Voluntary Disclosures

Give-Aways

- Not all privacy problems are due to evil social networking sites and web sites
- Some information is given away
- People don't always realize the consequences of what they say online

War 2.0

“Israel’s Army Radio reported on Wednesday that a raid on suspected militants in the West Bank planned for Wednesday was called off by the countrys military because a soldier posted details of the operation on Facebook.

“The Israeli newspaper Haaretz explained that the soldier posted a status update letting friends know that his unit was preparing to go to a West Bank village near Ramallah: ‘On Wednesday we clean up Qatanah, and on Thursday, god willing, we come home,’ the soldier wrote.”

Inappropriate Publications Aren’t New

- During World War II, the *Chicago Tribune* published a story suggesting that the U.S. was reading Japan’s naval codes — which was true. . .
- (The Japanese never saw the story)
- What’s different now?

The Difference

- No gatekeeper
- No single person to hold accountable (Roosevelt wanted to use the Marines to shut down the *Chicago Tribune* and/or wanted to charge the publisher with treason)
- Accessible from anywhere in the world
- It’s the same things that make Web 2.0 useful for other reasons—publishing is now rapid and decentralized

Usenet

- The decentralized publication problem started with Usenet
- People engaged in discussions would often post proprietary material
- Most companies required preclearance for publication—but was Usenet “publishing” or “talking with friends”?
- The social dynamic was the latter, but what was posted was rapidly distributed worldwide.

