

# Cloud Storage Auditing With Deduplication with Strong Privacy Protection

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The System developed with deduplication can store data in cloud but the data will be stored when the data is mismatched with the data which is already stored. The cloud storage auditing schemes which has deduplication are capable of file encryption, user privacy, reducing data leakage and providing strong data confidentiality. Our system overcomes brute-force attacks which usually causes problems to all the different cloud providers and completely unique methods to obtain the file index for checking duplicates in the file.

**Keywords**—cloud, deduplication, auditing, storage

## I. INTRODUCTION

Nowadays, cloud computing has been widely used and is witnessing rapid development. Cloud storage is in demand for its advantages like low cost, universal access and services. Cloud users can safely store their data in the cloud and are free from local storage burden. Users' privacy is well protected from the outside world. There are chances of loss of data due to some operational errors or any technical failures in the cloud. It is very important to ensure that file stored is free from security threats.

## II. ARCHITECTURE

System architecture of the model involved in providing cloud computing, typically consists of many cloud components with inter communicating with a loose coupling mechanism like messaging queue. The architecture of proposed design is shown in figure 1.

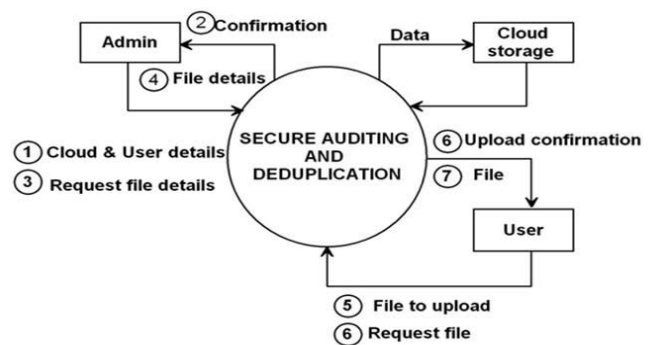


fig. 1

## III. ADMIN MODULE

Admin should provide admin id and password for login. Admin can see their profile details and they can edit profile details and password. Admin can see all user details. They can add new users, edit existing user details, and be able to delete any user account and can see all cloud account details. They are allowed to see the hash tag generated for all blocks which is uploaded by users and can check transaction details of any user by selecting the desired user account. After finishing the task Admin should click on the sign out option to come out from the existing session.

## IV. USER MODULE

Users should sign in into their account providing user ID and password, then they are directed to their profile. User has to upload the file and the file is broken into blocks of data and assigned a hashtag for each block. After every file upload generated hash tag is compared with existing hash tag from database if hash tag matched in that case file will not be uploaded into cloud, the number of instance of that block in database table will be increased. If hash tag did not match then that block hash details will be added in database and block will be uploaded in cloud. Logical Block Addressing (LBA) technique is used to identify what are the blocks present in a file. To get the contents stored, the user needs to click on the file and using LBA, the server has to find the block numbers of the selected file, download blocks and merge them to give the user

a complete file. User can see all their transactions and has to logout finishing all the tasks to sign off the session

## V. CLOUD SECURITY

One of the main objectives of the proposed design is the protection of user's privacy. Files uploaded are only accessible to the owners. The system runs an algorithm to check the authentication of the user and provides access to file.

When the user uploads a file, authenticator generation algorithm will generate the private key, authenticators and hash tag and uploads them to the cloud and the user will be provided with the link to the uploaded file. symmetric key encryption algorithm is used to encrypt the plain text. User is provided with the private key which is used to decrypt the ciphertext. If there is any change in the uploaded file, then the integrity check fails and a message is delivered to the user regarding the change of content.

If the user wants to access the file the user can send a request to the cloud by providing a keyword, the system verifies the credentials of the user and provides the ciphertext, authenticators and hash value. If the user doesn't pass the verification, the cloud will reject the user's request. Once the information retrieved from the cloud, using the private key, the user can retrieve the file from the cloud and access the file. This process is explained in figure 2.

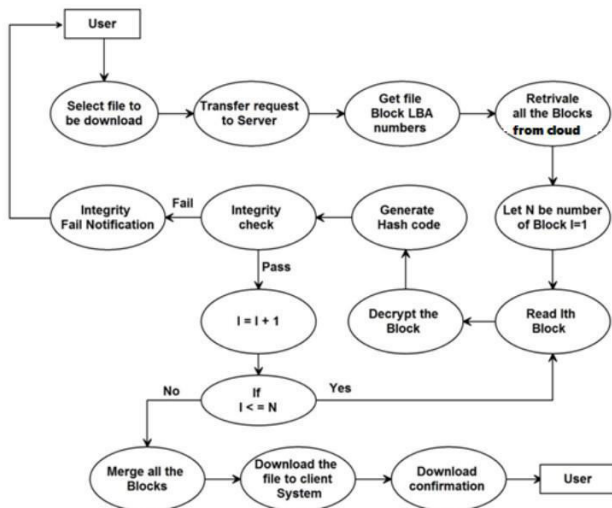


fig 2.

