

Flying Instruments-Only

Navigating Legal & Security Issues in Cloud Computing

Richard P. Goldberg

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(and former Java architect)

LISA 11.11.2010

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DISCLAIMER:

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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 paved and has a central divider. The surrounding landscape is flat and green, with a line of trees in the far distance.

What are the risks?

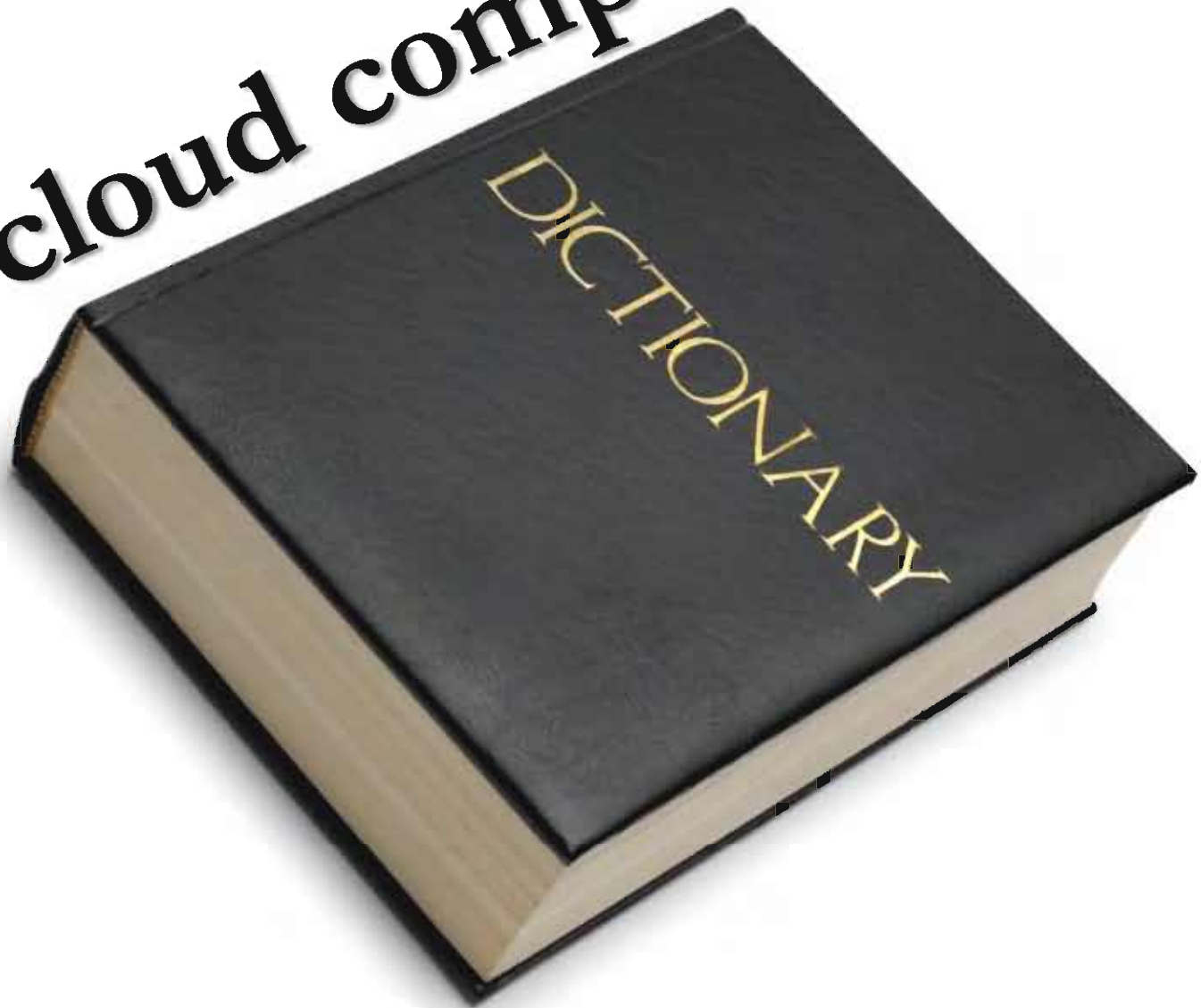
A long, straight road stretches into the distance under a blue sky with scattered clouds. The road is flanked by green grass and a line of trees in the background. The text is overlaid on the upper half of the image.