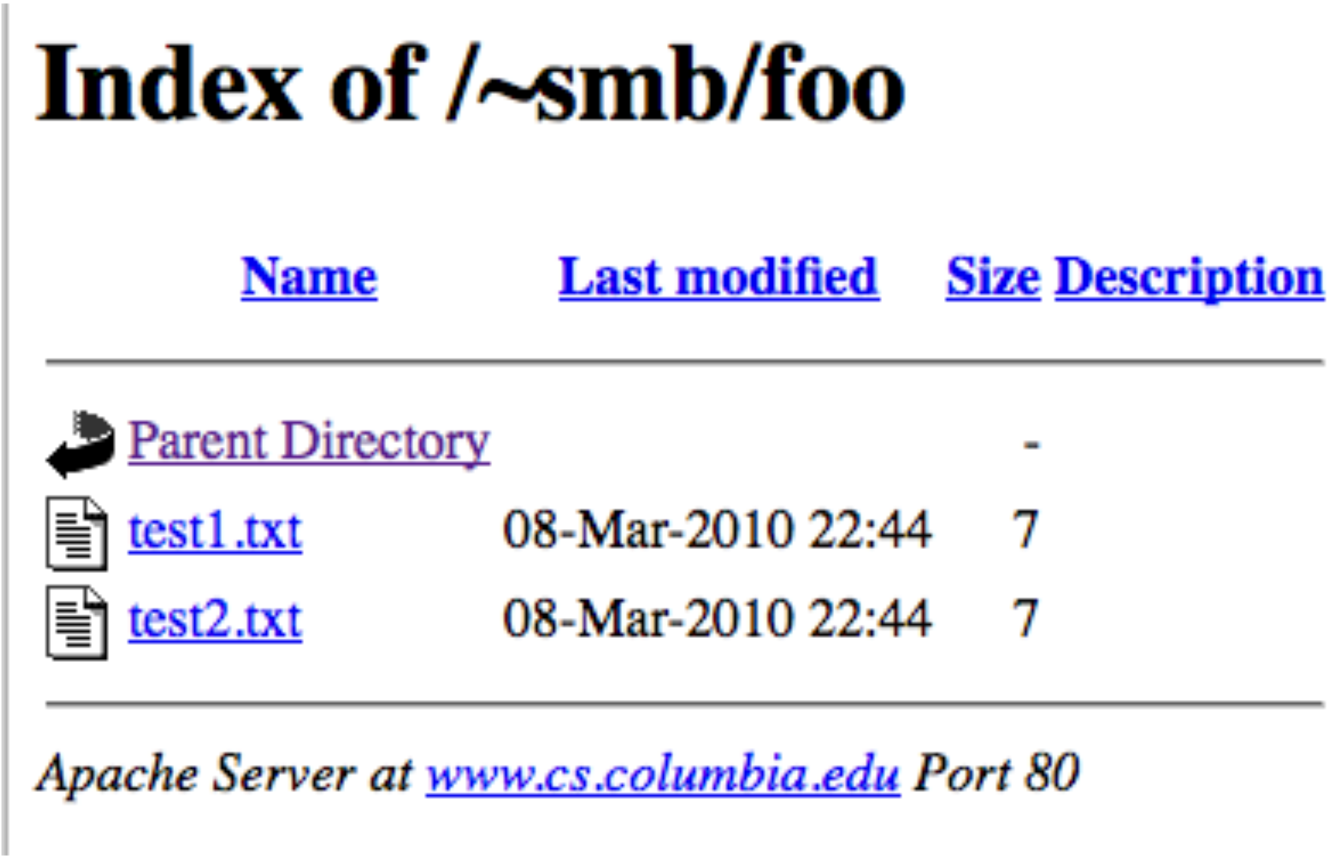
The Web Made it Worse

- Inappropriate content was now permanent
- Search engines could find it
- Better yet—search engines could find corporate markings for proprietary documents
  - ☞ Search for phrases like “IBM Confidential” or “AT&T Proprietary”
- Home in on the good stuff...

Unofficial Collaboration Channels

- Often, official mechanisms for sharing data don’t work well
- Simple solution: put the files on a web site and *assume* that no one else will see them
- But web servers will auto-list directories and search engines can find things. . .

Autolisting Directories



Index of /~smb/foo

Name	Last modified	Size	Description
Parent Directory		-	
test1.txt	08-Mar-2010 22:44	7	
test2.txt	08-Mar-2010 22:44	7	

Apache Server at www.cs.columbia.edu Port 80

Peer-to-Peer Filesharing

- Peer-to-peer file-sharing programs are designed to share files with minimal effort
- But what files?
- The goal—let's be honest—was to share MP3s and movies
- Some programs' default configuration shared all file types in certain directories.
- Do people put their music in **`My Documents`**?

Apparently, Some Do. . .

- Empircally, we do see documents on file-sharing networks
- The FTC notified about 100 organizations that sensitive customer and employee data was being shared that way
- “They might accidentally choose to share drives or folders that contain sensitive information, or they could save a private file to a shared drive or folder by mistake, making that private file available to others. In addition, viruses and other malware can change the drives or folders designated for sharing, putting private files at risk. As a result, instead of just sharing music, a user’s personal tax returns, private medical records or work documents could end up in general circulation on P2P networks.” (FTC)

A New Law?

- Congress considered a bill to require warnings about P2P programs
- Program must provide “clear and conspicuous notice that such program allows files on the protected computer to be made available for searching by and copying to one or more other computers”
- Such programs must not make themselves unduly hard to remove

You Can’t Call it Back

- Once something is on the Net, it’s probably there forever
- Email with the text “`XXX wishes to recall the message "YYYY"`” is ineffective on anything other than Microsoft Exchange
- In fact, it only draws more attention to the message. . .

Sexting

- People—not frequently teenage girls—take “suggestive” photos of themselves with their phones and send them to their (boy)friends
- (It’s not just teenage girls—don’t forget Anthony Weiner and his antics)
- The recipients display lots of class and circulate the pictures to several dozen of their closest, most trusted friends
- These “friends”, of course, share them further
- One result in several jurisdictions: threatened or actual child pornography charges
- Also: revenge porn

It’s Not Just Teens

- In 2001, a British attorney at a large multinational law firm forwarded a complimentary—but extremely intimate—email from his girlfriend, because he wanted to brag about his “attributes”
- One of his friends sent it further, saying that he felt “honour bound” to redistribute it
- The email rapidly became very public
- The attorney was fired; several of the forwarders were disciplined

What Happened?

