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Consistency Preservation in Data Cloud By Adopting Efficient Third Party Audit Election for Cloud Storage

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Abstract— Cloud Server consists of many shared resources like platform, software, and infrastructure. In cloud consistency influences the availability and performance of the system. To check the consistency, auditing is done where the data/report is evaluated to determine whether the cloud server safeguards the data, maintains consistency. The election of best suitable audit for the auditing purpose will help improve in maintaining the consistency level of the data in the cloud.

Keywords— Cloud storage, consistency, auditing, audit election.

I. INTRODUCTION

Cloud computing environment is dynamic where the user stores the data in the cloud. Cloud computing platforms provide the users with the ability to rent computing and storage resources on-demand to run their applications and use virtualization to combine virtual server's belonging to different users on a shared set of servers. Cloud storage services are nowadays becoming increasingly popular as they provide high scalability and availability at low operational cost. Cloud storage [1] is an establishing infrastructure that provides Platforms as a Service (PaaS), Software as a service (PaaS) and Infrastructure as a service (IaaS).Unfortunately, current cloud storage. Services are not adequate to support applications that require guarantees on consistency especially in the Presence of data updates.

Cloud Computing provides a scalable environment for large amounts of data and data processes that work on various applications and services by means of on-demand self service. It is now has become a source of Everything as a Service(XaaS) where everything from platform, softwares, applications, virtual hardware is available in the cloud storage and the consumers or users can access from the cloud. Amazon Elastic Compute cloud, Open Nebula, IBM Blue cloud,Nimbus, Eucalyptus, Enomalism are some of the cloud service providers. Using the support of Hardware as a Service (HaaS), SaaS, Data as a Service (Daas), IaaS can be delivered. In order to support the above mentioned services and to provide high availability and to support ubiquitous access, the data in the cloud server is replicated. It has become a prime factor for fast access of data in the cloud. However with this continuous replication of data, there exist some consistency issues. When the data is replicated in multiple locations, consistency should be maintained by ensuring that user receives the latest updates. Fig 1 explains the replication process in the cloud server.

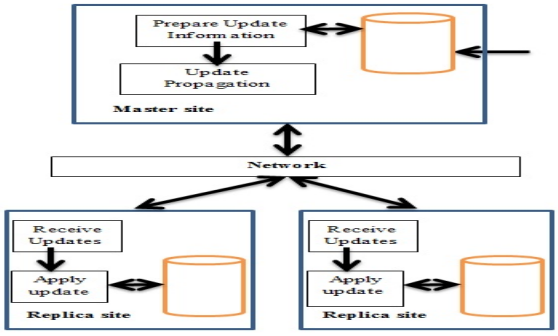


Fig 1. The replication of data in cloud server

In order to provide a solution for consistency issue in the cloud [2], [3], [5] consistency is provided as a service where it consists of a small cloud for audit and another cloud for data. The cloud for data is administered by the CSP (Cloud Service Provider). The cloud for audit consists of a small set of users who does a job. A Service Level Agreement (SLA) is signed between the cloud of data and the cloud of audit. The duty of the audit is to check if the required level of consistency is provided or not and if the cloud provider maintained cloud of data is violating SLA or not. In this a dual level auditing is

performed. Each user performs auditing at the basic level and an audit is elected from the group of the cloud of the audit to perform the higher level auditing.

The problem with this work is that the audit is elected with same probability from the cloud of audit. This does not provide the required level of efficiency in the auditing. The audit is thus elected based on the capability factor which measures the efficiency of the users with parameters like CPU utilization, memory and bandwidth. This will ensure that the audit is elected efficiently based on the corresponding capability to maintain the consistency.

II. RELATED WORK

Cloud Computing provides 24x7 access to all its consumers making it as an emerging service dependent paradigm. Every bit of the data is multiplied and stored on widely distributed cloud servers to gain high performance and availability. We review the reference [8], which proposes a technique to maintain the consistency of data replication. In this work the problem is identified as the probability of the consistency related to the maximum resource utilization. Here the update in
Conflict is handled by discarding the probability of update requests. Another approach is also provided to improvise the read after update consistency of data storage on the cloud environment. Lazy update technique is also used to separate the process of replication of data update and access in cloud server.

