Study of Seed Block Algorithm in Cloud Computing Environment

Ms. Ashwini S. Gharde, Ms. Kamini Ghaormare

Department of Master of Computer Applications, Rajiv Gandhi College of Engineering and Research , Nagpur University, Nagpur , Maharashtra, India
Department of Master of Computer Applications, Rajiv Gandhi College of Engineering and Research , Nagpur University, Nagpur , Maharashtra, India

Abstract—*In cloud computing huge amount of private data stored on a main cloud. There is a need of efficient and effective data recovery techniques. The purpose of recovery technique is to collect information from any back up server when the server fails to provide data to the server. This paper gives the overview of the smart data back up algorithm called seed block algorithm (SBA). The objective of SBA is to recover the files in case of cloud get destroyed or files may be deleted from the cloud.*
Keywords - SBA, Data Recovery, Cloud

I. INTRODUCTION

Now a days Cloud computing is achieving popularity every day. Cloud computing is used as a delivery platform which is a promising way for storing user data and provides a secure access to personal and business information. The users are provided with on demand services through the internet. Although cloud computing provides an environment through which managing and accessing data becomes easier. It also have consequences such as data leakage, data theft etc. If for example cloud get destroyed either due to any natural calamity (like flood earthquake) , then for back up and recovery client has to depend on service provider which ultimately means the data has to be stored in the server. There should be some methods that are successful to some extent in cloud computing domain which are the REMOTE DATA BACK UP SERVER. Whenever main cloud fails to provide user's data client will be able to contact the back up server where private data is stored. Also there are some challenging issues related with the existing data recovery techniques. To tackle these issues SBA algorithm is introduced.

II. REMOTE DATA BACK UP SERVER

Remote data back server is a server which stores main cloud's entire data as a whole and located as some remote place (Far away from cloud). If a main cloud i.e. if central repository lost its data then it uses the information from remote repository. The very clear objective is to help clients to collect information from remote repository if network connectivity is not available or the main cloud is unable to provide data to the clients. As shown in figure 1, if clients found that data is not available on central repository then clients are allowed to access the files from remote repository. As the data back up server is located at remote location it is also termed as remote data backup server. The architecture of remote data back up server is shown in Figure1.
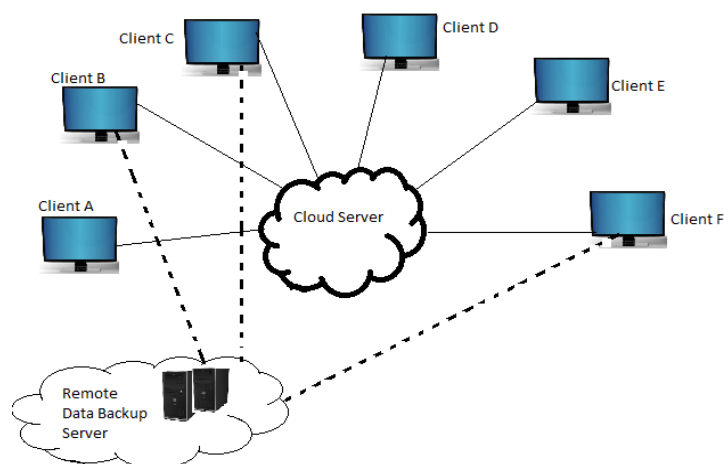

Figure 1. Architecture of Remote Data Back up Server

The Remote data backup services should cover the following issues.

1. Data Integrity: - Data Integrity specifies that the data remains unchanged and unaltered during transmission and reception.
2. Data Security:- The client's data should be fully protected and intentionally or intentionally it is not accessed by any other third party or other clients.
3. Data Confidentiality:- If there are number of users simultaneously accessing the cloud, the data files which are confidential belongs to only particular client must be hide from other clients.
4. Trustworthiness:- Cloud and Remote data back up cloud must plays a trustworthy role as it stores client's private data.
5. Cost efficiency:- The cost of data recovery process should be efficient so that maximum number of users can get benefited from data recovery service.
6. Relocation of Server:- While the data has been shifted to remote server, It provides the location transparency of relocated server to the clients.

III. SEED BLOCK ALOGITHM (SBA) ARCHITECTURE

This algorithm focuses on simplicity of the data back up and recovery process. It basically uses the concept of Exclusive OR (XOR) operation of the computing world. For Example if we take two data files A and B. When we XOR A and B, it produced X i.e. $X = A \oplus B$ as follows. First consider the following OR operation

A	B	A OR B
1	1	1
1	0	1
0	1	1
0	0	0

Consider $X = A \oplus B$ operation

A	B	$A \oplus B$
1	1	0
1	0	1
0	1	1
0	0	0

If suppose for example A data file get destroyed and we want our A data file back then we are able to get A data file back, with the help of B and X data file .i.e. $A = X \oplus B$.

B	X	$B \oplus X$
1	0	1
0	1	1
1	1	0
0	0	0

SBA architecture consists of the Main Cloud and its clients and the Remote Server. Here, first we set a random number in the cloud and unique client id for every client. Second, whenever the client id is being register in the main cloud; then client id and random number is getting EXORed ($\oplus$)with each other to generate seed block for the particular client. The generated seed block corresponds to each client is stored at remote server. Whenever client creates the file in cloud first time, it is stored at the main cloud. When it is stored in main server, the main file of client is being EXORed with the Seed Block of the particular client. And that EXORed file is stored at the remote server in the form of file' (pronounced as File dash). If either unfortunately file in main cloud crashed / damaged or file is been deleted mistakenly, then the user will get the original file by EXORing file' with the seed block of the corresponding client to produce the original file and return the resulted file i.e. original file back to the requested client

Example:-

As it's architecture shows the main cloud, it's clients and the remote server. Here first we set a random number for e.g. 100 the cloud and unique id for every client e.g. 101 for client 1. Second whenever the client is being register in the main cloud then the client id and random number is getting EXORed ($\oplus$)with each other to generate seed block for the particular client. The generated seed block (001) corresponds to each client is stored at remote server.

Whenever client creates the file in cloud first time, it is stored at the main cloud (e.g. 010). When it is stored in main server, the main file of client is being EXORed with the Seed Block of the particular client. And that EXORed file (100) is stored at the remote server in the form of file' (pronounced as File dash). If either unfortunately file in main cloud crashed / damaged or file is been deleted mistakenly, then the user will get the original file by EXORing file' with the seed block of the corresponding client to produce the original file (010) and return the resulted file i.e. original file back to the requested client. It is found that size of original data file stored at main cloud is exactly similar to the size of Back-up file stored at Remote Server.

IV. CONCLUSION

In this paper, study of remote data backup algorithm called seed block algorithm is done which helps the user to recover the disaster files from the remote location when the main cloud fails to fetch the files to the client. Experimentation and results shows that there is no modification can be done in the original file so the integrity of the file should be maintained and the time related issues also being solved by the proposed SBA so, it took minimum time to recover the files from remote server.

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