

Cloud Computing

- Applications and data storage are provided as services to the user via the internet.
 - Software as a Service (SaaS)
 - Platform as a Service (PaaS)
 - Infrastructure as a Service (IaaS)



Future Development

- IDC Estimates
 - \$16B in 2010
 - \$56B by 2014



Cloud Computing Activities	
Internet users who do the following online activities (%)	
Use webmail services such as Hotmail, Gmail, or Yahoo! mail	56%
Store personal photos online	34
Use online applications such as Google Documents or Adobe Photoshop Express	29
Store personal videos online	7
Pay to store computer files online	5
Back up hard drive to an online site	5

Source: Pew Internet & American Life Project April-May 2008 Survey, N=1,553 Internet users. Margin of error is ±3%.

- By 2013 it is estimated that 60% of the server workloads will be performed by virtual servers

Problems

- Law Enforcement must know cloud was used
- Evidence is difficult for law enforcement to seize
 - Evidence is remote
 - Evidence is vast
 - Evidence has complex structure
 - Evidence can remotely be changed by suspect

Solution

- Law Enforcement issues remote warrant to provider
- Valid warrant must have :
 - Which cloud app was used
 - Time of use
 - Associated username
- Create a tool to generate warrant information from seized devices (e.g. computers, phones, iPad)

Plan of Action

- Perform research on test machines to analyze where cloud applications store data remnants and what information resides in these remnants

Installation Report: Dropbox 1.0.10 Installer

Generated by InCtrl5, version 1.0.0.0
 Install program: C:\Documents and Settings\Owner\Desktop\Dropbox 1.0.10.exe
 1/10/2011 12:39 PM

Contents

- Registry
- Disk Contents
- Log Files
- Text Files

Registry

Keys ignored: @

- (none)

Keys added: 71

HKEY_USERS\S-1-5-21-1993962763-1454471165-839522115-1001_Classes*
 HKEY_USERS\S-1-5-21-1993962763-1454471165-839522115-1001_Classes*\shell
 HKEY_USERS\S-1-5-21-1993962763-1454471165-839522115...

Examples of Remnants

- Google Docs Cached Web Sites
 - Start Page - <https://docs.google.com>
 - Create a Document - <https://docs.google.com/documentary/create?hl=en>
- Drop Box
 - Creates an SQLite file, config.db. This file contains various information such as the user's email address

```

config.db
1 SQLite format 3
2 [REDACTED]recently_changed3(lp,460200/..
3 Jrecently_changed3(lp1(V38772633:/Evidence.txt
4 a(V38772633:/Public/How to use the Public
5 folder.rtf
6 a(V38772633:/Photos/Sample Album/Pensive
7 Parakeet.jpg
8 [REDACTED]@hotmail.com
9 [REDACTED]root_nst[REDACTED];dropbox_path
10 C:\Users\admin\Dropbox*[REDACTED]host_id13607e8
11 14ad42bc7d7cb2dda41ad964[REDACTED]
    
```

Impact - Law Enforcement will be able to gather evidence from the cloud