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): _



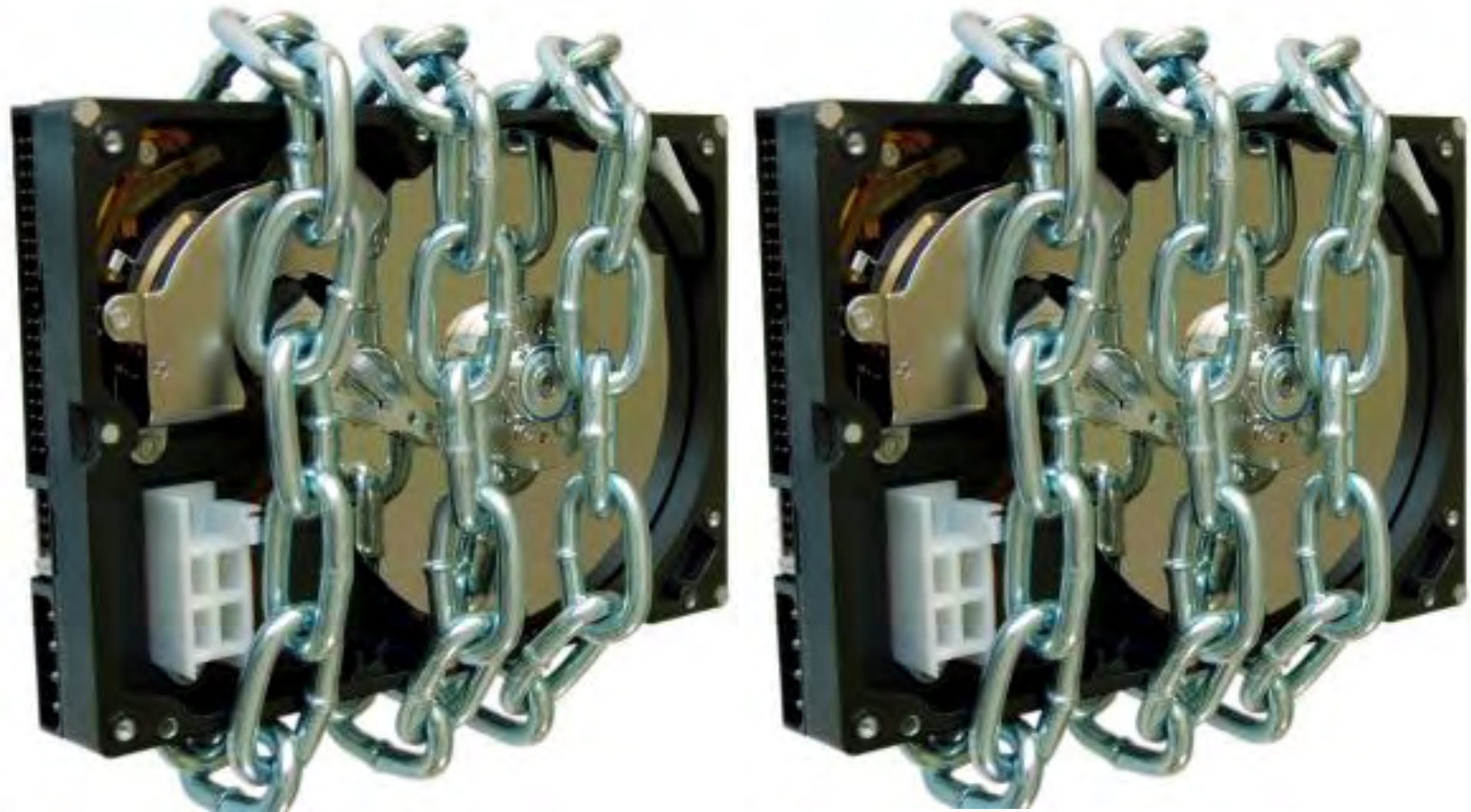
Promise

Secure

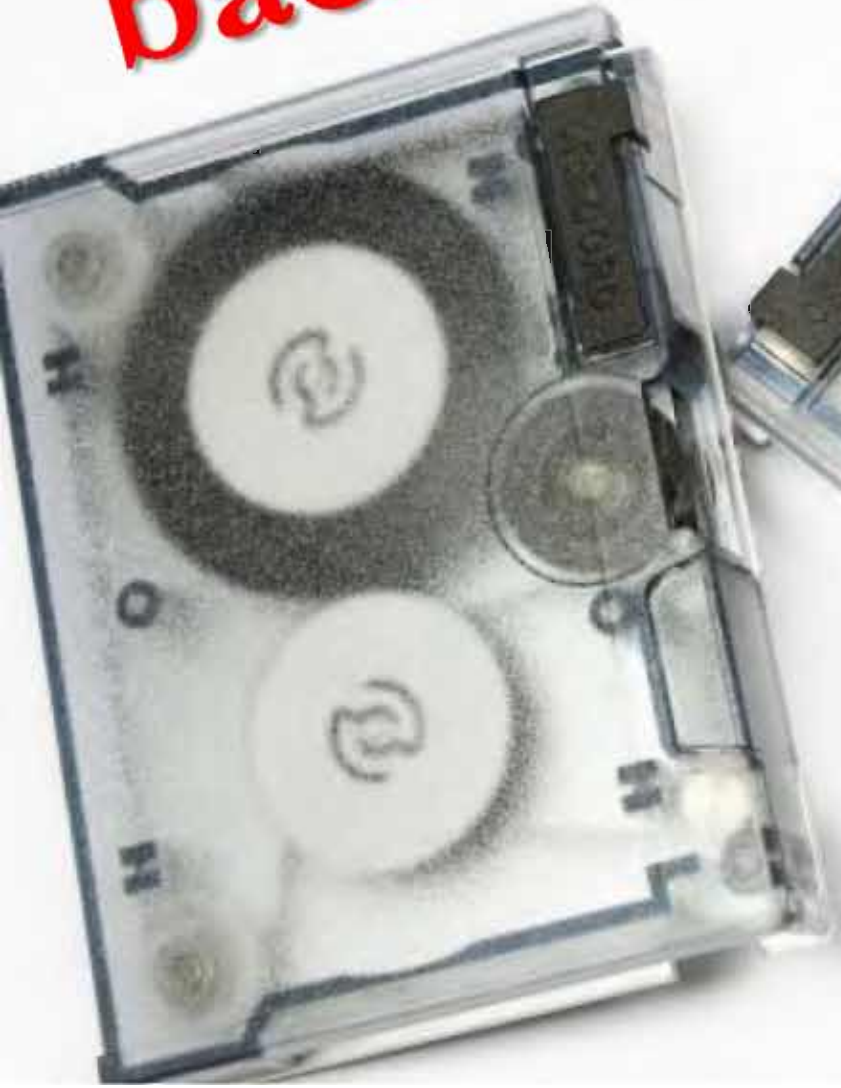
data



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™

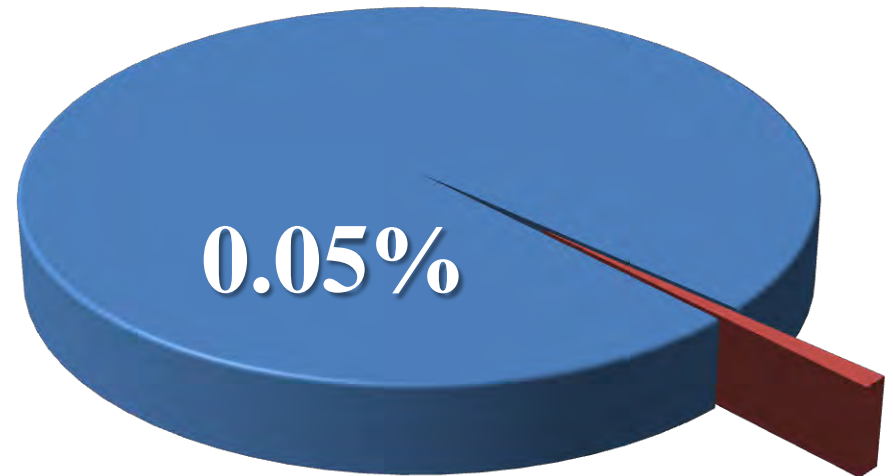
Docs & Spreadsheets BETA

4.4 million users

x

0.05%

2,200 users



Google

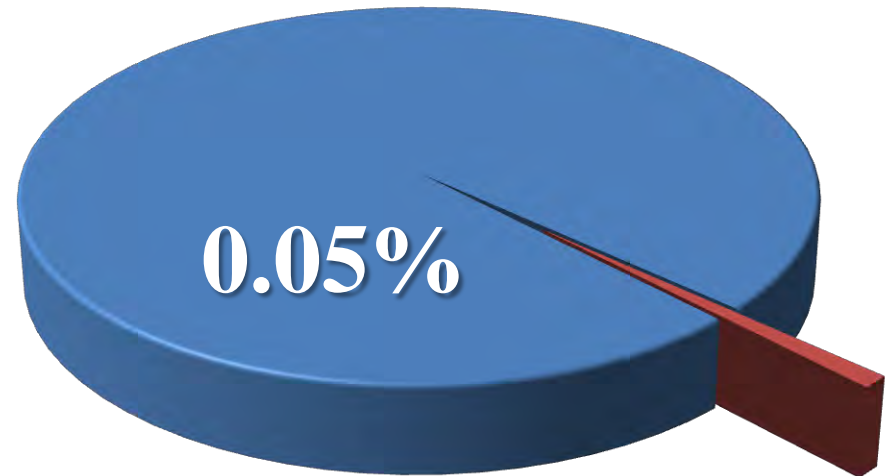
Docs & Spreadsheets BETA

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** · ·

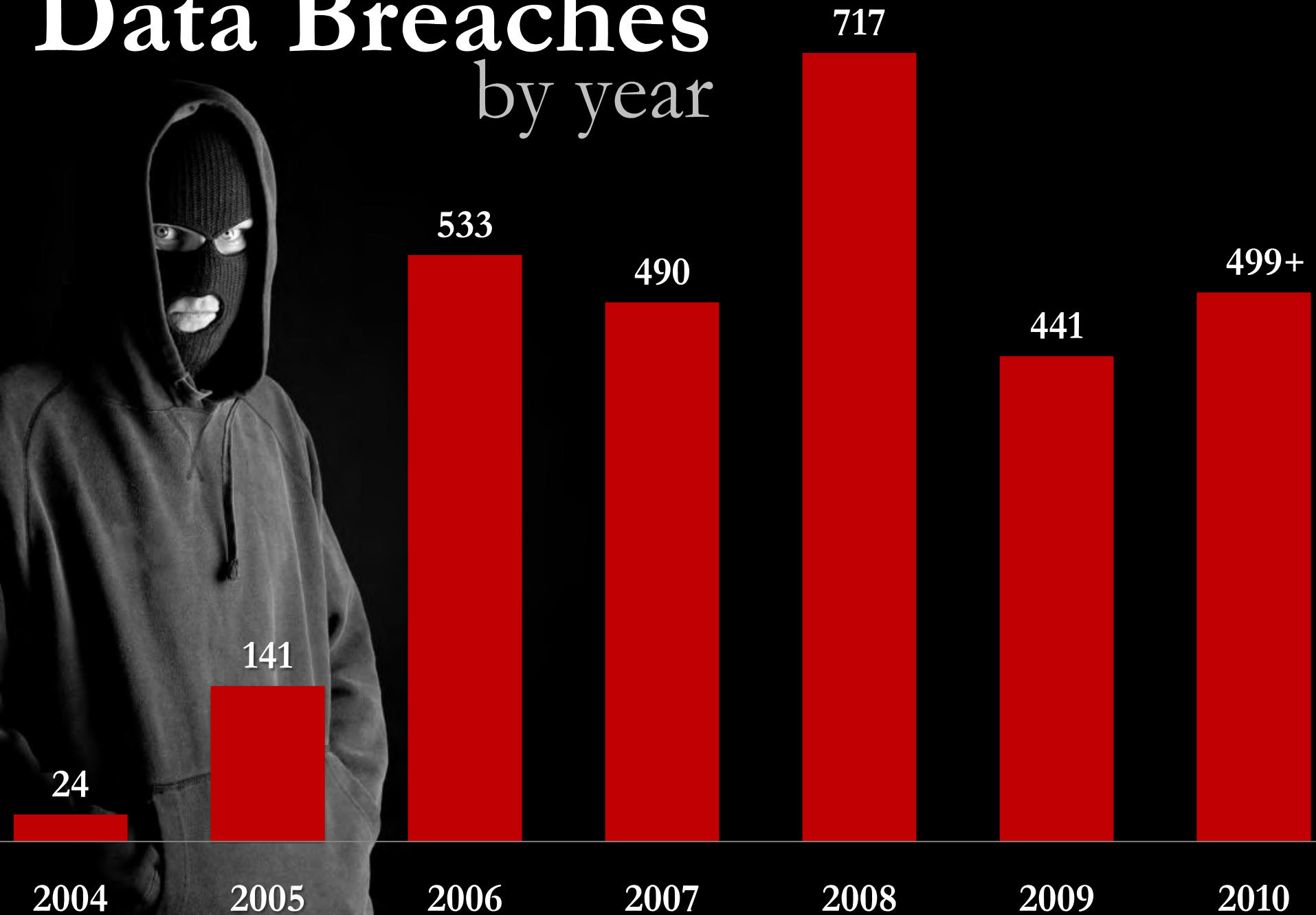
· · Mobile · ·

How can you know?

How can you know?

Control and Transparency

Data Breaches by year



64%

**of data breaches originate
outside the organization**



Source: Open Security Foundation

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

13th

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

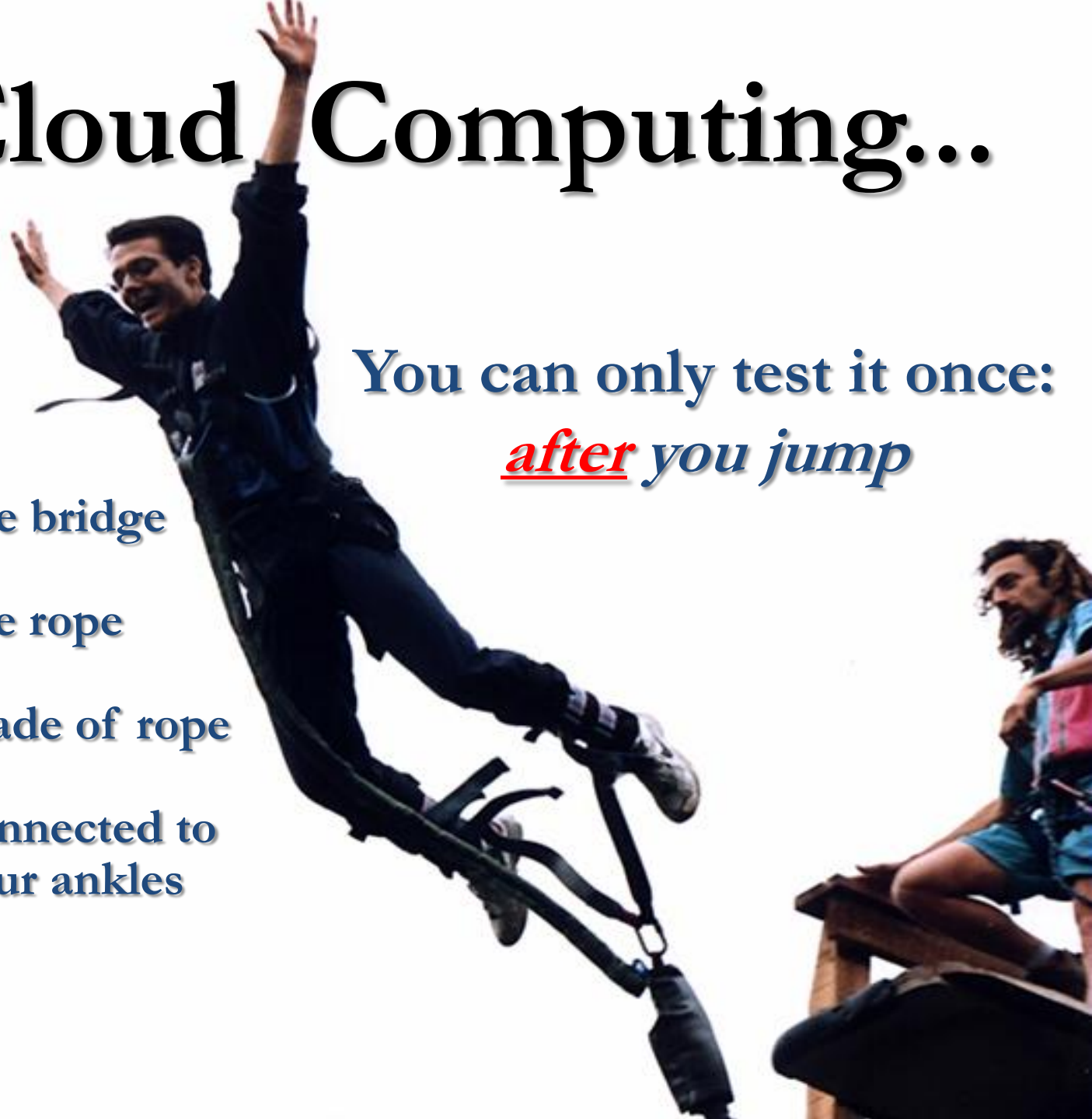


Still, there *is* a problem...

