

# Flying Instruments-Only

## Navigating Legal & Security Issues in Cloud Computing

**Richard P. Goldberg**

*Attorney at Law*  
*(and former Java architect)*

**LISA 11.11.2010**

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# DISCLAIMER:

**@GoldbergLawDC (twitter)**  
**Richard.Goldberg@GoldbergLawDC.com**

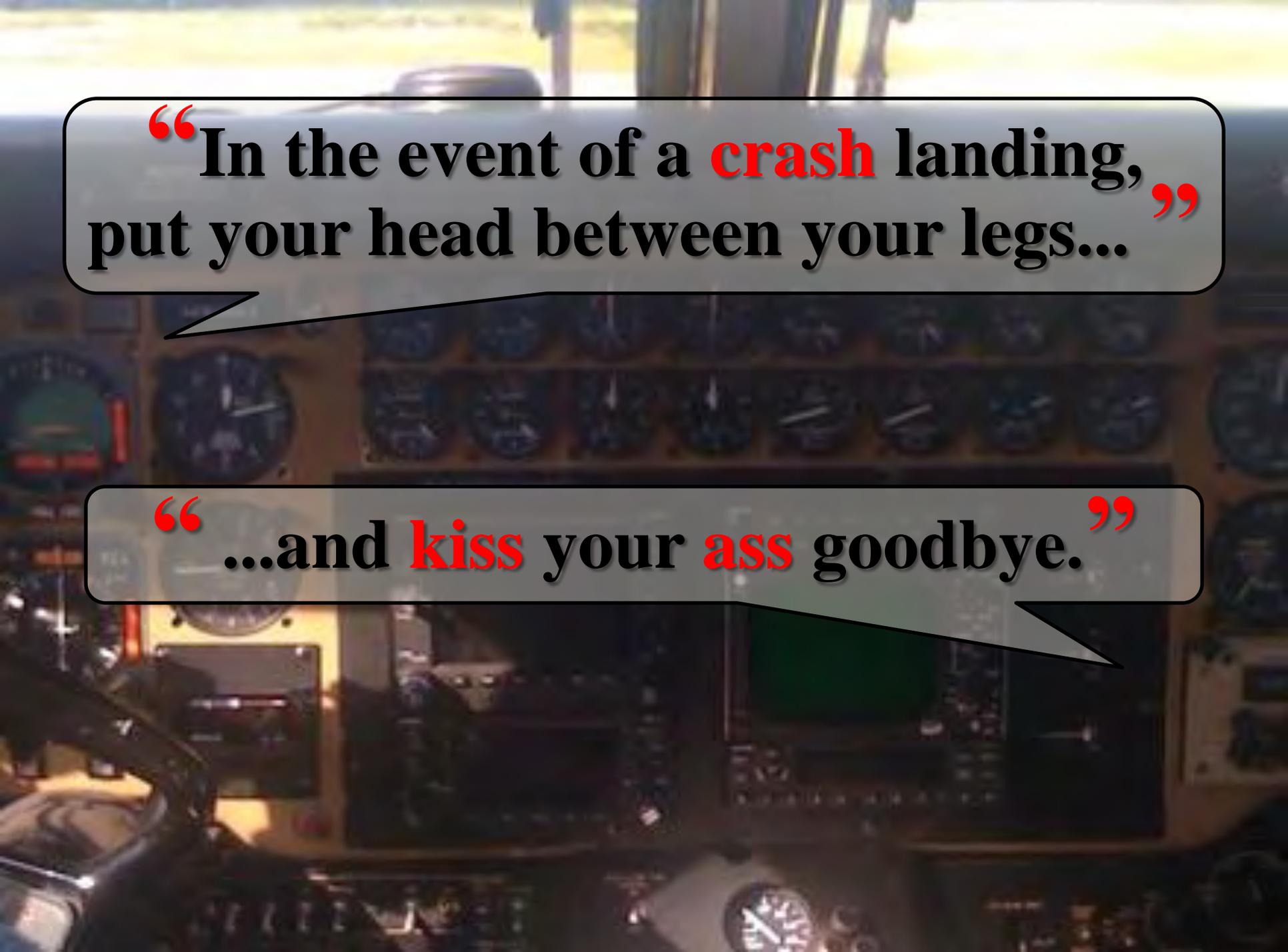
I am **a** lawyer.

I am **not your** lawyer.

*(except some of you, and you already know who you are)*

Cloud computing  
is **dangerous**





“In the event of a **crash** landing,  
put your head between your legs...”

“...and **kiss** your **ass** goodbye.”

“ You can delegate authority,  
but you can never delegate  
responsibility. ”

— **Richard E. Krafve**  
General Manager,  
Ford Motor Company,  
**Edsel Division**

A long, straight road stretches into the distance under a blue sky with scattered clouds. The road is flanked by green grass and a line of trees in the background. The text "What are the risks?" is overlaid in the center of the image.

**What are the risks?**

A long, straight road stretches into the distance under a blue sky with scattered clouds. The road is flanked by green grass and a line of trees in the background. The text is overlaid on the upper half of the image.

**What are the risks?**  
**Are you protected?**



**What are the risks?**  
**Are you protected?**  
**What can you do?**

**What is cloud computing?**



**cloud computing (n): \_**



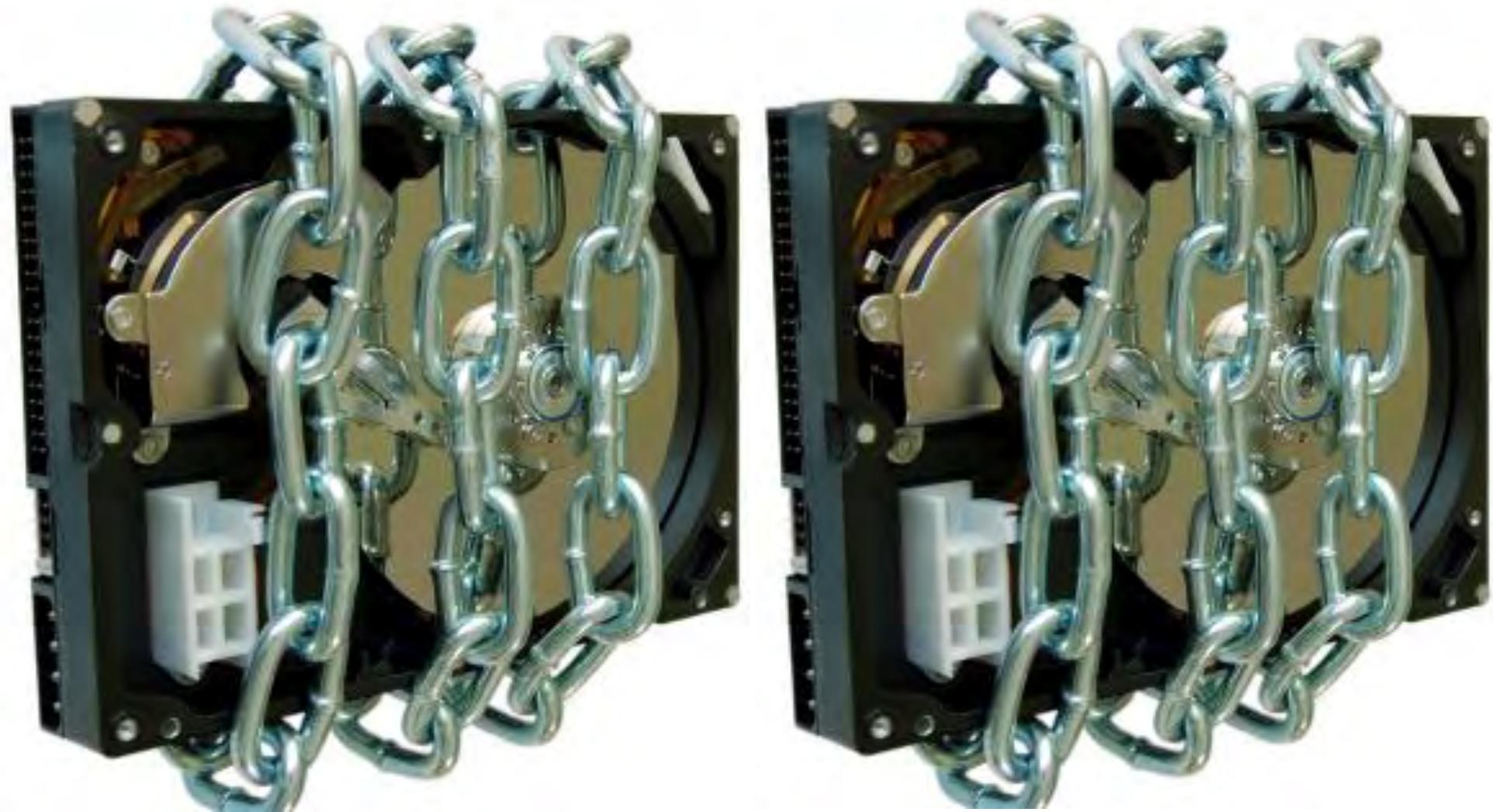
**Promise**

# Secure

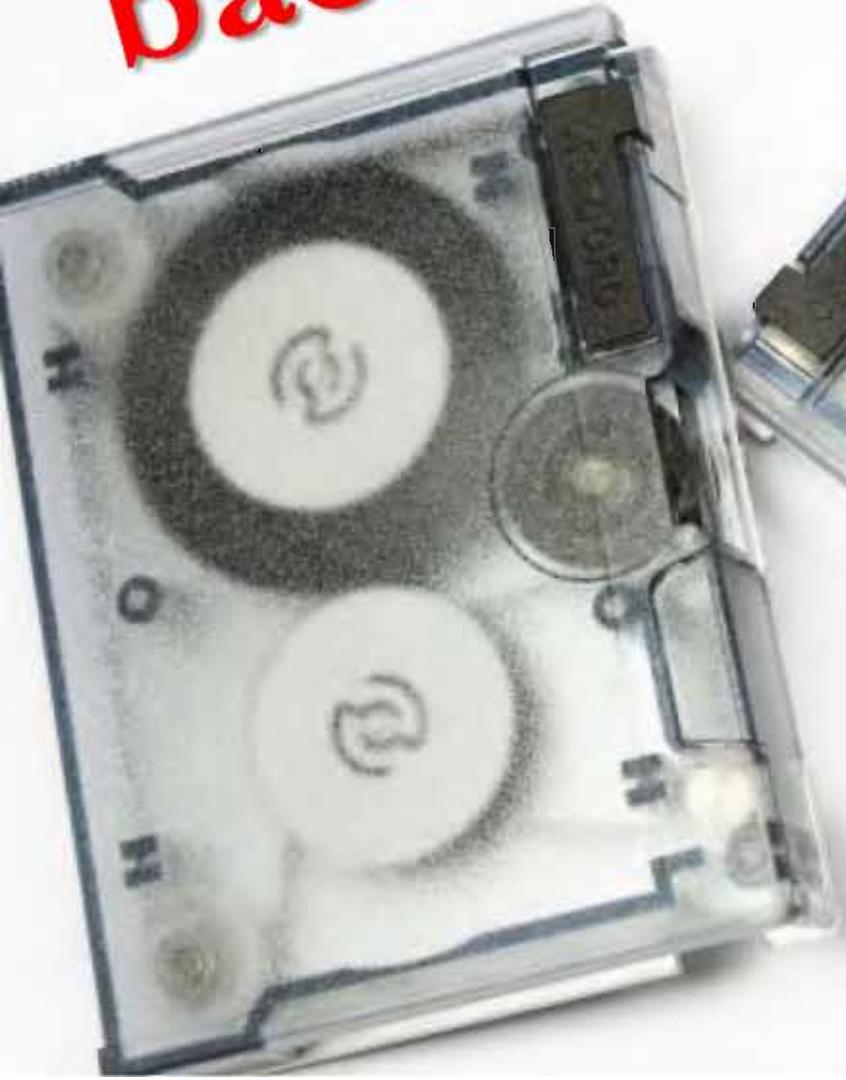
# data



# Secure **replicated** data



**No more  
backup tapes**



# Multitenancy



# Multitenancy

# Multitenancy



# Multitenancy



# Multitenancy



# Multitenancy



# Multitenancy



# Multitenancy



# Multitenancy





**Third-Party Admin**

# Automatic



# Automatic **scaling**



# Automatic **scaling**



**Are all of these cloud?**

**Probably not**

**It doesn't matter**



The things that **are** cloud...

and...



and...



The things that just  
**look** like cloud...



The things that just  
**look** like cloud...



... have the  
**same** problems

2  
things

create problems in  
cloud computing



# Multitenancy





**Third-Party Possession**

**This is not  
the problem**



It's this



“ You can’t say civilization  
don’t advance... in every war,  
they **kill you in a new way.** ”

— Will Rogers

# Why is cloud risky?

*“Man does not control his own fate. The women in his life do that for him.”*

*— Groucho Marx*



# Why is cloud risky?

“*Man does not **control** his own fate. The women in his life do that for him.*”

— *Groucho Marx*

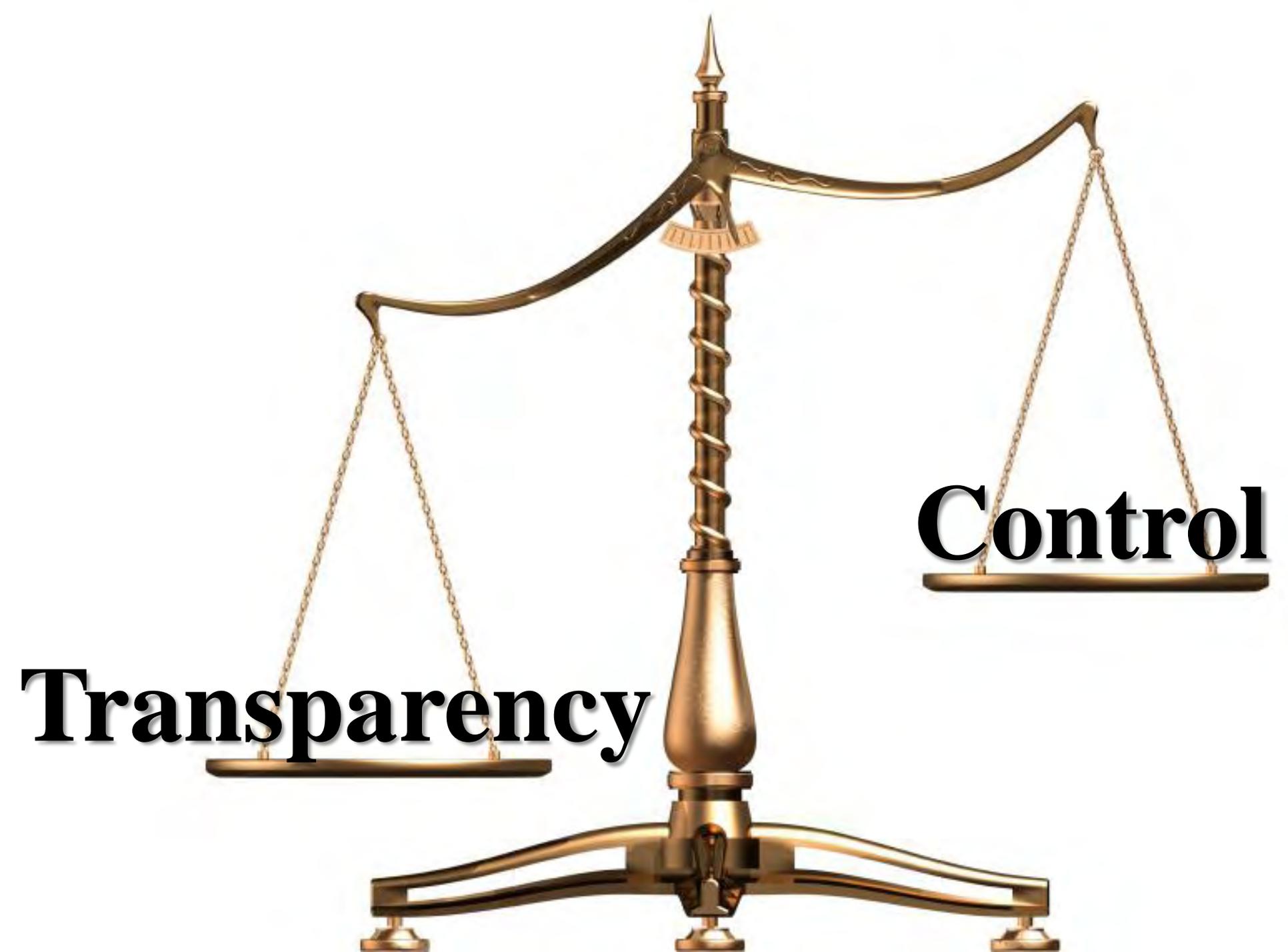


***Control***





**Transparency**



**Transparency**

**Control**

**So what's the  
worst that can *happen?***





*“Dear Google Docs user . . . .*

*We’ve identified and fixed a bug which may  
have caused **you** to share some of your  
documents without your knowledge.”*

