

Study of Cloud data storage technology and it's architecture implementation

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Abstract: Cloud computing offers standardized applications to users online and in a manner that can be accessed regularly. Such applications can be accessed by as many persons as permitted within an organisation without bothering about the maintenance of such application. The Cloud also provides a channel to design and deploy user applications including its storage space and database without bothering about the underlying operating system. Storage of data on the Cloud is one of the core activities in Cloud computing. Storage utilizes infrastructure spread across several geographical locations. Storage on the Cloud makes use of the internet, virtualization, encryption and others technologies to ensure security of data. There are many applications such as software for processing customer records in telecom, patient records in hospitals, email processing software accessing a single email in a mailbox etc. which require to access a single record in a database consisting of millions of records. A basic feature of these applications is that they need to access data sets which are very large but simple. Cloud computing provides computing requirements for these kinds of new generation of applications involving very large data sets which cannot possibly be handled efficiently using traditional computing infrastructure.

INTRODUCTION

The cloud is a term referring to accessing computer, information technology (IT), and data storage through a network connection, often by accessing data centers using wide area networking (WAN) or Internet connectivity.

Almost all IT resources can live in the cloud. A software program or application, a service, or an entire infrastructure. For example, if a business wanted to build an IT infrastructure, typically it would install the servers, software, and networking resources it needed, but nearly all of those services and resources are now accessible by going to third parties that offer them in the cloud.

A cloud storage system, consisting of a collection of storage servers, provides long-term storage services over the Internet. Storing data in a third party's cloud system causes serious concern over data confidentiality. General encryption schemes protect data confidentiality, but also limit the functionality of the storage system because a few operations are supported over encrypted data. Cloud storage is defined as "the storage of data online in the cloud," wherein a individual's data is stored in and accessible from multiple distributed and connected resources that comprise a cloud.

Cloud storage can provide the benefits of greater accessibility and reliability; rapid deployment; strong protection for data backup, archival and disaster recovery purposes; and lower overall storage costs as a result of not having to purchase, manage and maintain expensive hardware. There are many benefits to using cloud storage, however, cloud storage does have the potential for security and compliance concerns that are not associated with traditional storage system.

LITERATURE REVIEW

The following research articles are selected for review, keeping in mind the approaches of cloud data storage system and its architecture. This given below information is the observed, segregated and highlighted points from all the base systems whose paper we have used as reference paper for our system.

Our base system was a website for certain study on cloud storage build in year 2014 by "M. Lakshmi" and "M. Padma" this system gives an introduction to cloud storage technology. Cloud storage is comparatively better than traditional storage technology.[1]

The second system which we used for reference was called cost optimization algorithms for tier based cloud storage devices build in year 2018 by “Yaser Mansouri” and “Abdelkarim Errandi” this system helps reduction in operational cost of storage components hence it’s a cost efficient system.[2]

“Encryption of data in cloud storage” was our 3rd reference paper for our project it was build by “Po-Wen Chi,Chin-Laung Lei”in 2018. It helps for data encryption for secure cloud storage, fight against immoral interference with privacy of user.In this security is not completely assured as this scheme can be hacked.[3]

“I/O characteristics discovery in cloud storage system” was developed by “Jiang Zhou,Dong Dai,Yu Mao” in the year of 2018 . It’s a new method for I/O characteristics and pattern discovery in cloud storage. This project is not available for heterogeneous cloud storage system.[4]

