Implementation on Key Aggregate Cryptosystem for Data Sharing In Cloud Storage

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Abstract: Cloud Storage is a capacity of information online in the cloud, which is available from different and associated assets. Distributed storage can provide high availability and consistent, quality, reliable, assurance, debacle free restoration, and reduced expense. Distributed storage, imperative, usefulness, i.e., safely, proficiently, adaptability and offering information to others. Data privacy is essential in the cloud to ensure that the user's identity is not leaked to unauthorized persons. Using the cloud, anyone can share and store the data, as much as they want. To share the data in a secure way, cryptography is very useful. By using different encryption techniques, a user can store data in the cloud. Encryption and decryption keys are created for unique data that the user provides. Only a particular set of decryption keys are shared so that the data can be decrypted. A public–key encryption system which is called a Key-Aggregate cryptosystem (KAC) is presented. This system produces constant size cipher texts. Any arrangement of secret keys can be aggregated and make them into a single key, which has the same power of the keys that are being used. This total key can then be sent to the others for decoding of a cipher text set and remaining encoded documents outside the set stays private. The project presented in this paper is an implementation of the proposed system.

Keywords: KAC, Cloud Computing, Key Aggregation, Cryptography, Data Sharing.

I. Introduction

Considering data security, an ordinary way to deal with the objective without question is to rely on upon the server to approve the passage way control after affirmation, which suggests any unanticipated advantage increasing speed will reveal all data. In a shared residency disseminated figuring environment, things end up being significantly more severe. Information from different clients can be encouraged on segregated virtual machines (VMs) be that as it may, harp on a single physical device. Because of this, the cloud users may not have a firm belief that the cloud service providers are providing the confidentiality. For this reason, the cloud users may encrypt their data before storing it in the cloud. This can be explained using a simple example.

Using Figure1, let us assume there are two users: Alice and Bob. Alice has an account in Dropbox.com. Alice wants to store her photographs in Dropbox.com. But she doesn't trust the security features provided by Dropbox.com. So, she encrypts all her photos and uploads them to the Drop box. Bob who is a friend of Alice requests her to send the photographs that he is present in. If Alice sends them directly to Bob, then Bob cannot view them because they are encrypted with a key. Here there is a constraint as to how the decryption rights should be provided to Bob. Alice can encrypt all the files with one single key and send the key to Bob or encrypt each file and send Bob the respective keys. The first method is not applicable because all the other data can be sent to Bob. In the second method, the number of keys may be more for the number of photos. This becomes complex and requires key storage and sending of all of these keys may not be secure as it requires a secure channel to be sent. So here we can use the Key Aggregation Concept where all the keys are aggregated into one single key of constant size and can be sent through email or any other means securely. This allows Bob to view only his photos, and not Alice's.