# Google™

Docs & Spreadsheets BETA

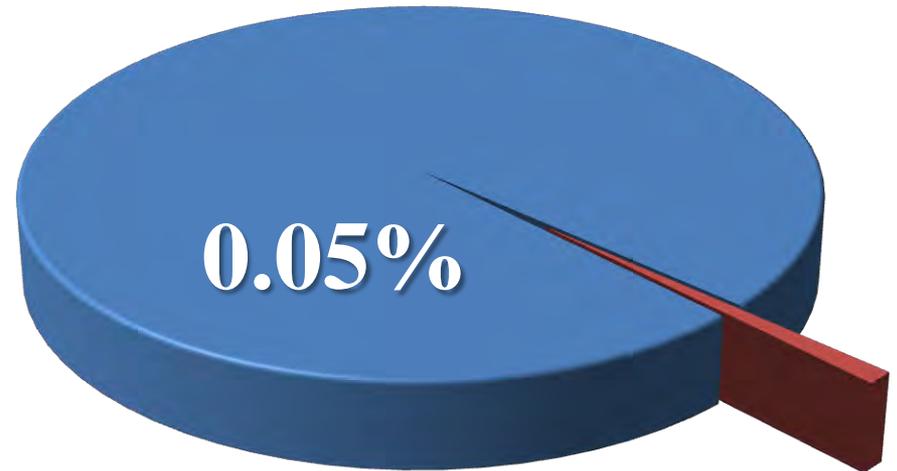
*4.4 million users*

*x*

*0.05%*

---

*2,200 users*



# Google

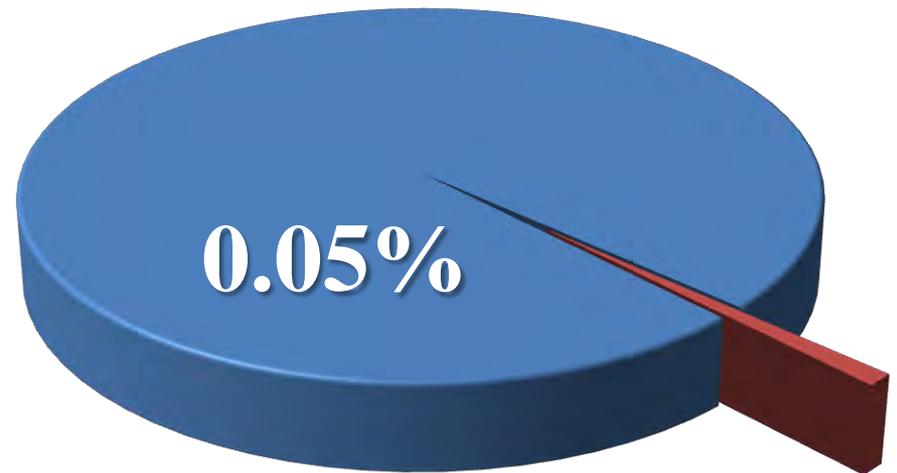
Docs & Spreadsheets BETA

4.4 million users

x

0.05%

2,200 users



... or 30 times the total number of Twitter employees

# ■ ■ ■ T ■ ■ ■ Mobile ■

- Estimated **one million** customers lose data
- Customers wait **two weeks** for it to be restored
- Data is two weeks **old**



- Voicemail transcripts from Google voice appear in **Google search results**
- Google knows but **doesn't tell anyone**



“He who knows does not speak.”

— Lao Tzu

“He who knows does not speak.”

— ~~Lao Tzu~~

“He who knows does not speak.”

— Google

“He who knows does not speak.”

— Google

*(and Toyota)*

**Why did it take so long?**



**We'll get to that...**

# February 2009

- QuickBooks online **failure**
- Financial data unavailable for **over 6 hours**
- **No explanation** provided to customers

**intuit**®

# June - July 2010

- Complete data-center **failure**
- Financial data unavailable for **over 24 hours**
- Followed by rolling failures over **4 weeks**
- Directed customers to **Twitter** for updates

**intuit**®

# November 2010

- More **failures** bring down customer sites
- Some fixed in **2 hours**, others last **half a day**
- Experts blame DOS attack, Intuit **stays quiet**

intuit®



Google™  
Voice Beta



intuit®



Google™  
Apps

· · **T** · ·

· · Mobile · ·

How can you know?

How can you know?

**Control and Transparency**

# Data Breaches by year



**64%**

**of data breaches originate  
outside the organization**



# When a data breach involves a **third party**...

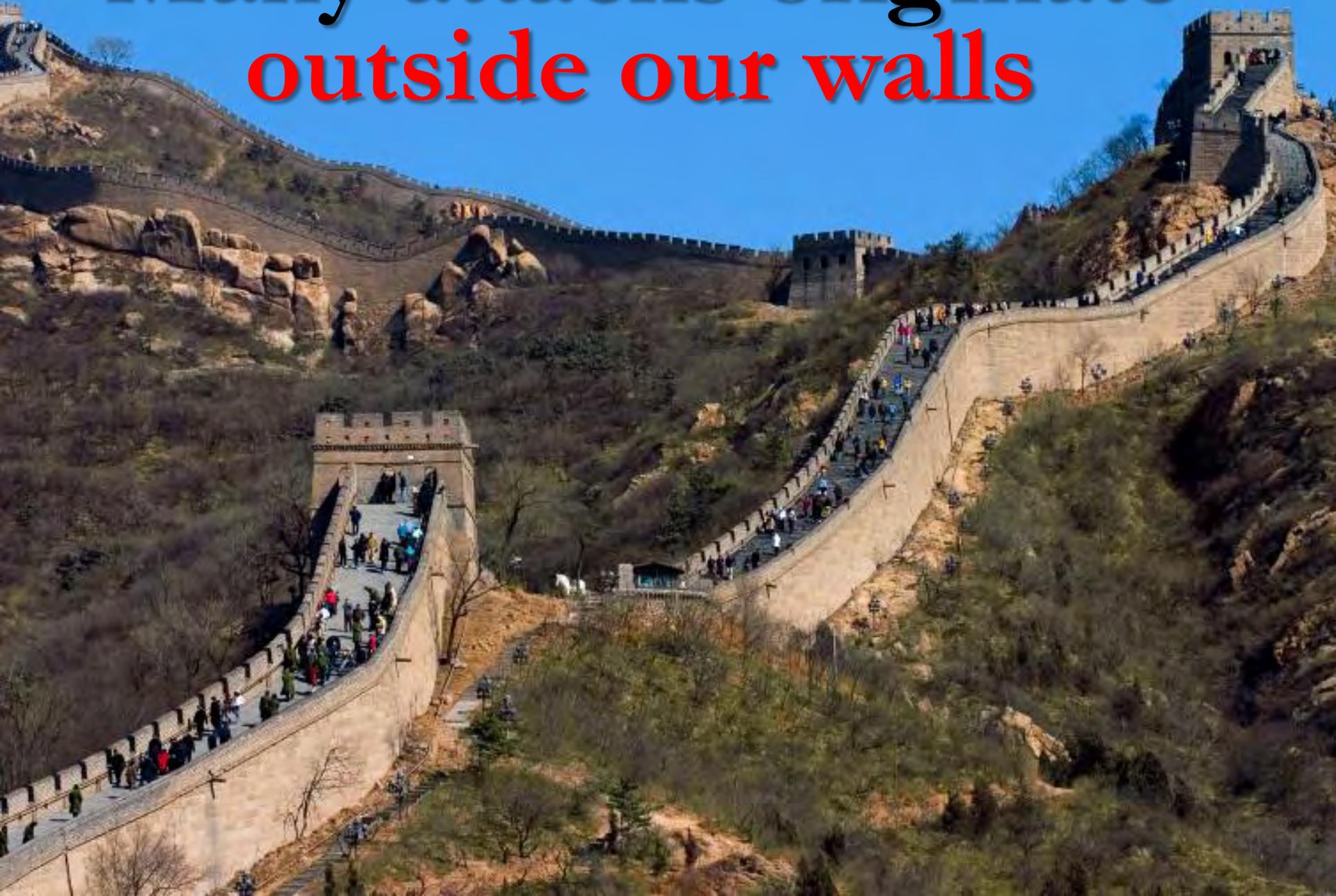


**twice**  
as many records are stolen



Source: Open Security Foundation

**Many attacks originate  
outside our walls**



**Are we all moving to cloud?**



In a survey by **Symantec** of  
Senior VPs, VPs, and Directors of  
**2010** priorities...

...cloud computing ranked

**13<sup>th</sup>**  
after energy savings

**So what are we  
doing here?**



In a survey by **Gartner** of  
Chief Information Officers of  
**2010** priorities...

...cloud computing ranked

**2nd**

after virtualization

What does  
that mean for  
cloud  
computing?





The future of  
cloud is  
**uncertain**

The background of the image is a close-up of a light-colored, textured concrete surface. A prominent, irregular crack runs diagonally from the top right towards the bottom left, passing through the text. The crack is deep and jagged, revealing a darker, fibrous interior. The overall texture is grainy and porous.

**The market**

**is fractured**

There's no turning back

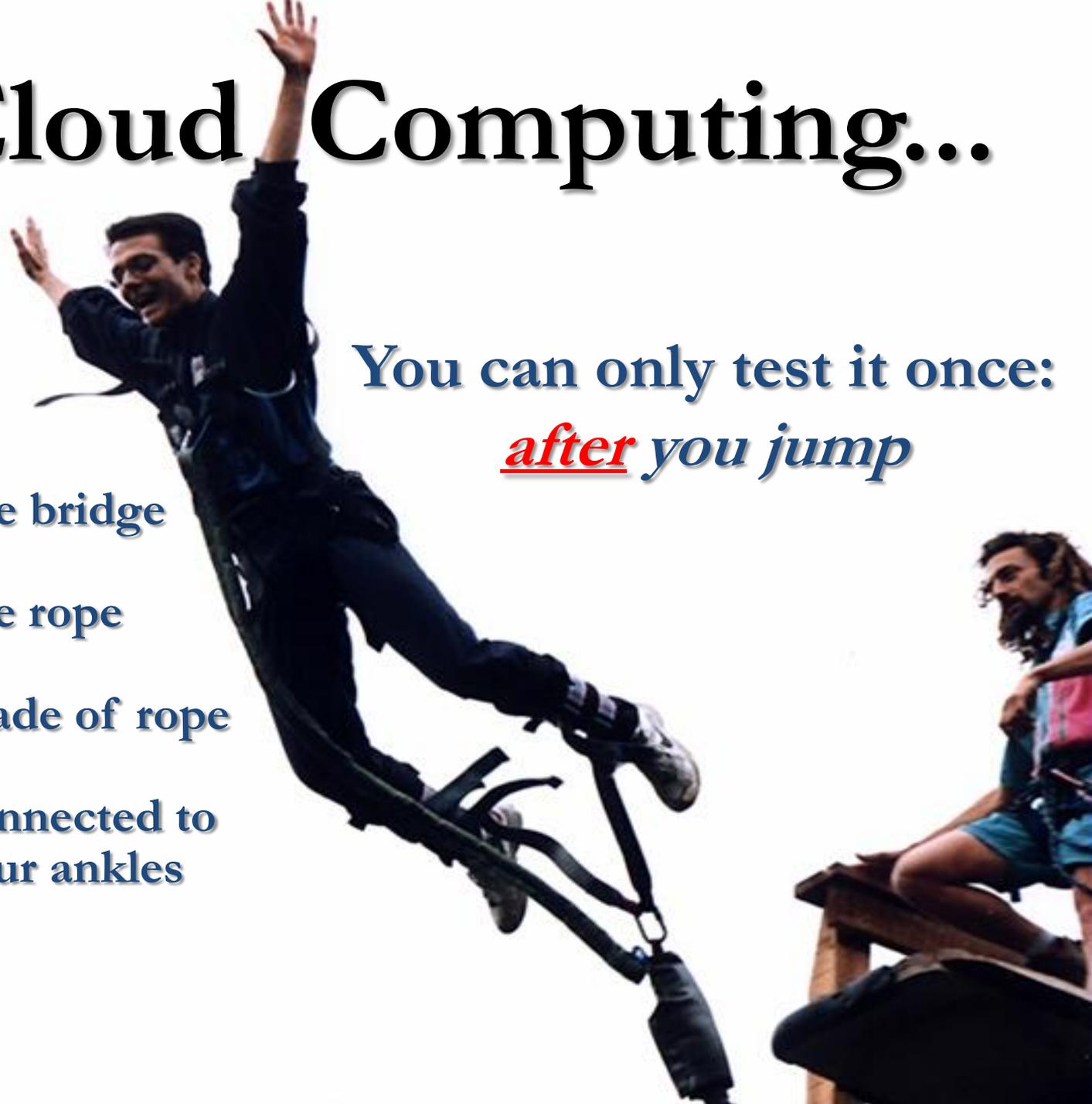


**Still, there *is* a problem...**

# Cloud Computing...

You can only test it once:  
*after you jump*

- the height of the bridge
- the length of the rope
- if the rope is made of rope
- if the rope is connected to anything but your ankles





*Careful, the beverage you are about to enjoy may be very hot.*



CUP CONTAINS 10% POST-CONSUMER RECYCLED FIBER

You can't see this until...

*Careful, the beverage you are about to enjoy may be very hot.*



CUP CONTAINS 10% POST-CONSUMER RECYCLED FIBER

# Inherent Dangers



An aerial photograph taken from an airplane window, showing a vast landscape below. The foreground is dominated by a large, dark blue body of water, likely a lake or a wide river. Beyond the water, there is a dense, green forested area. The sky is a deep blue, with some light clouds visible near the horizon. The overall scene is serene and expansive.

Inherent Dangers

Service Agreements

An aerial view from an airplane window showing a coastline with a mix of green land and blue water, with white clouds scattered below. The wing of the airplane is visible in the bottom left corner.

Inherent Dangers

Service Agreements

Collateral Dangers

An aerial photograph of a coastal city and a large body of water. The city is visible on the left side of the image, with a prominent bridge crossing a wide river or bay. The water is a deep blue, and the sky is a lighter blue with some wispy clouds. The overall scene is a wide-angle shot from a high altitude, likely from an airplane.

Inherent Dangers

Service Agreements

Collateral Dangers

Solutions (if any)

