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An Analysis on Data Recovery and Backup Technologies in Cloud Computing

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Abstract -*Cloud computing is the technology that is widely used for storing large numbers of data in any organizations. In today's data driven world, a large amount of data is generated daily. To deal with unexpected loss of these data there is a need of data backup and recovery services. In this paper we are exploring the various data backup and recovery techniques to understand the novelty of each of these approaches and also compare the pros and cons of these techniques.*

Key Words*: *Seed Block, Remote Server, Backup Privacy, Central Repository, Parity Cloud, Main Server.

1. INTRODUCTION:

1.1 What is Cloud Computing?

Cloud computing is the delivery of computing services including servers, database, storage, networking, software, analytics, and intelligence over the internet to offer faster innovation, flexible resources and economies of scale. There are three type of cloud computing infrastructure as a service (IaaS), Platform as a service (PaaS), and software as a service (SaaS).

1.2 What is Data Backup and Recovery?

Data Backup and recovery is the process of creating and storing copies of data that can be used to protect Businesses from data loss. Organizations opt to back up in the cloud to keep files and data readily available in the event of a system failure, outage or natural disaster etc. Backing up in cloud essentially means that the Businesses can create a copy of their data and store it in a different geographical location which then can be used in case of a data loss or corruption.

2. Literature Survey

We have reviewed a few papers on powerful data backup techniques. First paper we have considered is "Data backup and recovery technique" which was published on March, 2018 and published by K. Laxmi and et al [1]. In this paper they introduced seed block algorithm which is used for remote smart data backup. There are two objective of this algorithm. First one is to gather information from any remote location and second is to recover the file.

The second paper we have examined is named "A review on data backup techniques for cloud computing". Which was published in December, 2014 and published by Somesh P. Badhel and et al [2]. In this paper, The authors provide a review on various backup techniques used for cloud computing platform.

The 3rd paper we have considered is named as "Parity cloud service: a privacy protected personal data recovery service", which was published in Nov, 2011 and published by Chi Won Song, Sungmin Park, Dong Wook Kim, Sooyong Kang [3]. In this paper, they proposed a novel data recovery service framework on cloud infrastructure, a parity cloud service (PCS) and provide a privacy protected personal data recovery service. The framework does not require any user data to be uploaded to the server for data recovery. And the necessary server side resources for provide the recovery service are within a reasonable bound.

The 4th paper we reviewed is named as "Online Data backup and disaster recovery techniques in cloud computing", which was published in November, 2012 published by Ms. Kruti Sharma and et al [4]. In this paper they proposed a seed block algorithm and suggested a remote backup server. They explored powerful solutions in backup and recovery technique. This paper's objective is to summarize the powerful data backup and recovery techniques that are used in cloud computing domain.

The 5th paper we thoroughly reviewed is named as "ERGOT: A sementic based system for service discovery in distributed infrastructures", which was published in 2010 and published by Giuseppe Pirro and et al [5]. In this paper, the proposed ERGOT (Routing Grounded on taxonomy) is based on the semantic analysis. They did not focus on implementation complexity and time. The ERGOT system proposed in this paper enables semantic driven query answering in DHT but it does not fit well with semantic similarity search models. The problem with this model is the increased time complexity and implementation complexity.

The 6th paper we have reviewed is named as "An analysis of cloud backed file system and backup algorithm", which was published in June, 2020, published by Shalima N S and et al [6]. In this paper they discuss various backup algorithm for cloud backed offerings in cloud. This paper mentioned the cloud backed report system is backing up facts and distribution reproduction of the facts over a community network to an off-web page server.

The 7th paper we have examined is named as "Smart data backup technique for cloud computing using seed block algorithm strategy", which was published in September, 2015 and published by Mr. G. S. Narke and et al [7]. In this paper they proposed a smart remote data backup algorithm, seed block algorithm. Their proposed algorithm has two parts, the first one helps the users to collect information from any remote location in the non-presence of or loss of network connectivity and the second one recovers the files if by mistake file gets deleted or if the cloud gets destroyed due to any reason. They presented detailed design of proposed seed block algorithm. This algorithm is robust in assisting the users to collect information from any remote location in the loss of network connection and if file deletion occurs due to any reason cloud gets destroyed till we can also recover files.

The 8th paper we have considered is named "A smart data backup technique in cloud computing using signcryption". Which was published by Sridevi. N and et al [8]. This paper they propose a smart remote data backup algorithm and the objective of proposed algorithm has two partsthe first one helps the users to collect information from any remote location in the absence of network connectivity and second one recovers the files in case of the file deletion or if the cloud gets destroyed due to any reason. This paper also proposed a smart remote data backup technique using signcryption technique.

The 9th paper we have reviewed is name as "Cloud backup and recovery techniques of cloud computing and a comparison between AWS Azure cloud", which was published in July, 2020 and published by Shivang Modi and et al [9]. In this paper they explored few current techniques which can be effective answers in the shape of "online data backup and recovery techniques". The goal of this paper was to outline the competent data backup and recovery strategies which might be utilized in cloud computing domain. This paper compares the capabilities of two crucial cloud vendors Amazon web service (AWS) and Microsoft's windows Azure. The 10th paper we have examined is named as "Data backup and recovery technique for cloud server using seed block algorithm", which was published in February, 2015 and published by R. V. Gandhi and et al [10]. In this paper they proposed a smart remote data backup algorithm. The objective of this proposed algorithm is twofold, first it help the users to collect the information from any remote location in absence of network connectivity and second is to recover the files at the time of the deletion of files or if the cloud gets destroyed due to any reason. They focuses on the security concept for the backup files stored at remote server without using any of the existing encryption techniques.

3. PERFORMANCE EVALUATION

Table.1-Comparison between various techniques of Back-up and Recovery

Sl. No.	Approach	Advantage	Disadvantage
1	SBA[11]	Easy to implement	inefficient
2	Parity Cloud Service[3]	Reliable Privacy Low cost	increased complexity
3	LINUX BOX[12]	Low cost	High bandwidth, Complete server backup at a time
4	HSDRT[13]	Used for movable clients	Costly, Increased redundancy
5	ERGOT[5]	Exact match retrieval, privacy	High complexity
6	Cold/Hot Backup Strategy[14]	Triggered when only failure detected	Cost increases as data increases

The advantages and disadvantages of all the above discussed algorithms are described in the Table-1. Due to the high applicability and need of backup process in many organizations and enterprises, the role of a remote data back –up server with an efficient technique is very important and it is a hot topic of research.

4. CONCLUSIONS

In this review paper, we have presented detailed review of the most recent backup and recovery techniques. All the above techniques tried to cover different issues of data backup and recovery for cloud computing such as Cost of implementation, security, implementation complexities, redundancy and recovery in short span of time. However each one of the backup and recovery solution for cloud computing is unable to achieve all the issues of remote data backup server with less storage space.

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