Survey on Cost-Efficient Multi-Cloud Storage and Data Hosting Scheme In Cloud Computing

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ABSTRACT: Cloud storage has gained attention from both the academics and industrial communities. Cost is one of the main challenges to be addressed in cloud computing. Also, the complexity increases due to different availability of different services. To address this current scenario, we present a survey paper to study and analyze the multi-cloud storage and data hosting scheme in cloud computing.

KEYWORDS: Multi-Cloud, data hosting, service providers, cloud storage

I. INTRODUCTION

Cloud computing, an internet based model for enabling convenient on-demand network access to shared resources. It provides various utilities over internet such as software, hardware, data storage, and infrastructure. Cloud computing providers deliver application via internet, which are accessible from desktop and mobile apps. Cloud computing technology grouped into three sections: they are SaaS, PaaS, and IaaS. SaaS (Software-as-a-Service) it is an on-demand application service. It eradicates the need of installing and running application on customers own computers. PaaS (Platform-as-a-Service) it is an on-demand platform service to host customer application. It is a delivery of computer platform and also solution as a service. IaaS (Infrastructure-as-a-Service) in this user can benefit from networking infrastructure services, data storage and computing services. Rather than purchasing server, software, data center space client can buy those resources as a fully outsourced service. [1]

Data will be saved on the cloud service provider's servers. Subscribers have to pay the service providers for cloud storage service. This service provides flexibility and scalability for the data storage. It also supplies customers with the advantage of paying only for the amount of data they need to store for a specific period of time. Customers can store data without any concerns for efficient storage techniques and maintainability issues with very large amount of data storage. In addition to these benefits, customers can access easily their data from geographical region where the cloud service providers' network can be accessed. Data storage can also redefine the security issues that are targeted on customer's outsourced data. Since service providers are separate market entities, data integrity and privacy are the critical issues that need to be addressed in cloud computing. Distribution of data over several service providers provides better privacy as well as ensures data availability. This can be achieved by splitting the data among various service providers available in the market, based on his budget. Also, a decision for the customer can be provided, to whichservice providers must he chose to gain access to data, with respect to data access QOS offered by the service providers at the location of data retrieval.
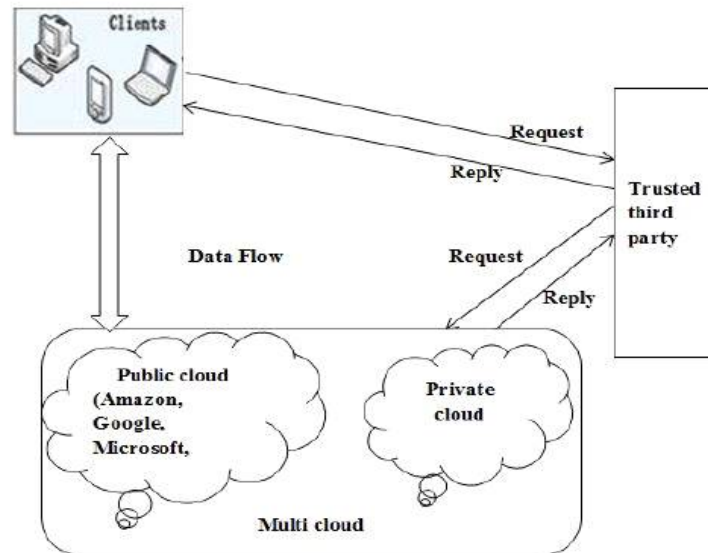
Figure 1: Multi-Cloud Architecture

In multi-cloud architecture, a data storage system involves three different entities as shown in Figure 1. Client is an entity either individual customer or organization which uses cloud to save large amount of data and depend on cloud for maintenance and assessing of data. Cloud service providers have significant storage and computation resources to manage client data and offer storage utility to the client. In multi-cloud, service providers organize their resources and provide data storage service to the client. Trusted Third Party is an entity to which verification parameters are stored. [2]

II. LITERATURE SURVEY

1. A Survey on Cost-Effective Multi-Cloud Storage in Cloud Computing [3]
With variant advantages of cloud computing, it also brings new challenges in maintaining data integrity and highly available reliable data storage facility. Cost is also a major issue when switching to multi-cloud. This survey paper is based on research related to single and multi-cloud cost, security and availability based scenario. This work aims to support the use of multi-cloud environment over single cloud to reduce the risk.

