

## Personal File Storage

Personal file storage services are aimed at private individuals, offering a sort of "network storage" for personal backup, file access, or file distribution. Users can upload their files and share them publicly or keep them password-protected.

Prior to the advent of personal file storage services, off-site backup services were not typically affordable for individual and small office computer users.

Sometimes people prefer hosting their files on a publicly accessible HTTP server. In this case, they generally choose paid hosting, and use their hosting for this purpose. Many free hosting providers do not allow the storage of files for non-website-related use.

Common file hosting services include:

Amazon Cloud Drive, Box.net, Dropbox, FileServe, Gladwinput, Google Drive, Hotfile, Humyo, Jungle Disk, Apple's iCloud, iDisk, MediaFire, Mozy, RapidShare, Microsoft's SkyDrive, Softonic, SpiderOak, SugarSync, SwissDisk, Ubuntu One, Wuala, Yousendit, ZShare, and many more

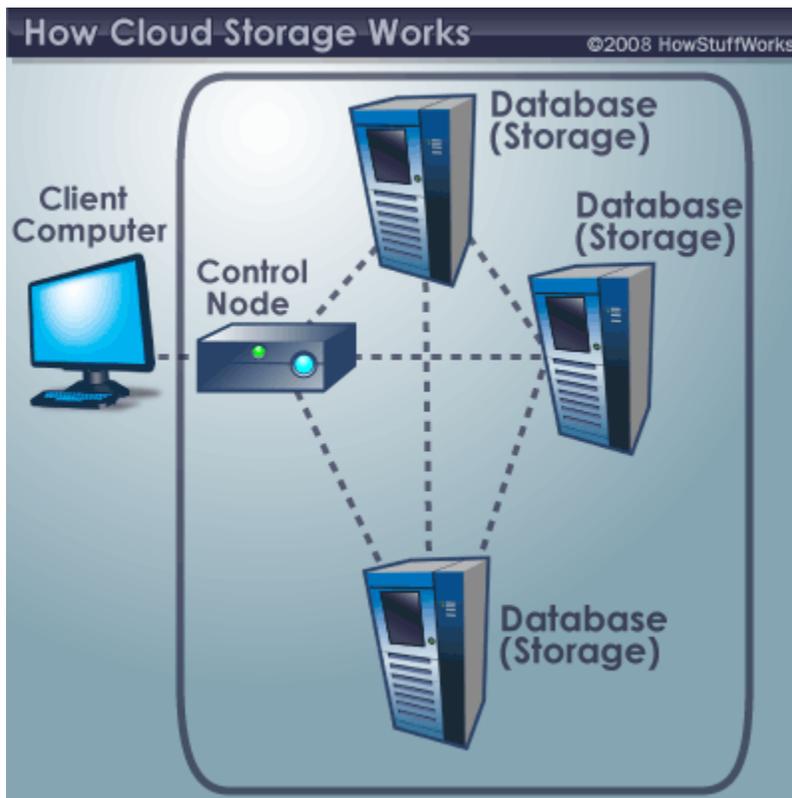
Scribd, Docstoc, Google Docs, Issuu, wePapers and Yumpu are document-sharing services.

## How Cloud Storage Works

Typical cloud storage system architecture includes a master control server and several storage servers.

Comedian George Carlin has a routine in which he talks about how humans seem to spend their lives accumulating "stuff." Once they've gathered enough stuff, they have to find places to store all of it. If Carlin were to update that routine today, he could make the same observation about computer information. It seems that everyone with a computer spends a lot of time acquiring data and then trying to find a way to store it.

For some computer owners, finding enough storage space to hold all the data they've acquired is a real challenge. Some people invest in larger hard drives. Others prefer external storage devices like thumb drives or compact discs. Desperate computer owners might delete entire folders worth of old files in order to make space for new information. But some are choosing to rely on a growing trend: cloud storage.



While cloud storage sounds like it has something to do with weather fronts and storm systems, it really refers to saving data to an off-site storage system maintained by a third party. Instead of storing information to your computer's hard drive or other local storage device, you save it to a remote database.

