An Analysis of secure user data in cloud computing using encryption techniques

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Abstract

Cloud computing is a model for enabling suitable, on-demand network access to a shared pool of configurable and reliable computing resources. It provides the capabilities of computing and storage resources. Cloud storage is a model of data storage where the digital data is stored in logical pools. The cloud storage providers are responsible for keeping the data available and accessible.To keep the data safe encryption is the best technique for converting data into another form which cannot be easily understood by anyone except authorized parties. Cloud encryption is a service offered by cloud storage providers whereby data or text transformed using encryption algorithms and then placed on a storage cloud. In this paper we have discussed about safe data storage in cloud, possible issues, and comparison of security algorithms.

Keywords

Cloud computing, Cloud storage**,** Data security, Encryption algorithms.

Introduction

Cloud computing means storing and accessing data and programs over the internet. The important aspect of cloud computing is secure data which has been stored and cannot be hacked. Even though there are some security issues for the sensitive data many possible solutions also therefor a trust worthy cloud environment [1]. Cloud storage is a service model in which data is maintained, managed and back up remotely and made available to user over a network. The three main cloud storage models are public cloud, private cloud, hybrid cloud [2]. Private cloud storage services provide a dedicated environment protected behind an organization's firewall. These clouds are appropriate for users who need customization and more control over their data. Public cloud storage services provide multi-tenant storage environment that is more suitable. Hybrid cloud storage is a combination of the other two models that includes at least one private cloud and public cloud infrastructure.

The concept of secure storage includes certain techniques which keeps all data safe. Cloud storage providers can offer a service called cloud encryption whereby data or text is transformed using encryption algorithms and then placed on a storage cloud. This would be useful for the users to protect confidentiality of data stored [3]. The advantage of cloud computing storage is includes augment or back up existing storage systems, migrating clouds. Some services of cloud storage come in hybrid implementations that link to remote service provider's storage. These arrangements can make cloud data storage for feasible alternative and promising option for remote site storage.

Methodology

A systematic review presented in [6] is followed in this research work to present the comparison

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for different approaches related which are absolutely related to encryption techniques used for data confidentiality. The focus of this review is to find out the solution for encryption failure during cloud storage process. Some researchers contribute their efforts in data correctness as well as efficiency in [3]. In [8] review process was adopted partially for comparing encryption techniques in cloud computing.

Issues and challenges of data security

Cloud computing technologies include the control based one for data security to protect data. User access control is one of the best concern for prevent from malicious activity. There are data security challenges in the cloud, the need to protect confidential data, auditing, compliance concern, and loss of visibility. Following table differentiates the defect of each encryption algorithms.

TABLE 1: COMPARISON OF PUBLIC KEY ENCRYPTION RELATED ALGORITHMS

TECHNIQUES	**MERITS**	**DEMERITS**
RSA Encryption	1.Using the RSA encryption providing more security	1. Problem during file transferring
Predicate Encryption	**1.** Creating Generic Model for providing Security.	**1.** Problem of Uploading Files
Fuzzy Identity-Based Encryption	**1**. Using User Attribute Encrypt the File. 2. Keys Encryption	**1.** Hamming Distance Problem. 2. Error Tolerant

Review of literature

The author has been analyzed as follows regarding secure data storage in cloud and encryption algorithms. The following paper explains the techniques which are related to secure storage and its merits and demerits.

CONG WANG AND KUI REN, focused about auditing data storage for correctness guarantee. The scheme achieves the integration of storage correctness insurance and data error localization, i.e., whenever data corruption has been detected during the storage correctness verification across the distributed servers. But the public key encryption scheme needs to be developed to overcome the problem of encryption failure.

Result and discussion

During review the concepts of security issues in cloud computing and different encryption techniques for data storage were compared. The reason for encryption failure has been identified and the possible solutions are provided. The following table describes merits and demerits of MCL-PKE scheme. And the graph denoting accurate performance of various algorithms.

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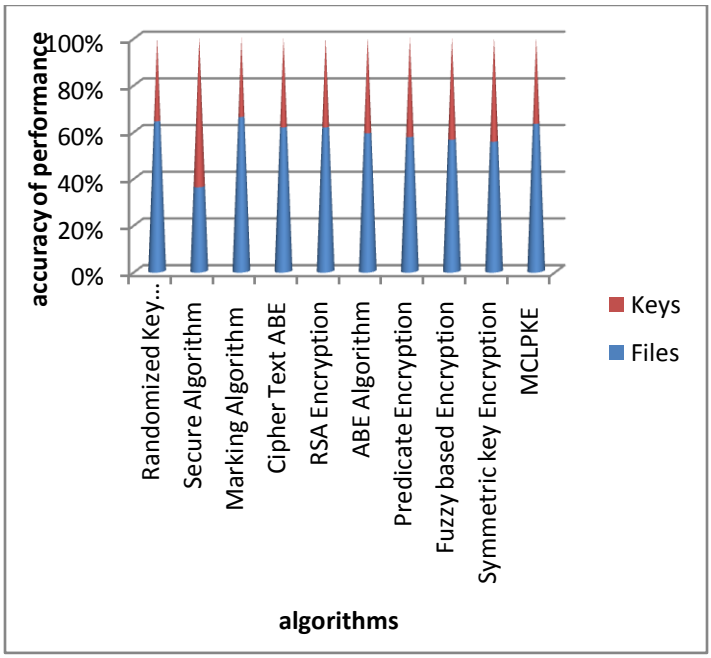
TABLE 2: MERITS AND DEMERITS OF MCL-PKE SCHEME

SCHEME	MERITS	DEMERITS
MCL-PKE SCHEME	1. Asymmetric key generation 2. Solves key escrow problem 3. Solves revocation problem	1. No assurance for storage correctness guarantee. 2. Encryption failure.

FIGURE 1: COMPARISON OF ALGORITHMS



Conclusion and Future enhancement

In this paper encryption scheme has been proposed to make storage of data in cloud successfully without encryption failure. Security issues and challenges and also comparisons have been made between RSA encryption, predicate encryption and fuzzy identity based encryption to find which is best and it has to be used in cloud data storage. An encryption technique plays an important role for safe storage of data in cloud. In future several approaches can be compared to produce security results and effective framework can be provided.

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