# Inherent Dangers



# Inherent Dangers

# Federal Data Protection Laws



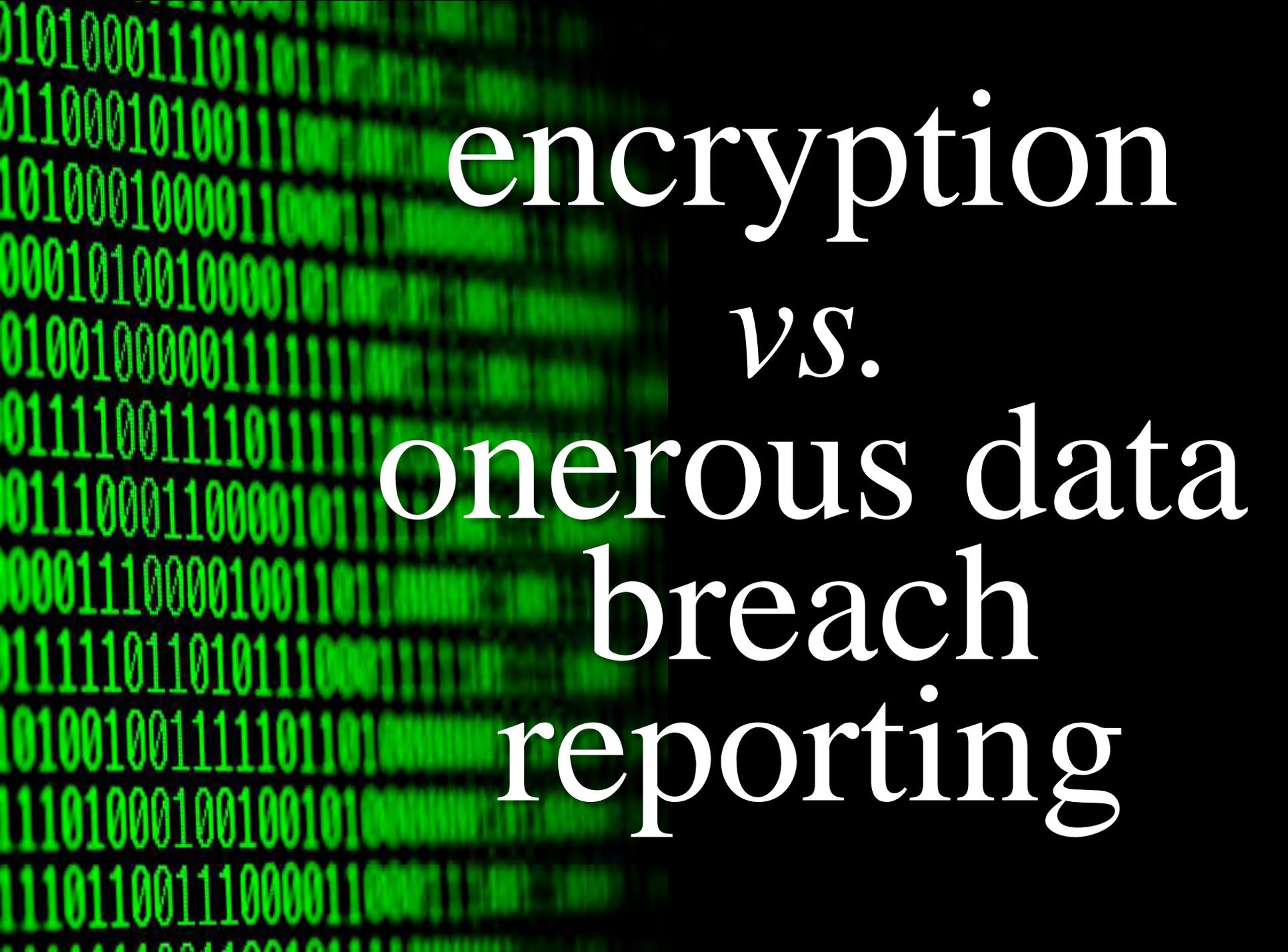


# **HIPAA**

**Health Insurance Portability  
and Accountability Act**



**“Business Associate Agreements”**



encryption

*vs.*

onerous data  
breach  
reporting

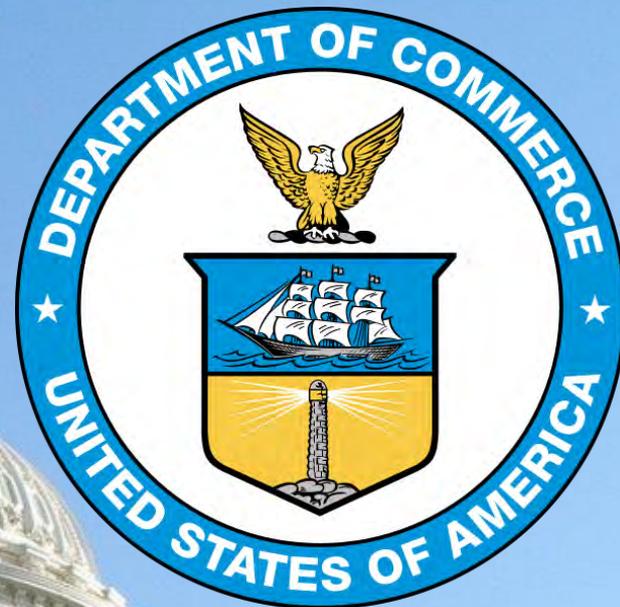


*“Reasonably anticipated  
threats or hazards”*

# NIST

National Institute of  
Standards and  
Technology

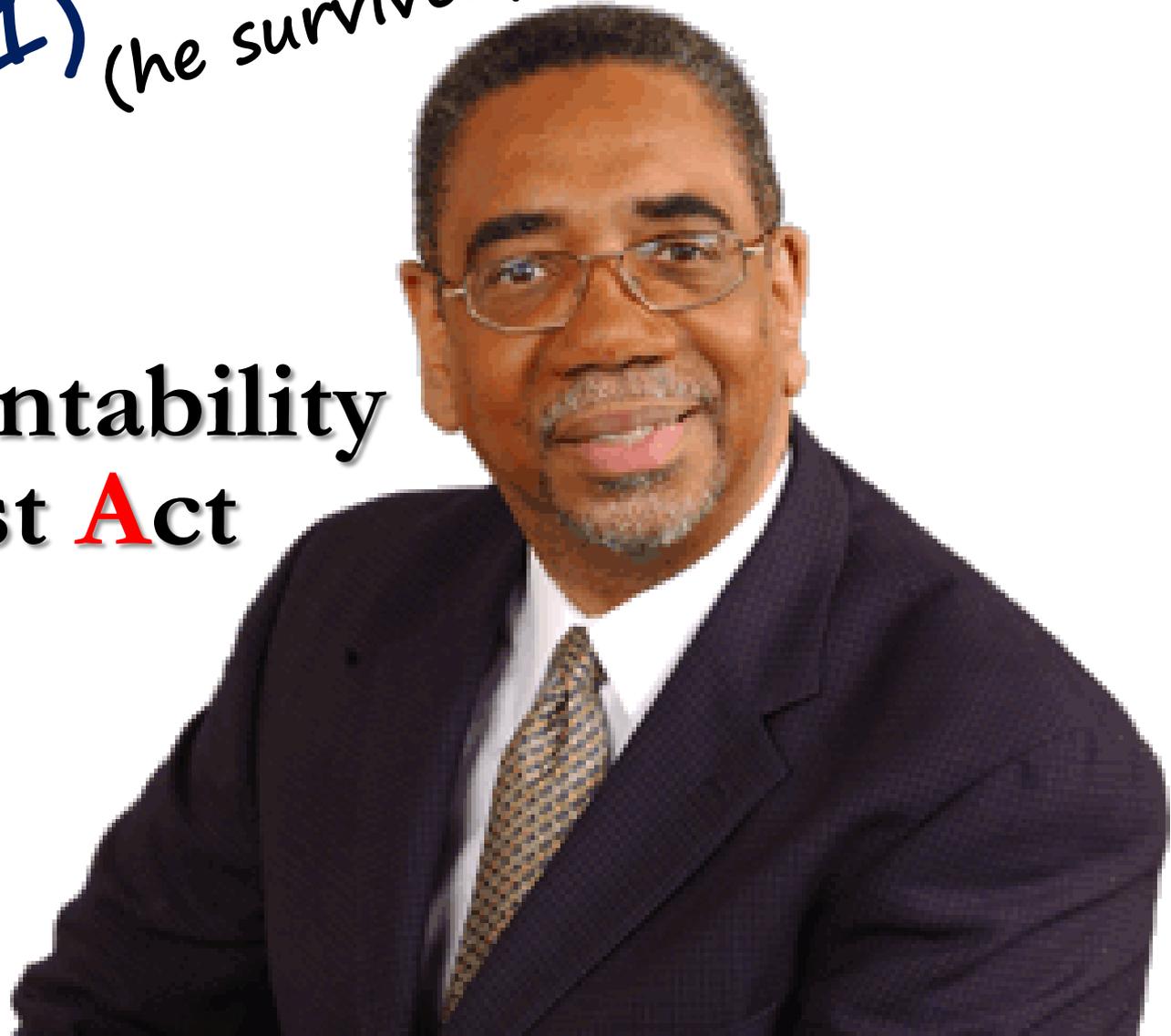
FIPS 140-2  
& SP 800



**More federal laws are coming**



Rep. Bobby Rush  
(D-IL1) (he survived)



**D**ata **A**ccountability  
and **T**rust **A**ct



# **Passed** the House of Representatives

*December 8, 2009*



*a day after a day that will live in inphamy*



**Mirrors protections  
in Gramm-Leach-Bliley Act**



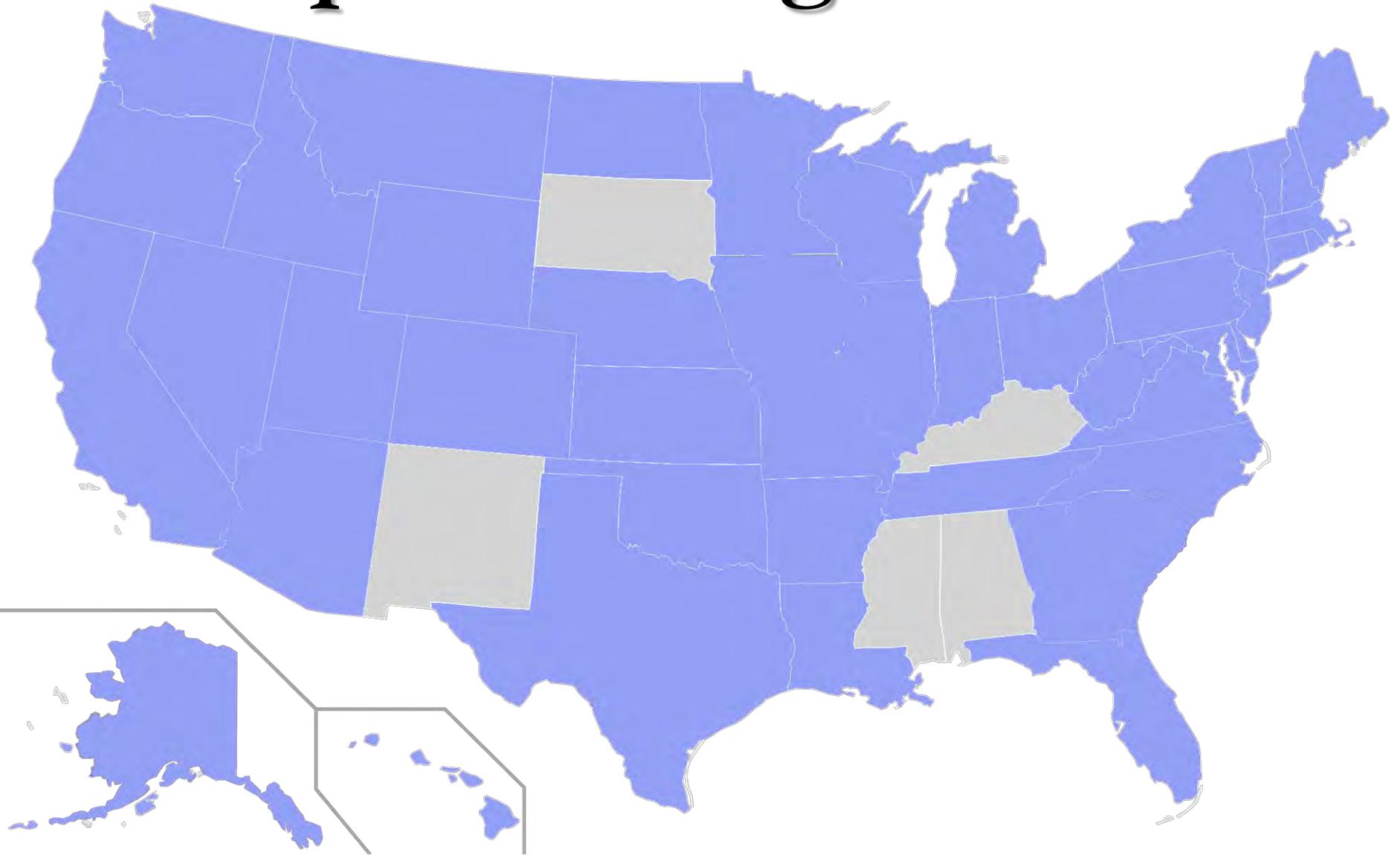
**Requires consumer and FTC notification  
after data breach**

...unless “no risk of harm”

**Server**



# Preempts existing state law



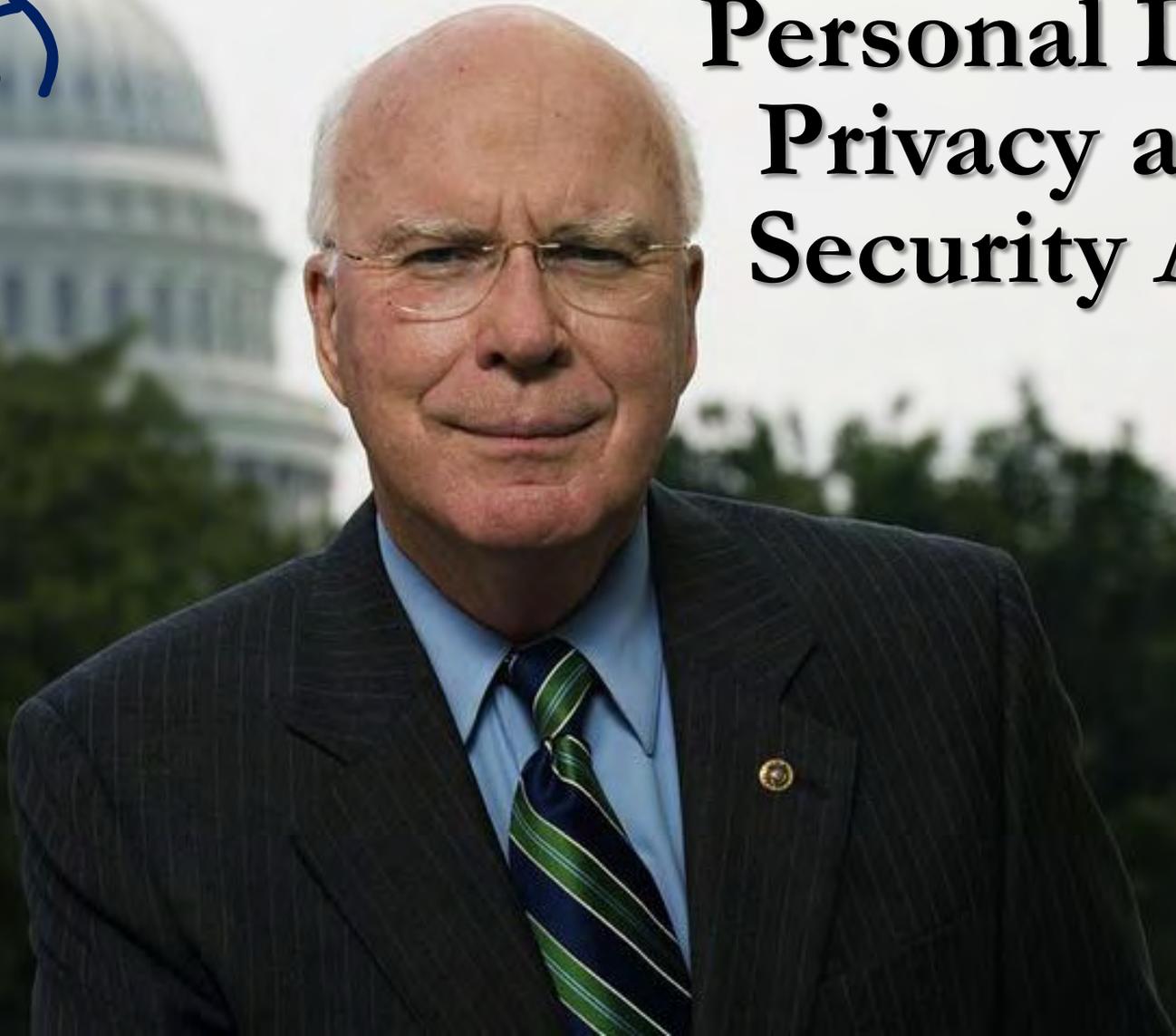


**We'll get to that...**

Sen. Patrick Leahy  
(D-VT)



**Personal Data  
Privacy and  
Security Act**



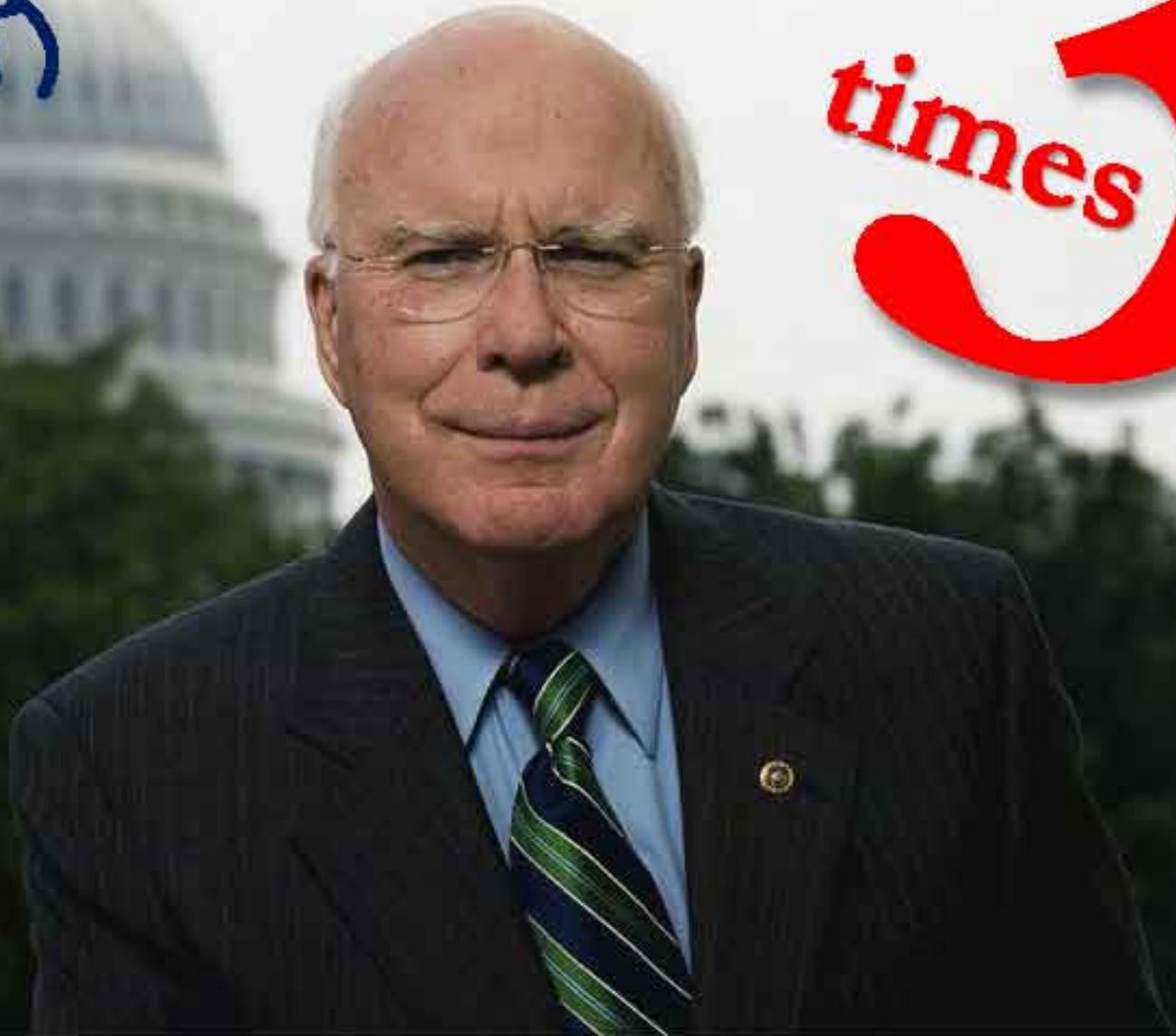
“ *This [bill] . . . provide[s] Americans with notice when they have been victims of a data breach . . . [and] also deals with the underlying problem of lax security . . . to help prevent data breaches from occurring.* ”