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 clear, pale blue, and the overall scene is captured from a high altitude, looking down. The text is overlaid on the upper portion of the image.

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 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

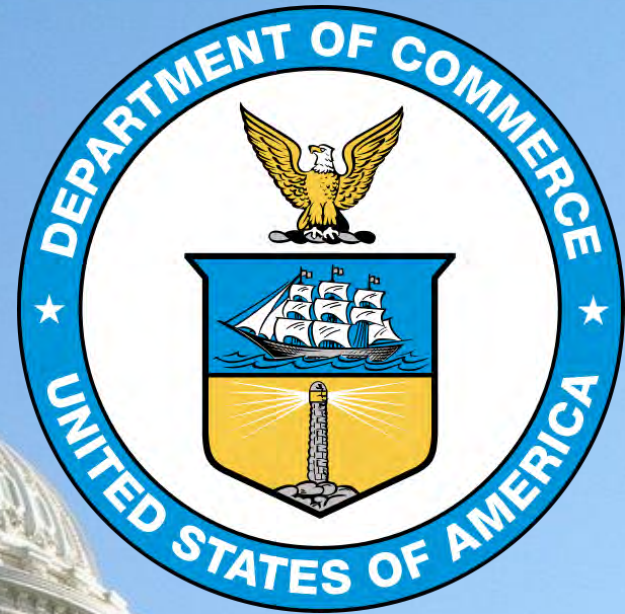


***“Reasonably anticipated
threats or hazards”***

NIST

National Institute of
Standards and
Technology

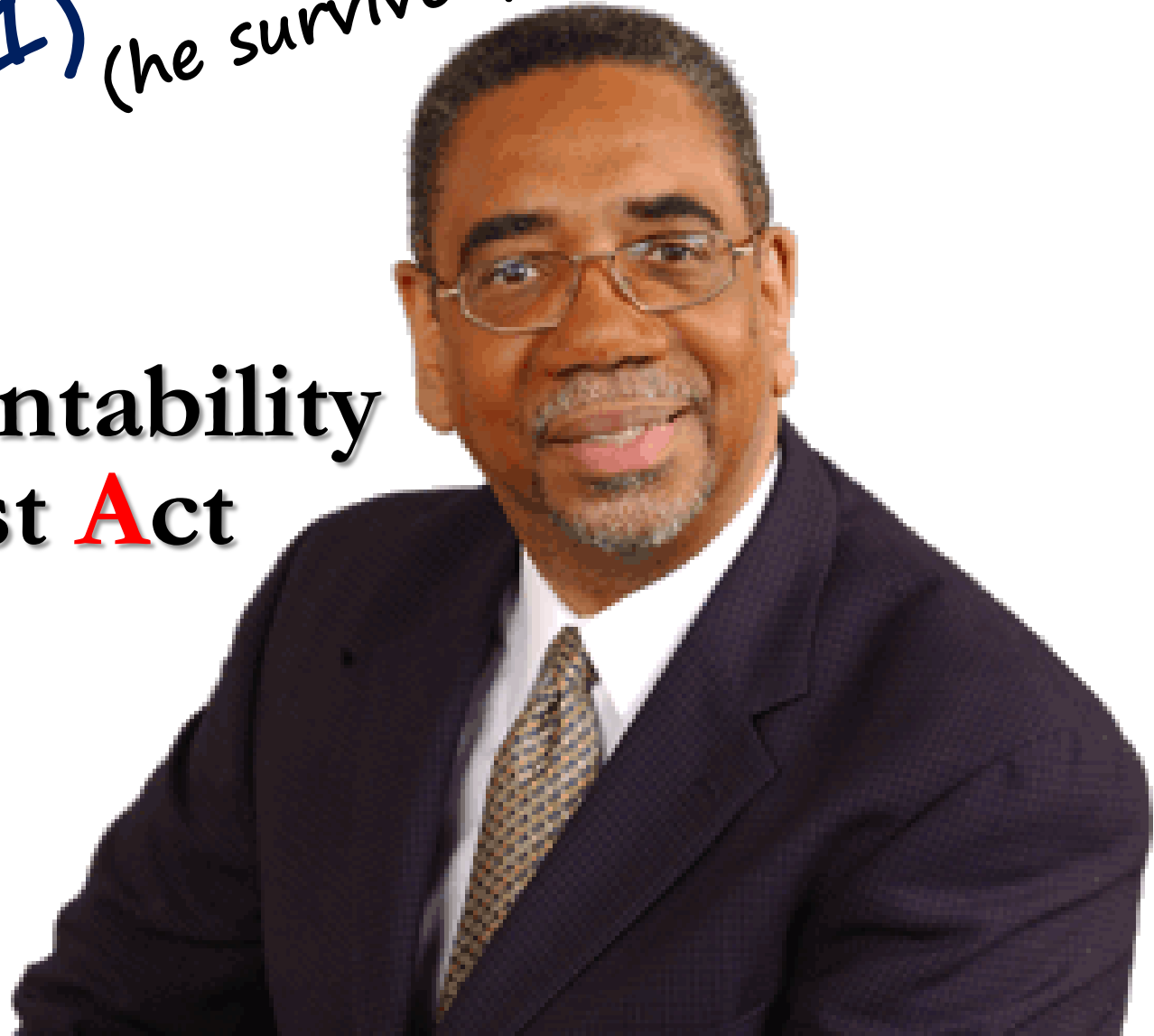
FIPS 140-2
& SP 800



More federal laws are coming



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



Data **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**



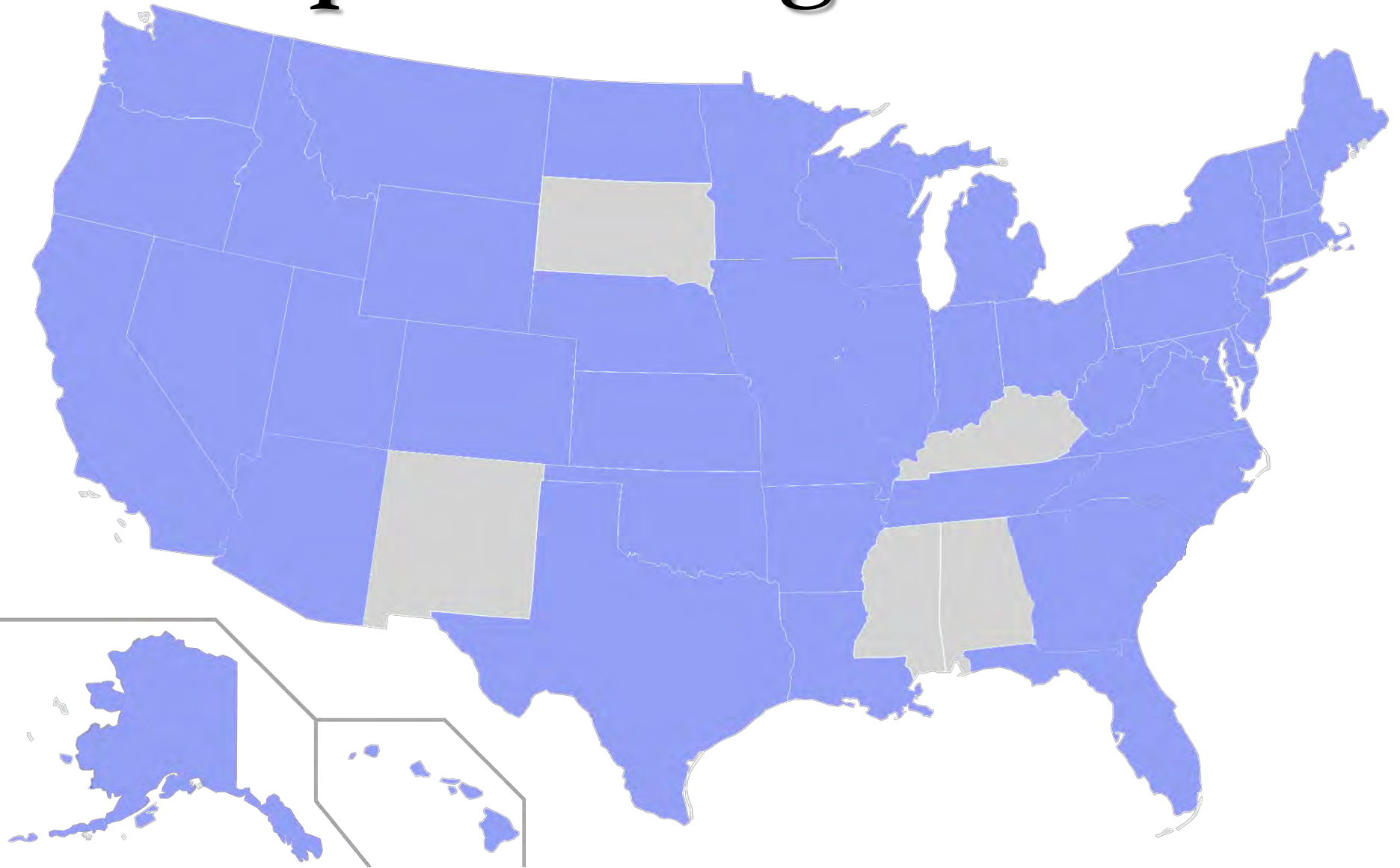
**Requires consumer and FTC notification
after data breach**

...unless “no risk of harm”