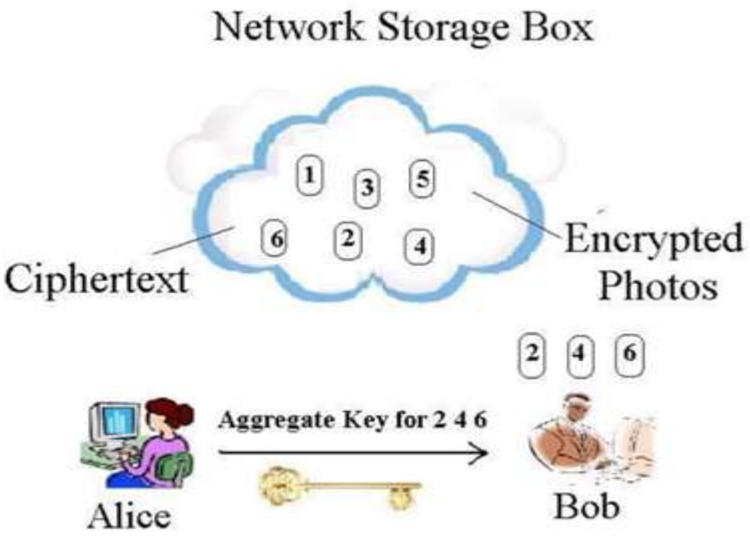


Figure1.Communication between Two Users

II. PROPOSED SYSTEM

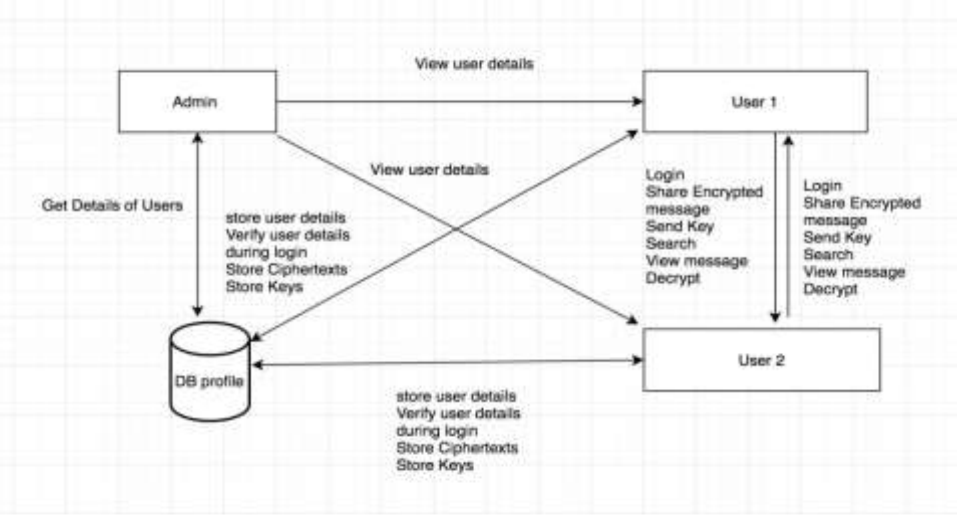


Fig 2. Architecture Diagram

Description and Modules Design:

The architecture diagram shows the various components that are involved in the system and their dependency on each other. The users, admin, and database are the components that are involved, and each component performs a specific operation. The users exchange messages between themselves. The information and keys are stored in the database,and the admin can control users and view user details using the database.

The design phase is to ensure that the project gets developed according to the requirements .The entire design is divided into five modules and each module has a specific functionality, and it is related to other modules. Following are the five modules:

- Registration of user and authentication
- Key generation
- Encryption and storage
- Data sharing using aggregate key
- Decryption and view content

III. ALGORITHM USED

The ElGamal algorithm is one of the best practices to achieve secure encryption and decryption process of sharing information. There are three components: (a) key generation, (b) encryption, and (c) decryption.

Key generation: The key generator works as follows:

1. Peter generates an efficient description of a multiplicative cyclic group **G** and pick a prime **p** with generator **g**
2. Peter chooses a random **x** from**{0…… p-1}**
3. Peter computes **y= g^x**
4. Peter publishes **y**, along with the description of **G**, **p**, **g** as his **public key**. Peter retains **x** as his **private key** which must be kept secret

Encryption:
The encryption algorithm works as follows:
To encrypt a message m to Peter under his public key **(G, p, g, y)**

1. David chooses a random **I** from**{1……p-2}** then calculates **c1= g^y**
2. David calculates the shared secret**s=y^i**
3. David converts his secret message **m** into an element **m' of G**
4. David calculates **c2= m' .s**
5. David sends the cipher text to Peter **(c1, c2) = (g^i. m'. y^i) = (g^i. m'.$(g^x)^i$)**

Decryption: The decryption algorithm works as follows:

To decrypt a cipher text **(c1, c2)** with his private key **x**

1. Peter calculates the shared secret**s = c1^{x}**
2. Then he will calculate plaintext message **m**, by converting **c2.s^{-1}**

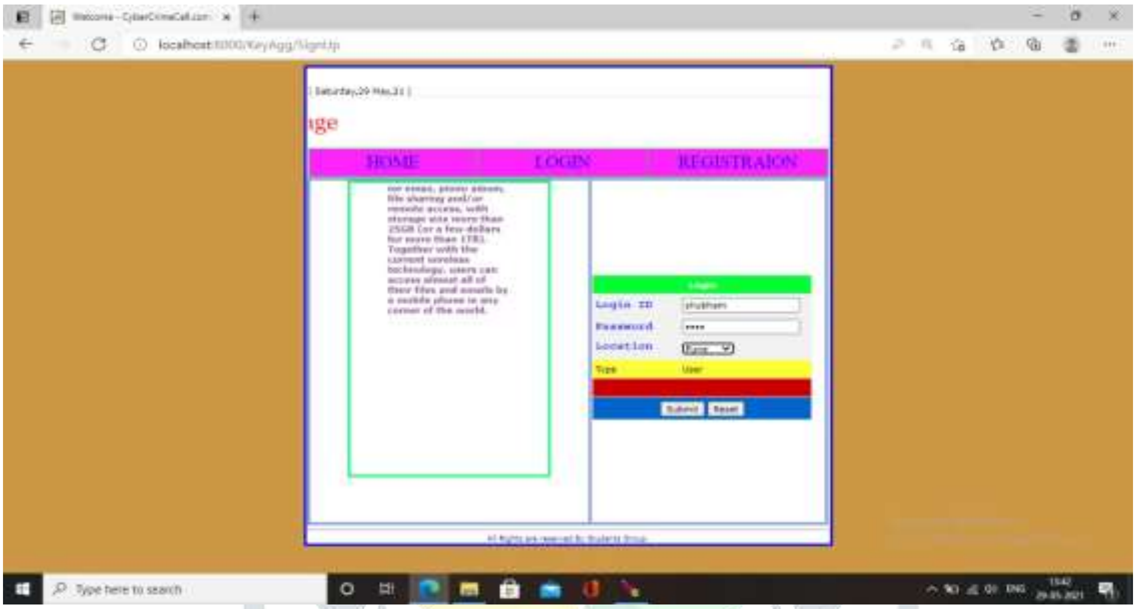
$$\text{Where } c2= m'.\, y^{i},\ S=y^{i}\text{and}.y = g^{x}c2.s^{-1} = m'.y^{i}.(g^{xi})^{-1}$$