- Imagine a wandering bard, spreading a “naughty” rumor wherever he goes
- Imagine a monk in a scriptorium making several copies of such stories and sending them out by courier
- Someone takes a letter to the copier room, makes lots of copies, and mails them
- What is the bandwidth in recipients/second?
- A quantitative difference in speed has become a qualitative difference

Can We Create Time-Limited Email?

- General approach: encrypt the email with some key; destroy the key after a certain interval
- To read the email, the recipient first has to either retrieve the key or upload the mail to a decryption server
- In either case, the message is displayed on the recipient's screen, which can be copied
- If nothing else, the recipient can use another device to photograph the screen
- Yes, that's true of Snapchat. . .

The Converse Problem

- On the other hand, creating a message which can't be read until a certain time is (in principle) easy
- Launch satellites with private cryptographic keys into the L4 and L5 Earth-Sun Lagrange points
- Multiply-encrypt the message, alternating between the public keys for each of the two satellites
- Each leg—they're 8 light-minutes from earth, and 13.86 light-minutes apart—can do one decryption; there's no way to talk faster than the speed of light

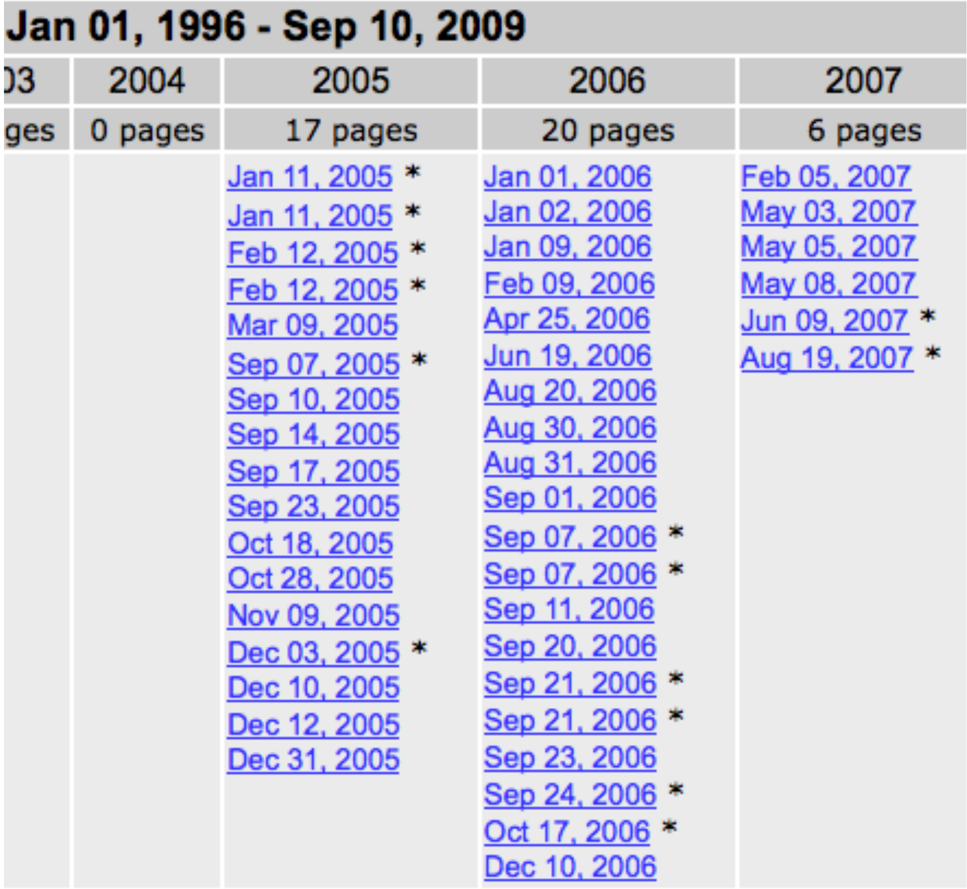
Social Networks

- Facebook et al. are personal places
- People post things about themselves and their friends
- Such postings can follow them around

What’s the Problem?