Server



Preempts existing state law



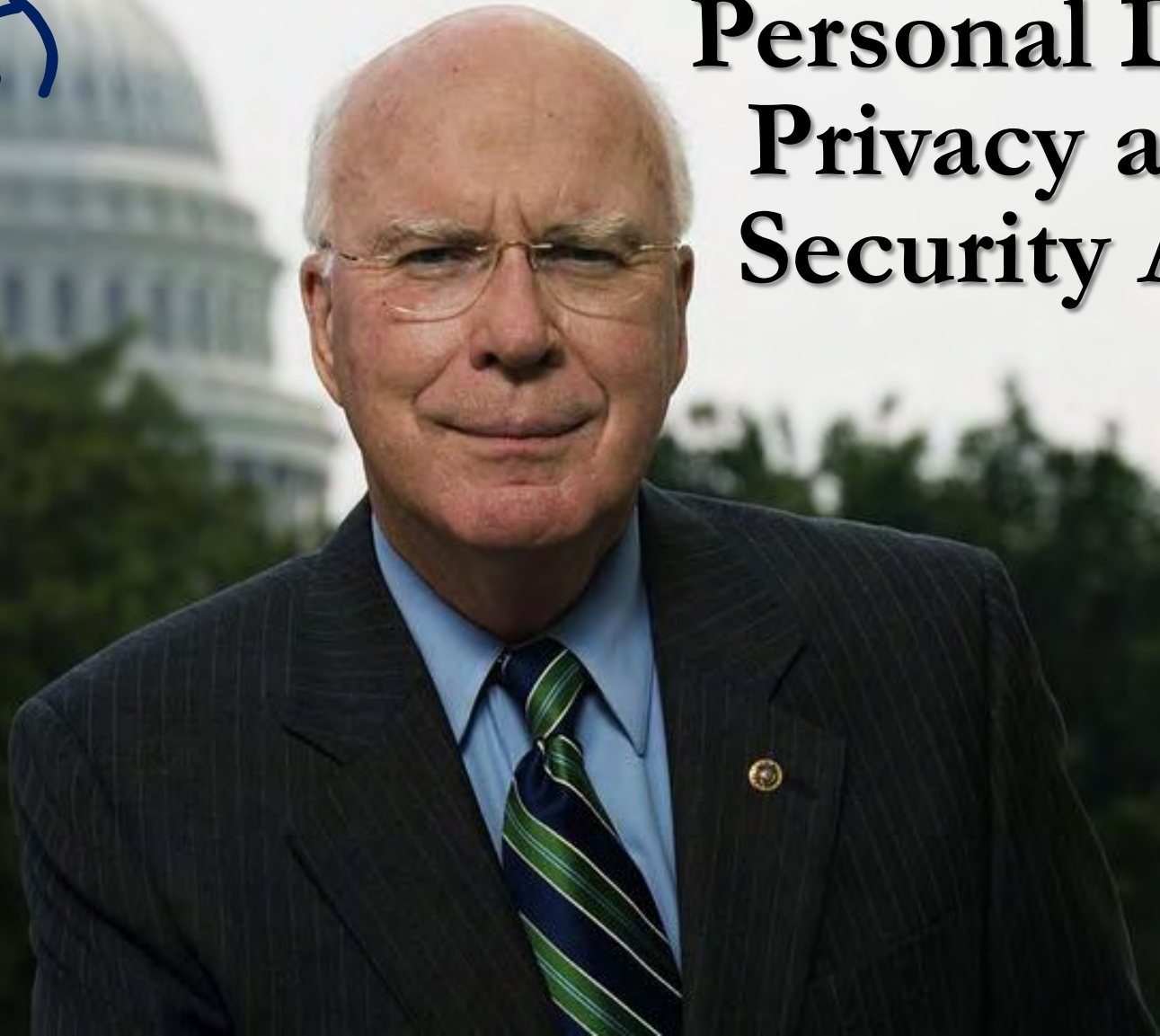


We'll get to that...

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

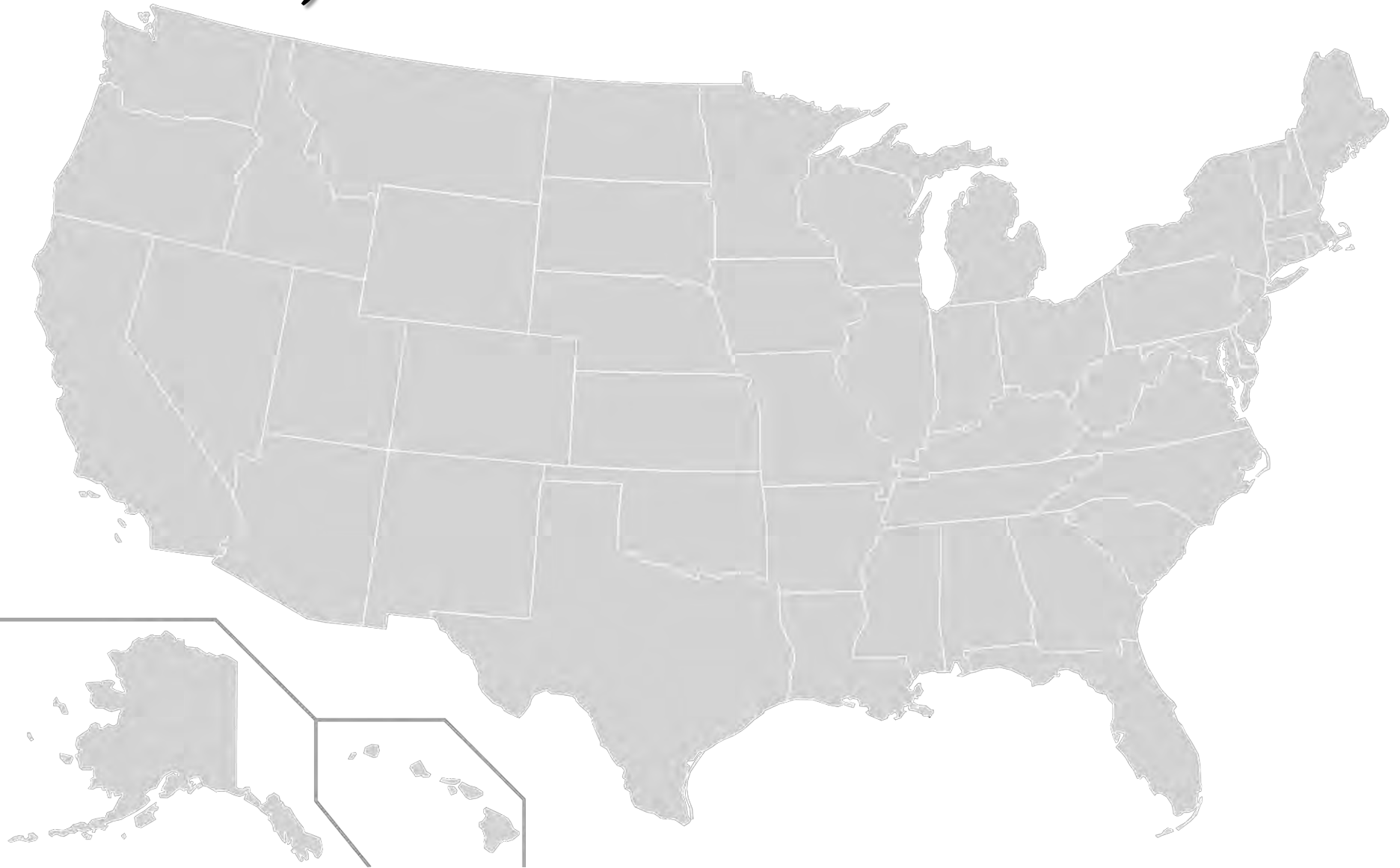
Sen. Patrick Leahy
(D-VT)

times

3

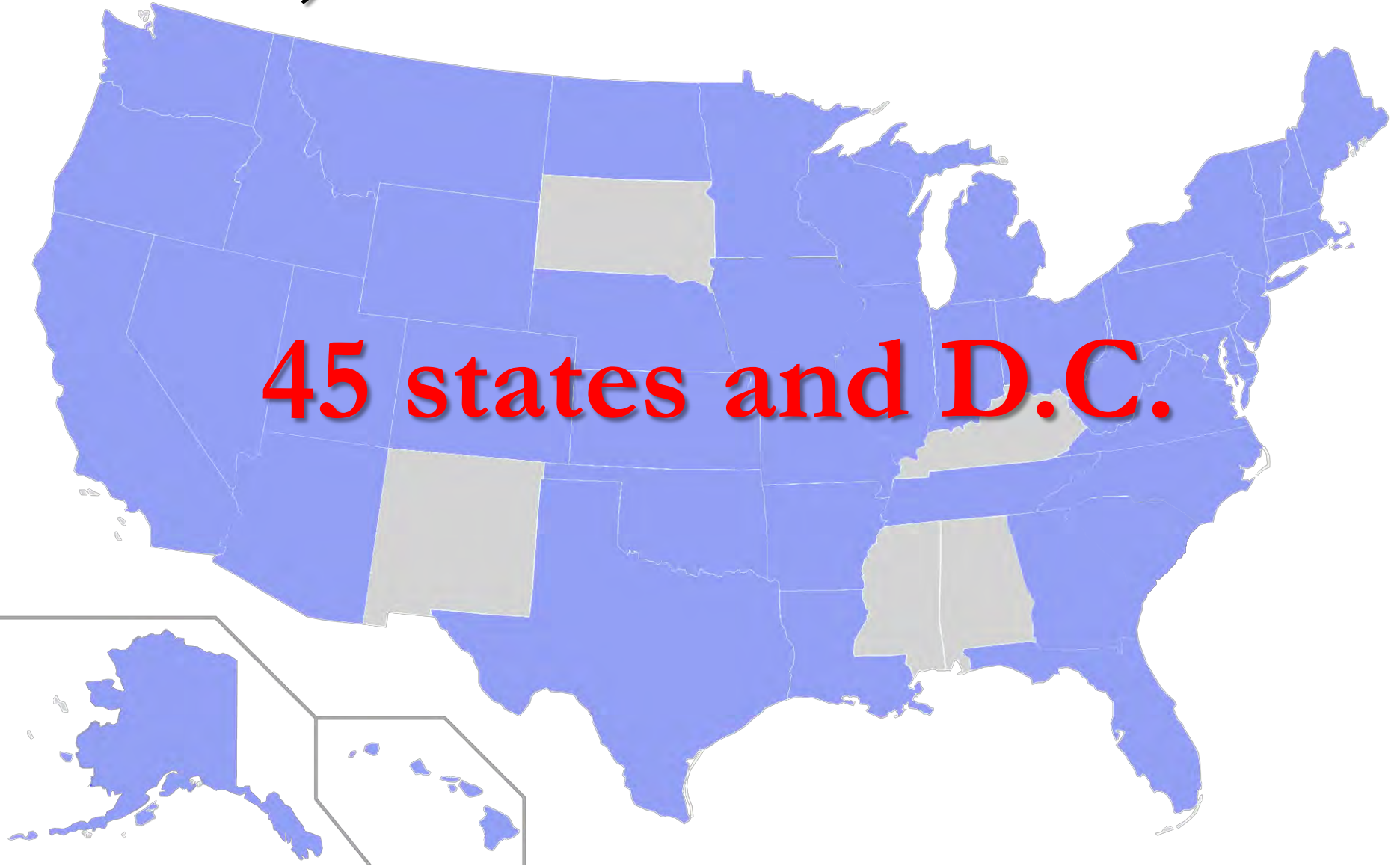


It's not just the feds...