2. A Secured Cost Effective Multi-Cloud Storage in Cloud Computing [4]
In this paper, authors have proposed a secured cost-effective multi-cloud storage model in cloud computing which holds an efficient distribution of data among the available Service Providers in the market, to provide customers with data availability as well as secure storage.Providing better privacy and ensuring data availability can be achieved by splitting the user's data block into data pieces and distributing them among the available Service Providers.

3. Erasure Coding Vs. Replication: A Quantitative Comparison [5]
High availability in peer-to-peer DHTs demands data redundancy. This paper compares two popular redundancy schemes: replication and erasure coding. Unlike previous comparisons, authors have taken the characteristics of the nodes that comprise the overlay into account, and analyze that in some cases the benefits from coding are limited, and may not be worth its disadvantages.

4. A Comparative Survey on Availability and Integrity Verification in Multi-Cloud [6]
Many organizations have migrated to cloud and demand for resource is increasing. Hence the providers are now delivering multi-cloud environment to meet this need. If multiple providers cooperatively work together the availability of resource can be increased. But still clients are concerned that their data is correctly stored and maintained by providers without intact. Though the providers administer enough safety measures there are still many security issues happening in cloud. Integrity verification of customers data is made by using a technique called Provable Data Possession(PDP). This paper provides analysis about various Provable Data Possession techniques in cloud.

5.   Ensuring Data Integrity Using Cooperative Provable Data Possession for Multi-Cloud Environment [7]

Important feature for cloud computing environment is to maintain integrity of stored data. Implementation of encryption of the information is done in such a way that it will be impossible for the attackers to read the resources sent on the internet. Advanced Encryption Standard (AES) and Elliptic Curve Cryptography (ECC) are the methods used for the encryption. Outcome will be text (cipher) which is decrypted on the receiver's side. AES and ECC algorithm can be implemented together to provide proper security.

6.   Understanding Data Characteristics and Access Patterns in a Cloud Storage System [8]

Understanding the inherent system characteristics is essential to the design and optimization of cloud storage system, and few studies have methodically investigated its data characteristics and access patterns. Authors found that there are much diversity between cloud storage system and traditional file systems: our cloud storage system has greater file sizes, smaller read/write ratio, and lower set of active files than those of a typical traditional file system. With a trace-driven simulation, they found that the cache efficiency can be improved by 5 times using the guidance from authors' observations.

7.   A Study on Cloud Computing Services on Business Organizations in India [9]

With cloud computing we can access various resources from anywhere. In this paper, author provides a review on the motivation factors of choosing cloud computing, the several cloud deployment and service models. It also explores certain advantages of cloud computing over traditional IT service environment- including lower capital costs, achieve economies of scale, storing data on-demand, scalability, accessibility and flexibility are considered as adoption reasons for cloud computing environment.

III. CONCLUSION

In this paper, we study and analyze multi-cloud storage and data hosting scheme in cloud computing. Customers put their data into single cloud which is liable to vendor lock-in risk. In addition, the loss of service availability and data integrity are the major problems for the customer. To address the current scenario, a collaborative cost-effective solution for multi-cloud data hosting scheme should be found. Also, to meet the availability requirement of different services, an economical redundancy mechanism (i.e., replication or erasure coding) based on specific data access patterns can be found. Much research has been done on the single cloud and more research is going in the area of multi-cloud to overcome these cost and security issue as well.

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