

# Study on Various Cloud Storage Systems

Sumit S. Sagane<sup>#1</sup>

I.T. Department  
PRMIT & R, Badnera  
Amravati, India  
sumitsagane@gmail.com

Dr. G. R. Bamnote<sup>\*2</sup>

Prof. & Head Department of CSE  
PRMIT & R, Badnera  
Amravati, India

**Abstract:** Cloud storage services are so handy nowadays as it save space on your portable drive, smart phone or computer. It syncs all your files through all your devices. You can get storage space for free. A lot of personal information & potentially secure data that people share on their computer. This information is transferred to the cloud now a day. Computer users rely on the safe and efficient storage of their data in computer files. We present personal storage system that is trusted friends with cloud storage. Propose system i.e. Personal storage system is secure & private offsite storage service. Personal storage system is the efficiently combines resources from trusted friends and cloud services to provide a flexible, trusted and private personal storage system.

**Keywords:** Cloud storage, Personal storage

## I. Introduction

Users store their data in a set of social friends. Popular social network such as MySpace and Facebook provide communication, storage and social application for hundreds of millions of users. Facebook has over 400 million active users. Over 63% of Facebook users have less than 100 friends [4]. Personal storage systems constitute an alternative approach to average personal storage [1], [2]. A social network consist of all the people i.e. friend, family and others with whom one shares a social relationship [3]. User data is neither unknown peer nor stored in a centralized server. Facebook in 2012, the number of members is 901,000,000 [5]. Social network provide a platform to facilitate communication and sharing between users [6]. It means a small number of trusted friends group on social network. Social network are popular infrastructure for communication, interaction, information sharing on the internet. Personal storage system is the efficiently combines resources from trusted friends and Cloud services to provide a flexible, trusted and private personal storage system [17].

Every user handle hundreds of gigabytes to store digital information including photos, video, work document and communication flow like email and social communication. Personal storage system that combines resources of trusted friends with cloud storage for improving the service quality achievable. Dropbox, Box.net is examples of new storage companies (Personal Clouds). Its sophisticated storage services to end users by making use of raw storage provided by data center owners.

## II. Storage System

**Local storage systems:** Data is store in an electromagnetic or optical form for access by a computer processor.

Storage systems divide into two categories:

- **Primary storage:** holding data in memory. i.e. random access memory or RAM and other built-in devices such as the processor's cache.
- **Secondary storage:** It holds data on tapes, hard disks drives (HDD), and other devices requiring input/output operations.

Primary storage is much faster to access than secondary storage. On the other hand, secondary storage can hold much more data and for a longer time than primary storage. Hard disks are designed to provide data persistently. This means that data always preserves the previous version of itself when it is modified.

**Network-attached storage:** Network-attached storage (NAS) is a device specifically built to store and serve data. NAS devices are connected to a network and provide a central point allowing access to different clients. In the last years, NAS devices have gained popularity as a convenient method for sharing and backing up data among multiple computers. NAS devices are specialized by their hardware and software. Depending on the model, multiple hard disk drives can be attached.

**Distributed storage systems:** Distributed storage systems are composed by several storage resources from different computers or dedicated devices put together to form a large storage service. Distributed storage services provide a more scalable, efficient solution, reliable. A storage node is a network element that poses one or more physical storage devices to provide a simple storage

### Peer-to-Peer storage systems:

Peer-to-Peer (P2P) has increased popularity during in the past years. P2P systems aggregate resources from many nodes and resulting in a decentralized management make them available among nodes, when referring to storage systems. P2P is composed by storage a node i.e. peers with equal privileges [12]. Each participant brings its own disk space to the system and makes it available to all nodes, so peers are both suppliers and consumers of resources without the need of a

central server. Therefore, a large collaborative and distributed storage system is built. Furthermore, as P2P systems build an overlay network on top of the Physical network topology.

**Cloud Storage System:** In Cloud storage systems data is stored in virtualized pools of storage, hosted in large data centers. Data stored on Cloud storage systems is made available as a service through a web service application programming interface (API), a cloud storage gateway or through a Web-based user interface.