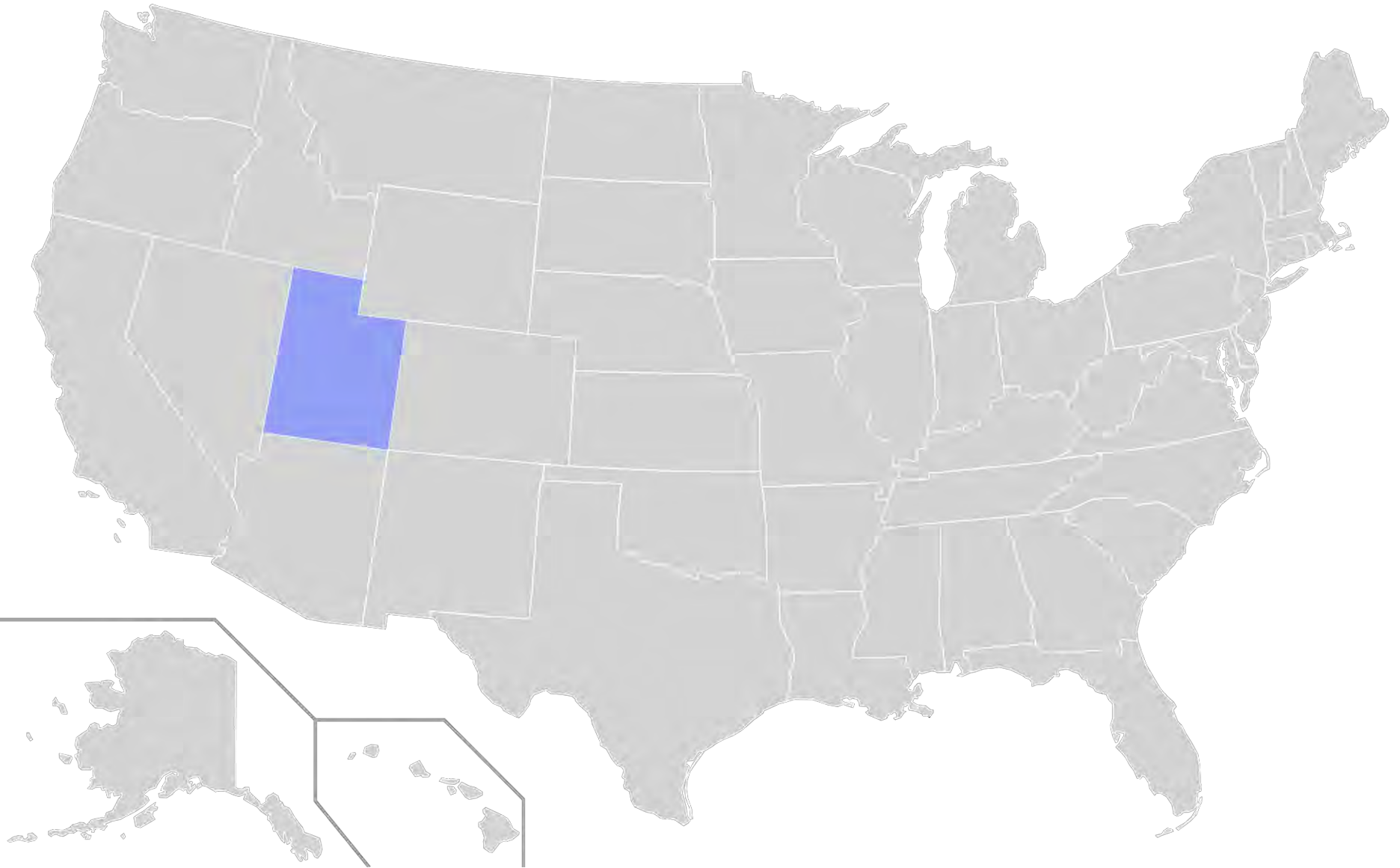


It's not just the feds...

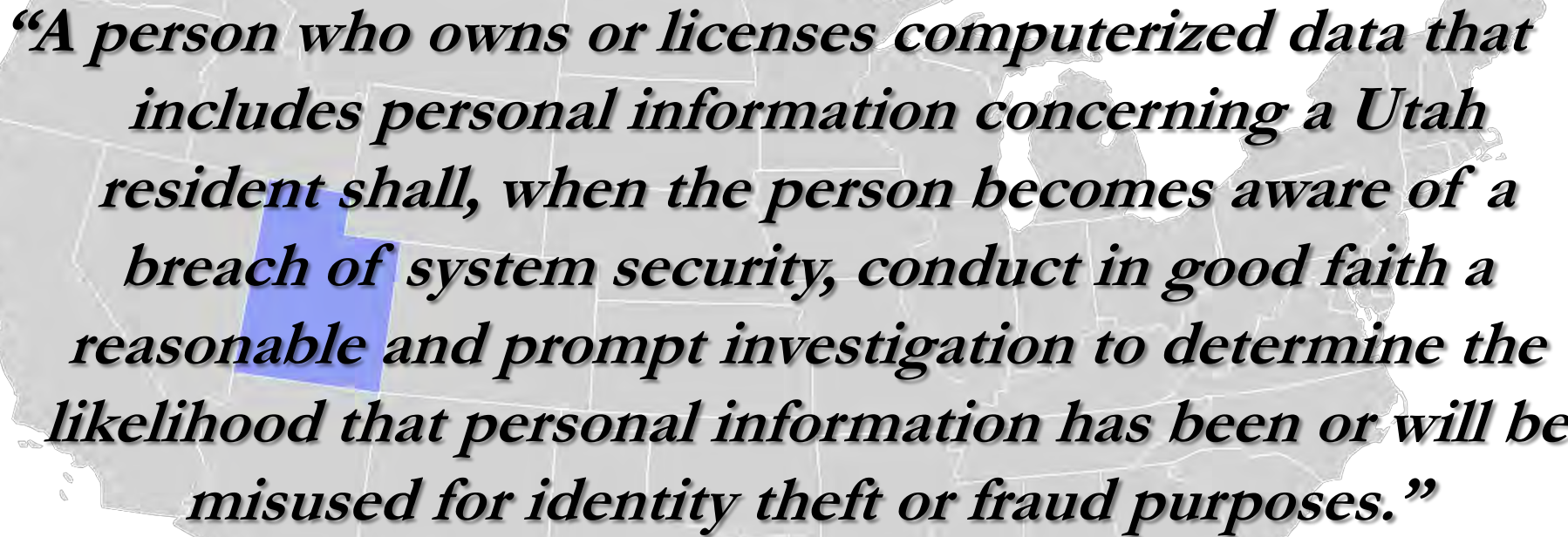
45 states and D.C.



Some are less strict than others...



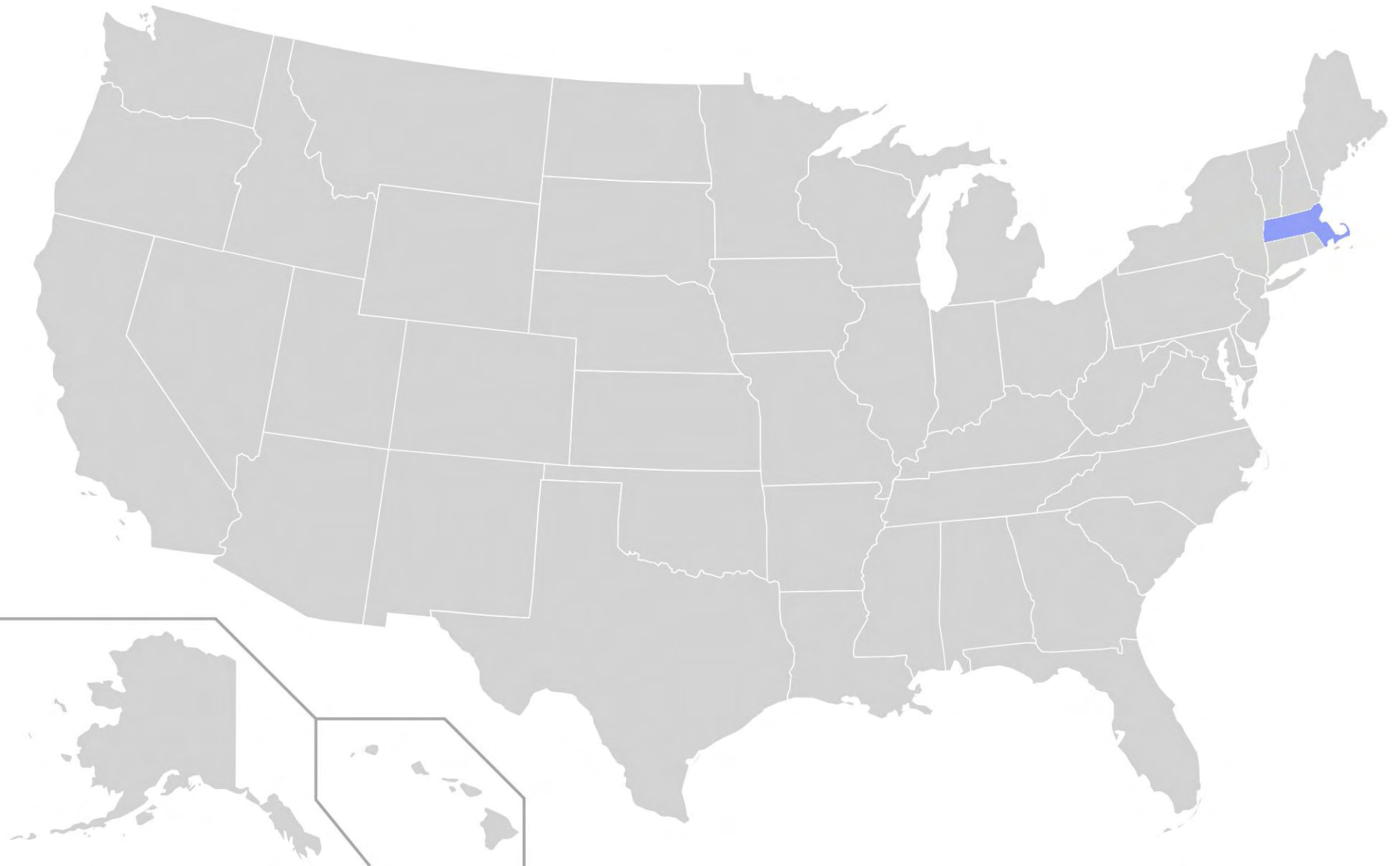
Some are less strict than others...