PROPOSED SYSTEM

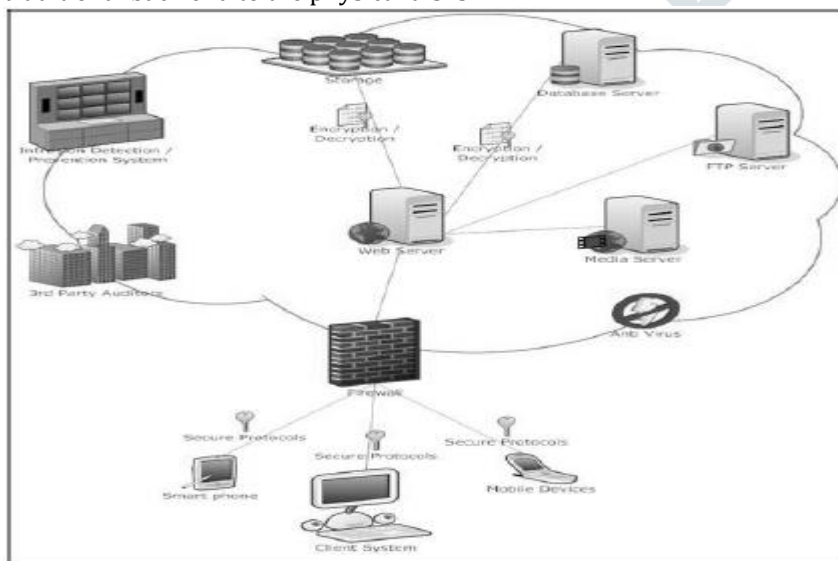
In our proposed system we address the problem of forwarding data to another user by storage servers directly under the command of the data owner. We consider the system model that consists of distributed storage servers and key servers. Since storing cryptographic keys in a single device is risky, a user distributes his cryptographic key to key servers that shall perform cryptographic functions on behalf of the user. These key servers are highly protected by security mechanisms. The distributed systems require independent servers to perform all operations. We propose a new threshold proxy re-encryption scheme and integrate it with a secure decentralized code to form a secure distributed storage system. The encryption scheme supports encoding operations over encrypted messages and forwarding operations over encrypted and encoded messages.

ADVANTAGES OF PROPOSED SYSTEM:

1. Tight integration of encoding, encryption, and forwarding makes the storage system efficiently meet the requirements of data robustness, data confidentiality, and data forwarding.
2. The storage servers independently perform encoding and re-encryption process and the key servers independently perform partial decryption process.
3. More flexible adjustment between the number of storage servers and robustness

CLOUD STORAGE ARCHITECTURE

Cloud storage architectures are primarily about delivery of storage on demand in a highly scalable and multi-tenant way. Generically, cloud storage architectures consist of a front end that exports an API to access the storage. In traditional storage systems, this API is the SCSI protocol; but in the cloud, these protocols are evolving. There, you can find Web service front ends, file-based front ends, and even more traditional front ends (such as Internet SCSI, or iSCSI). Behind the front end is a layer of middleware that I call the storage logic. This layer implements a variety of features, such as replication and data reduction, over the traditional data-placement algorithms (with consideration for geographic placement). Finally, the back end implements the physical storage for data. This may be an internal protocol that implements specific features or a traditional back end to the physical disks.



Role of our project Cloud Drive in Cloud Computing World :

Objective of Project

Main objective :

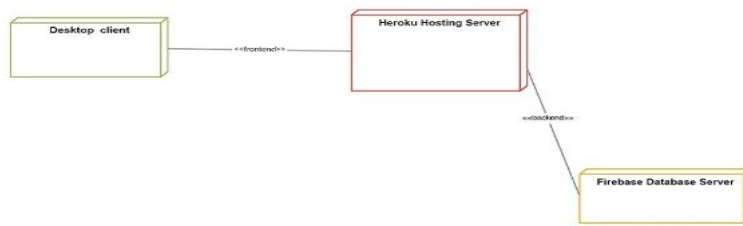
Our major objective is to develop an operational Online Cloud storage system.

Specific Objective :

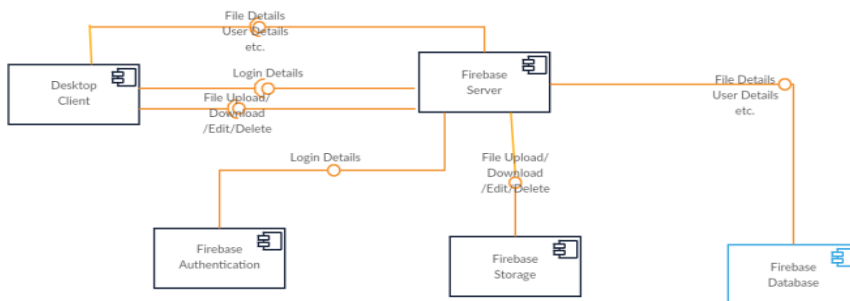
- To Store Data Online
- User can store and download data from website.
- User can view File details and can add other files like .doc, .pdf and etc.
- User can view the overall report through generated pie charts from the given details.
- Helps user to search files.
- It is easy to use and understand.
- Encryption.
- Share files.
- Chats with other users.
- Graph Reports.
- Pie chart generation.