**Amazon S3:** (Simple Storage Service) is part of the Amazon Web Services. The design has not made public, but according to Amazon it provides scalability, high availability and low latency. Amazon has data centers in entire globe, locations such as Europe, North America or East Asia. Amazon claims that the standard redundancy option provides 99.999999999% durability and 99.99% availability. Amazon S3 pricing depends on a variety of aspects: redundancy level, storage used, number of request (GET, PUT, etc.), data transferred and the geographic region [13].

Amazon S3 (Simple Storage Service) is a web service that offers cloud storage through a simple HTTP-based interface. The Amazon web services platform is one of the most prominent and widely used cloud computing environments with data centers spread out access the world, incorporating (virtual) server, database, payment, and other facilities. its S3 storage service stores many billions of objects. The S3 service stores objects in a reliable, distributed manner in the back-end. It charges for the storage used, the amount of data transferred in- and out of the Amazon environment, and per request issued for an object.

The storage inside S3 is organized in the form of *buckets* in which data objects can be placed. S3 does not support a hierarchical object structure such as common in file systems. The web interfaces defines simple actions, through HTTP, PUT, GET, POST, and DELETE methods, on buckets themselves and on objects inside buckets. It is possible to share buckets and objects with others by setting the access control policy accordingly.

**Windows Azure:** Microsoft has also developed a cloud computing platform. Microsoft's data centers are located along the USA, Europe and Asia. Pricing is similar to the previously mentioned providers, with pay-as-you-go [10]. You can open a Windows Azure account for free. Windows Azure can be used to build a web application that runs and stores its data in Microsoft datacenters.

#### **Mozy :**

Mozy [8] is a cloud storage facility focusing on backup of files on individual computers. The Mozy client keeps watch on the file system and submits these changes to online storage. All data stored in the cloud is encrypted at the local computer, which makes Mozy more secure than Dropbox and ADrive. Furthermore, Mozy uses incremental backups to only store differences between files rather than completely

new versions of files for every small change. It supports restoring versions of files up to 30 days old.

Like Dropbox, it offers 2 GB for free. A paid subscription for personal use offers unlimited storage capacity for \$5 per month. Business users pay per amount of data used. Mozy does not have functionality for synchronizing multiple computers or sharing data with other users. Like many other products, Mozy supplies few details about the design of their storage facility.

**Box.com:** Box.com adopts a free model providing a free account of 5GB and paid accounts from 5GB up. As strengths, online edition of documents and an API to allow third-party applications to interact with their storage system. As weaknesses, Box.com free accounts have a file size limit of only 100MB, which limits and may be not suitable for some users. It does not provide a desktop application to synchronize your local files to domestic users [16].

### **III. Cloud Storage Face-off: Dropbox, Google Drive, SkyDrive**

**Dropbox:** Dropbox provide 2GB of free storage but you can get 500 MB of extra space for every friend. You can earn a maximum of 18 GB and grand total of 20GB inclusive of your initial 2 GB.

For more storage, you can opt for the Pro Dropbox account that offers 100GB, 200GB and 500GB from \$9.99, \$19.99 and \$49.99 per month respectively or save 17% by paying \$99, \$199 and \$499 yearly[15].

Dropbox Teams provides a solution for large groups of users, between 5 and 50 users. Windows, Mac OS, Linux, iOS, Android and BlackBerry operating system supported to dropbox. User can get more free space by using Dropbox's Camera Upload feature on your desktop or smartphone.

Uploading files through the Dropbox website has a limit of 300MB. No file size limit has when uploads through the Dropbox Desktop app have. Dropbox has also successfully integrated with Facebook Groups where you can share files from your dropbox files to your Facebook Groups.

Dropbox does not have any online editor document. Files can be downloaded only. Dropbox app provides on Smartphone or tablet. You can check Microsoft Office files, Apple iWork files, Text file, images audio/video files, and PDF files. Documents cannot be edited with the app but can be opened with another editing app.

Dropbox is a powerful and simple sharing tool. It is also very secure with 2-step verification, and a 4-digit password lock for the mobile app [15].

