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A Survey on Data Storage Techniques in Cloud Computing

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Abstract -*Cloud computing is a computer model that provides a dynamically scalable infrastructure for computing resources by connecting a large pool of systems in private, public or hybrid networks. Cloud computing allows users and organizations, without any burden associated with local hardware resources and software management, to remotely store their data and enjoy good quality applications on demand. One of the services provided by cloud computing is cloud storage that enables the upload and retrieval of different types of data. Accessing the cloud storage service via the Internet and paying as a subscription was the reason for the development of methods and techniques to effectively store data and reduce storage security vulnerabilities in cloud storage. This paper provides an overview of some proposed cloud storage methods and techniques, their advantages and disadvantages and stresses the current storage requirements in cloud computing.*

Key-Words: **Cloud Computing, Cloud Storage, Cloud Security.**

1. INTRODUCTION

Cloud services are often accessible on demand and often purchased on a "pay-as-you-go" or subscription basis. Exactly where the hardware and software are located and how it works does not matter to the user, he only needs a desktop with an internet connection. Due to the emergence of cloud computing, the processing and storage of huge volumes of data have been enormously improved in recent decades. Cloud computing features include on demand self-service, broad network access, resource pooling, swift elasticity, and measured service. Self-service on-demand means that organizations can access their own computer resources and manage them. Broad network access allows Internet or private networks to provide services. Most importantly, someone else provides and manages the service you use on your behalf. Why people move to cloud computing because it allows users to access data and resources from any geographical location at any time also has many advantages, such as reduced infrastructure costs, scalability, no maintenance, and only what we use must be paid for. Amazon's simple storage service (AS3) is the innovator of cloud computing. Software as a service (SaaS), Platform as a service (PaaS), Infrastructure as a service (IaaS) are the different types of services offered in cloud computing. Services are accessible on the Internet in the public cloud and are owned and operated by a cloud provider. Single organization operates the cloud infrastructure in a private cloud and is managed by the organization or a third party. The service is shared by several organizations in a community cloud and is only available to these groups. The infrastructure may be owned and operated by a cloud service provider (CSP). The reason why developers and businesses are leaning towards Single Page Applications nowadays is because of the rise of JavaScript on the web. The ever increasing popularity of JavaScript has led to the development of several JavaScript based frameworks and libraries whose primary aim is to make web development more efficient by allowing code reusability, streamlining the development process and also code maintainability.

2. DATA STORAGE TECHNIQUES IN CLOUD COMPUTING

Different kind of data storage techniques used in cloud computing are described below.

2.1 Identity Based Authentication

IBS systems for identification - based encryption (IBE) and decryption and identity - based signature IBS systems for IBHMCC. Resources and services are distributed across numerous consumers. There is therefore a chance of various security risks. Therefore, authentication of users and services is an important requirement for cloud security. When SSH Authentication Protocol (SAP) is used in the cloud, it becomes very complex. As an alternative to SAP, a new identity based authentication protocol was proposed, based on a hierarchical model with the corresponding signature and encryption scheme.

Identify based authentication protocol restricts the sequence of steps:

1. In first step client C sends Client Hello Message to servers S. The message contains of the following attributes Cn.session identifier ID and c specification.
2. In Second step server S responds to client with a server Hello message which contains new fresh random number Sn. [1]

2.2 Implicit Security for Online Data Storage

In cloud computing, the provision of security for data stored on distributed servers is of major concern. It is likely that the conventional (explicit) way of dealing with data security will be broken later. As a result, for several applications, the explicit security architecture is inadequate. In this online data storage technique using implicit security, stored data is divided into two or more pieces and stored in arbitrarily selected network locations. This information about exactly where the pieces are kept is known and backed up on a single server and allows admission to repeatedly change passwords when using them. At the same time, clients tend to keep basic and notable passwords that lead to brute force attacks. In addition, since the files on the internet are aged, the keys offer the data owner only adequate encryption. Access to these pieces depends not only on password knowledge, but also on where the pieces are stored. The data partition is carried out in such a way that the knowledge of each of the last pieces must reproduce the data and that none of the individual pieces reveals any valuable information. [3]

2.3 Way of Dynamically Storing Data in Cloud

Cloud data storage may not be fully trusted because customers did not have a local copy of data stored in the cloud. In order to address these problems, a new protocol system was proposed using the data reading protocol algorithm to check the data integrity service providers to help customers to control data security using the proposed automatic algorithm for automatic data readier. This mechanism uses the homomorphism tokens, blocking erasure and unblocking factors and distributed erasure coded data, a flexible distributed storage integrity audit mechanism (FDSIAM). [1]

2.4 Efficient Third Party Auditing

Cloud computing is a technology that allows users to store their data remotely and access different services so that users can develop their own application using a cloud platform and can store cloud - based data using cloud infrastructure. Although cloud service providers enable us to do so, the main concern is security, so the user is not confident whether the data he has stored is integral. We can use the symmetrical key cryptography technique, which allows TPA to carry out audits without a local copy of user data, thereby reducing overhead computing and transmission, which also prevents TPA from learning the knowledge of the data stored during the audit. This scheme achieves batch auditing of multiple audit requests from various users, and this scheme also supports dynamic data operations such as insertion, deletion and updating. [1]