— Sen. Patrick Leahy

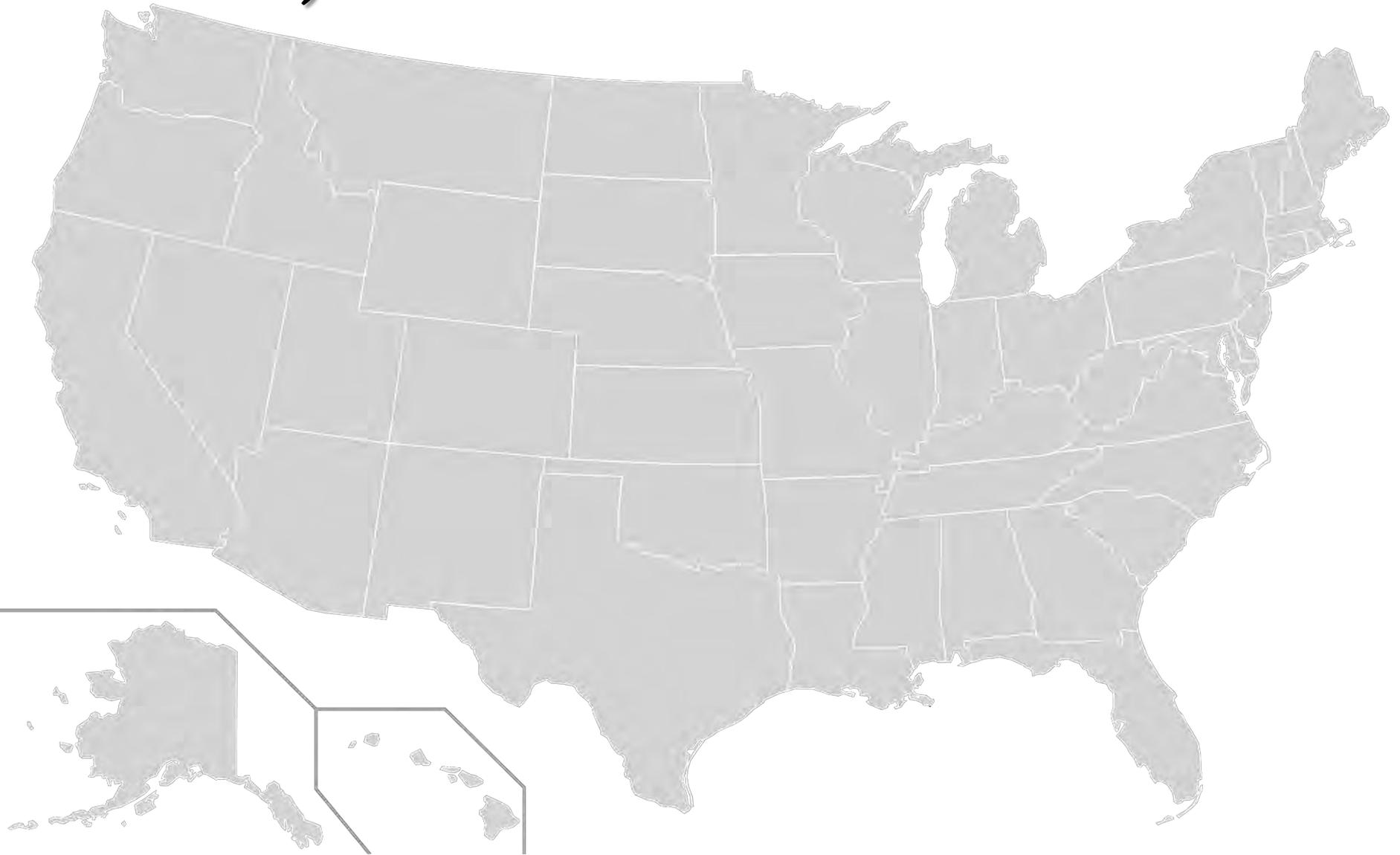
Sen. Patrick Leahy  
(D-VT)

times

3

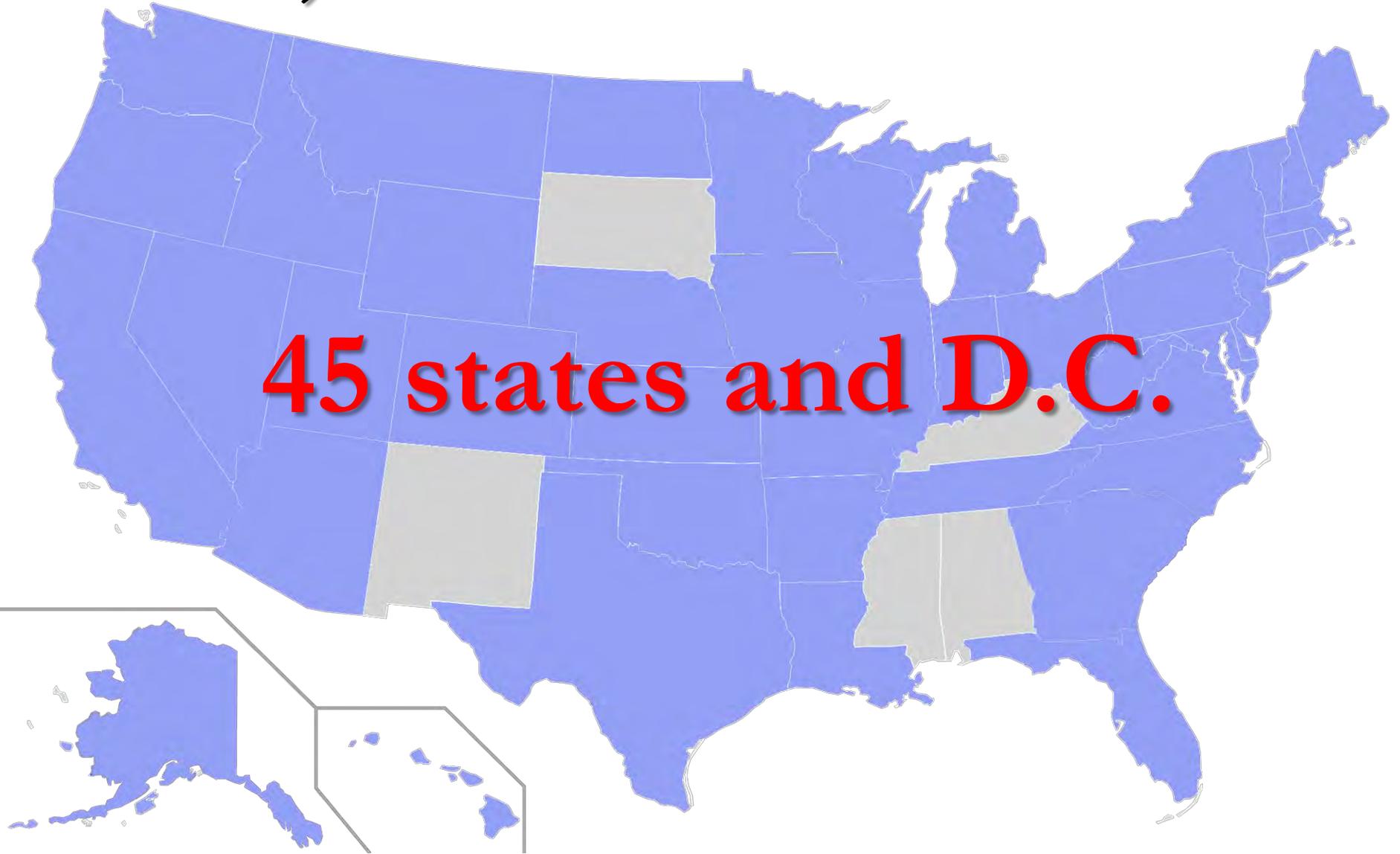


**It's not just the feds...**

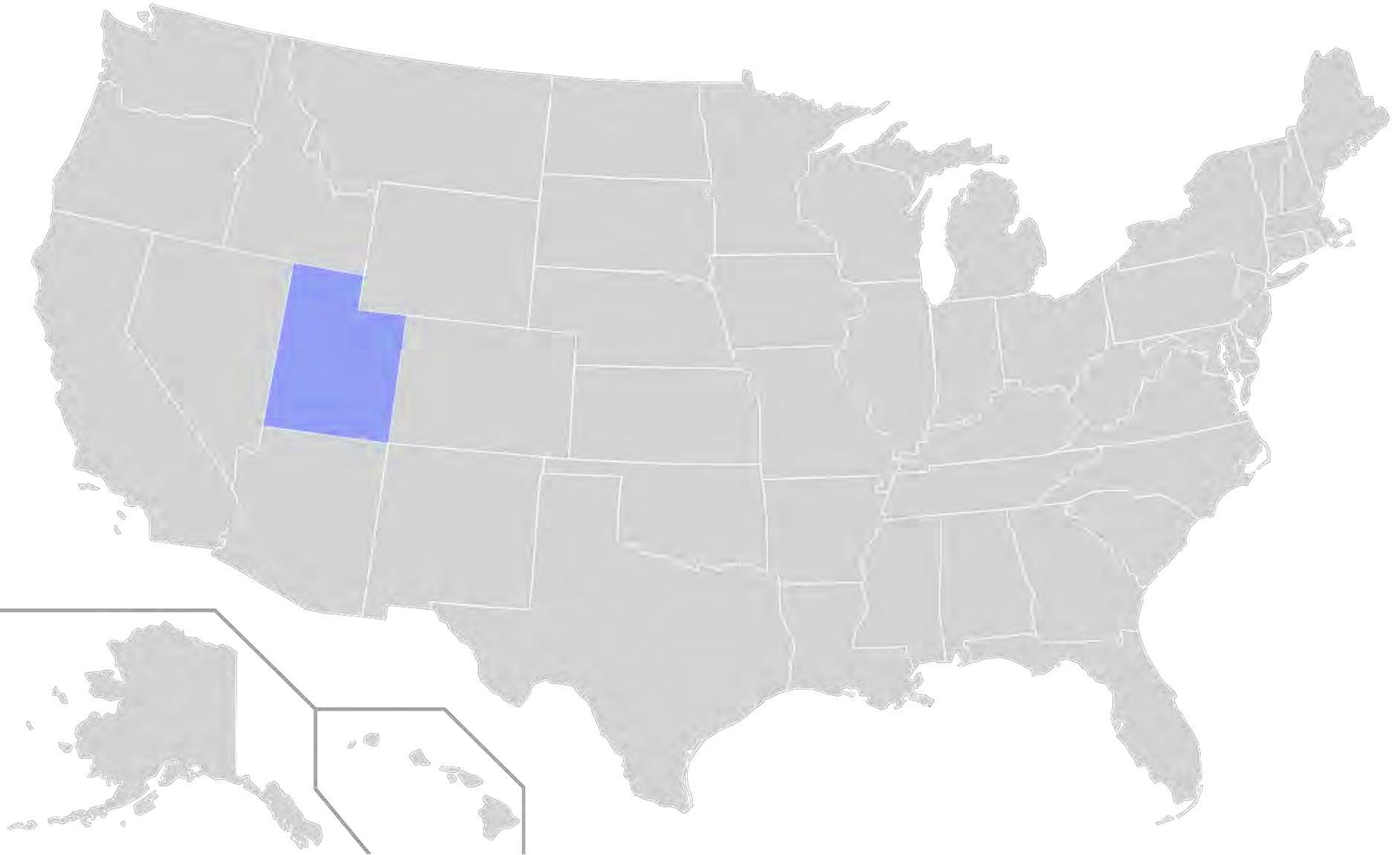


**It's not just the feds...**

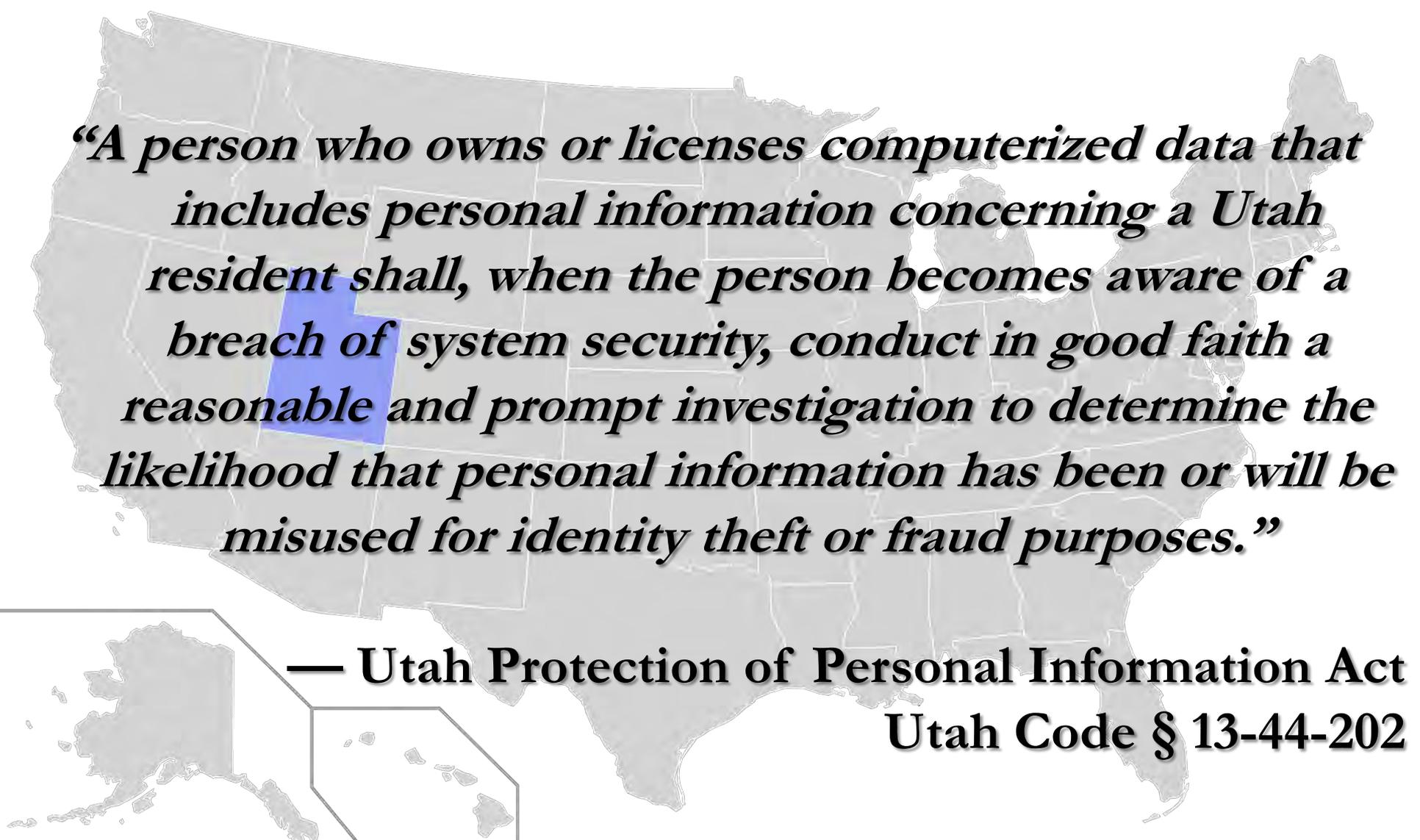
**45 states and D.C.**



**Some are less strict than others...**



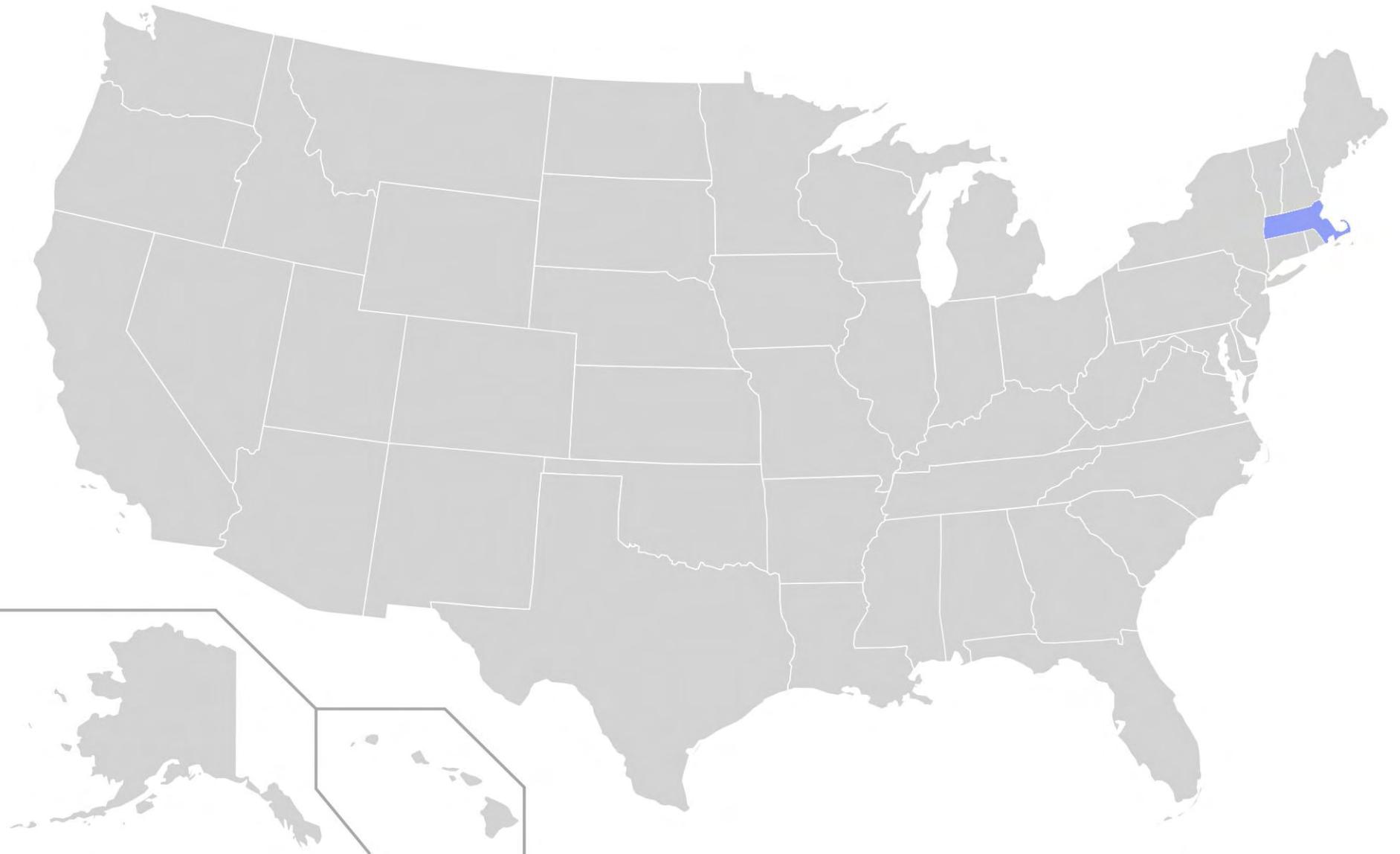
# Some are less strict than others...



