

# CLLOUD STORAGE: RISKS AND REWARDS (1)

By J  r  my Legendre

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*J  r  my Legendre is a brilliant student in computer security at Norwich University's School of Business and Management. He submitted an excellent paper on cloud storage for his IS340 Introduction to Information Assurance class in Fall 2012 and has graciously allowed us to publish his work here. Everything that follows is M. Legendre's with minor edits by Mich. The work is split into two parts for publication in this series.*

## Introduction

Backing up to the cloud means putting your backups on a remote server that can be accessed by Internet connection.[1] You can access your information from anywhere you have an Internet connection without taking up space on your machine's hard drive. Many businesses have started to use cloud computing and it is expected that there will be a "26 percent growth in adoption over the next several years".[2] However, the cloud is not *just* for businesses; even the U.S. government has started to adopt the cloud model. Cloud storage is offered for personal use (for free or fee) by a number of companies including Apple (iCloud), Dropbox and Google (Google Drive). With massive adoption of cloud backups users are increasingly concerned about how secure this backup method is.[3] With 100 percent adoption of cloud backups, everything will be available from anywhere. How much should you trust the cloud?

## Why has Cloud Storage Become Popular?

Cloud storage is not a new way to backup your files. The idea was first introduced in the 1960s by computer scientists John McCarthy and J.C.R. Licklider.[4] So why has cloud storage only become popular in recent years?

Prior to the 1990s, bandwidth and what we consider decent transfer rates were rare. In the 1970s, typical transfer speeds (for those who had the Internet) were around 300 bits per second,[5] – 27 seconds per kilobyte or approximately eight hours per megabyte. These speeds are not adequate for transferring large amounts of data. Furthermore, few people had access to the Internet during the 1970s and even into the early 1990s. For example, only two percent of households in the U.S. had access in 1994 and only twenty-six percent had access in 1998.[6] There was not much of a market for personal cloud storage services.

Online storage services started to spring up as bandwidth and speeds increased and more people started using the Internet.[7] Among the first to popularize this service was Dropbox, Inc. in 2007.[8] They pioneered seamless operating system integration, competitive prices and even offered a free plan with limited options. Dropbox created the industry standard for remote backup services.[9] Apple's iCloud storage service launched in 2011 and Google Drive in 2012.

## Cloud Storage: The Risks and Rewards

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Dropbox alone had four million users in February 2010[10] and more than one hundred million users as of November 2012.[11] Apple's iCloud hit over 190 million users in October of 2012[12] and Google Drive announced their ten million-user mark in June 2012.[13]

### Risks

Cloud storage may be convenient but is your data secure? No matter which cloud storage service you choose, the services "have full access to your data and control where it is stored".[14 ] Cloud servers have been compromised, causing uncertainty or data compromise for customers.

### Dropbox Compromises

Although Dropbox is currently the face of personal cloud storage, it is not because they are the most secure. Back in July 2011 Dropbox announced that a code update had "completely disabled the authentication system for an unknown period of time".[15] That means that for a few hours, anyone could access any Dropbox account without any credentials. For many of us, that is a pretty scary thought. Although Dropbox reassured us that they are "implementing additional safeguards to prevent this from happening again", they were compromised once again in July 2012.[16]

The July 2012 compromise ended with a small number of customers' accounts being subject to unauthorized access. Sound familiar? Dropbox launched a full investigation and announced "that usernames and passwords recently stolen from other websites were used to sign in to a small number of Dropbox accounts. This may not sound like it is their fault but one of the accounts accessed was "an employee Dropbox account containing a project document with user email addresses". The email addresses acquired were then spammed. Since the 2012 compromise Dropbox has added an optional two-factor authentication system that sends a temporary code to your phone needed to log in and a "new page that lets you examine all active logins to your account". [17] Dropbox has not, to date reported any compromises since the attack.

### iCloud Compromise

The iCloud compromise was a scary glimpse into the reality of what a little social engineering and loosely followed internal policies can lead to. In one hour Mat Honan's "entire digital life was destroyed".[18] Hackers social engineered their way into Honan's iCloud account by calling AppleCare and using his email address, billing address and last four digits of his credit card as identification.[19]

The hackers obtained his billing address from a simple and public *whois* lookup. From there they called Amazon (who also has a cloud storage service) and asked to change the email address on the account to an email address the hackers had access to. Amazon did so without a problem after the hacker provided Honan's billing address as identification. The hackers were able to reset the password on the Amazon account by having password reset information sent to the newly changed email and get hold of the last four digits of his credit card once inside.[20]

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## Cloud Storage: The Risks and Rewards

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They now had enough information to fulfil AppleCare's identification requirements and get into Honan's iCloud account. Once the hackers were in Honan's iCloud account they were able to "reset his iCloud password, reset his Gmail password, gain control of his Twitter account".[21] Sadly, this is not the end of the destruction of Honan's "digital life". Honan had Find my iPhone turned on for his iPhone/iPad and Find my Mac[22] turned on for his MacBook Air. This is a service that allows you to locate your lost or stolen Apple products and even remotely wipe those devices, which is exactly what the attackers did.

Although this attack was not a technological one, this says a lot about how careful Apple really is with your account. Strict enforcement of policies to prevent social engineering attacks like this one is a must in any company holding sensitive information. Do not let this one isolated incident taint your decision-making. There have not been any other breaches reported since this incident and none before.

### Google Drive Compromises

There have been no major Google Drive compromises to date. A user reported on Google's support forum that he received a legitimate email from Google saying there was an "unauthorized attempt to login" to his account from Shanghai. Another user reported the same problem in the thread.[23] Luckily, the hackers were not able to access either of these accounts but what would happen if they were to get in?

Google states in their Terms of service that "Anything that has been permanently deleted from Google Drive by the owner, or if the owner's account was deleted, can't be recovered. It's also not possible to recover anything in Google Drive after a Google Apps domain administrator deletes someone's account."[24] In the event your Google Drive is compromised and wiped, there is *nothing* you can do to get your files back.

Google Drive seems like the safest choice on the surface but you risk losing everything you have ever backed up onto your account if there is a breach.

### END NOTES

- [1] (Freedman 2012)
- [2] (Clancy)
- [3] (Krossman)
- [4] (Mohamed)
- [5] (12ht)
- [6] (National Science Foundation)
- [7] (Rhea, Wells and Eaton)
- [8] (Dropbox, Inc)
- [9] (Zelman)
- [10] (Ying)
- [11] (Constine)
- [12] (Lardinois)

## Cloud Storage: The Risks and Rewards

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- [13] (Crook)
- [14] (Schwartzberg)
- [15] (Bott)
- [16] (Ferdowsi)
- [17] (Kerr)
- [18] (Honan)
- [19] (Kerr, Apple Responds to Journalist's iCloud Attack)
- [20] (Manjoo)
- [21] (Rose)
- [22] (Apple, Inc.)
- [23] (Google Support Forum)
- [24] (Google, Inc)

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*More next week.*

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## Cloud Storage: The Risks and Rewards

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### BIO

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