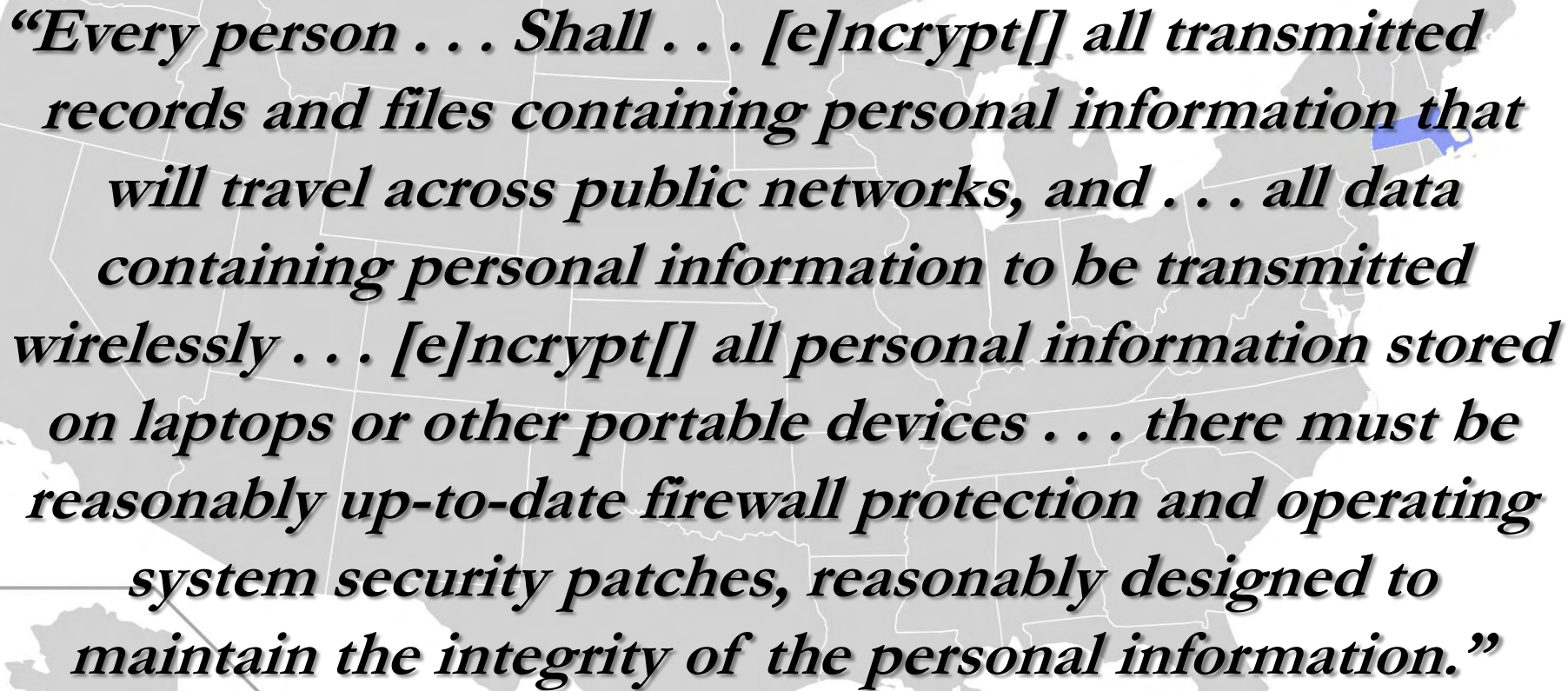
“A person who owns or licenses computerized data that includes personal information concerning a Utah resident shall, when the person becomes aware of a breach of system security, conduct in good faith a reasonable and prompt investigation to determine the likelihood that personal information has been 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

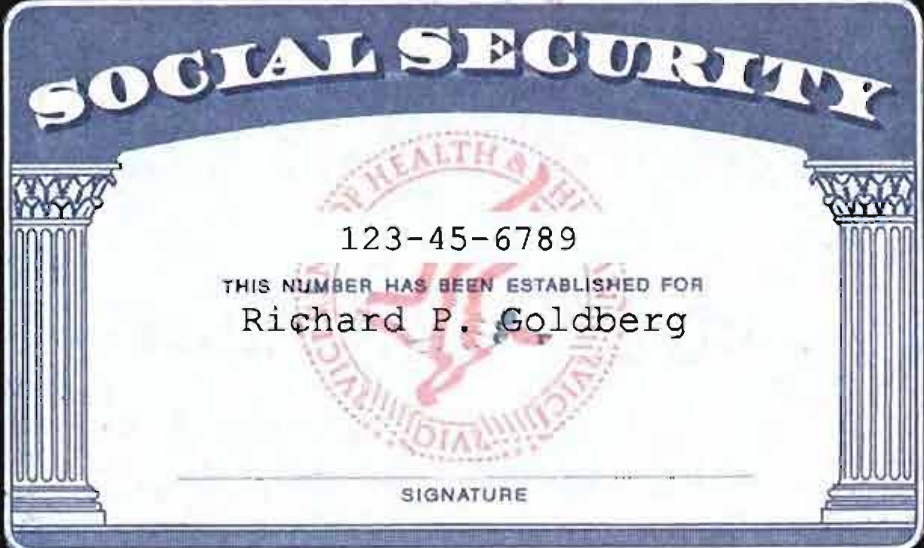


Corporate Data Policies









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





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

Mind if we look around?

Audits?

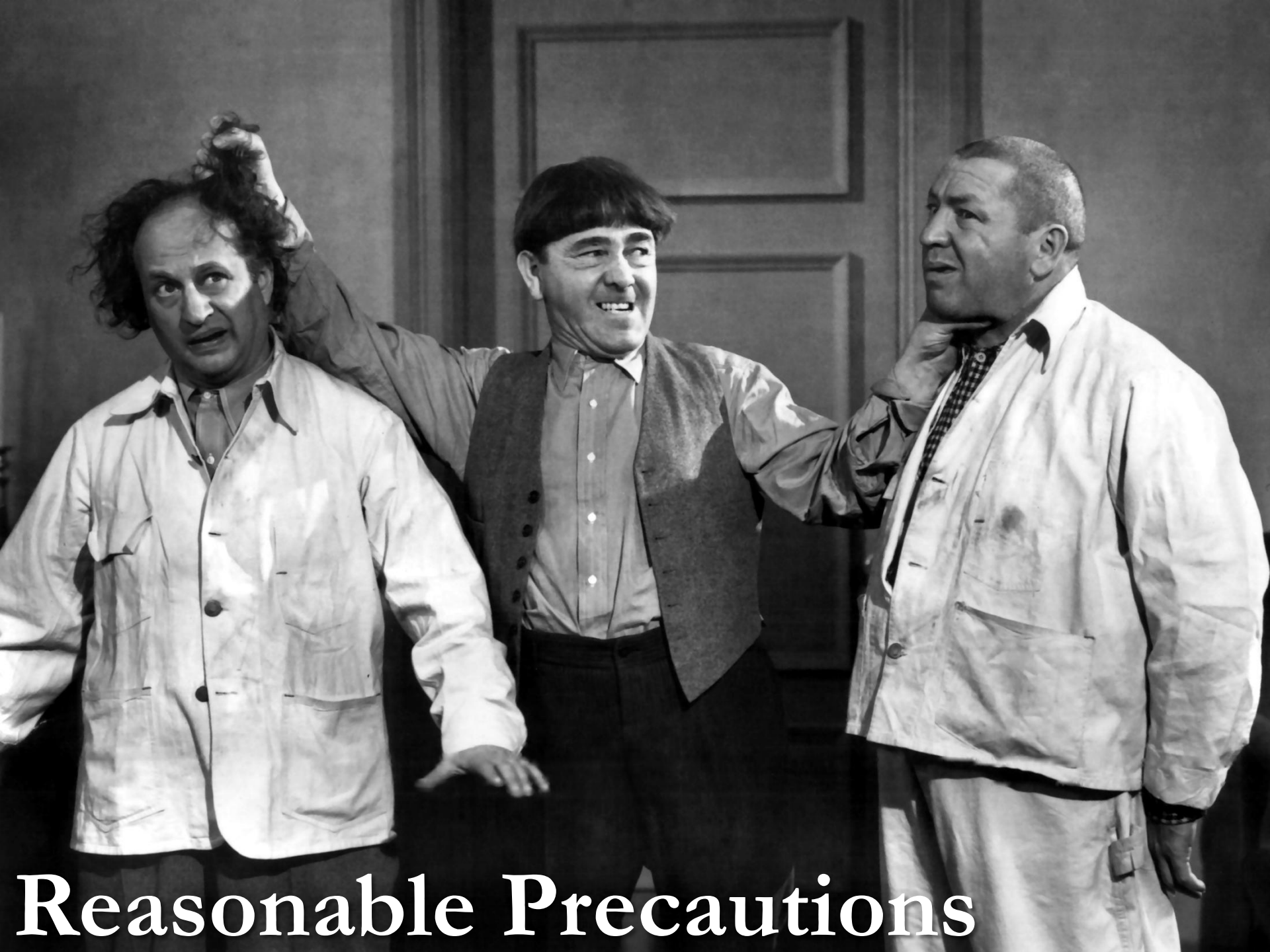


Meet standard or face **steep** fines



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:¹ 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)

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

PLACE OF TESTIMONY

COURTROOM

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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, 202-640-933

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

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

American LegalNet, Inc.
www.FormsWorkFlow.com

DATE AND TIME

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Law Office of Richard P. Goldberg, 1600 Pennsylvania Ave. NW, Washington, DC 20500