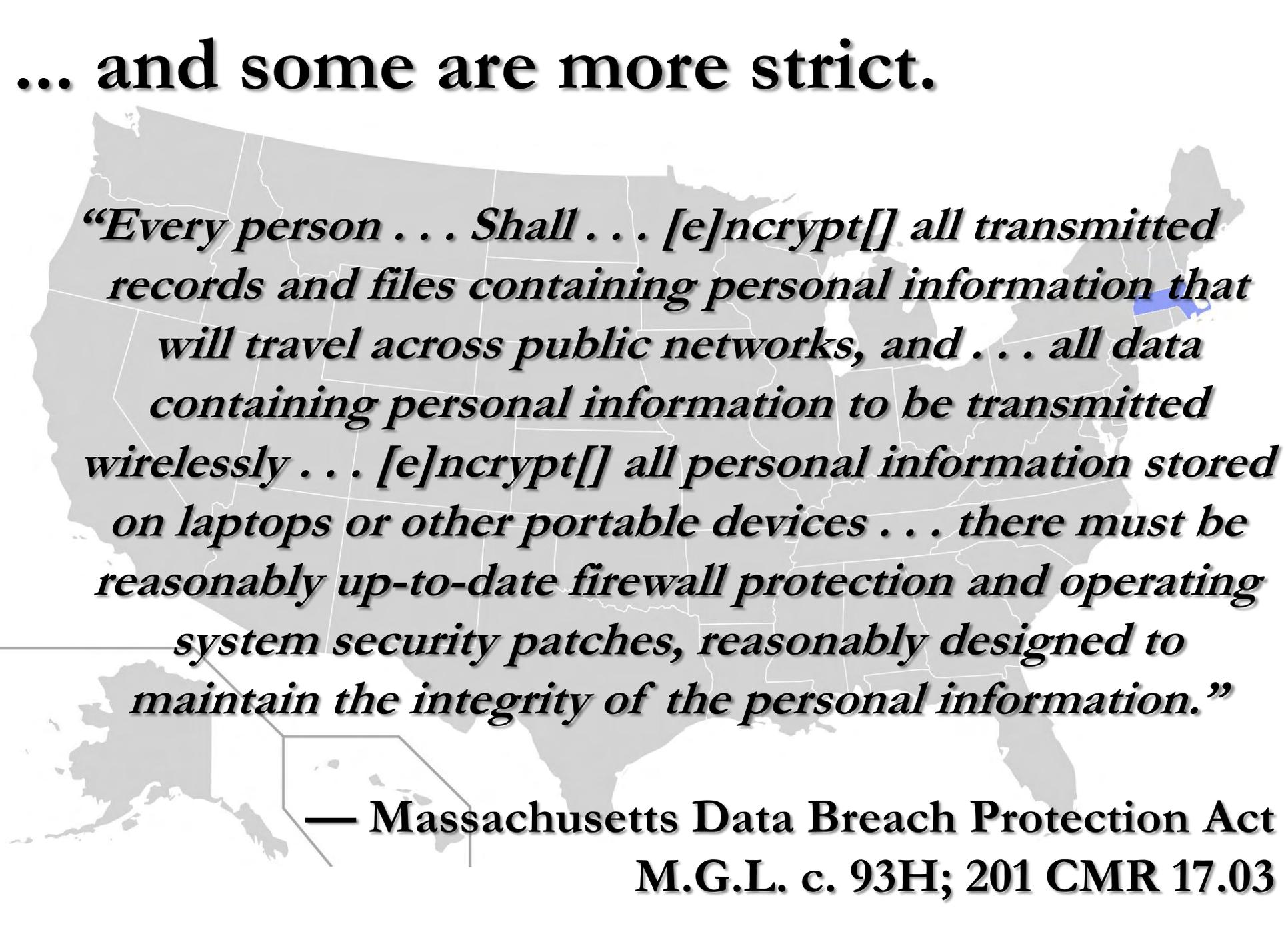
*“A person who owns or licenses computerized data that includes personal information concerning a Utah resident shall, when the person becomes aware of a breach of system security, conduct in good faith a reasonable and prompt investigation to determine the likelihood that personal information has been or will be misused for identity theft or fraud purposes.”*

— Utah Protection of Personal Information Act  
Utah Code § 13-44-202

**... and some are more strict.**



**... and some are more strict.**



***“Every person . . . Shall . . . [e]ncrypt[] all transmitted records and files containing personal information that will travel across public networks, and . . . all data containing personal information to be transmitted wirelessly . . . [e]ncrypt[] all personal information stored on laptops or other portable devices . . . there must be reasonably up-to-date firewall protection and operating system security patches, reasonably designed to maintain the integrity of the personal information.”***

**— Massachusetts Data Breach Protection Act  
M.G.L. c. 93H; 201 CMR 17.03**

A map of the United States with the state of Massachusetts highlighted in blue. The rest of the map is in a light gray color. The text is overlaid on the map.

*“there must be reasonably **up-to-date** firewall protection  
and **operating system security patches**”*

— **Massachusetts Data Breach Protection Act**  
**M.G.L. c. 93H; 201 CMR 17.03**

Some level of **security**

**Notification** upon breach





Added requirements  
for **certain data**  
if there is a breach

# International Data Protection Laws





# European data privacy laws are **strict**.

*“Personal data shall not be transferred to a country or territory outside the European Economic Area unless that country or territory ensures an adequate level of protection for the rights and freedoms of data subjects in relation to the processing of personal data.”*

— U.K. Data Protection Act

Requires employee **consent**

Requires employee **consent**

free

Requires employee **consent**

**informed**

Requires employee **consent**

revocable

not enough





EU  
Data  
Protection  
Directive

“right to be forgotten”





**Streamlined**  
**international data transfer**

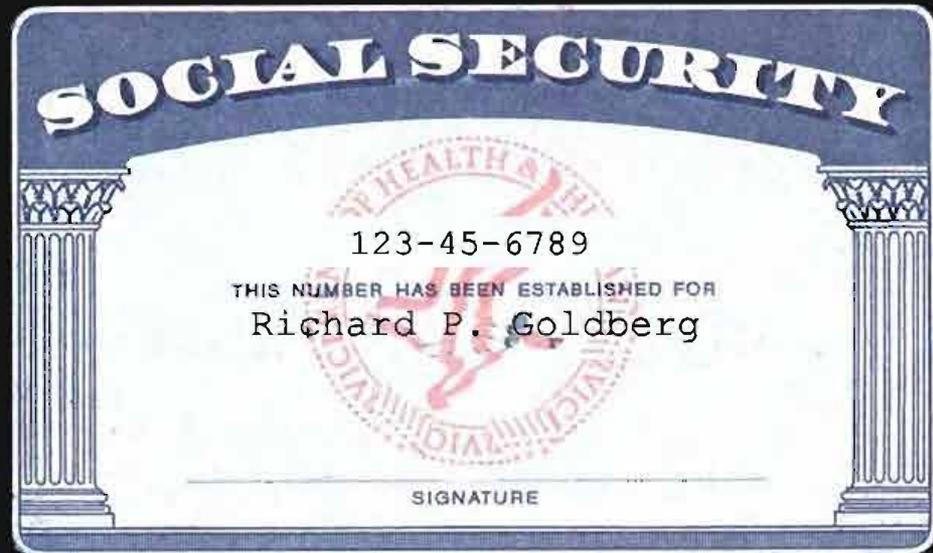


# Corporate Data Policies









**Payment Card Industry  
(PCI)  
Data Security Standard**





Hello, **911**? We'd like to report an intruder...

Mind if we look around?

**Audits?**

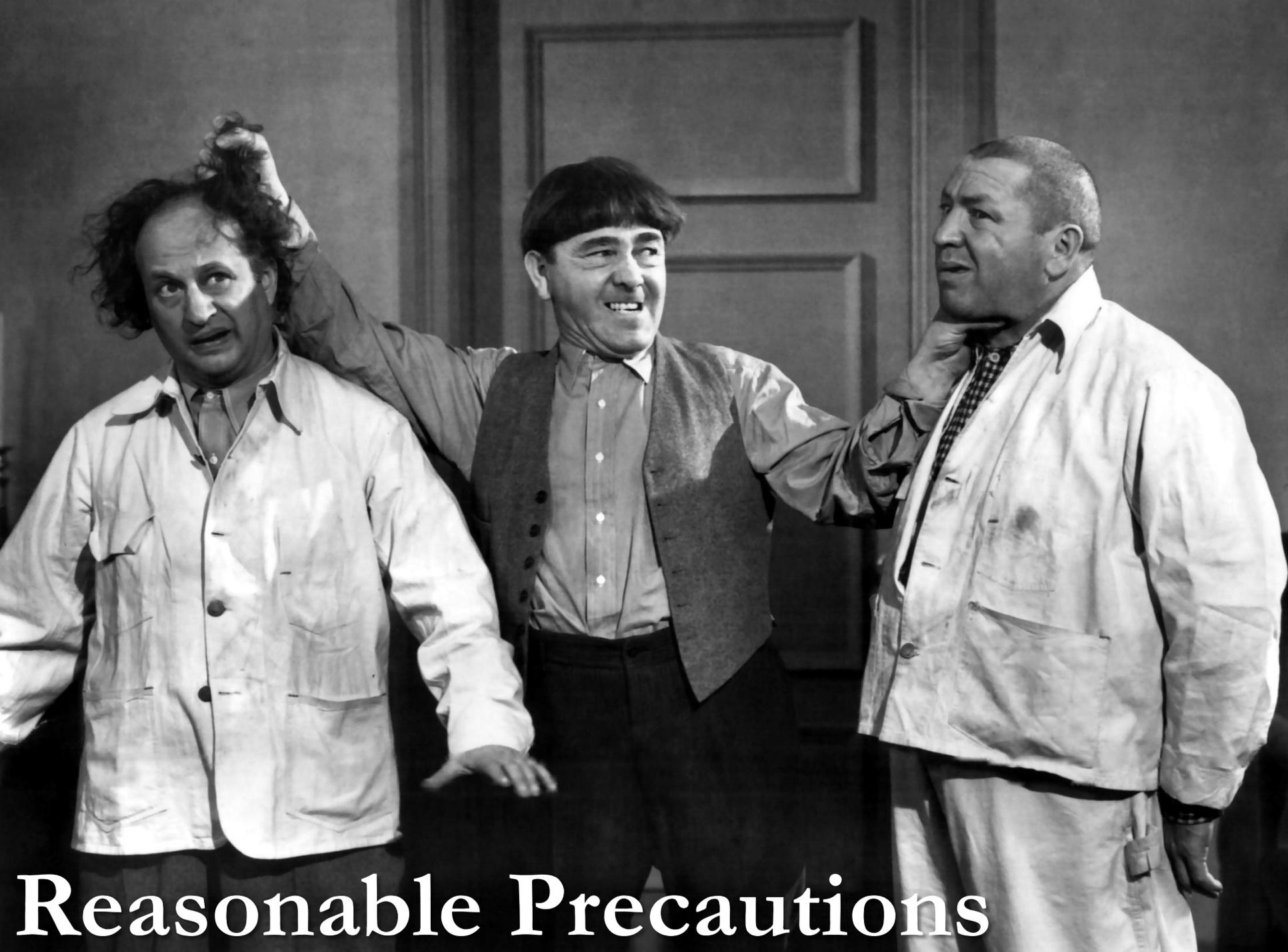


Meet standard or face **steep** fines



# Attorney-Client Privilege

**Reasonable Precautions**



**Reasonable Precautions**



Customer  
Service

**Reasonable Precautions**



Enterprise  
Engineer

Customer  
Service

**Reasonable Precautions**

Enterprise  
Engineer

Customer  
Service

Quality  
Assurance

Reasonable Precautions

Enterprise  
Engineer

Customer  
Service

Quality  
Assurance

Reasonable Precautions?

Subpoena

# Civil Discovery

*Federal Rule of Civil Procedure 34(a)(1)*

*“ to produce and permit the requesting party or its representative to inspect, copy, test, or sample the following items in the responding party’s possession, custody, or control . . . any designated documents or electronically stored information . . . stored in any medium from which information can be obtained either directly or, if necessary, after translation by the responding party into a reasonably usable form ”*

**Issued by the**  
**UNITED STATES DISTRICT COURT**  
 District of Columbia

Someone Who Had An Idea

**SUBPOENA IN A CIVIL CASE**

V.

Sucker, LLC

Case Number:<sup>1</sup> 2:07-cv-65535 (S.D.N.Y.)

TO: Poor Schlub  
 12345 Combination Idiot Would Have On Luggage Ln, Washington, D.C. 20005

YOU ARE COMMANDED to appear in the United States District court at the place, date, and time specified below to testify in the above case.

PLACE OF TESTIMONY	COURTROOM
	DATE AND TIME

YOU ARE COMMANDED to appear at the place, date, and time specified below to testify at the taking of a deposition in the above case.

PLACE OF DEPOSITION Law Office of Richard P. Goldberg, 1600 Pennsylvania Ave. NW, Washington, DC 20500	DATE AND TIME 02/07/2010 10:00 a.m.
---	--

YOU ARE COMMANDED to produce and permit inspection and copying of the following documents or objects at the place, date, and time specified below (list documents or objects):  
 All correspondence and/or documents memorializing communications between you and any officer, manager, partner, member, or employee of Sucker, LLC regarding the idea we had and you stole.

PLACE Law Office of Richard P. Goldberg, 1600 Pennsylvania Ave. NW, Washington, DC 20500	DATE AND TIME 02/07/2010 10:00 a.m.
---	--

YOU ARE COMMANDED to permit inspection of the following premises at the date and time specified below.

PREMISES	DATE AND TIME
----------	---------------

Any organization not a party to this suit that is subpoenaed for the taking of a deposition shall designate one or more officers, directors, or managing agents, or other persons who consent to testify on its behalf, and may set forth, for each person designated, the matters on which the person will testify. Federal Rule of Civil Procedure 30(b)(6).

ISSUING OFFICER'S SIGNATURE AND TITLE (INDICATE IF ATTORNEY FOR PLAINTIFF OR DEFENDANT)	DATE 3/5/2008
---	------------------

ISSUING OFFICER'S NAME, ADDRESS AND PHONE NUMBER  
 Richard P. Goldberg, Law Office of Richard P. Goldberg, 1600 Pennsylvania Ave. NW, Washington, DC 20500, 202-640-1933

(See Federal Rule of Civil Procedure 45 (c), (d), and (e), on next page)

<sup>1</sup> If action is pending in district other than district of issuance, state district under case number.