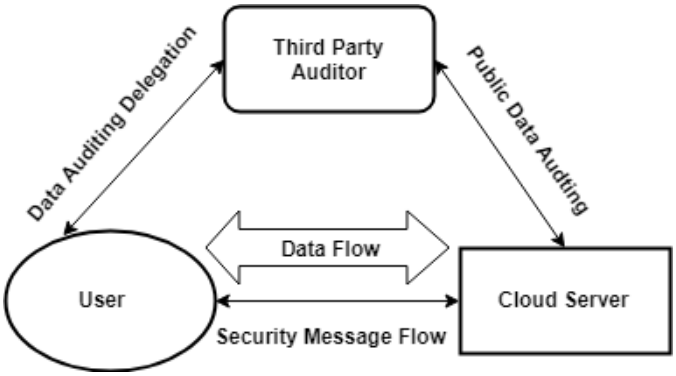

Fig 1: Architecture of Third Party Auditing Scheme

2.5 Storage Security of Data

Since cloud computing resources tend to be widely distributed across the web, which causes extreme data security problems. The sending of data on the web is unsafe due to the attack by the invader. In the cloud environment, data encryption is therefore an essential purpose. A system structure consists of three data backups for data recovery. These backups are located in a remote area from the primary server. This technique used the encryption algorithm SHA Hash, the SFSPL algorithm to split files and the compression algorithm GZIP.A guaranteed cross platform for distributed computing is thus proposed. [3]

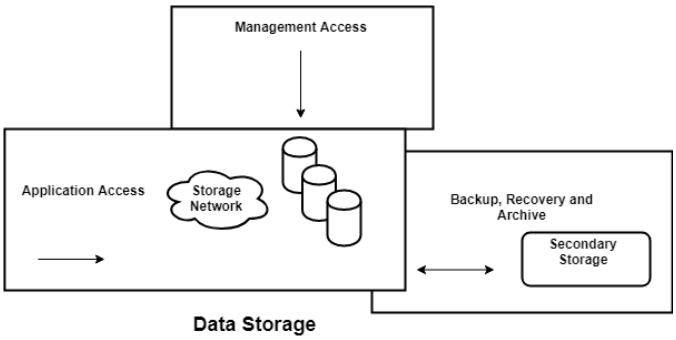

Fig 2: Security Mechanism of Domain

3. ADVANTAGES OF CLOUD STORAGE TECHNIQUES

Accessibility: Files in the cloud can be accessed via an Internet connection from anywhere. This allows you to move beyond time zone problems and geographical location.

Cost savings: Cloud storage for your company will cost a small or medium - depending on organization size. This reduces your annual operating costs and even more savings, as the remote storage of information does not depend on internal power.

Disaster recovery: All companies should invest in an emergency backup plan and by creating a second copy of important files, cloud storage can be used. These files can be stored remotely and accessed via an internet connection.

Storage immortality: The cloud offers the opportunity to avoid the soon - to - be - obsolete risk of buying hardware. Instead, you can pay for your company's capacity and performance and your provider can upgrade the environment to keep pace with the latest technology. This is caused by other cloud providers ' competitive pressures.

4. DISADVANTAGES OF CLOUD STORAGE TECHNIQUES:

Security and privacy in the cloud: There are concerns about the remote storage of valuable and important data. Before you adopt cloud technology, you should be aware that you provide a third - party cloud service provider with sensitive business information, which could jeopardize your company. For this reason, it is important to select a reliable service provider that keeps your information secure.

Bandwidth limitations: There may be a bandwidth allowance depending on which service you choose. If your company exceeds the allowance, charges may be expensive. Some vendors offer unlimited bandwidth and this is something to consider when selecting the right provider**.**

Vulnerability to Attacks: There is a vulnerability to external hack attacks with your business information stored in the cloud. The internet is not completely secure, which is why sensitive data can always be stealthy**.**

Lifetime costs: The cost of public cloud storage could increase and tend to increase over the years. It's the same as buying a new car with a high upfront cost. The convenience of lease payments may seem attractive at the beginning, but you'll have to pay a lot to keep the car for a kilometer overage. This is when the cost of your life will hit you. If your applications are local and your data is in the cloud, networking costs can be increased.

5. CONCLUSION

Cloud Computing is a web based developing computing model, which permits the clients to access data and resources from any geographical location at any time on subscription basis. Cloud data storage technology is the core area in cloud computing and solves the data storage mode of cloud environment. In this paper, we introduce the related concepts of cloud computing and cloud storage. Cloud computing moves the application software and database to the large data centre where the data management and service may not be fully worthy. Cloud storage is much more beneficial and advantages then the earlier traditional storage system especially in scalability, cost reduction, portability and functionality requirement. This paper introduced an overview on secure storage techniques in Cloud Computing. Initially a few storage strategies that give security to data in cloud have been discussed and furthermore highlighted the need for future research on storage methods to provide vastly improved security and accountability.

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