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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

The background of the slide is a blurred image. On the left, there is a circular object that appears to be a hard drive or a similar storage device. On the right, there is a green cable or wire extending across the frame. The overall image is out of focus, serving as a decorative backdrop for the text.

may leave
sensitive data
lingering around

You may have to
produce it



**This guy is
bad enough**



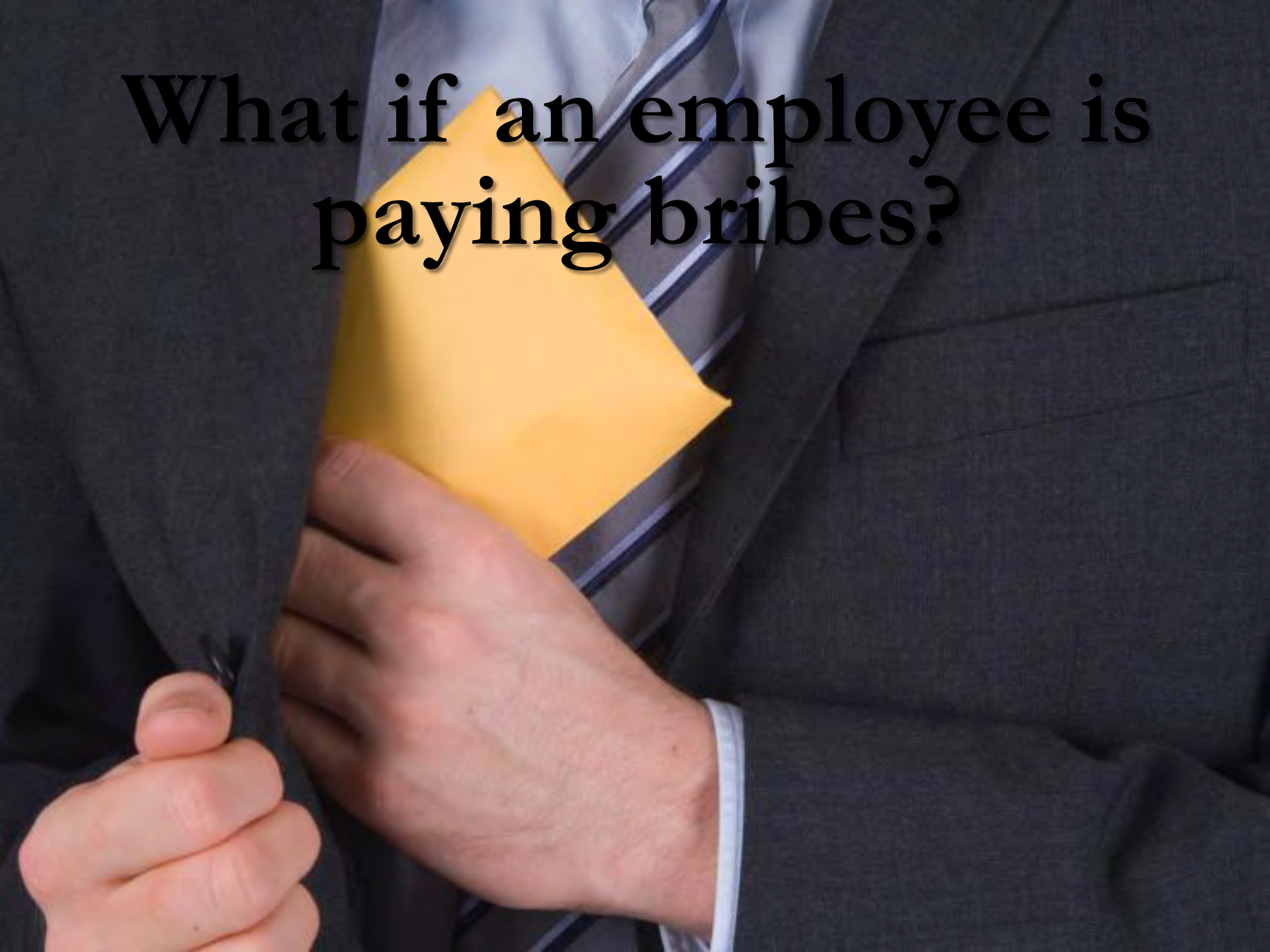
What if it's
this guy?



**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

GoogleTM
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 750 GB hard drive. 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.