PLACE OF TESTIMONY

COURTROOM

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DATE

3/5/2008

ISSUING OFFICER'S NAME, ADDRESS AND PHONE NUMBER

Richard P. Goldberg, Law Office of Richard P. Goldberg, 1600 Pennsylvania Ave. NW, Washington, DC 20500, 202-640-933

(See Federal Rule of Civil Procedure 45 (c), (d), and (e), on next page)

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American LegalNet, Inc.  
www.FormsWorkFlow.com

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ISSUING OFFICER'S NAME, ADDRESS AND PHONE NUMBER  
Richard P. Goldberg, Law Office of Richard P. Goldberg, 1600 Pennsylvania Ave. NW, Washington, DC 20500, 202-640-933

As used herein, the term “**documents**” shall mean and include, without limitation, the original and all copies of any written and any other tangible thing including the following: any handwritten, typed, oral, visual, or electronic communications or representations, agreements, contracts, letters, envelopes, correspondence, e-mails, telegrams, facsimiles, bulletins, calendars, circulars, notices, specifications manuals, instructions, directives, guidelines, meeting minutes, working papers, accounts, literature, books magazines, newspapers, articles, press releases, trade letters and internal and external newsletters, questionnaires, booklets, work assignments, reports, motion picture films, videotapes, advertisements, brochures, sound recordings, photographs, drawings, charts, graphs, diagrams, studies, analyses, surveys, memoranda, memoranda of conversations, notes, notebooks, diaries, data sheets, telephone logs, telephone messages, work sheets, calculations, drafts of the aforesaid, computer-readable data, and all copies of the aforesaid upon which have been placed any additional marks or notations, **in your possession, custody, or control**. Any documents contained in electronic storage, such as on computer diskette or any other computer-readable form, shall be produced in that same form.

**A litigation hold  
to freeze data**



Can you  
ensure files  
won't be  
**deleted?**



Have  
“deleted” files  
been **deleted**?





Are they on a backup tape  
you don't **control**?

# Data retention policies



may leave  
**sensitive data**  
lingering around

You may have to  
**produce** it



**This guy is  
bad enough**



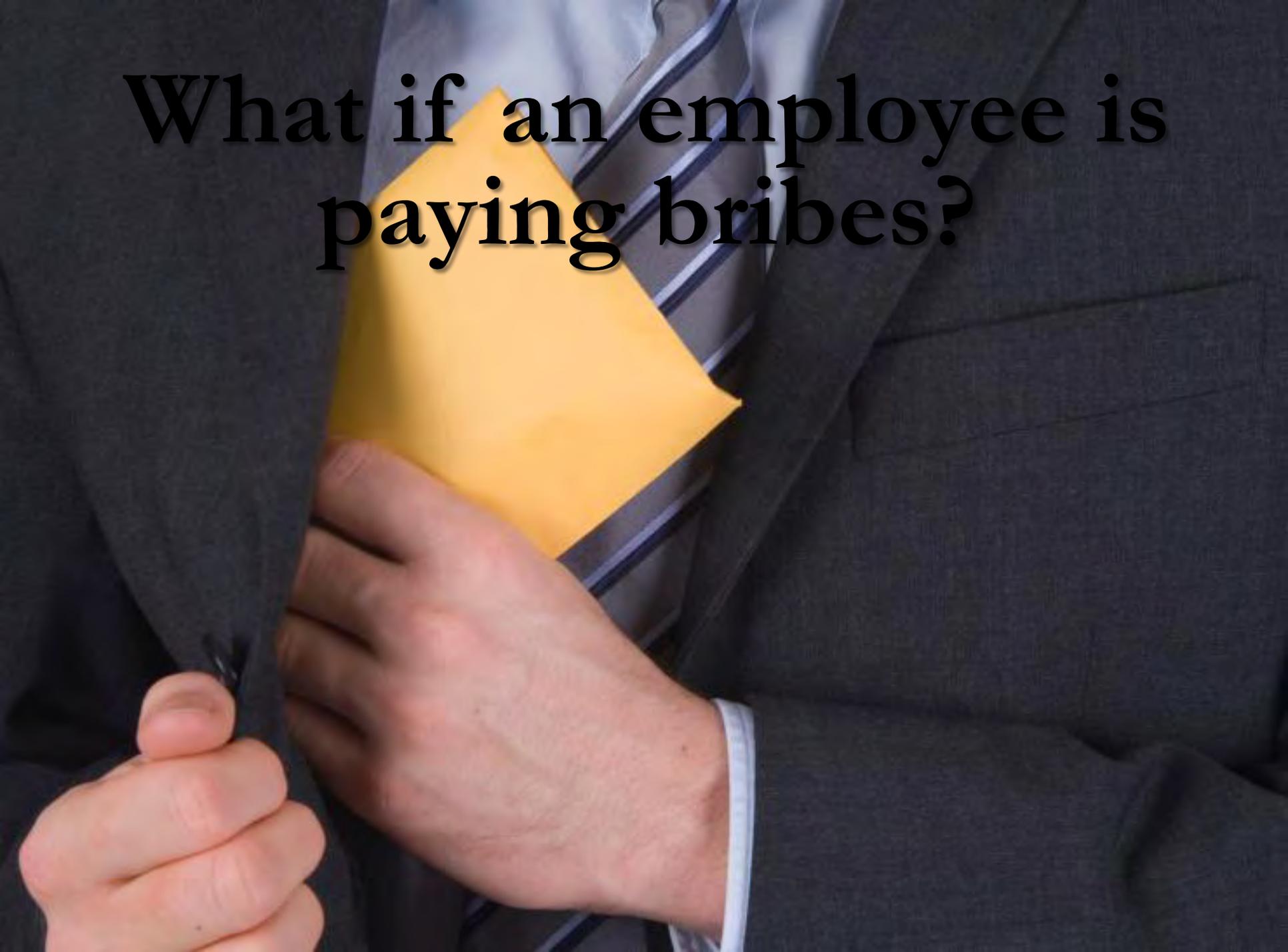
What if it's  
*this guy?*



**What if an employee is  
paying bribes?**



**What if an employee is  
paying bribes?**



**Two options:**  
(both are bad)

1



2



Why?

***Control***





**Transparency**



# **Third-Party Possession**

# Multitenancy



# Cloud Service Provider Agreements



**“ The best way to  
keep one’s word is  
not to give it. ”**

**— Napoleon**

**Google**<sup>TM</sup>  
Docs & Spreadsheets BETA



*“4.2 You acknowledge and agree that the form and nature of the Services which Google provides may change from time to time without prior notice to you.”*



*“4.3 . . . you acknowledge and agree that Google may stop (permanently or temporarily) providing the Services . . . to you or to users generally at Google’s sole discretion, without prior notice to you.”*



*“4.4 You acknowledge and agree that if Google disables access to your account, you may be prevented from accessing the Services, your account details or any files or other content which is contained in your account.”*

***rackspace***®



*“12.1 You will not have access to your data stored on the Rackspace Cloud™ during a suspension or following termination.”*

**rackspace**®



*“12.2 We backup the Rackspace Cloud systems.*

*. . . we may destroy all but the most recent backup. These backups may not be available to you.”*



**rackspace®**



Cloud provider agreements  
tend to protect the **cloud provider**



Not the cloud consumer

**Trust**



**Trust**



Faith



**Trust**



How?



**We'll get to that...**

# Collateral Dangers



“*To expect the unexpected  
shows a thoroughly  
modern intellect.*”

— Oscar Wilde

*“To expect the unexpected shows a thoroughly modern intellect.”*

— Oscar Wilde

*“There are also unknown unknowns—the ones we don’t know we don’t know.”*

— Donald Rumsfeld



# Third-Party Subpoena

*Federal Rule of Civil Procedure 45(a)(1)(A)(iii)*

*“ command each person to whom it is directed to do the following . . . produce designated documents, electronically stored information, or tangible things in that person’s possession, custody, or control ”*



**Your  
cloud  
provider**



**Your data**



**...and here**

*Is data properly segregated?*

A photograph of a server rack with multiple drive bays. Each bay contains a hard drive with a red indicator light. The drives are arranged in a grid pattern. The text "Is data properly segregated?" is overlaid on the image in a red, italicized font.

**This is more  
than just a  
data leak...**





**it's a  
disaster**



**Who** will get the first call?

What do you do with  
**old** backups?



# Third-Party Subpoena

*Federal Rule of Civil Procedure 45(a)(1)(A)(iii)*

**No notice requirement.**

# Third-Party Subpoena

*Federal Rule of Civil Procedure 45(a)(1)(A)(iii)*

No notice requirement.

If a cloud provider gave up  
your sensitive data...

# Third-Party Subpoena

*Federal Rule of Civil Procedure 45(a)(1)(A)(iii)*

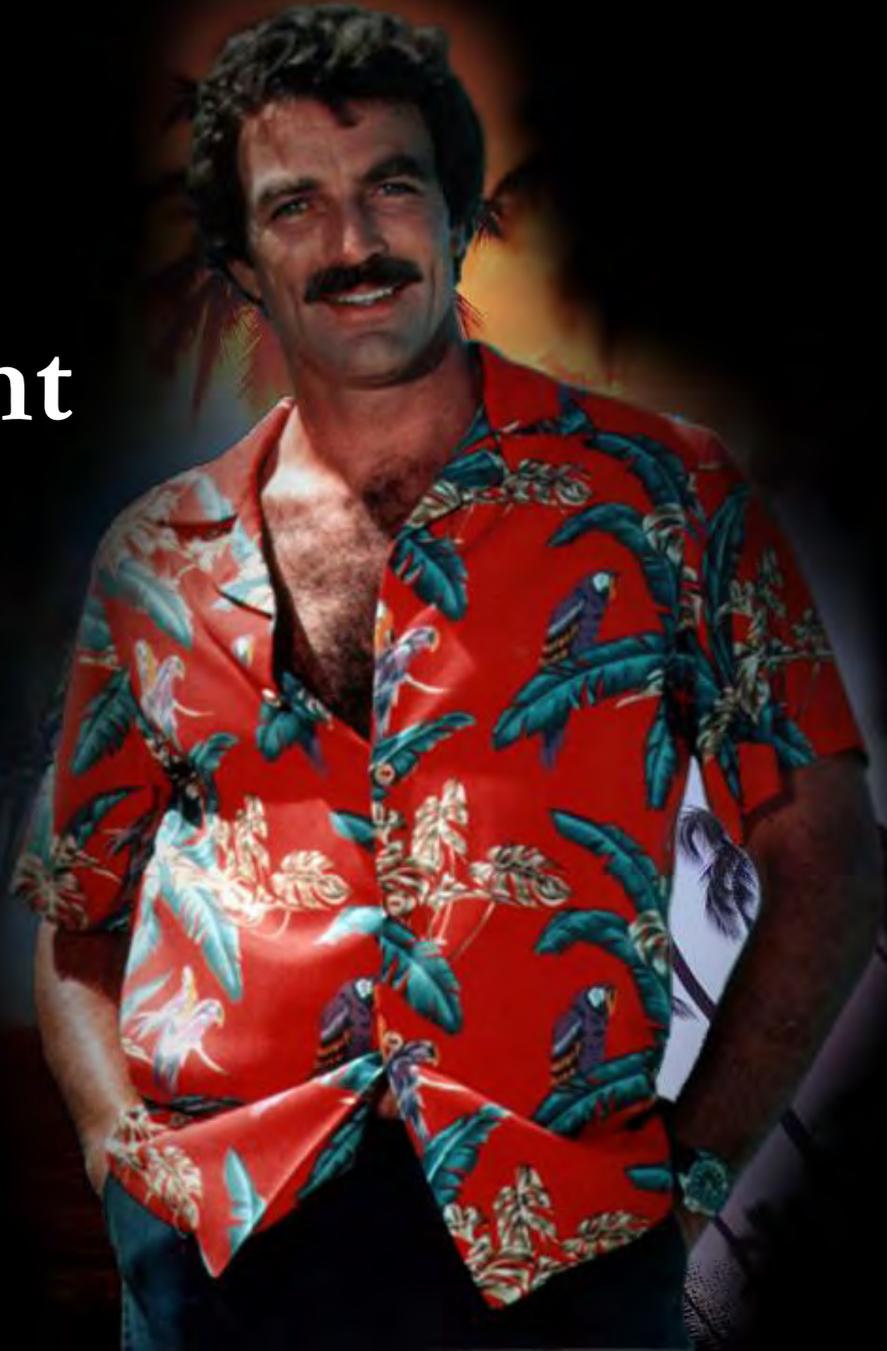
No notice requirement.

**You would never know**



**it's a  
disaster**

Third parties want  
your data.