Another study on the auditing of cloud [9] explains about the implementation of a Third Party Auditor (TPA) to audit the integrity and consistency of the data. He has experience and resources to audit. A normal user does not contain these resources. IT companies like Microsoft, Google, and Amazon provide storage and backup services for customer data. A customer must rely upon these storage services provided by these companies but they have no guarantee on providing the promised integrity and consistency. It is the duty of the auditor to check for the promised level of service guaranteed in the Service Level Agreement (SLA)

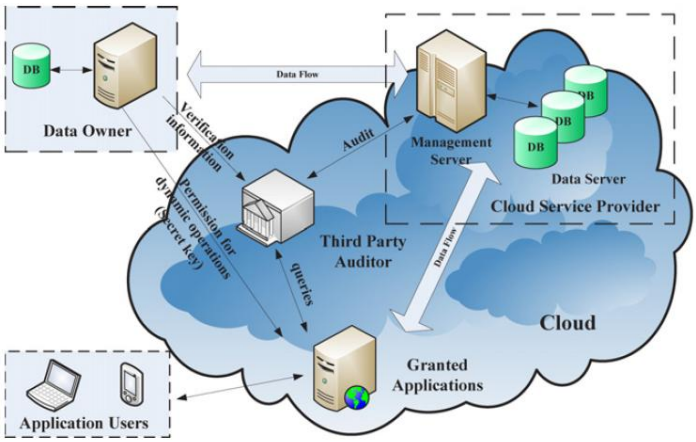
III. PROPOSED SYSTEM

In the dual level auditing for checking the consistency of the cloud, an audit is elected plainly from the cloud of audit, where each and every user has the same probability to become an auditor. Whereas different users have a distinct ability with regards to availability of bandwidth, CPU utilization, storage. This audit election can be done using the method of capability factor where each user has a unique ID. A table is constructed with ID number assigned to each and every user based on their efficiency. The user with least CPU utilization will be assigned the highest value and most utilization, the smallest. Based on this numbering the user with the most efficiency of all three factors will be elected as the auditor. For example, in the below table given (TABLE 1), user 3 has least CPU utilization, in the scenarios where users with least CPU utilization is required user 3 is elected as the auditor. Likewise, high band width scenario elects user 2 as the auditor and user 3 for high memory storage.

TABLE 1: CAPABILITY FACTOR

Parameters	**Auditor**		
	User 1	**User 2**	**User**
CPU Utilization	4.3	2.4	2
Band Width	2.5	4.4	2
Memory Storage	3.5	1.8	3

IV. ARCHITECTURE DESIGN



Audit system architecture for cloud computing.

Fig 2: The Audit Process

The above fig 2 explains about the audit process which is carried out to show violations in the Service Level Agreement. The user delegates the third party auditor with higher capability to check the cloud server data.
This is implemented using queries. Once the audit is done, the report is generated to the application user and the data owner.

V. CONCLUSION

In this paper a new approach is adopted to elect an audit. Auditing is done, where the data/report is evaluated to determine whether the cloud server safeguards the data, maintains consistency. The election of best suitable audit for the auditing purpose will help to rectify the errors caused in the audit procedure and thus indirectly helps in maintaining the consistency of the data in the cloud server. The chart in fig 3 gives the values of each user and their rating based on the efficiency.

