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SECURITY AND PRIVACY PRESERVING IN FOG CLOUD COMPUTING

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***Abstract*— The storage service is excellent unless users outsource their sensitive data to cloud storage server. Cloud server gets full access and control over user's data once data is outsourced to the cloud. It can read or search through the user's data. Recently, fog server based three-layer architecture has been presented for secure storage. In that architecture, the portion of data to be stored in cloud, fog and user's local machine. Some portion of data in the cloud and their customized hash algorithm, take extra computation/storage overhead, In this project, we create fog-based cloud storage scheme. In that scheme, data is splitted into multiple blocks through xor-combination and combine this blocks into 2-blocks or 3-blocks using xor-operation. So using this scheme, we enhance the efficiency of fog based cloud storage service and improve the security of fog server for a robust fog centric cloud computing infrastructure and we we enhance cypto system to secure data without revealing any information from it.**

I.INTRODUCTION

In traditional cloud computing scenario, once users outsource their data to the cloud, they can no longer protect it physically. Cloud Service Provider (CSP) can access, search or modify their data stored in the cloud storage. At the same time, the CSP may loss the data unintentionally due to some technical faults. Alternating, a hacker can violate the privacy of the user data. Using some cryptographic mechanisms (such as encryption, hash chain), confidentiality or integrity can be protected. However, cryptographic approach cannot prevent internal attacks, no matter how much the algorithm improves. To protect data confidentiality, integrity and availability (CIA), several research communities introduced the idea of Fog Computing placing fog devices in between the user and the cloud server. One of the prominent and recent works in this field is proposed by Wang et al. They also formulated the computational intelligence (CI) to determine the portion of data to be stored in cloud, fog and user's local machine. They maintained a rating system for cloud server so that user can rate the cloud servers and the cloud servers tend to act responsively.

- We proposed a secure cloud storage scheme based on fog computing employing XOR−Combination, Block−Management and CRH operation. XOR Combination together with Block- Management contributes to maintain privacy and to prevent data loss. CRH operation ensures detection of data modification.
- Theoretical security analysis proves the privacy guarantee, data recoverability, and modification detection of the proposed scheme.
- We implemented a prototype version of the scheme and conducted experiments to verify its performance in comparison with the contemporary scheme. Results prove its efficiency in terms of time and memory usage.

PROPOSED SYSTEM

To protect data confidentiality, integrity we propose a fog-based cloud storage scheme for data confidentiality, integrity and availability. For confidentiality and availability (even after malicious events), we propose a method referred to as Xor-combination that splits the data into several blocks, combine multiple blocks using Xor operation and outsource the resulted blocks to different cloud/fog servers. We achieve two goals in our project, one is privacy of the data and the other is recoverability of the data in case of data loss. We improve the security of fog server as well as cloud server.

SYSTEM DESIGN

1. Storing Procedure

Storing procedure takes a file to be uploaded to cloud server securely. It has several steps and most crucial steps take place in fog server. When the user intends to upload a data file, he sends the file to the fog server through some secure channel. Then, fog server starts processing the file.

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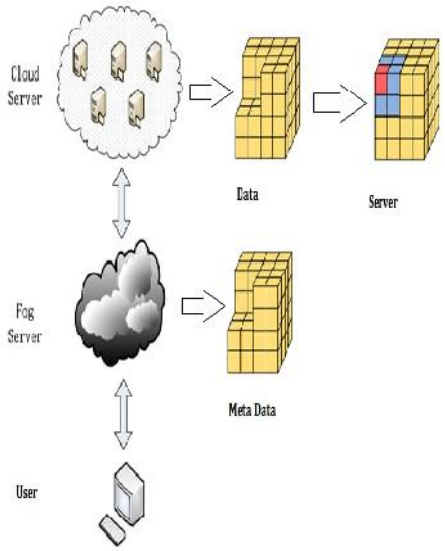
2.Splitting
Fog server pads the file as per needs based on system policy. After that fog server splits the file into several fixed length blocks and combines them. At the end of this step, we get two sets of 2-block-combinations and 3-blockcombinations together known as combined blocks.

3. Integrity Processing
For each combined block, fog server generates random number, file key and stores this information into fog database for future integrity check.

4. Block Management
At this module, fog server determines which block to be stored to which cloud server using block management technique and stores this metadata into fog database and sends the blocks to respective cloud servers.
5. Cloud Storage
Cloud server receives and stores the blocks along with metadata into its storage.

6. Retrieval Procedure
Retrieval procedure takes a request of a file, collects necessary combined blocks from various cloud servers, and checks their integrity. If integrity check fails then it requests faulty blocks from other cloud servers. When all the necessary combined blocks pass integrity check, the fog server reconstructs the entire file and sends it back to the user.



HARDWARE CONFIGURATION

The Below Hardware Specifications were used in both Server and Client machines when developing

Processor	:	Intel(R) Core(TM) i3
Processor Speed	:	3.06 GHz
RAM	:	2 GB
Hard Disk Drive	:	250 GB

SOFTWARE CONFIGURATION

The Below Software Specifications were used in machines when developing SERVER

Operating System	:	Windows 7
Technology Used	:	ASP.net
Database	:	My-Sql

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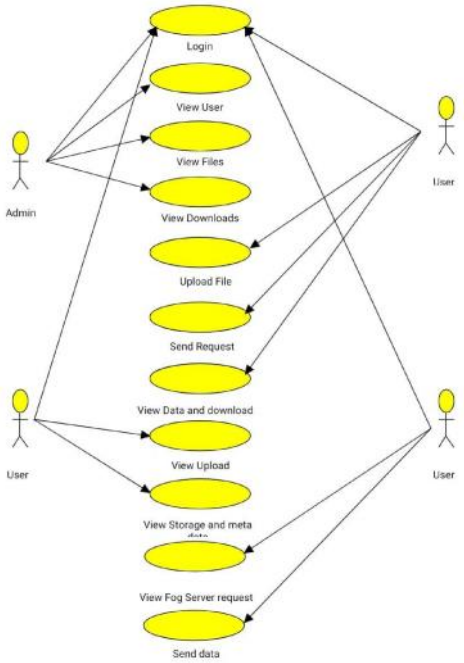
USE CASE DIAGRAM



CONCLUSION

Fog based three-layer architecture befits to a secure solution for robust cloud storage against cyber threats. This project we proposed a scheme that undertakes preventive activities to a trusted fog server and puts the actual data in twisted format to multiple cloud servers. We enhanced the efficiency of fog based cloud storage service. We improve the security of fog server for a robust fog centric cloud computing infrastructure.

FUTURE ENHANCEMENT

To enhance the efficiency of fog based cloud storage service.
To improve the security of fog server for a robust fog centric cloud computing infrastructure.
To enable cloud server to compute cryptic data without revealing any information from it.

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