**Google Drive:** Gmail account provides Google Drive Application start with 5GB worth of storage space. Extra space can be purchased with various plans having range from 25GB to 16TB. Upgrading to any account will also give you the same amount of storage in Picasa while your Gmail Storage is upgraded to 25 GB [14]. Google Drive is available

for Windows and Mac OS. In terms of mobile, Google Drive is available only on iOS and Android.

Google Drive allows you to disable automatic deletion of old versions. Google Drive is also an online document editor which converts your Microsoft Office document (.doc / .docx) into a Google Document (.gdoc) before editing. There is a file size upload limit of 10GB on the desktop app and website version.

The Google Drive website supports unique files like Adobe Illustrator (.AI) and Photoshop (.PSD) files, Autodesk AutoCad files and Scalable Vector Graphics files [14]. You can see MS-Office documents, but can only edit it after converting it to a Google Docs file type. you can do basic edits to Google Docs files and view movie files through the app. Google Drive has unique file type support (Adobe, AutoCad files) which makes it easier to view those files online.




**SkyDrive:** SkyDrive comes with 7GB of free storage. They have the cheapest upgrade plans. They classify their upgrades as add-ons to your 7GB of space [9]. SkyDrive is readily available for Windows and Mac OS. SkyDrive has their own app for iOS, Windows Phone and Android.

SkyDrive desktop application access every file when allows you to installed in PC. Turned on your PC, connected to the internet with SkyDrive running, you can access all files through the SkyDrive website. SkyDrive support MS Web Apps which include Microsoft Office Word, Excel, PowerPoint and OneNote on the web browser. Mobile app that works together with SkyDrive, where you can automatically syncs and uploads to SkyDrive.

Most Microsoft Office file types can be viewed and edited thanks to its Microsoft Web App. It supports .MP4 and .WMV video files and formats can only be downloaded. The SkyDrive app only allows you to view files in a way similar to Dropbox. SkyDrive is the remote access to the files on your PC, native support for Windows Phones and the ability to take sync notes on your mobile via OneNote app.

#### IV. Propose System

**Personal Storage System:** Base on observation of existing systems, It is very difficult to chat with friends when offline. No guarantee to reach our data to friends. Particular at night, user can't chat with friends, never access data from friends. So that this personal system will provide a cloud space to upload /download data the absence of friends and keep record in database who upload the data and download the data. Users are able to decide where to store their data which can completely on friend, only in cloud or mix of them. Maintain data availability during 24 hour of day is so difficulty to provide this facility during the period of day when user online.

Features	 <b>Dropbox</b>	 <b>Google Drive</b>	 <b>SkyDrive</b>
<b>Free Storage</b>	2 GB	5 GB	7 GB
<b>Upgrade Pricing</b>	100GB \$99/year, 500GB \$499/year	25GB \$2.49 100GB \$4.99 2TB \$99.99	27GB \$10/year 57GB
<b>Supported Platforms</b>	Windows, Mac OS, Linux, iOS, Android, BlackBerry	Windows, Mac OS, iOS, Android	Windows, Mac OS, iOS, Android, Windows Phone
<b>Features</b>	Selective Folder Syncing, Events Tracking, Version History, Sharing Link, Facebook Group Integration	Selective Folder Syncing, Events Tracking, Version history Sharing Permission Settings, Commenting on Files, Online Document Editor	Events Tracking, Version History, Sharing Permission Settings, Commenting on Files, Microsoft Office Web Apps. Document Editing.
<b>Version History</b>	30 Days for All Files	30 Days or 100 Document Revisions	30 Days or 25 Document Revisions
<b>File Upload Limit</b>	Unlimited Through Desktop App, 300MB Through Website	10GB Through Both Desktop App and Website	2GB Through Desktop App, 300MB Through Website
<b>Sharing</b>	Simple Sharing Link	Customized Sharing and Access Settings	Customized Sharing and Access Settings
<b>Security</b>	2-Step Verification, 4-Digit Passcode for Mobile App	2-Step Verification Across All Google Services	Verification Code when Accessing PC Files Remotely
<b>Supported File Types</b>	Microsoft Office, Apple iWork, Audio, Video and Image Files	Adobe Illustrator (.AI) & Photoshop (.PSD), Autodesk AutoCad, Audio, Video and Image Files	Microsoft Office, Audio, Video and Image Files

*Table 1: Comparison of Cloud system*

- To providing social storage relationships among users.