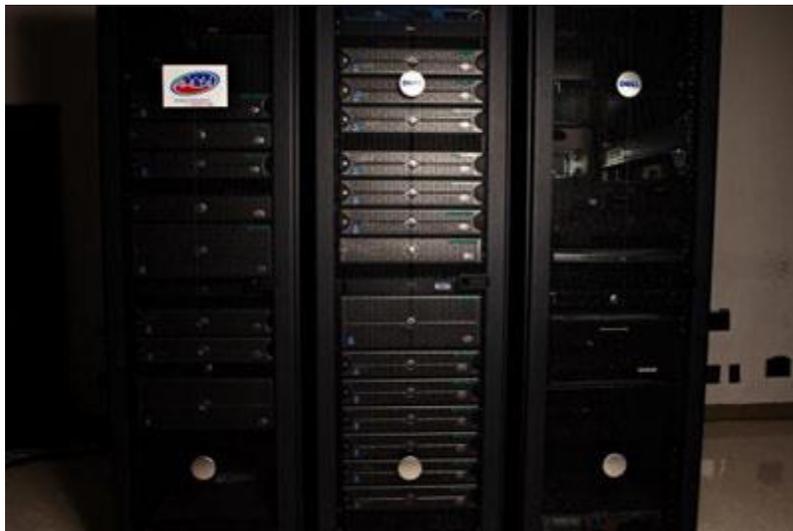
The Internet provides the connection between your computer and the database.

On the surface, cloud storage has several advantages over traditional data storage. For example, if you store your data on a cloud storage system, you'll be able to get to that data from any location that has Internet access. You wouldn't need to carry around a physical storage device or use the same computer to save and retrieve your information. With the right storage system, you could even allow other people to access the data, turning a personal project into a collaborative effort.

## Cloud Storage Basics

There are hundreds of different cloud storage systems. Some have a very specific focus, such as storing Web e-mail messages or digital pictures. Others are available to store all forms of digital data. Some cloud storage systems are small operations, while others are so large that the physical equipment can fill up an entire warehouse. The facilities that house cloud storage systems are called data centers.

At its most basic level, a cloud storage system needs just one data server connected to the Internet. A client (e.g., a computer user subscribing to a cloud storage service) sends copies of files over the Internet to the data server, which then records the information. When the client wishes to retrieve the information, he or she accesses the data server through a Web-based interface. The server then either sends the files back to the client or allows the client to access and manipulate the files on the server itself.



Cloud storage systems generally rely on hundreds of data servers. Because computers occasionally require maintenance or repair, it's important to store the same information on multiple machines. This is called redundancy. Without redundancy, a cloud storage system couldn't ensure clients that they could access their information at any given time. Most systems store the same data on servers that

use different power supplies. That way, clients can access their data even if one power supply fails.

Not all cloud storage clients are worried about running out of storage space. They use cloud storage as a way to create backups of data. If something happens to the client's computer system, the data survives off-site. It's a digital-age variation of "don't put all your eggs in one basket."

## Examples of Cloud Storage

There are hundreds of cloud storage providers on the Web, and their numbers seem to increase every day. Not only are there a lot of companies competing to provide storage, but also the amount of storage each company offers to clients seems to grow regularly.

You're probably familiar with several providers of cloud storage services, though you might not think of them in that way. Here are a few well-known companies that offer some form of cloud storage:

- Google Docs allows users to upload documents, spreadsheets and presentations to Google's data servers. Users can edit files using a Google application. Users can also publish documents so that other people can read them or even make edits, which means Google Docs is also an example of cloud computing.
- Web e-mail providers like Gmail, Hotmail and Yahoo! Mail store e-mail messages on their own servers. Users can access their e-mail from computers and other devices connected to the Internet.
- Sites like Flickr and Picasa host millions of digital photographs. Their users create online photo albums by uploading pictures directly to the services' servers.
- YouTube hosts millions of user-uploaded video files.
- Web site hosting companies like StartLogic, Hostmonster and GoDaddy store the files and data for client Web sites.
- Social networking sites like Facebook and MySpace allow members to post pictures and other content. All of that content is stored on the respective site's servers.
- Services like Xdrive, MediaMax and Strongspace offer storage space for any kind of digital data.

