

HETEROGENEOUS DATA STORAGE OF DIFFERENT CLOUD SERVICES

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Abstract

In this emerging computing platform, the cloud provider, application developers, and end users can all reap benefits. One of the most attractive cloud services nowadays is data storage, many well-known cloud service providers (CSPs) have started providing lucrative data storage services during the past few years, including Microsoft SkyDrive, Amazon S3, Dropbox, Apple iCloud, and Google drive. In this paper, we propose exploiting heterogeneous data storage of different Cloud services by building a Cloud storage, which aggregates multiple Cloud storage services, provides enhanced privacy, and offers a distributed file sharing system..

Keywords: Cloud computing, cloud storage, cloud services.

1.Introduction

The demand of outsourcing data has greatly increased in the last decade. To satisfy the need for data storage and high performance computation, many cloud computing service providers have appeared, such as Amazon Simple Storage Service (Amazon S3), Google App Engine, Microsoft Azure, Dropbox and so on. There are two obvious advantages to store data in Cloud Servers:

1) The data owners save themselves out from the trouble of buying extra storage servers and hiring server management engineers. 2) It is easier for the data owner to share their data with Intended recipients when the data is stored in the cloud. Despite of the above advantages of cloud storage, there still remain various challenging obstacles, among which, the privacy and security of users' data have become two major issues. Traditionally, the data owner stores his/her data in the trusted servers, which are generally controlled by a fully trusted administrator. However, the cloud is usually maintained and managed by a semi-trusted third party (Cloud provider).

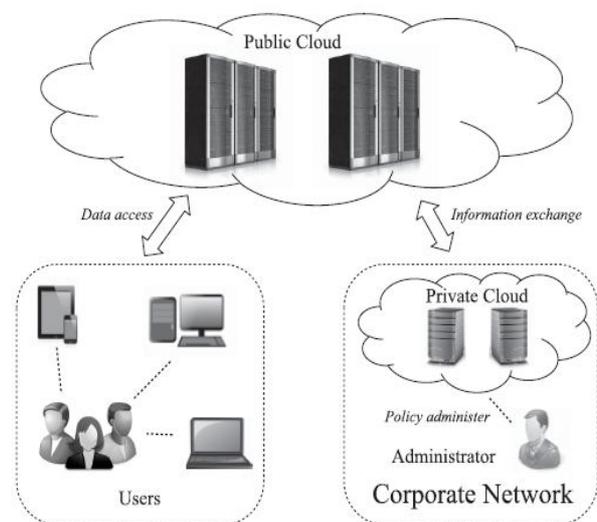


Fig. share or access the data with the public cloud

The high level architecture of the hybrid cloud storage system is illustrated in Fig. 1. In this architecture, the users who wish to share or access the data only interact with the public cloud; there is no access for public users to access the private cloud, which greatly reduces the attack surface for the private cloud.

As a result, traditional security storage technologies cannot be directly applied in the cloud storage scenario. While it is desirable for the data owner to share his/her private data with intended recipients, it presents an even more challenging problem since we have to make sure that except the intended recipients, nobody, including the cloud providers have access to Data.

Cloud computing has grown as an adoptable technology for many of the organizations which consists of dynamic scalability and entry to virtualized resources being a service with the Internet [1]. Impair computing, as an emerging calculating paradigm, enables customers to remotely shop their data inside a cloud, so as to enjoy solutions on-demand.

2. LITERATURE REVIEW

An overlay network (or overlay in short) is a virtual or logical network on top of another network with addressable end points [12]. Overlays are often used to provide a routing topology not available in the underlying network. Encoding is the process in which data is converted into another form. Possible encoding applications include reduction of the file size (e.g., compression) or hiding data inside other file formats to conceal the original content (e.g., steganography) [9]. Decoding is the reverse process to restore the encoded data to their original form. A credential is the attestation of authority to access a given CS account. This can be achieved through providing a security handle, e.g., an OAuth [15] token with restricted access (time out) or a username/password pair with full access to that account.