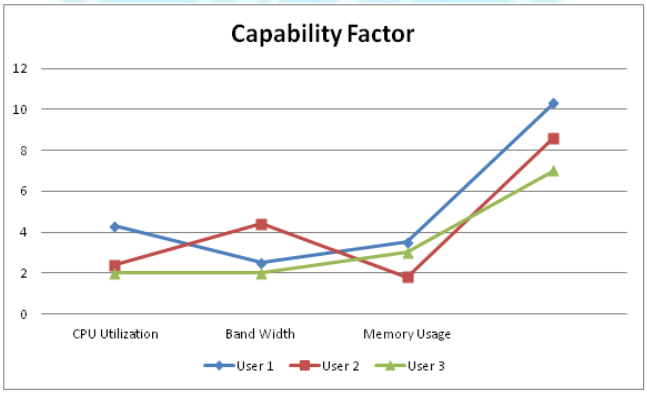


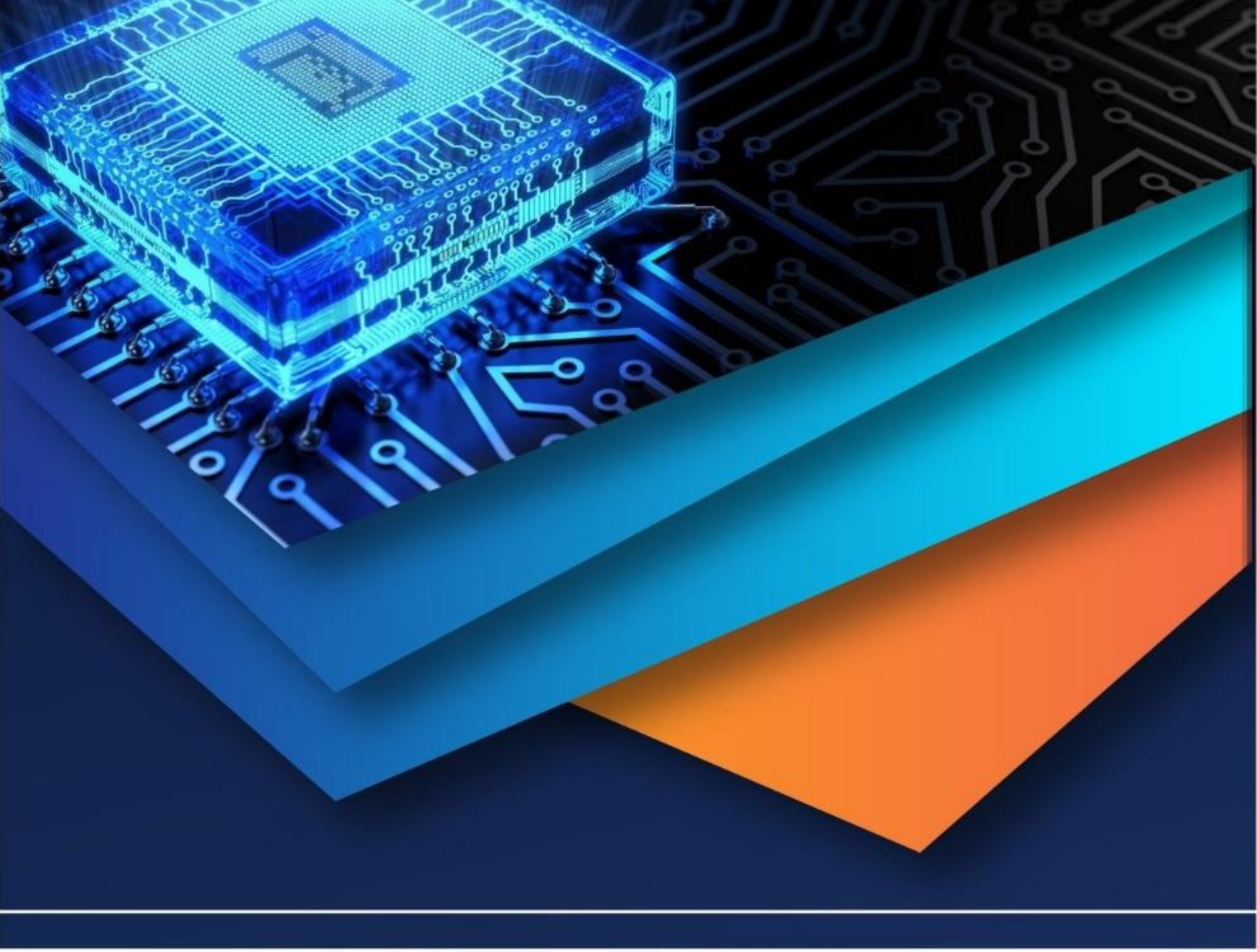
Fig 3: The efficiency measurement

VI. ACKNOWLEDGMENT

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