Some of the services listed above are free. Others charge a flat fee for a certain amount of storage, and still others have a sliding scale depending on what the client needs. In general, the price for online storage has fallen as more companies have entered the industry. Even many of the companies that charge for digital storage offer at least a certain amount for free.

Is there enough of a demand for storage to support all the companies jumping into the market? Some people think that if there's space to be filled, someone will fill it. Others think the industry is destined to experience a crash not unlike the dot-com bubble burst in 2000. We'll have to wait and see.

## Potential Cloud Storage Problems

### Data Center Design

- Physical security is just as important as network security. Data servers are valuable not only because the machines themselves are expensive, but also because the data stored on them could include sensitive information. Malicious hackers don't rely solely on cracking into a computer system electronically -- sometimes they try to infiltrate a system by gaining access to its physical computers.
- A single data server's power requirements aren't very taxing. But when a data center has hundreds of servers, it's crucial that the center's electric wiring can support the workload.
- Like all computers, data servers generate heat. Too much heat can impair or damage servers, so the data center needs an effective cooling system to prevent such problems.

### Concerns about Cloud Storage

The two biggest concerns about cloud storage are reliability and security. Clients aren't likely to entrust their data to another company without a guarantee that they'll be able to access their information whenever they want and no one else will be able to get at it.

To secure data, most systems use a combination of techniques, including:

- Encryption, which means they use a complex algorithm to encode information. To decode the encrypted files, a user needs the encryption key. While it's possible to crack encrypted information, most hackers don't have access to the amount of computer processing power they would need to decrypt information.
- Authentication processes, which require to create a user name and password.
- Authorization practices -- the client lists the people who are authorized to access information stored on the cloud system. Many corporations have multiple levels of authorization. For example, a front-line employee might have very limited access to data stored on a cloud system, while the head of human resources might have extensive access to files.

Even with these protective measures in place, many people worry that data saved on a remote storage system is vulnerable. There's always the possibility that a hacker will find an electronic back door and access data. Hackers could also attempt to steal the physical machines on which data are stored. A disgruntled employee could alter or destroy data using his or her authenticated user name and password. Cloud storage companies invest a lot of money in security measures in order to limit the possibility of data theft or corruption.

The other big concern, reliability, is just as important as security. An unstable cloud storage system is a liability. No one wants to save data to a failure-prone system, nor do they want to trust a company that isn't financially stable. While most cloud storage systems try to address this concern through redundancy techniques, there's still the possibility that an entire system could crash and leave clients with no way to access their saved data.

Cloud storage companies live and die by their reputations. It's in each company's best interests to provide the most secure and reliable service possible. If a company can't meet these basic client expectations, it doesn't have much of a chance -- there are too many other options available on the market.

If you don't yet have a service for storing and syncing your data in the cloud, you need one. You might even need more than one.

These days, you can sign up for an online cloud storage service, such as Dropbox, Box, or Google Drive, and have all your files made available to you no matter where you are or which device you're using. The very best cloud storage solutions play nicely with other apps and services to make the experience of *doing something* with your files relatively seamless to you.

Some cloud storage services are niche, such as one on this list that specializes in e-signatures, so your collaborators can sign all those documents that you're storing and sharing via the cloud. Other cloud services specialize in online backup, while still others shine for their file-syncing capabilities. File-syncing has become an integral part of online backup.

Many great cloud storage services have a free account that usually comes with a few limitations. Sometimes, however, it's worth paying for a service to get a lot more storage space or the ability to upload really big files. Other perks often include increased access to file-version history (meaning you could restore an important business proposal to the version you had before your colleague made a bunch of erroneous changes), more security, or more features for collaboration and working with teams.

If you want the utmost in comparisons, take a look at the [insane chart of cloud backup services](#) on Wikipedia.