**Google wants to index your data.**

**All of it.**

**Google™**  
**Docs & Spreadsheets** BETA

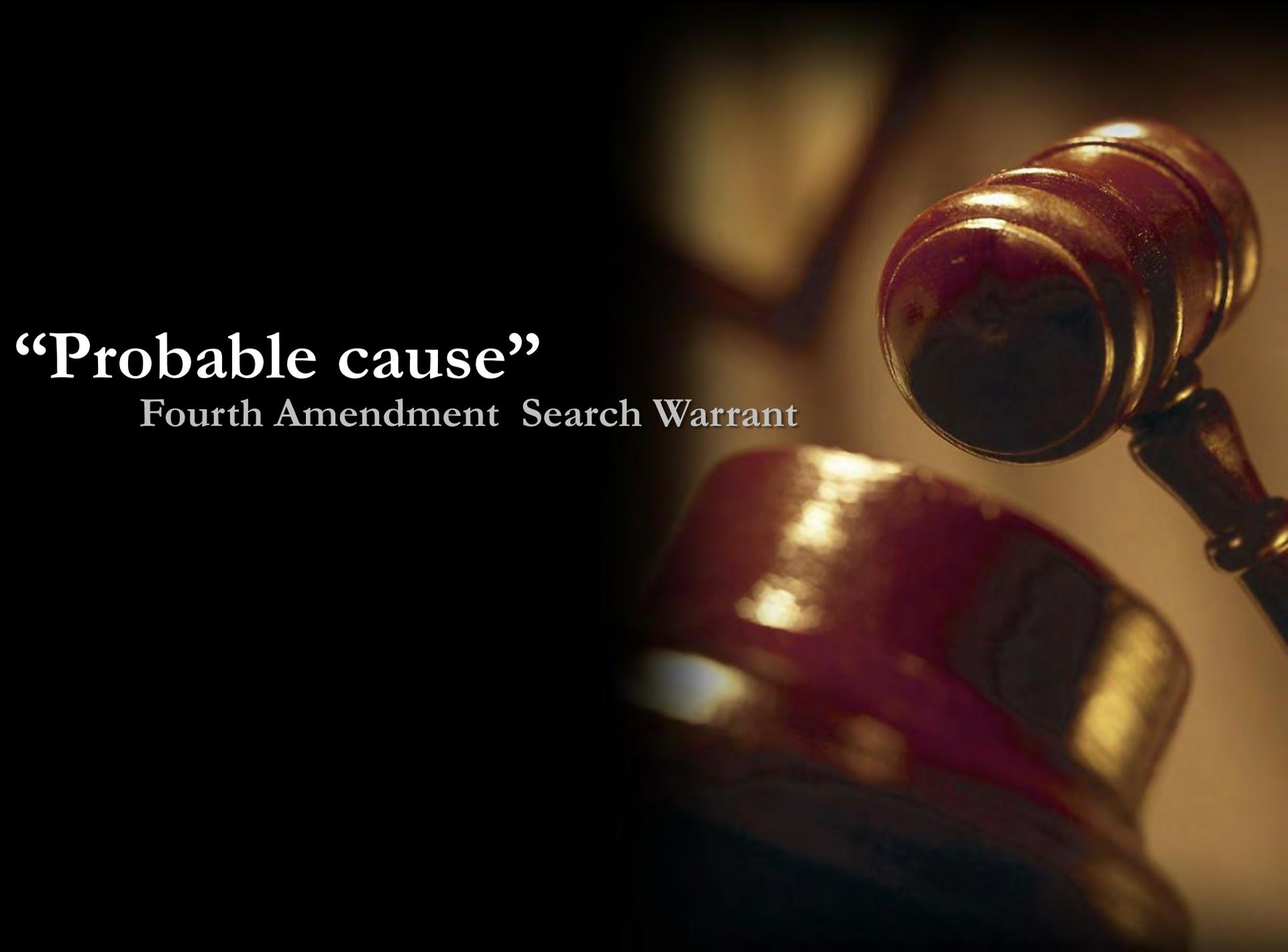
**You would never know**

You would never know

**Control and Transparency**

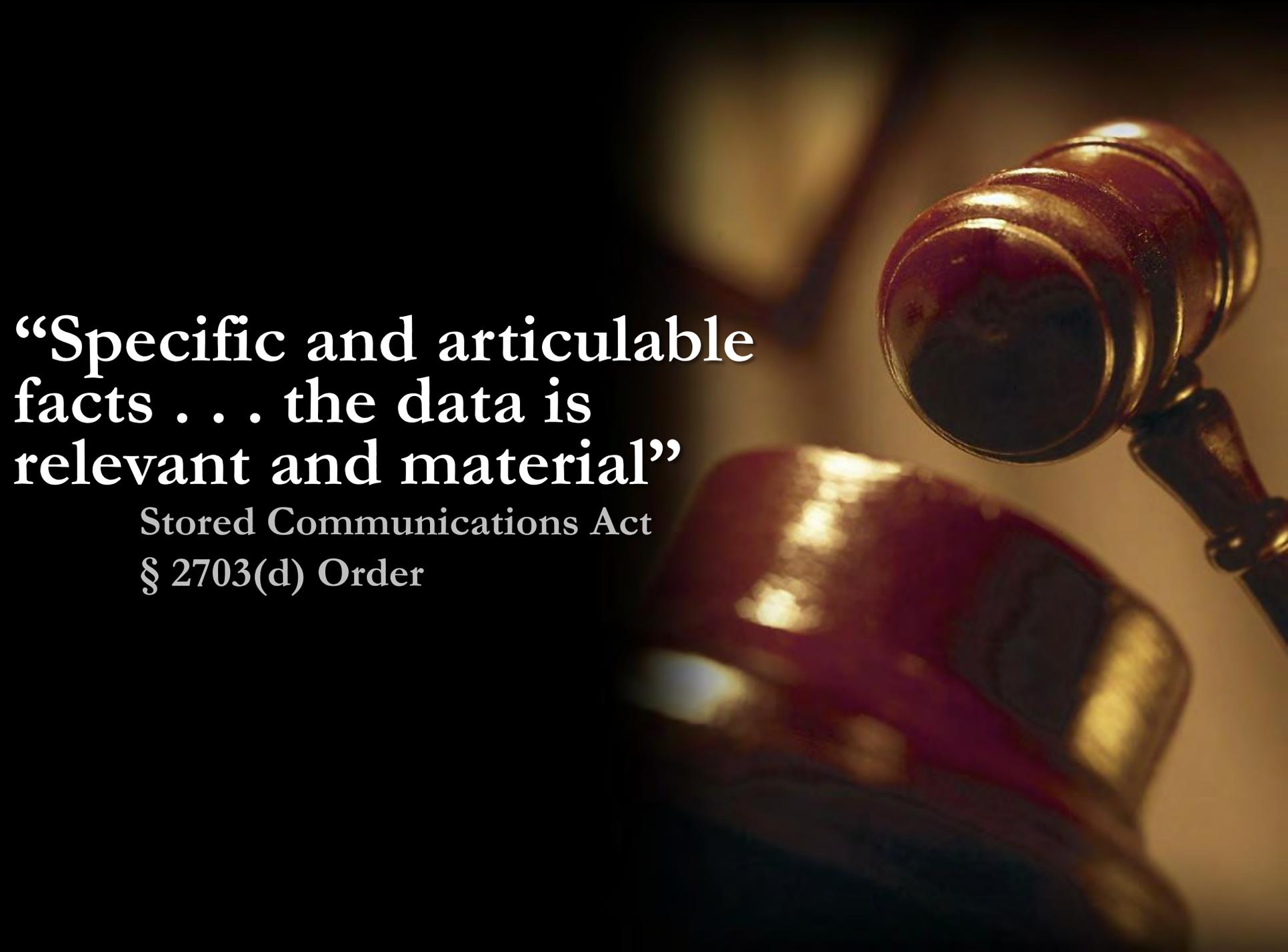


# Search Warrants



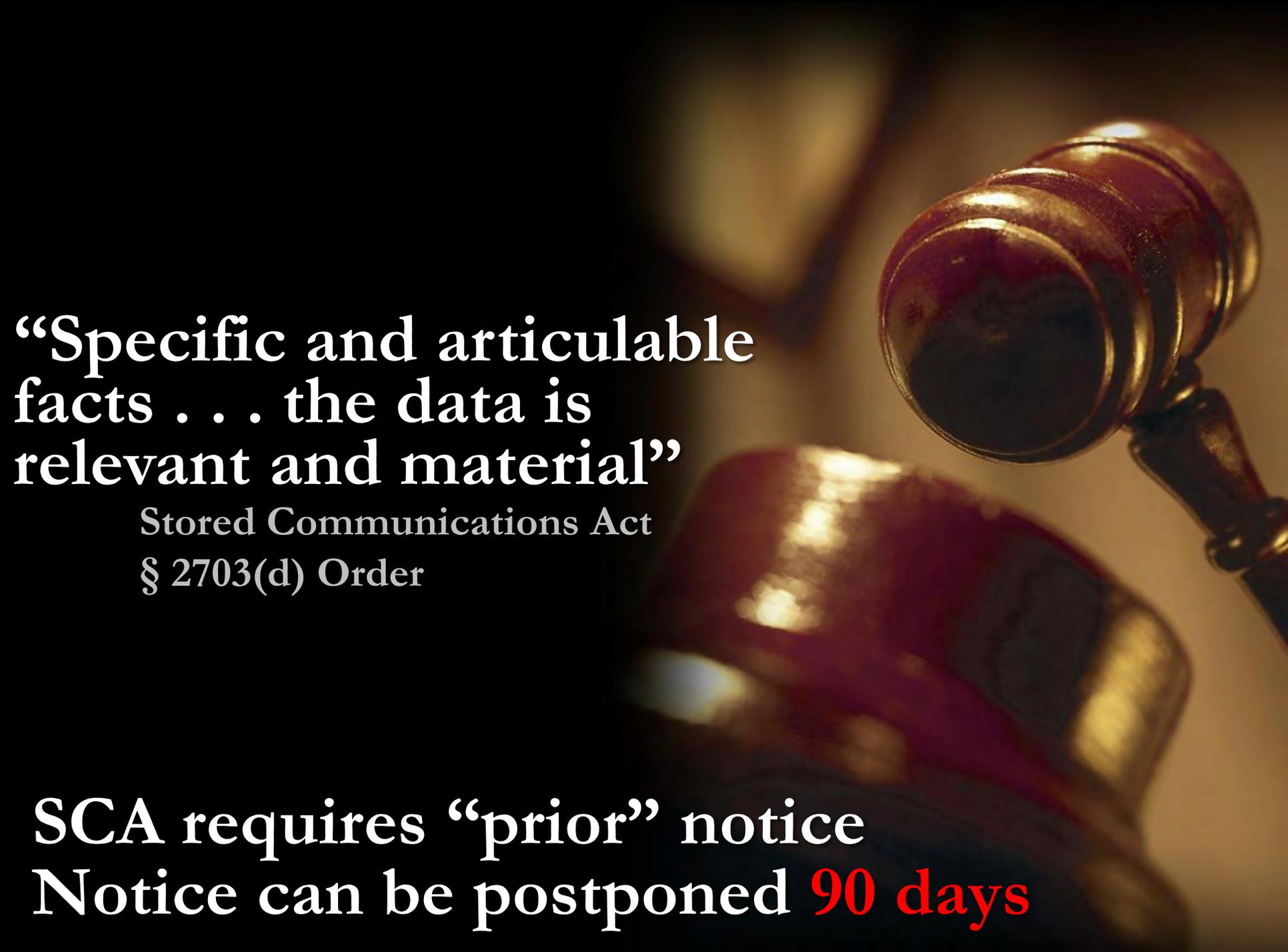
**“Probable cause”**

Fourth Amendment Search Warrant



**“Specific and articulable  
facts . . . the data is  
relevant and material”**

Stored Communications Act  
§ 2703(d) Order



“Specific and articulable  
facts . . . the data is  
relevant and material”

Stored Communications Act  
§ 2703(d) Order

SCA requires “prior” notice  
Notice can be postponed **90 days**

So what's the real danger?

How bad can it get?

Cloud computing  
is **dangerous**



Cloud computing  
is **dangerous**

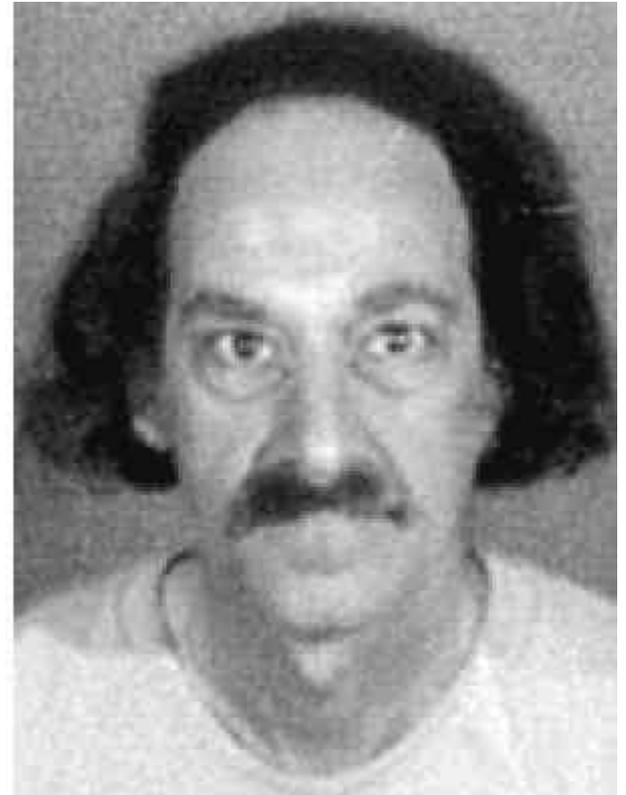
*This thing*

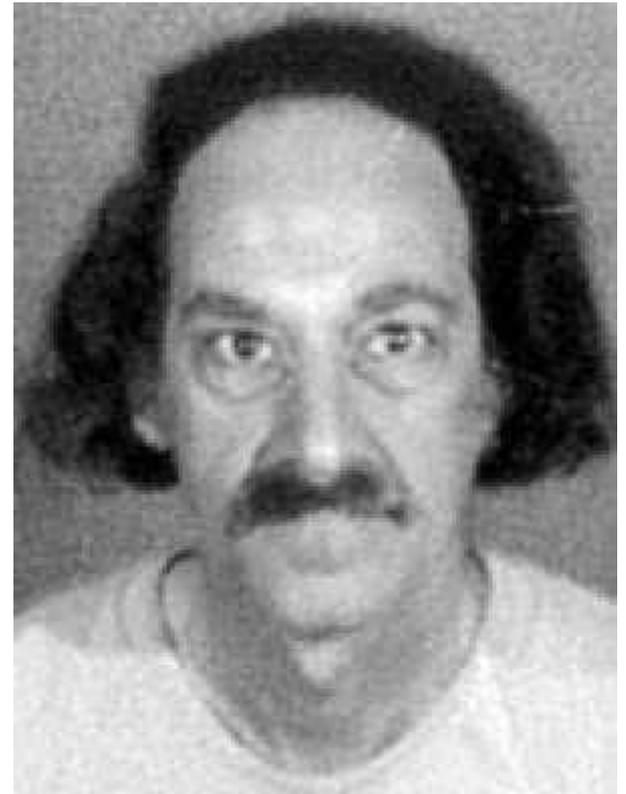


Cloud computing  
is **dangerous**

*And the  
plane*

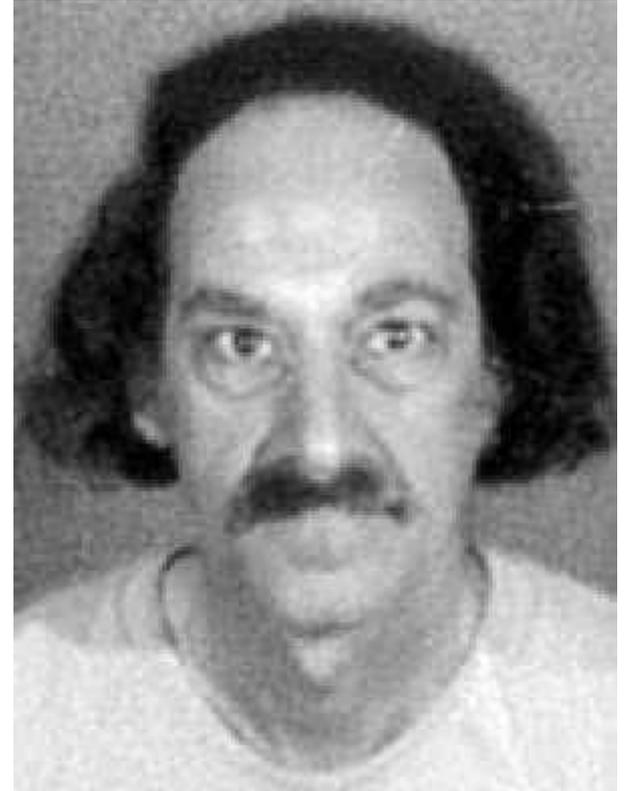






**Richard S. Goldberg**

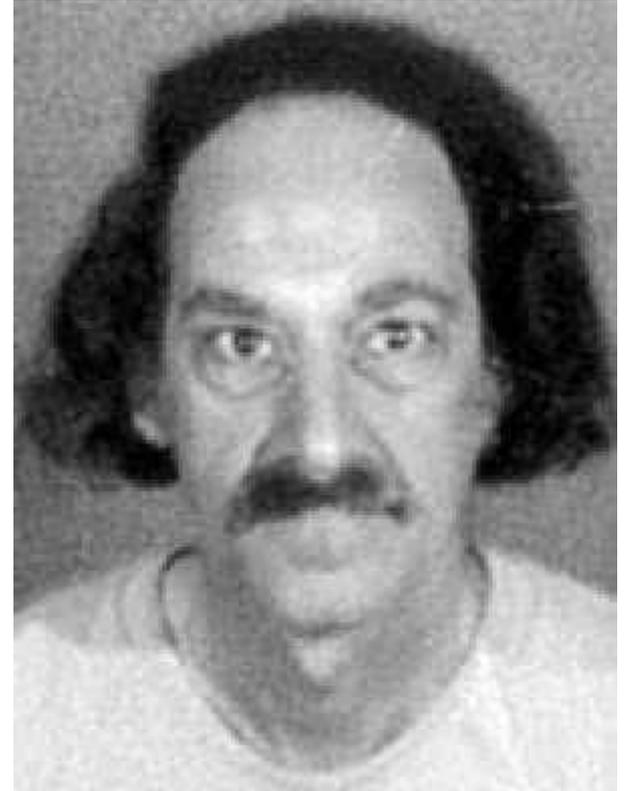
I am Richard **P.** Goldberg



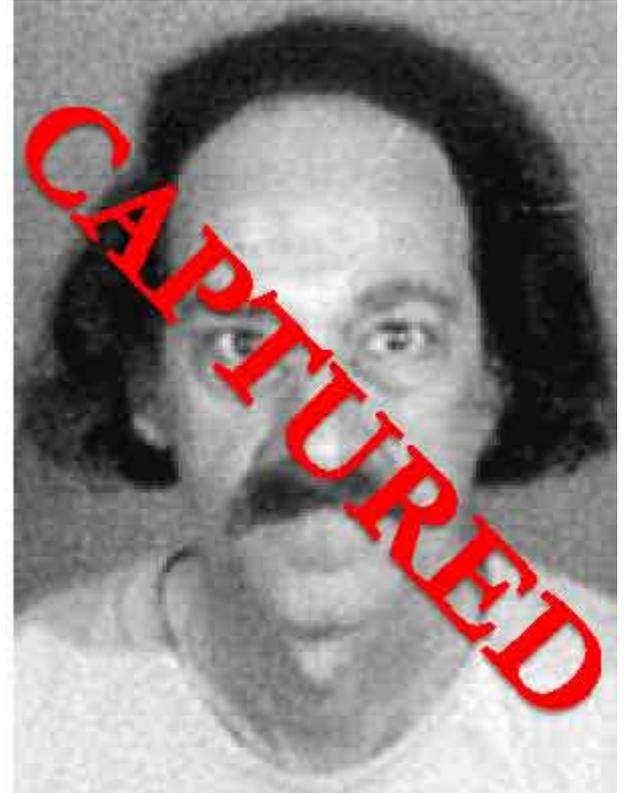
Richard **S.** Goldberg

I am Richard **P.** Goldberg

We are **not** related

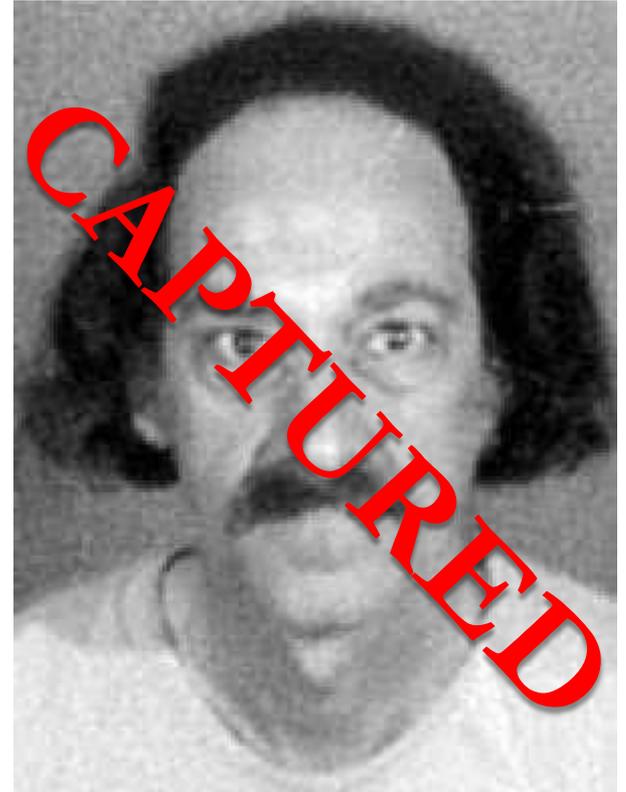


Richard **S.** Goldberg





Uses your cloud  
service provider...