Employ a social front-end as entry points of only those users which are members of the social network are capable of accessing to our Personal storage system. User management and access control issues are partially delegated to the social network avoiding additional complexity to the storage system.

- To storing and updating the data of users and the location of their data.

Users must download the personal storage client to connect to the system. Perform basic data operations, like storing and retrieving files from the system. Client can store their information in the storage space. Personal Storage Client is the generation of data redundancy before inserting a file into the system.

- Introduce the charts that show how user's data is distributed among his friends and cloud.

This chart will illustrate where user's data is store and whom a user is storing data. The application state maintains up to date the data management information about user's files. This information expresses which friends store which files and the network address of each friend. The maintenance process of this information is carried out by personal Storage Clients installed at participants. In fig 1 propose system show how user distribute data among friends.

**Data Availability:** Maximum friend of user are offline. During night hour, it failed to maintained high data availability. Data uploaded by each of friend may be offline so the user would have to wait for those friend to come back online before completing all data transfer.

**Small FriendGroup:** a small FriendGroup contain trustable friend over 63% of Facebook user have less than 100 friends [4]. Minimum friend interact with each other. Cloud storing service can completely guarantee data available and high amount of data redundant to make of friend.

## V. Conclusion

Here we compare various storage system in cloud computing and also compare our propose system i.e. Personal storage system. The proposed system provides secure personal storage system. Personal storage systems are aimed to secure and private off-site storage service. Personal storage system that combines the resources of trusted friends with cloud storage for improving storage service quality while preserving privacy. System will provide a flexible and user-defined cloud so that it improves the performance of storage.

## VI. References

- [1] S. Pearson, "Taking account of privacy when designing cloud computing services," Software Engineering Challenges of Cloud Computing, at HP Laboratories, 2009.
- [2] J. Li and F. Dabek, "F2F: Reliable storage in open networks," in IPTPS MIT, 2006.
- [3] Scott Golder, Denis Wilkinson and Bernardo Huberman, "Rhythms of social interaction: Messing within a massive online network," at HP Lab, 2006.
- [4] Charl Blake, Rodrigo Rodrigues "High availability, Scalable storage, Dynamics Peer Network: Pick Two" MIT Laboratory for Computer Science, 2003.
- [5] C. Wilson, B. Boe, A. Sala, K. P. Putta swamy, and B. Y. Zhao, "User interactions in social networks and their implications," in EuroSys'09, 2009.
- [6] K. Chard, S. Caton, O. Rana, and K. Bubendorfer, "Social cloud: Cloud computing in social networks" in IEEE CLOUD'10, 2010.
- [7] L. Toka, M. Dell'Amico, and P. Michiardi, "Online data backup: A peer-assisted approach," in IEEE P2P'10, 2010.
- [8] Mozy – Safe, Secure, Affordable Online Backup, <http://mozy.com/>
- [9] Microsoft Windows Live Skydrive, <http://skydrive.live.com/>
- [10] Azure Cloud Files. <http://www.azure.com/cloud>, Retrieved: 2012
- [11] SandipTayal , "Task Scheduling Optimizing for the cloud computing System" , in IJAEST , Vol no. 5, Issue No. 2. 2011.
- [12] L. Toka, M. Dell'Amico, and P. Michiardi, "Online data backup: A peer-assisted approach," in IEEE P2P'10, 2010.
- [13] Amazon S3. <http://aws.amazon.com/s3>, Retrieved: 2012.
- [14] Google Cloud Storage. <https://developers.google.com/storage/>, Retrieved: 2012. Google Drive. <https://drive.google.com>, Retrieved: 2012
- [15] Dropbox. <https://www.dropbox.com>, Retrieved: 2012.
- [16] Box.com. <https://www.box.com/>, Retrieved: 2012.
- [17] Sumit S. Sagane, Dr. G. R. Bamnote "Flexible, Trusted and Private Personal Storage System" in cloud computing International Journal of Computer Science and Applications Vol. 6, No.2, Apr 2013 ISSN: 0974-1011.