- Secondary use—personal data is being used when judging employment suitability
- Persistence of data—data has a long lifetime
- The “Wayback Machine”: **`www.archive.org`**

The Wayback Machine



Jan 01, 1996 - Sep 10, 2009

03	2004	2005	2006	2007
ges	0 pages	17 pages	20 pages	6 pages
		Jan 11, 2005 *	Jan 01, 2006	Feb 05, 2007
		Jan 11, 2005 *	Jan 02, 2006	May 03, 2007
		Feb 12, 2005 *	Jan 09, 2006	May 05, 2007
		Feb 12, 2005 *	Feb 09, 2006	May 08, 2007
		Mar 09, 2005	Apr 25, 2006	Jun 09, 2007 *
		Sep 07, 2005 *	Jun 19, 2006	Aug 19, 2007 *
		Sep 10, 2005	Aug 20, 2006	
		Sep 14, 2005	Aug 30, 2006	
		Sep 17, 2005	Aug 31, 2006	
		Sep 23, 2005	Sep 01, 2006	
		Oct 18, 2005	Sep 07, 2006 *	
		Oct 28, 2005	Sep 07, 2006 *	
		Nov 09, 2005	Sep 11, 2006	
		Dec 03, 2005 *	Sep 20, 2006	
		Dec 10, 2005	Sep 21, 2006 *	
		Dec 12, 2005	Sep 21, 2006 *	
		Dec 31, 2005	Sep 23, 2006	
			Sep 24, 2006 *	
			Oct 17, 2006 *	
			Dec 10, 2006	

More Subtle Leaks

- Association patterns leak
- “Birds of a feather. . . ”
- Democrats (mostly) friend Democrats, Republicans (mostly) friend Republicans, gays mostly friend gays, etc.
- An MIT study showed that gay males had many more openly gay Facebook friends than did straight males—and that this could be used to identify the sexuality of closeted men.

Protecting Facebook Data

- Facebook has elaborate privacy controls
- Many people are unaware of them
- They're not easy to use well—there's a serious usability problem
- Facebook says that 20M users changed some settings—at a time when they had 350M users
- One nice feature: it's possible to see how anyone on your friend list will see your profile

They Keep Changing Things

- Facebook frequently changes its policies and mechanisms
- New defaults are more open
- This is a conscious decision by Facebook, which thinks that people want more openness
- Also: how will Facebook make money?

