ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

Ensuring The Integrity of Data In Cloud Based on Homomorphic Verifiable Response and Hash Index Hierarchy

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Abstract:

Cloud computing is computing in which large groups of remote servers are networked to allow centralized data storage and online access to computer services or resources. Cloud computing relies on sharing of resources to achieve coherence and economies of scale, similar to a utility (like the electricity grid) over a network. The cloud must have to ensure data integrity and security of data of user. Identity-Based Provable data possession (PDP) is a technique for ensuring the integrity of data in storage outsourcing construction of an efficient scheme for distributed cloud storage to support the scalability of service and data migration, in which of multiple cloud service providers to cooperatively store and maintain the clients' data. Based on verifiable response and hash index hierarchy, we have proposed a cooperative PDP scheme to support dynamic scalability on multiple storage servers. According to zero knowledge interactive proof system having security with using RSA algorithm for data transfer.

Keywords:

Multi-cloud storage, Cooperative Provable Data Possession, Data Integrity, Hash Index Hierarchy, Homomorphic Verifiable Response.

Introduction:

Cloud computing security or, more simply, cloud security is an evolving sub-domain of computer security, network security, and, more broadly, information security. It refers to a broad set of policies, technologies, and controls deployed to protect data, applications, and the associated infrastructure of cloud computing.

Security issues associated with the cloud:

Organizations use the Cloud in a variety of different service models (SaaS, PaaS, and IaaS) and deployment models (Private, Public, Hybrid, and Community). There are a number of security issues/concerns associated with cloud computing but these issues fall into two broad categories: security issues faced by cloud providers (organizations providing software-, platform-, or infrastructure-as-a-service via the cloud) and security issues faced by their customers (companies or organizations who host applications or store data on the on the cloud). The responsibility goes both ways, however: the provider must ensure that their infrastructure is secure and that their clients' data and applications are protected while the user must take measures to fortify their application and use strong passwords and authentication measures.When an organization elects to store data or host applications on the public cloud, it loses its ability to have physical access to the servers hosting its information. As a result, potentially business sensitive and confidential data is at risk from insider attacks. According to a recent Cloud Security Alliance Report, insider attacks are the third biggest threat in cloud computing. Therefore, Cloud Service providers must ensure that thorough background checks are conducted for employees who have physical access to the servers in the data center. Additionally, data centers must be frequently monitored for suspicious activity. In order to conserve resources, cut costs, and maintain efficiency, Cloud Service Providers often store more than one customer's data on the same server. As a result there is a chance that one user's private data can by viewed by other users (possibly even competitors). To handle such sensitive situations, cloud service providers should ensure proper data isolation and logical storage segregation.

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The extensive use of virtualization in implementing cloud infrastructure brings unique security concerns for customers or tenants of a public cloud service. Virtualization alters the relationship between the OS and underlying hardware - be it computing, storage or even networking. This introduces an additional layer - virtualization - that itself must be properly configured, managed and secured. Specific concerns include the potential to compromise the virtualization software, or "hypervisor". While these concerns are largely theoretical, they do exist. For example, a breach in the administrator workstation with the management software of the virtualization software can cause the whole datacenter to go down or be reconfigured to an attacker's liking. Some security and privacy issues that need to be considered are as follows

1) Authentication: Only authorized user can access data in the cloud

2) Correctness of data: This is the way through which user will get the confirmation that the data stored in the cloud is secure

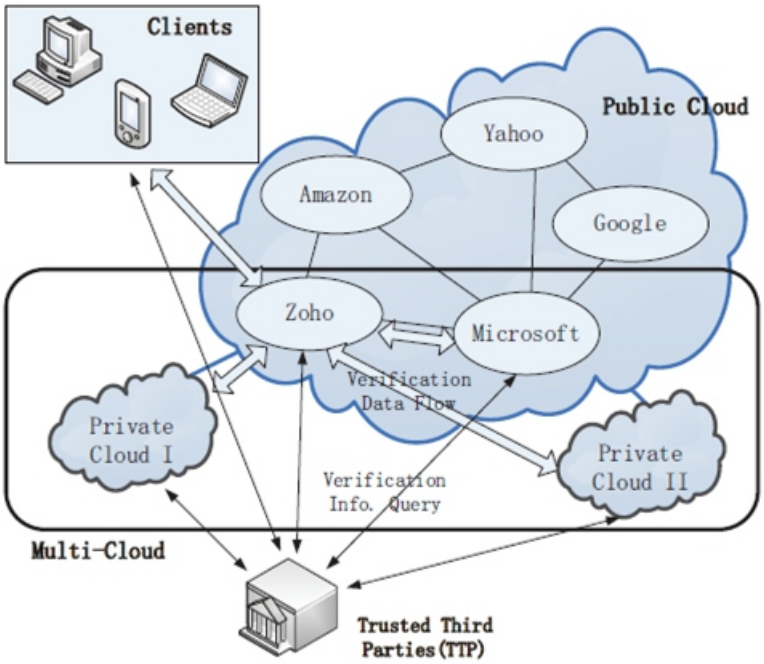
3) Availability: The cloud data should be easily available and accessible without any burden. The user should access the cloud data as if he is accessing local data

4) No storage Overhead and easy maintenance: User doesn't have to worry about the storage requirement & maintenance of the data on a cloud

5) No data Leakage: The user data stored on a cloud can accessed by only authorize the user or owner. So all the contents are accessible by only authorize the user.