$$=m'.g^{xi}.g^{-xi}$$

$$=m'.(g^{xi}/g^{xi})$$

$$=M'$$

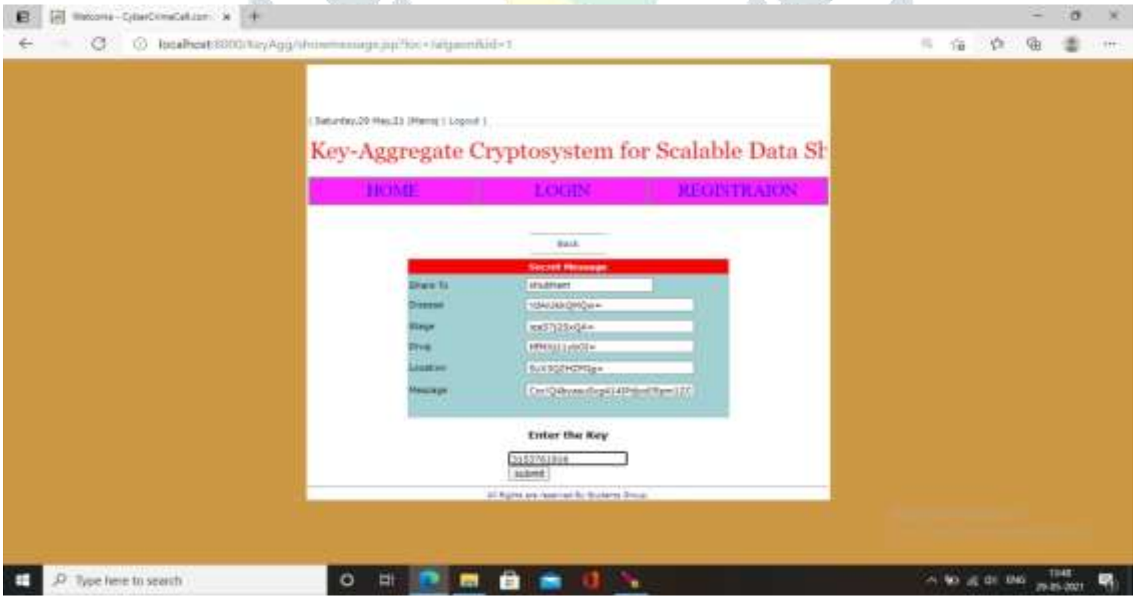
IV. RESULT AND DISCUSSION



for emails, phone album, file sharing and/or remote access, with storage size more than 25GB (or a few dollars for more than 1TB). Together with the current wireless technology, users can access almost all of their files and emails by a mobile phone in any corner of the world.

Login ID: shubham
Password: ••••
Location: [illegible]
Type: User

Fig 3. User Login



[Saturday,29 May,21 [Menu] | Logout]
Key-Aggregate Cryptosystem for Scalable Data Sh
HOME
LOGIN
REGINTRAION
Back
Secret Message
Enter the Key
submit
All Rights are reserved By Students Group
Type here to search

Share To: shubham
Disease: [illegible]
Stage: [illegible]
Drug: [illegible]
Location: [illegible]
Message: [illegible]

Fig 4.Secret message generate

V. CONCLUSION

In the present world, the sharing of the data between the users without any data leakage has become a big challenge. Data sharing services are one of the essential functions provided in cloud computing. Data in the cloud is of greater importance and needs to be protected from unauthorized access. In this paper an efficient method is analyzed to avoid any data leakage.

Usually, the data is stored in an encrypted format, which will make the data storage in the cloud more secure. However, the problem comes while sharing the encoded data and providing thedecryption rights to the users. An analysis and implementation are provided to share the encrypted data to the end user. In this proposed implementation, encryption processes are done at two places one at the time of storing and another at the time of sharing. The users who share the secret messages should also need to know the decryption process. In the proposed paper, a set of decryption keys are aggregated and sent to the end user. One must decrypt the data with theaggregate key to see the original text. By this policy of encryption and decryption, it will effectively increase the secure manner of communication and provides successful delegation of decryption rights to the intended user over the ciphertexts that they are authorized to view. The implemented application has been tested in various scenarios and executed successfully.

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