TABLE I: A FEATURE COMPARISON OF CLOUD STORAGE SERVICES.

Feature	Generic Cloud storage services	SpiderOak	Wuala	otixo	PiCsMu
Overlay	-	-	-	✓	✓
Additional Service Support	-	-	-	✓	✓
Fragmentation to Multiple Clouds	-	-	-	-	✓
Built-in Client-side Encryption	-	✓	✓	^a	✓
Encoding	-	-	-	-	✓
Decentralized Index	-	-	-	-	✓

^aEncryption might be offered by underlaying CSs only.

3. PROMINENT RESEARCH WORK

PiCsMu shows advantages in terms of increased security and privacy: the data encoding, file part encryption, and file fragmentation processes, combined, add another layer of tasks to reconstruct original files, thus, turning it even harder for an attacker to gain access to the content of original files. Another advantage is data redundancy: multiple fragments in multiple CSs prevents data loss in case that a single CS provider shuts down its services like, e.g., Mega upload [21]. Furthermore, additional storage space is available with PiCsMu, since multiple CS that offer free storage can be aggregated the comparison of related generic Cloud storage services in Table I presents six key features, describing the presence of the specified feature, while “-” denotes the lack of it:

“Overlay” defines that the CS builds a management network on top of other CSs. Therefore, the CS does not store content data itself, but in an under laying CS. “Additional Service Support” represents whether a CS supports the aggregation of other CSs’ storage, thus, expanding its storage capabilities.

TABLE II: A COMPARISON OF P2P FILE SHARING SYSTEMS.

Criteria	Napster	Gnutella	BitTorrent	FreeNet	PiCsMu
Topology	Centralized	Decentralized	Centralized	Decentralized	Decentralized
Architecture	Unstructured	Unstructured	Unstructured	Unstructured	Structured
Lookup	Central Index	Flooding	Tracker/DHT	Key-based	DHT
Storage on Peers	✓	✓	✓	✓	-
File Search	Internal	Internal	External	External	Internal
Download	Peers	Peers	Peers	Peers	CSs
Upload	Peers	Peers	Peers	Peers	CSs
Private Sharing	-	-	✓	-	✓

The PiCsMu System presents a share functionality, which uses a P2P network. Thus, the comparison of related P2P file sharing systems is presented in Table II

The Scheduler should take the file size into consideration. Furthermore, the Scheduler could decide which CS to take, based on the current performance of the CS in order to optimize PiCsMu for the end user. Since this optimization considers the storage of data, the time of retrieval of the data is not known in advance and could be anticipated based on previous user behavior.

This paper does not consider any legal implications, such as boundaries of Cloud storage services. Thus, the PiCsMu User has the responsibility to decide about legal aspects, whether the use of a Cloud storage overlay system is conforming (i.e. fair-use) to the terms of service and its legal intent of CS providers. Additionally, such legal aspects will be explored in the future, including views of various stakeholders and their interests

4. CLOUD STORAGE

A lot of the cloud processing infrastructure can be transmitted via a reliable info center services and build different levels about the server virtualization technology, consisting associated with. It could be any place to provide network infrastructure to utilize these services [9]. "Cloud" normally presents the computing needs off users’ just one access position.

Cloud storage system structure style consists of a number of following layers.

1. Storage layer: Storage layer is the majority part of the cloud storage. FC storage devices can be Fiber Channel storage devices can be IP NAS and storage devices, etc., can also be a SCSI or SAS storage devices such as DAS. Cloud storage is generally a

huge volume of storage devices and also the distribution of several different regions, each various other through vast area circle, Internet or FC Fiber Channel systems together.

