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SECURE AUDITING AND DEDUPLICATING DATA IN CLOUD

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ABSTRACT:

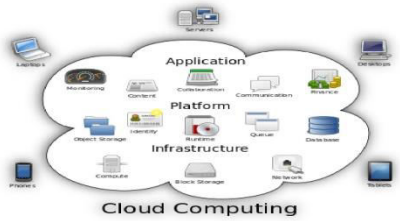
As the cloud computing technology develops during the last decade, outsourcing data to cloud service for storage becomes an attractive trend, which benefits in sparing efforts on heavy data maintenance and management. Nevertheless, since the outsourced cloud storage is not fully trustworthy, it raises security concerns on how to realize data deduplication in cloud while achieving integrity auditing. In this work, we study the problem of integrity auditing and secure deduplication on cloud data. Specifically, aiming at achieving both data integrity and deduplication in cloud, we propose two secure systems, namely SecCloud and SecCloud+. SecCloud introduces an auditing entity with a maintenance of a MapReduce cloud, which helps clients generate data tags before uploading as well as audit the integrity of data having been stored in cloud. Compared with previous work, the computation by user in SecCloud is greatly reduced during the file uploading and auditing phases. SecCloud+ is designed motivated by the fact that customers always want to encrypt their data before uploading, and enables integrity auditing and secure deduplication on encrypted data.

Keywords: SecCloud, deduplication, Cloud Servers, Auditor.

INTRODUCTION

What is cloud computing?

Cloud computing is the use of computing resources (hardware and software) that are delivered as a service overa 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.



Structure of cloud computing

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.

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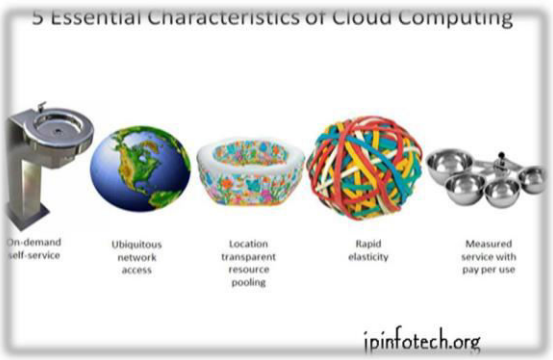
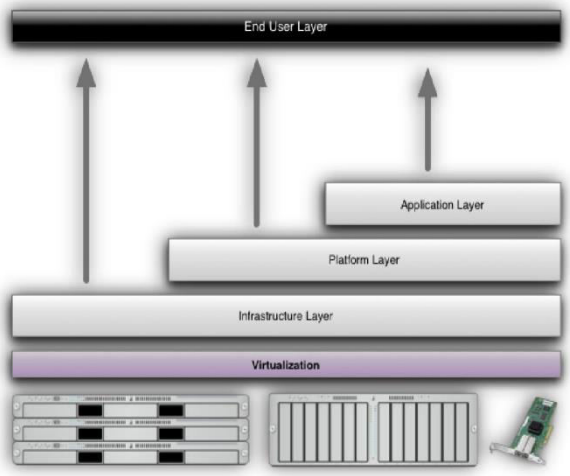


Characteristics of cloud computing

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.



Structure of service models

Benefits of cloud computing:

1. **Achieve economies of scale** –increase volume output or productivity with fewer people. Your cost per unit,project or product plummets.
2. **Reduce spending on technology infrastructure.** Maintain easy access to your information with minimalupfront spending. Pay as you go (weekly, quarterly or yearly), based on demand.
3. **Globalize your workforce on the cheap.** People worldwide can access the cloud, provided they have anInternet connection.
4. **Streamline processes.** Get more work done in less time with less people.
5. **Reduce capital costs.** There's no need to spend big money on hardware, software or licensing fees.
6. **Improve accessibility.** You have access anytime, anywhere, making your life so much easier!

II. IMPLEMENTATION

Modules:-

- Cloud Servers
- Data Users Module
- Auditor
- Secure De-duplication System

Modules Descripton:-

Cloud Service Provider

- In this module, we develop Cloud Service Provider module. This is an entity that provides a data storage service in public cloud.
- The CS provides the data outsourcing service and stores data on behalf of the users.
- To reduce the storage cost, the CS eliminates the storage of redundant data via deduplication and keeps only unique data.
- In this paper, we assume that CS is always online and has abundant storage capacity and computation power.