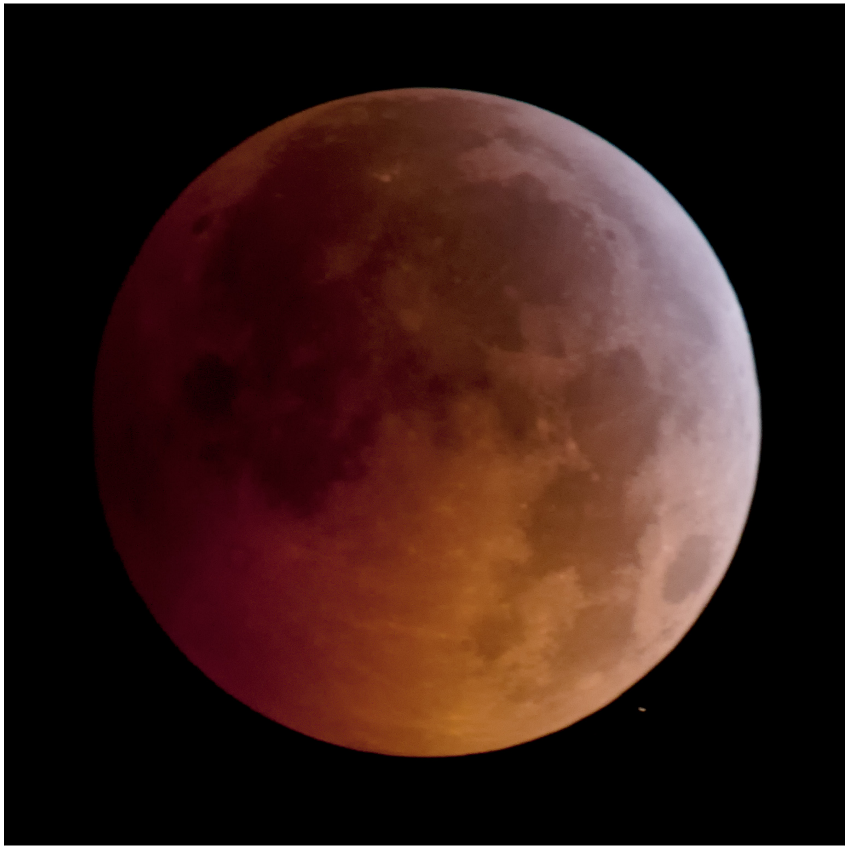
EXIF Tags

- JPGs contain a lot of metadata
- Some is about the photo:

```
Exposure Time: 1/60 sec
F-Number: f/4.5
Exposure Program: Not Defined
Exposure Bias: 0 EV
Metering Mode: Pattern
Light Source: Unknown
Flash: Flash, Auto, Return Detected
Focal Length: 44.00 mm
```

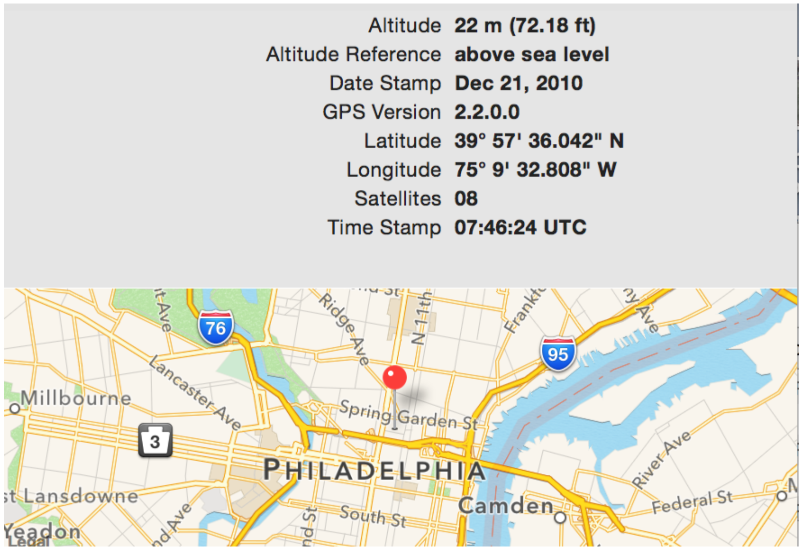
- But it can also include the camera model and serial number and GPS location