2. Basic management: Cloud-based storage management is the core part is stored in the cloud part of the most difficult to achieve. Based management through the clusters, distributed file systems and grid computing technology, cloud storage between multiple storage devices to work together, so that multiple storage devices can begin to provide the same service, and to provide bigger and more powerful better data access performance. Fig.3 is the basic management structure.
3. Application interface layer: cloud storage request interface layer would be the most accommodating part. Different managing units can easily cloud the exact storage kind of business; create a different request service interface given by different purposes.
4. Access layer: Any authorized user by way of a standard application interface in order to log general public cloud storage space system, delight in cloud storage space service. Different operating units of cloud storage, cloud storage to provide access to different types and access methods. Through the user access layer, any authorized user can at any place, using a networked terminal device, according to the standard application interface to log public cloud storage platform, enjoy cloud storage service.

5. PRAPOSED SYSTEM

Proposed System consists following steps to aggregate cloud services' storage and upload files:

File Fragmentation: The key advantages of experiencing the fragmentation step are: (1) send out file parts to many CSs worldwide, being managed within an overlay; (2) 1 entity (CS) struggles to reconstruct the whole file info, enabling an increased degree involving privacy; and (3) an error correction program code (e. Gary., Reed Solomon) could be applied intended for data redundancy. Lower than replacement running the particular encoding step is that data could be stored anywhere, even if CSs demand file type restrictions. It enables the particular aggregation involving CSs' safe-keeping: all CSs keep data, in much the same, independently involving file type restrictions.

Managing Index: The index information, which holds the metadata about files, e.g., in which Cloud Service the file was stored, how the data was encrypted, how the file was split into several small chunks, and how the data was encoded into other file types.

Data Uploading Process: After manage index of file. Files are uploading on different cloud services like Google drive, Amazon, Drop Box and sound cloud.

Cloud Services for data storage: Initial, user absolutely essential register CSs' references for his personal make use of. Assuming in which Google Picasa, Sound Cloud, Dropbox, and Facebook or MySpace credentials tend to be registered while using the Application; the fragmentation process has the capacity to calculate in to how many

report parts your PDF X could be split good maximum upload size of every CS. In this specific use case the assumption is that your PDF Times is split into report parts.

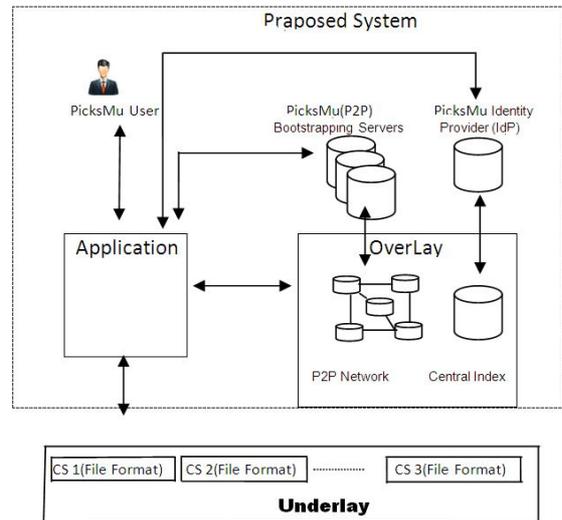


Figure 2.ProposedSystem

Users who wish to share or access the data only interact with the public cloud

The Proposed System Index consists out of information entities of the Proposed System file upload process result and contains all parameters necessary to locate and reconstruct a file within the Proposed System. The Proposed System Index consists of three independent top-level entities: the File Information, Credential Information, File Part Information. Only with all three entities the Proposed System Application can find all corresponding file parts and can reconstruct the original file.

6. CONCLUSION

Cloud Storage System for Multiple Usage shows advantages in terms of increased security and privacy: the

data encoding, file part encryptions, and file fragmentation processes, combined, add another layer of tasks to reconstruct original files, thus, turning it even harder for an attacker to gain access to the content of original files. Another advantage is data redundancy: multiple fragments in multiple cloud services prevents data loss in case that a single CS provider shuts down its services like, e.g., Mega upload. Furthermore, additional storage space is available with Platform-independent Cloud Storage System for Multiple Usage, since multiple CS that offer free storage can be aggregated

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