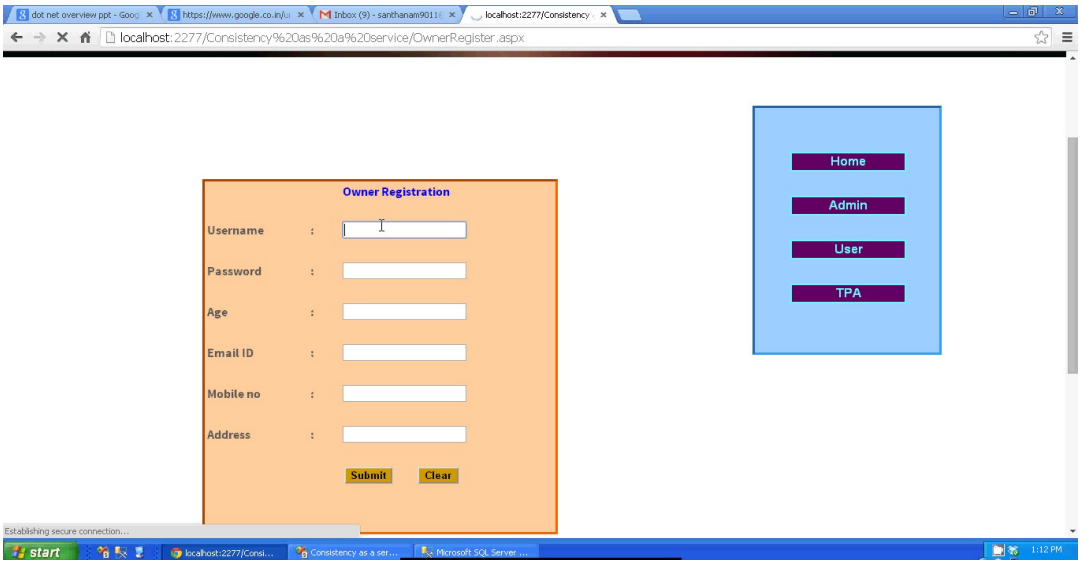
consistency for the users' applications._Advantages of Proposed System-Do not require a global clock among all users for total ordering of operations._The users can assess the quality of cloud services. choose a right CSP._Among various candidates, e.g, the least expensive one that still provides adequate consistency for the users applications.

V. RESULTS









VI . CONCLUSION

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

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