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III. LITERATURE SURVEY

1) A view of cloud computing

AUTHORS: M. Armbrust, A. Fox, R. Griffith, A. D. Joseph, R. Katz, A. Konwinski, G. Lee, D. Patterson, A.Rabkin, I. Stoica, and M. Zaharia Cloud computing, the long-held dream of computing as a utility, has the potential to transform a large part of the IT industry, making software even more attractive as a service and shaping the way IT hardware is designed and purchased. Developers with innovative ideas for new Internet services no longer require the large capital outlays in hardware to deploy their service or the human expense to operate it. They need not be concerned about overprovisioning for a service whose popularity does not meet their predictions, thus wasting costly resources, or underprovisioning for one that becomes wildly popular, thus missing potential customers and revenue. Moreover, companies with large batch - oriented tasks can get results as quickly as their programs can scale, since using 1,000 servers for one hour costs no more than using one server for 1,000 hours. This elasticity of resources, without paying a premium for large scale, is unprecedented in the history of IT.

2)Secure and constant cost public cloud storage auditing with deduplication

AUTHORS: J. Yuan and S. Yu
Data integrity and storage efficiency are two important requirements for cloud storage.
Proof of Retrievability
(POR) and Proof of Data Possession (PDP) techniques assure data integrity for cloud storage. Proof of Ownership (POW) improves storage efficiency by securely removing unnecessarily duplicated data on the storage server. However, trivial combination of the two techniques, in order to achieve both data integrity and storage efficiency, results in non - trivial duplication of metadata (i.e., authentication tags), which contradicts the objectives of POW. Recent attempts to this problem introduce tremendous computational and communication costs and have also been proven not secure.

IV. SYSTEM STUDY

Feasibility Study

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are

- ECONOMICAL FEASIBILITY
- TECHNICAL FEASIBILITY
- SOCIAL FEASIBILITY

System Requirements:

Hardware Requirements:

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Floppy Drive : 1.44 Mb.
- Monitor : 15 VGA Colour.
- Mouse : Logitech.
- Ram : 512 Mb.

Software Requirements:

- Operating system : - Windows XP.
- Coding Language : J2EE
- Data Base : MYSQL

System Testing

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner.

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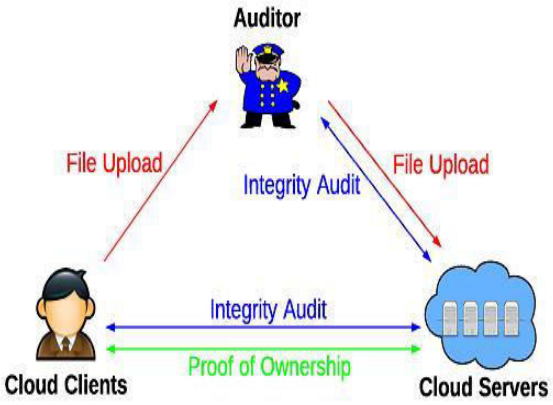
There are various types of test. Each test type addresses a specific testing requirement.

Types of Tests

Unit testing
Integration testing
Functional test
System Test
White Box Testing
Black Box Testing

System Design

System Architecture:



System Analysis

Existing System:

- Ateniese et al. proposed a dynamic PDP schema but without insertion operation.
- Erway et al. improved Ateniese et al.'s work and supported insertion by introducing authenticated flip table.
- Wang et al.proposed proxy PDP in public clouds.
- Zhu et al. proposed the cooperative PDP in multi-cloud storage.
- Wang et al. improved the POR model by manipulating the classic Merkle hash tree construction for block tag authentication.

Proposed System:

- In this paper, aiming at achieving data integrity and deduplication in cloud, we propose two secure systems namely SecCloud and SecCloud+.
- SecCloud introduces an auditing entity with maintenance of a MapReduce cloud, which helps clients generate data tags before uploading as well as audit the integrity of data having been stored in cloud.
- Besides supporting integrity auditing and secure deduplication, SecCloud+ enables the guarantee of file confidentiality

V. CONCLUSION

Aiming at achieving both data integrity and deduplication in cloud, we propose SecCloud and SecCloud+. SecCloud introduces an auditing entity with maintenance of a MapReduce cloud, which helps clients generate data tags before uploading as well as audit the integrity of data having been stored in cloud. In addition, SecCoud enables secure deduplication through introducing a Proof of Ownership protocol and preventing the leakage of side channel information in data deduplication. Compared with previous work, the computation by user in SecCloud is greatly reduced during the file uploading and auditing phases. SecCloud+ is an advanced construction motivated by the fact that customers always want to encrypt their data before uploading, and allows for integrity auditing and secure deduplication directly on encrypted data.

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