## VI. CLOUD DEDUPLICATION

Data deduplication is a specialised data compressing approach for removing replica copies of repeating data. Often known as Intelligent (data) compression Single-instance (data) garage. Used to enhance garage usage and

also can be carried out to community information transfers to decrease the range of bytes that be sent.

Figure 3 explains the deduplication process

Data deduplication compares objects (usually files or blocks) and removes objects (copies) that already exist in the data set. Process consists of four steps:

1. Divide the data into "chunks" or blocks. In this project, each chunk is 500 bytes.
2. For each block of data, compute a hash value.
3. Use these values to see if the same data has already been placed in another block..
4. Replace the duplicate data with a reference to an existing database object.

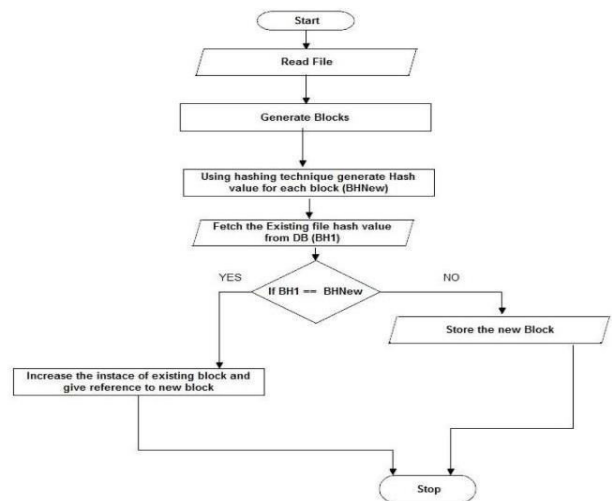


fig 3.

## VI. CONCLUSION

In this paper, we have discussed how to protect the user privacy and save the space in the cloud using the deduplication process. This paper discusses the detailed methodology of deduplication. The results obtained show that the proposed system has higher efficiency in saving storage space and also has better integrity protection.

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#### References

- [1] The Gnu Multiple Precision Arithmetic Library (GMP), Oct. 2019.
- [2] H. Cui, R. H. Deng, Y. Li, and G. Wu, "Attribute-based storage supporting secure deduplication of encrypted data in cloud," *IEEE Trans. Big Data*, vol. 5, no. 3, pp. 330\_342, Sep. 2019.
- [3] M. Bellare, S. Keelveedhi, and T. Ristenpart, "Message-locked encryption and secure deduplication," in *Proc. Annu. Int. Conf. Theory Appl. Cryptograph. Techn.* Berlin Germany: Springer, 2013, pp. 296\_312.
- [4] G. Ateniese, R. Burns, R. Curtmola, J. Herring, L. Kissner, Z. Peterson, and D. Song, "Provable data possession at untrusted stores," in *Proc. 14th ACM Conf. Comput. Commun. Secur. (CCS)*, 2017, pp. 598\_609.
- [5] R. Ding, H. Zhong, J. Ma, X. Liu, and J. Ning, "Lightweight privacy-preserving identity-based verifiable IoT-based health storage system," *IEEE Internet Things J.*, vol. 6, no. 5, pp. 8393\_8405, Oct. 2015.
- [6] Y. Fan, X. Lin, G. Tan, Y. Zhang, W. Dong, and J. Lei, "One secure data integrity verification scheme for cloud storage," *Future Gener. Comput. Syst.*, vol. 96, pp. 376\_385, Jul. 2019.
- [7] J. Gantz and D. Reinsel, "Encrypted Data In Cloud", *IEEE Trans. Big Data*, vol. 5, no. 3, pp. 330\_342, Sep. 2019.
- [8] W. Guo, H. Zhang, S. Qin, F. Gao, Z. Jin, W. Li, and Q. Wen, "Out-sourced dynamic provable data possession with batch update for secure cloud storage," *Future Gener. Comput. Syst.*, vol. 95, pp. 309\_322, Jun. 2019.
- [9] Wenting Shen, Ye Su and Rong Hao, "Lightweight Cloud Storage Auditing With Deduplication Supporting Strong Privacy Protection", March 2020.
- [10] Shunrong Jiang, Tao Jiang, Liangmin Wang, "Secure and Efficient Cloud Data Deduplication with Ownership Management", *IEEE Transactions on Services Computing*, vol. 13, Issue 6, 2020.
- [11] Y. Fan, X. Lin, G. Tan, Y. Zhang, W. Dong, and J. Lei, "One secure data integrity verification scheme for cloud storage," *Future Gener. Comput. Syst.*, vol. 96, pp. 376\_385, Jul. 2019.