CLOUD DRIVE DEPLOYMENT SYSTEM



CLOUD DRIVE DATABASE SYSTEM



Decentralized System : As mentioned in the above diagram, this system is decentralized. There are different servers for maintaining different requirements. There are dedicated servers for authentication, storage and database for better security and faster speed.

SYSTEM REQUIREMENTS

- Operating System : Windows 8/10
- Application Server : GlassFishServer 4.
- Front End : JDK 1.7, JSP 2.2
- Script : JavaScript.
- Server side Script : Java Server Pages.
- Database : Microsoft SQL Server 2012
- IDE USED : NETBEANS 8.2

RESULT :

Here, we are designing a cloud storage system for robustness , confidentiality and functionality. This Online storage provides a lot services to users which includes; Daily usage of users, keep records about the files , graph of usage of data, availability of data

- Users online login on cloud

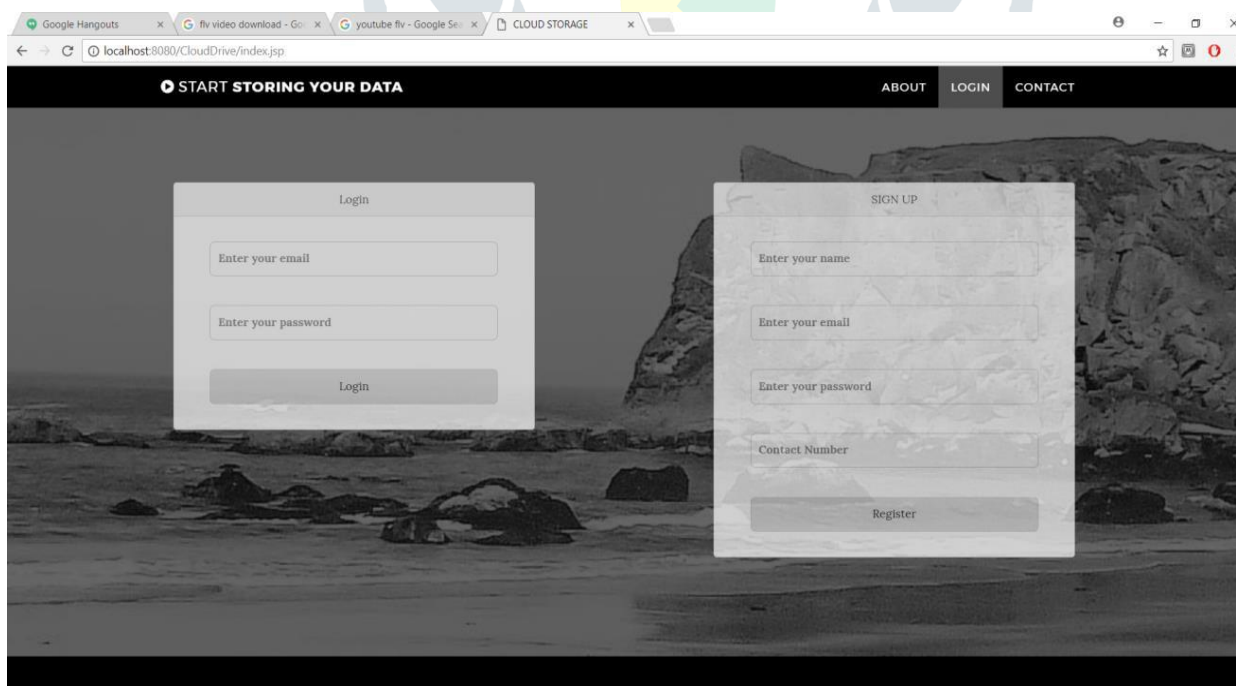
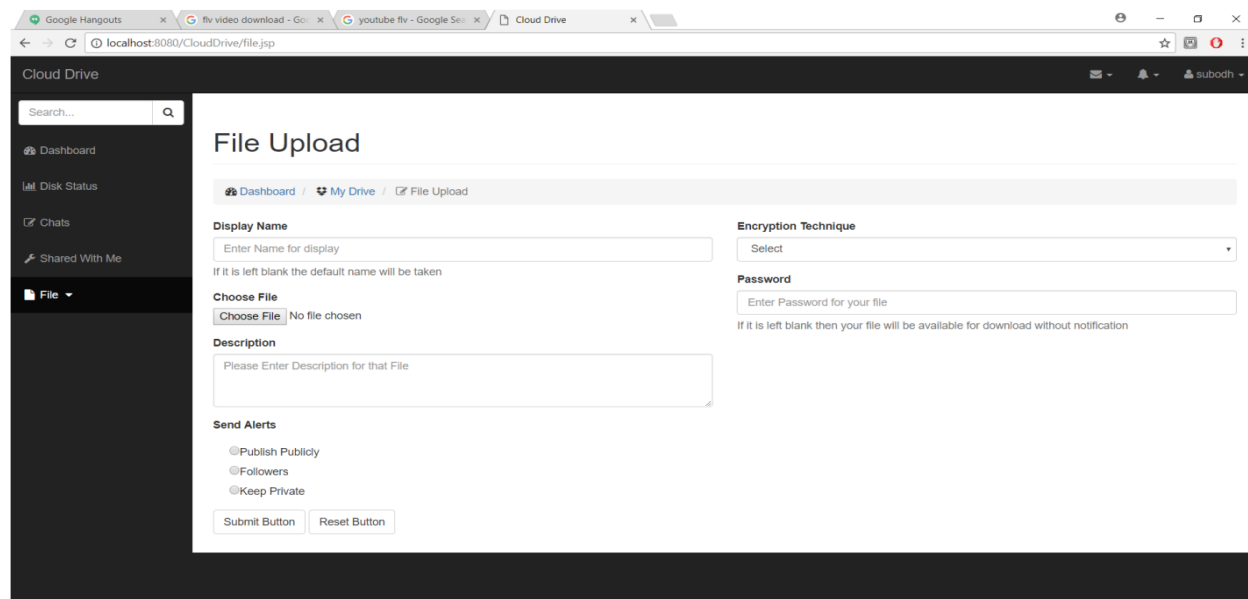