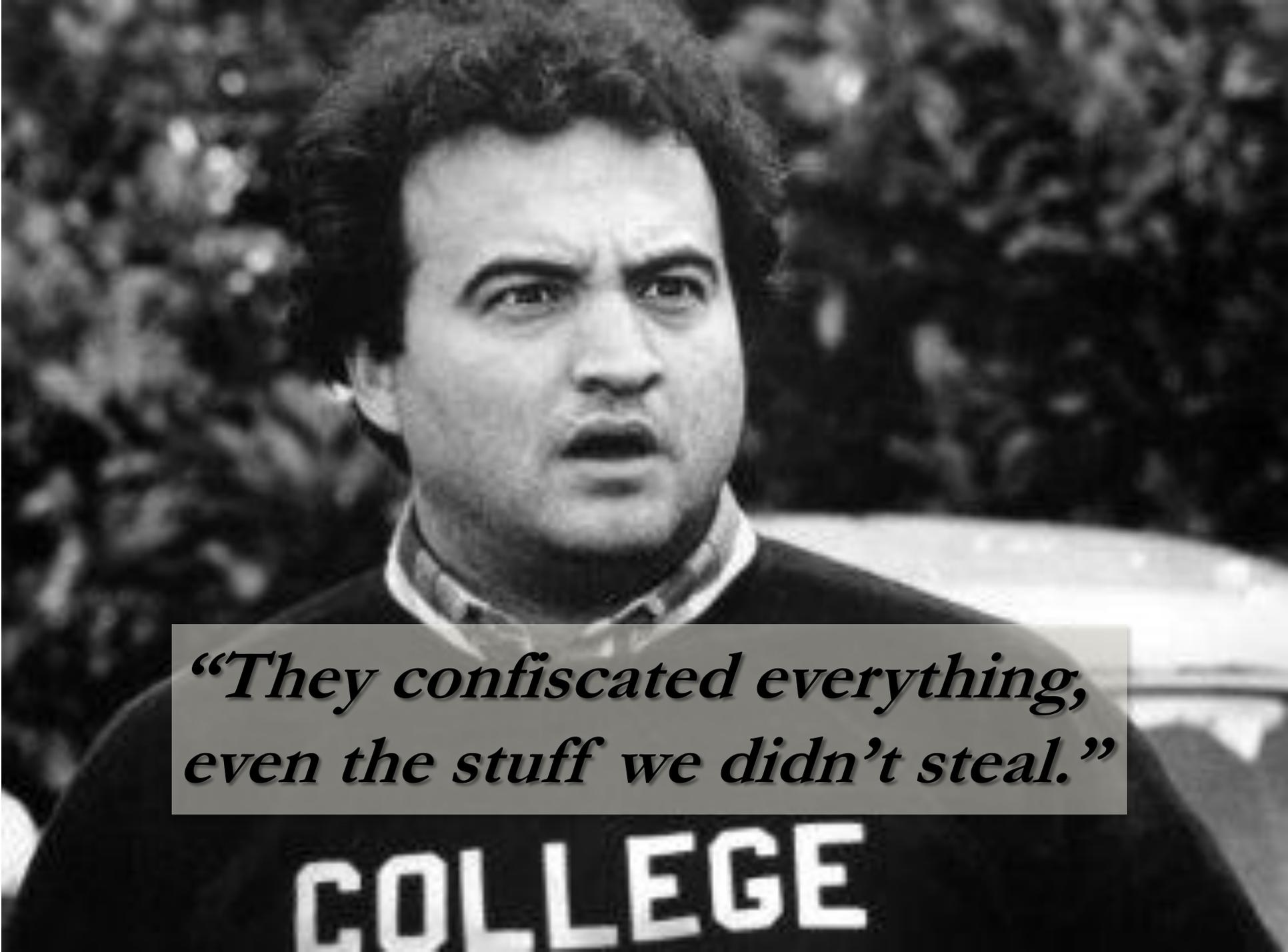




**The FBI can back up a truck...**



**...and seize everything**

A black and white photograph of a man with dark, curly hair, looking upwards and to the right with a surprised or concerned expression. He is wearing a dark-colored sweatshirt with the word "COLLEGE" printed in large, white, block letters across the chest. The background is out of focus, showing what appears to be a car and some foliage.

*“They confiscated everything,  
even the stuff we didn’t steal.”*

COLLEGE

**No**

**No comment**

A close-up photograph of two hands, likely belonging to a fortune teller, holding a glowing white orb. The hands are adorned with multiple rings and bracelets. The background is dark blue, and the orb is the central focus, emitting a bright light. The word "future?" is written in a stylized font across the orb.

**future?**

**WIRED THREAT LEVEL**

# **FBI Defends Disruptive Raids on Texas Data Centers**

(Crydon Technology and Core IP)

# WIRED THREAT LEVEL

“FBI agents seized about 220 servers belonging to him and his customers, as well as routers, switches, cabinets for storing servers and even power strips.”

# WIRED THREAT LEVEL

“Customers who went to... try to retrieve their equipment were threatened with arrest.”

“ The trouble with heart disease is that the first symptom is often hard to deal with: *sudden death.*”

— Dr. Michael Phelps



# Solutions (if any)

*“On the Internet, nobody knows you’re a dog.”*



**Enhance Transparency**

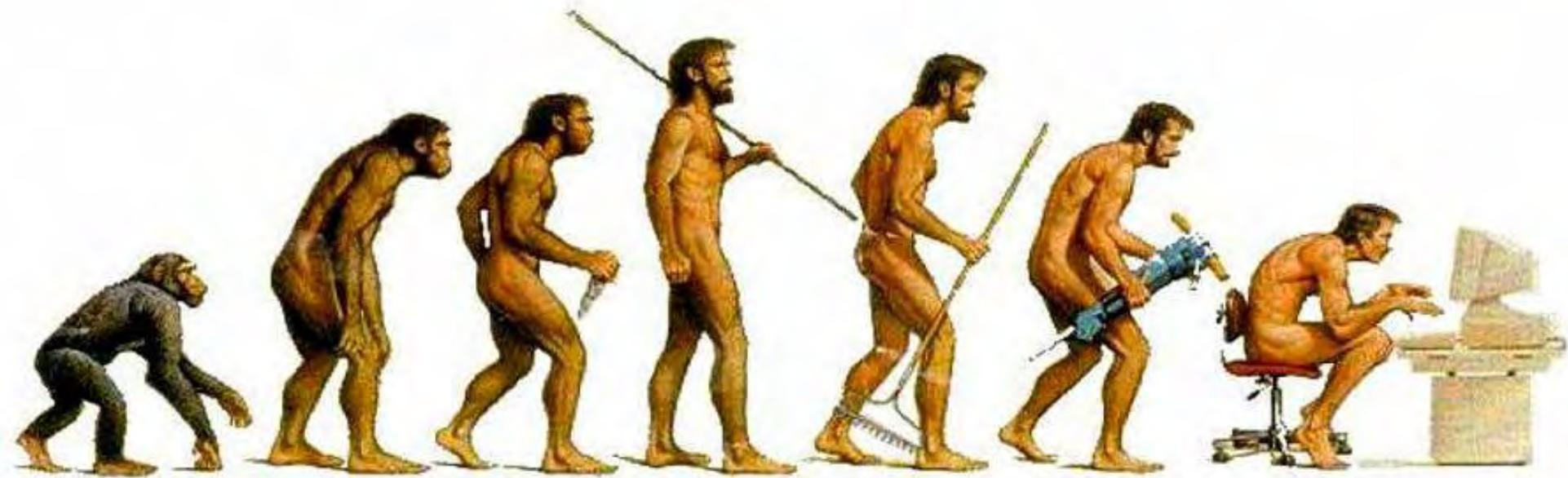


# InformationWeek

THE BUSINESS VALUE OF TECHNOLOGY

## Los Angeles Goes Google

*As of Monday, city employees will be able to start using Google Apps for daily computing tasks . . .*



**Cloud computing will evolve.**

*“Yes, he’s a sleazy lawyer, but he’s my sleazy lawyer.”*



**Increase Control**

# **Control and Transparency**

But **how?**

**Trust**





**Advance notice**  
of data release



# Encryption

**Prompt** notice of data breach



**Clear**  
data-retention  
policies



# Audit rights

A close-up photograph of a person in a dark suit and light-colored shirt writing on a document with a silver pen. The document is held by another hand. In the background, a computer keyboard and a monitor displaying a website are visible. The text 'Audit rights' is overlaid on the image in a large, bold font, with 'Audit' in red and 'rights' in black.

**Rights** to access data



**But there are **still** problems**

**You need a **plan** in advance**



**Failure** to notify



Failure to  
adhere to policies

**No employee vetting**





**Data seizure or service failure**

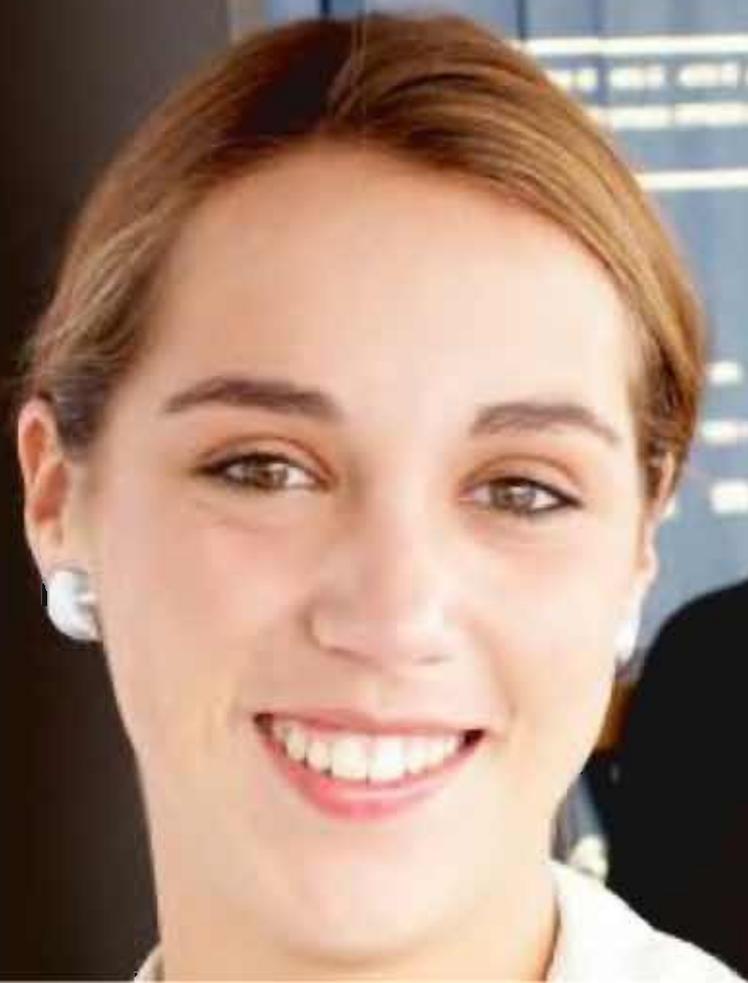
Data held  
hostage



**Company counsel must  
understand these issues**

**before** an emergency

Not  
your audience





**It may feel like this**



# Change the Law

(and the landscape)

# CloudAudit/A6

**Automated Audit, Assertion, Assessment, and Assurance API**

(This attacks the transparency problem.)

# **Digital Due Process**

## **Electronic Communications Privacy Act Reform**

(This attacks the control problem, but only for law enforcement.)

# **Coalition for Platform Parity**

**Search Warrant, Subpoena, and Border Search Reform**

(This attacks the control problem.)

# Reform requires support

(Without it, some current problems cannot be solved.)

**A quick summary...**

“ You can delegate authority,  
but you can never delegate  
responsibility. ”

— Richard E. Krafve  
General Manager,  
Ford Motor Company,  
**Edsel Division**

**This guy**

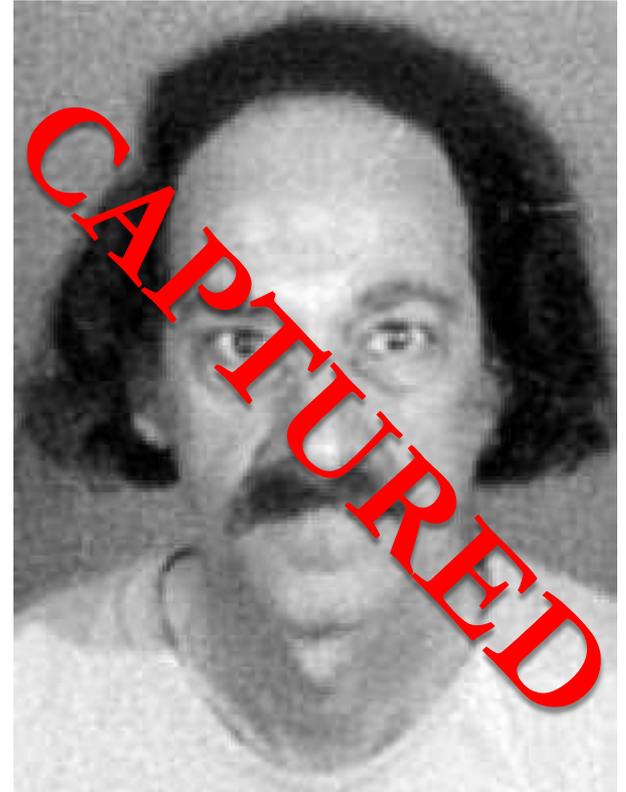


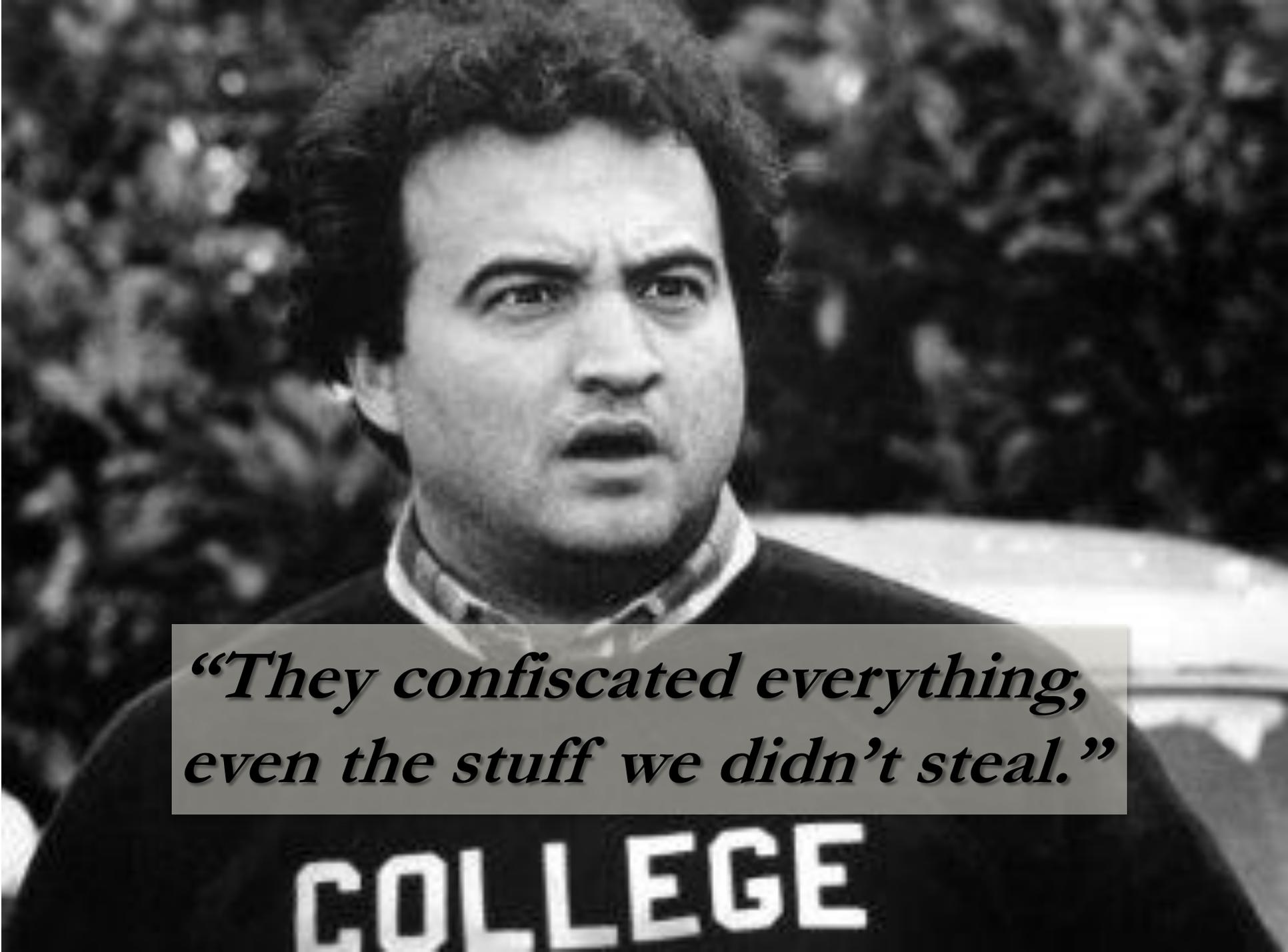
**This guy**





Uses your cloud  
service provider...



A black and white photograph of a man with dark, curly hair, looking slightly to the right with a surprised or concerned expression. He is wearing a dark-colored sweatshirt with the word "COLLEGE" printed in large, white, block letters across the chest. The background is out of focus, showing what appears to be a car and some foliage.

*“They confiscated everything,  
even the stuff we didn’t steal.”*

COLLEGE

***Control***





**Transparency**



# **Third-Party Possession**

# Multitenancy





Cloud provider agreements  
tend to protect the **cloud provider**

**Trust**



# Change the Law

(and the landscape)



Cloud computing  
is **dangerous**

*This thing*



Cloud computing  
is **dangerous**

*And the  
plane*



# Flying Instruments-Only

## Navigating Legal & Security Issues in Cloud Computing

Richard P. Goldberg

*Attorney at Law*  
(and former Java architect)

LISA 11.11.2010

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