A Lunar Eclipse

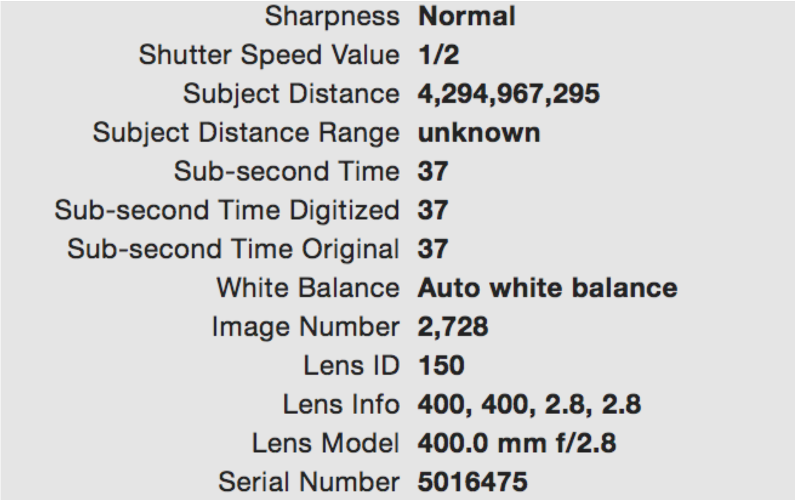


(Photo by Matt Blaze)

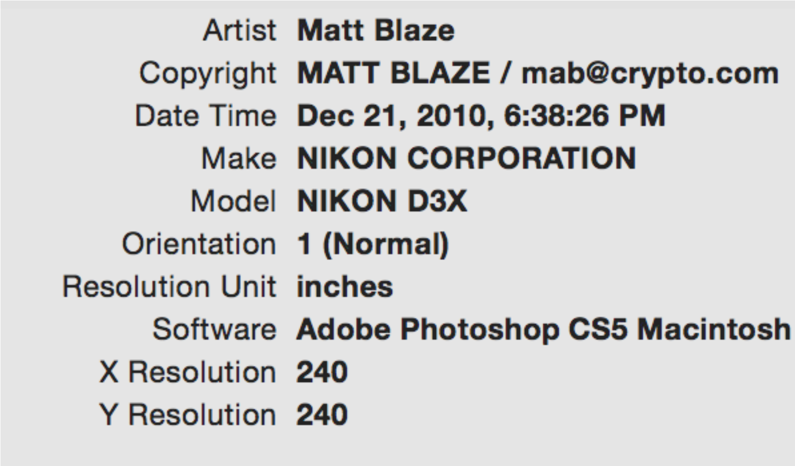
Some of the Metadata



Altitude	22 m (72.18 ft)
Altitude Reference	above sea level
Date Stamp	Dec 21, 2010
GPS Version	2.2.0.0
Latitude	39° 57' 36.042" N
Longitude	75° 9' 32.808" W
Satellites	08
Time Stamp	07:46:24 UTC



Sharpness	Normal
Shutter Speed Value	1/2
Subject Distance	4,294,967,295
Subject Distance Range	unknown
Sub-second Time	37
Sub-second Time Digitized	37
Sub-second Time Original	37
White Balance	Auto white balance
Image Number	2,728
Lens ID	150
Lens Info	400, 400, 2.8, 2.8
Lens Model	400.0 mm f/2.8
Serial Number	5016475



Artist	Matt Blaze
Copyright	MATT BLAZE / mab@crypto.com
Date Time	Dec 21, 2010, 6:38:26 PM
Make	NIKON CORPORATION
Model	NIKON D3X
Orientation	1 (Normal)
Resolution Unit	inches
Software	Adobe Photoshop CS5 Macintosh
X Resolution	240
Y Resolution	240

Issues

- Carelessness
- Technological surprises
- Conversational nature
- Loss of control of information

Carelessness

- People don’t think through the consequences of what they post
- Aspects: audience; persistence; findability

Technology

- People don’t understand their technology—or technological changes
- Aspects: hidden data; surprising behavior; new algorithms

Conversations

- The net can feel like a private space for talking with friends
- People talk more freely among their friends
- Aspects: confusing context

Loss of Control

- Cost of access is lower
- Cost of copying and redistribution is very much lower
- Aspects: new technology; wide audiences; misplaced trust
- Privacy is *defined* as the ability to control what happens to your information

People Haven’t Adapated Yet

- Just as with malicious behavior, our behavior patterns have not yet adapated to the Net
- This is complicated by the general unawareness of underlying technologies and the rate of technological change