Fig. Users online login on cloud

- To Store Data Online



○ Fig. To Store Data Online

- User can store and download data from website.
- User can view File details and can add other files like .doc, .pdf and etc.
- User can view the overall report through generated pie charts from the given details.

CONCLUSION :

We would like to conclude through study of literature surveys that we are going to construct a secure cloud storage application which provides a lot of services to users which includes daily usages of users , keep records about files , graph of usage of data ,availability of data. Cloud storage is more advantageous than traditional storage because of its availability, performance and functional requirements. Our study on Cloud Storage system is to be implemented under java technology. This insulates the application from technical implementation and enhancement to support future technologies in a transparent manner without having the major impact on the application. This also enables the easy portability of application to other operating system and databases. Thus we were able to understand in greater details the various software engineering processes, and were able to apply them to our live project.

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REFERENCES :

- [1] Jiang Zhou, Dong Dai, Yu Mao, "I/O characteristics discovery in Cloud storage system", IEEE 2018, USA ,vol. 3 ,pp. 170- 177
- [2] Jiehui-ju, Jialin Zhang, " A survey on cloud storage" IEEE ,2012, Journal of Computers, vol. 6, No. 8, pp. 1764- 1771.
- [3] Kun Liu, Jianguo, " Research on Cloud data technology and its implementation" IWIEE, 2012, vol.12, pp. 133- 137.
- [4] M. Lakshmi, M. Padma, " Study on Cloud Storage" IJCSMC, 2014, India Issue. 5, pp. 966-971
- [5] Po-Wen Chi, Chin-Laung Lei, " Encryption of data in cloud storage" IEEE 2018, Taiwan, Journal vol.3 , Issue. 3, pp. 1968-1978.
- [6] Yaser Mansouri, Abdelkarim Errandi, " Cost optimization algorithms for tier based on cloud storage devices" IEEE, 2018, Qatar , pp 622-629.