6) No Data Loss: Provider may hide data loss on a cloud for the user to maintain their reputation

ARCHITECTURE:



EXISTING SYSTEM:

There exist various tools and technologies for multi-cloud, such as Platform VM Orchestrator, VMwarevSphere, and Ovirt. These tools help cloud providers construct a distributed cloud storage platform for managing clients' data. However, if such an important platform is vulnerable to security attacks, it would bring irretrievable losses to the clients.

For example, the confidential data in an enterprise may be illegally accessed through a remote interface provided by a multi-cloud, or relevant data and archives may be lost or tampered with when they are stored into an· uncertain storage pool outside the enterprise. Therefore, it is indispensable for cloud service providers to provide security techniques for managing their storage services.

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PROPOSED SYSTEM:

To check the availability and integrity of outsourced data in cloud storages, researchers have proposed two basic approaches called Provable Data Possession and Proofs of Retrievability .Ateniese et al. first proposed the PDP model for ensuring possession of files on untrusted storages and provided an RSA-based scheme for a static case that achieves the communication cost.

They also proposed a publicly verifiable version, which allows anyone, not just the owner, to challenge the server for data possession..They proposed a lightweight PDP scheme based on cryptographic hash function and symmetric key encryption, but the servers can deceive the owners by using previous metadata or responses due to the lack of randomness in the challenges. The numbers of updates and challenges are limited and fixed in advance and users cannot perform block insertions anywhere.

MODULES:

- Multi cloud storage
- Cooperative PDP
- Data Integrity
- Third Party Auditor
- Cloud User

MODULE DESCRIPTION:

Multi cloud storage:

Distributed computing is used to refer to any large collaboration in which many individual personal computer owners allow some of their computer's processing time to be put at the service of a large problem. In our system the each cloud admin consist of data blocks.

The cloud user uploads the data into multi cloud. cloud computing environment is constructed based on open architectures and interfaces, it has the capability to incorporate multiple internal and/or external cloud services together to provide high interoperability. We call such a distributed cloud environment as a multi-Cloud .A multi-cloud allows clients to easily access his/her resources remotely through interfaces.

Cooperative PDP:

Cooperative PDP (CPDP) schemes adopting zero-knowledge property and three-layered index hierarchy, respectively. In particular efficient method for selecting the optimal number of sectors in each block to minimize the computation costs of clients and storage service providers. Cooperative PDP (CPDP) scheme without compromising data privacy based on modern cryptographic techniques

Data Integrity:

Data Integrity is very important in database operations in particular and Data warehousing and Business intelligence in general. Because Data Integrity ensured that data is of high quality, correct, consistent and accessible.

Third Party Auditor:

Trusted Third Party (TTP) who is trusted to store verification parameters and offer public query services for these parameters. In our system the Trusted Third Party, view the user data blocks and uploaded to the distributed cloud. In distributed cloud environment each cloud has user data blocks. If any Modification tried by cloud owner an alert is send to the Trusted Third Party.

Cloud User:

The Cloud User who has a large amount of data to be stored in multiple clouds and have the permissions to access and manipulate stored data. The User's Data is converted into data blocks. The data blocks are uploaded to the cloud. The TPA views the data blocks and Uploaded in multi cloud. The user can update the uploaded data. If the user wants to download their files, the data's in multi cloud is integrated and downloaded.

CONCLUSION:

Our experiments clearly demonstrated that our approaches only introduce a small amount of computation and communication overheads. Therefore, our solution can be treated as a new candidate for data integrity verification in outsourcing data storage systems. As part of future work, we would extend our work to explore more effective CPDP constructions.

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Finally, it is still a challenging problem for the generation of tags with the length irrelevant to the size of data blocks. We would explore such a issue to provide the support of variable-length block verification. Scheme to support dynamic scalability on multiple storage servers. We also showed that our scheme provided all security properties required by zero knowledge interactive proof system, so that it can resist various attacks even if it is deployed as a public audit service in clouds by using this construction we are Deprecating all the limitation which is to be found in previously derived scheme.

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