GoogleTM
Docs & Spreadsheets BETA

You would never know

You would never know

Control and Transparency

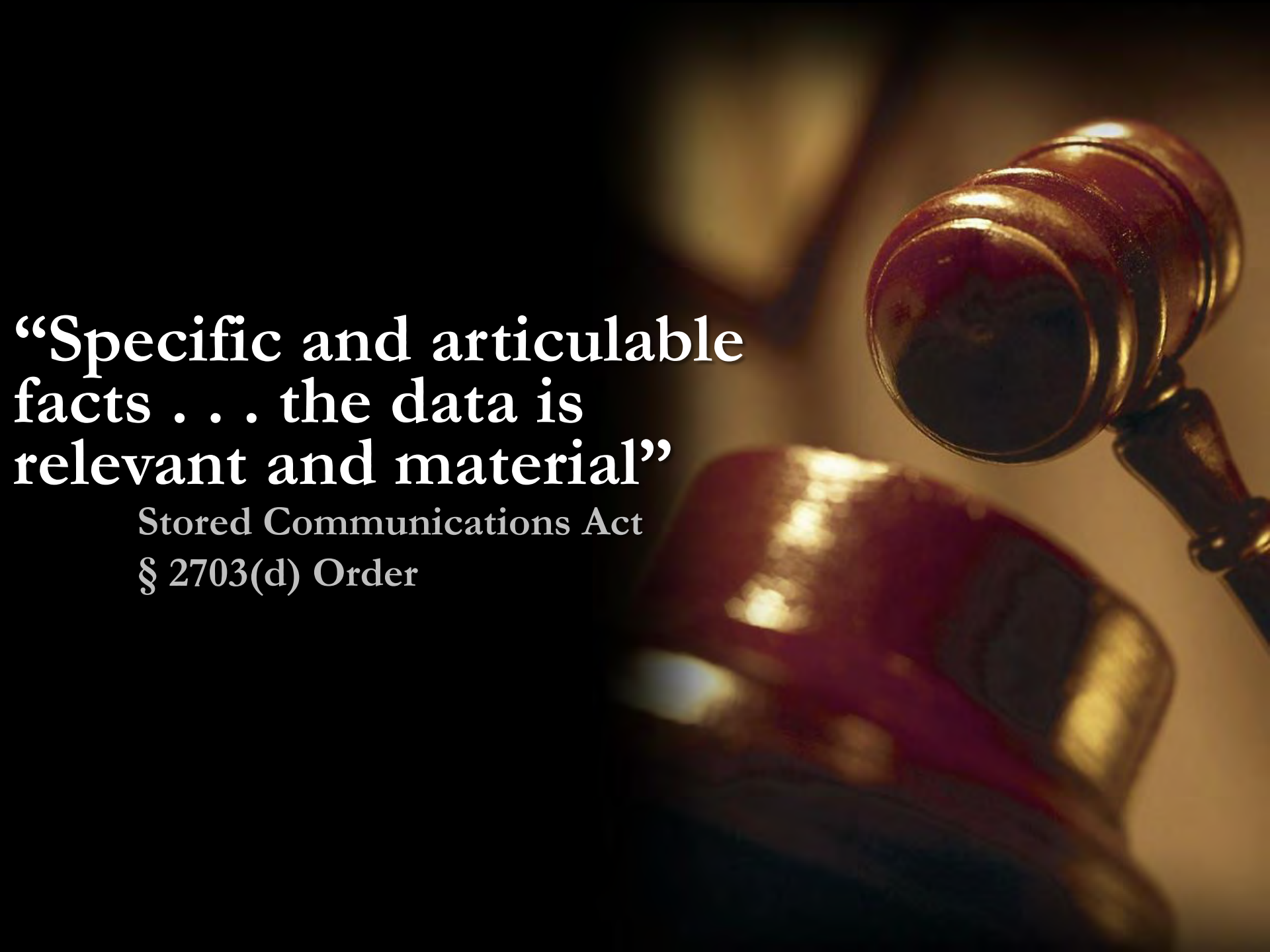


Search Warrants




“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

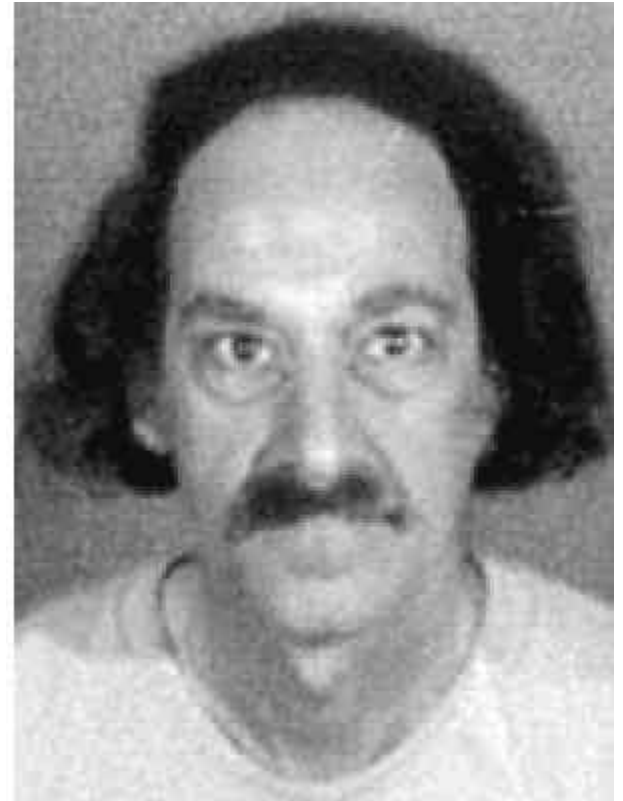
This thing

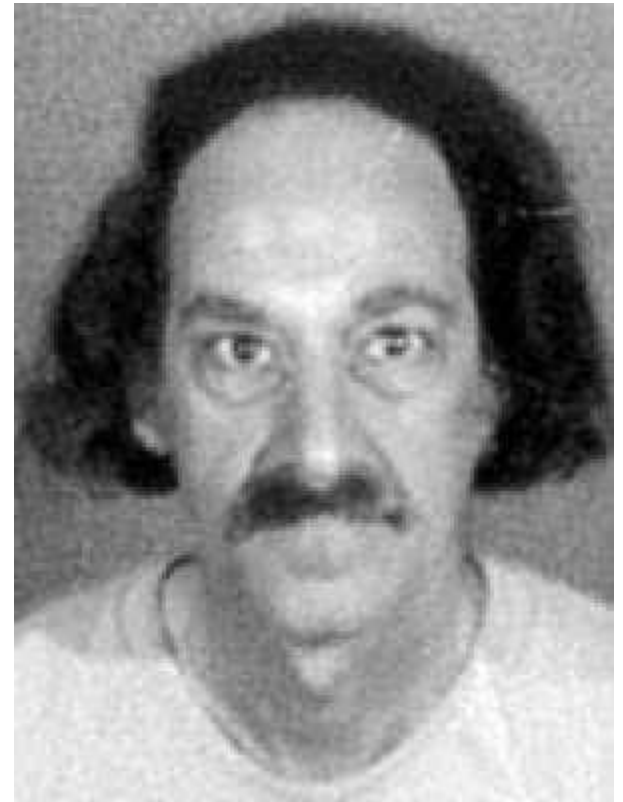


Cloud computing
is dangerous

And the
plane

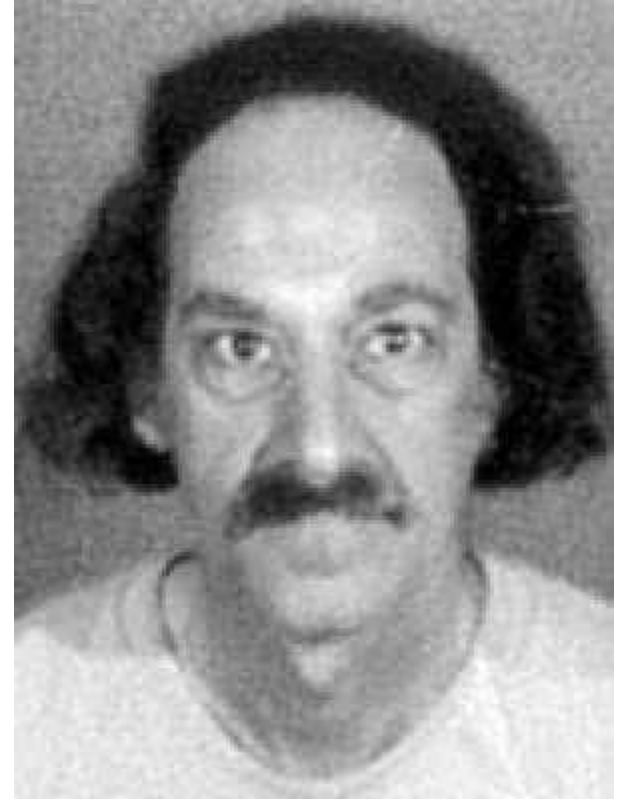






Richard S. Goldberg

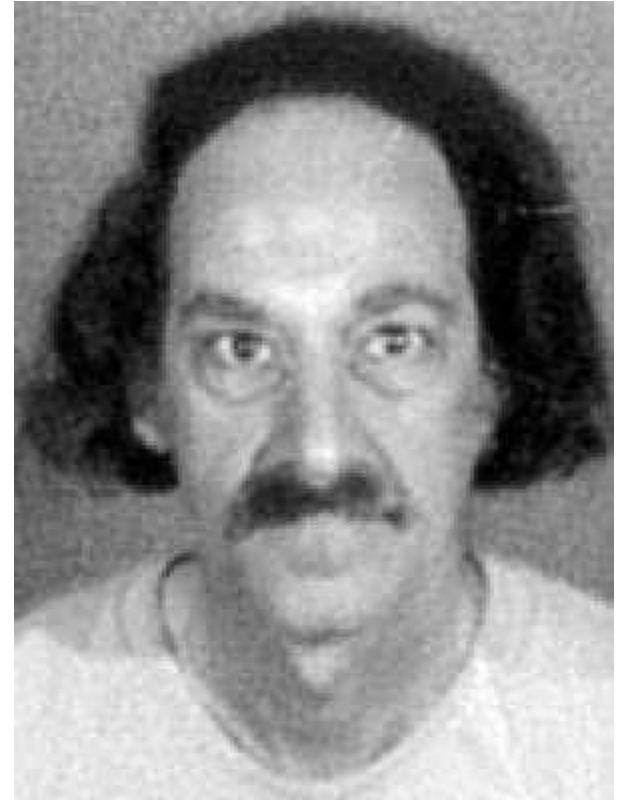
I am Richard **P.** Goldberg



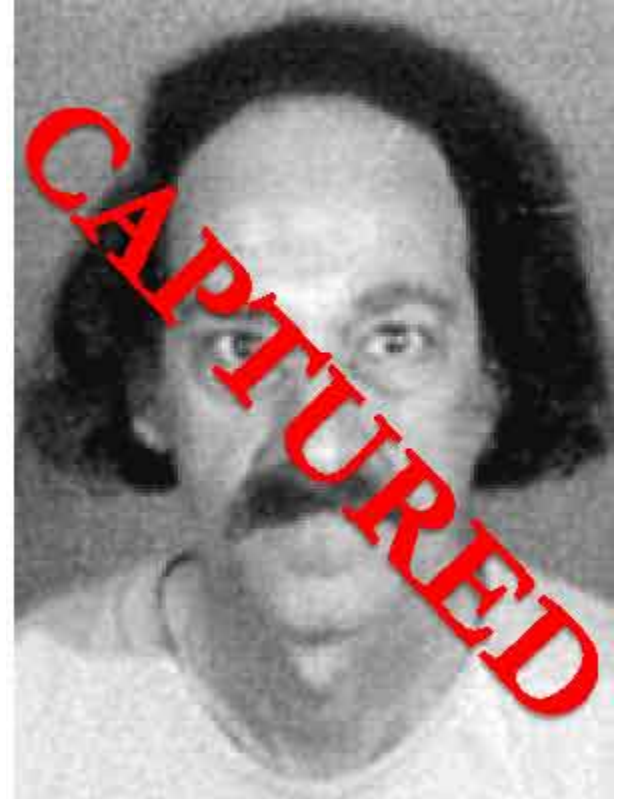
Richard **S.** Goldberg

I am Richard **P.** Goldberg

We are **not** related

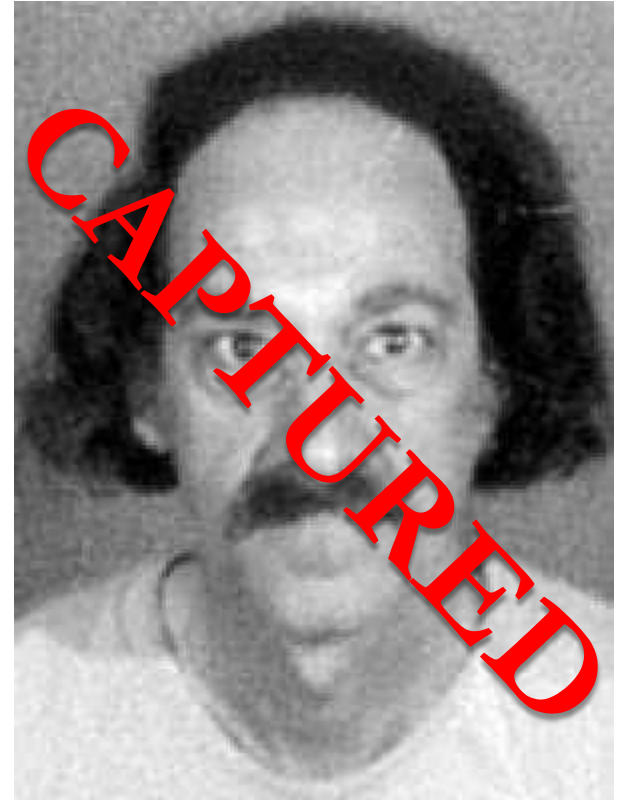


Richard **S.** Goldberg





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

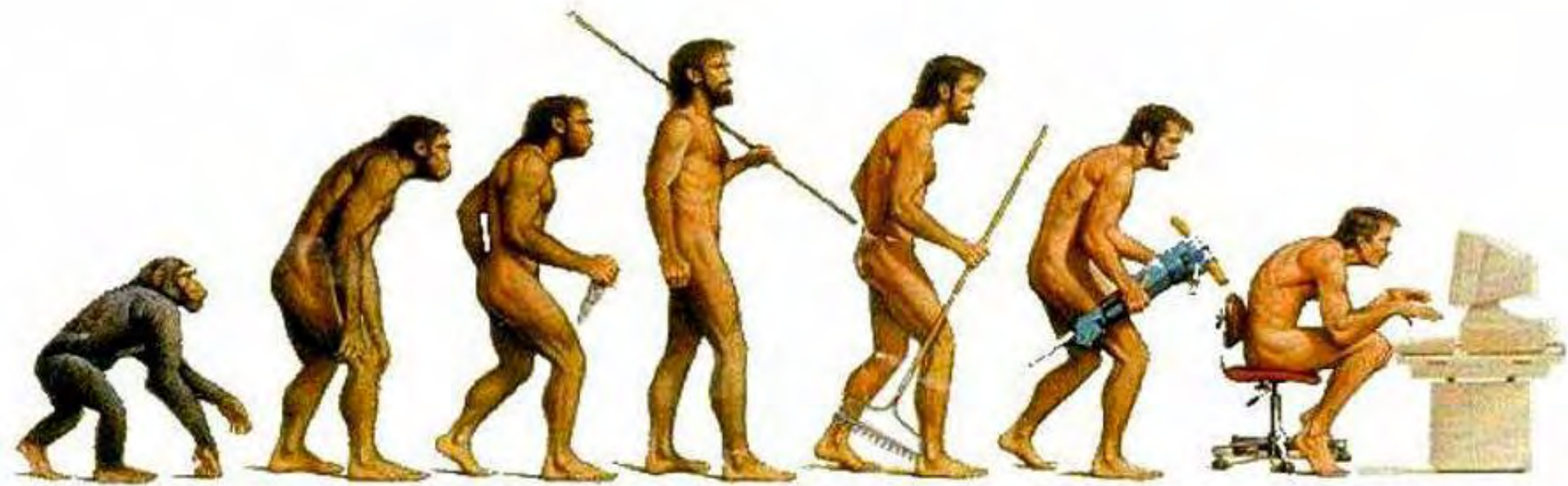


InformationWeek

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



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

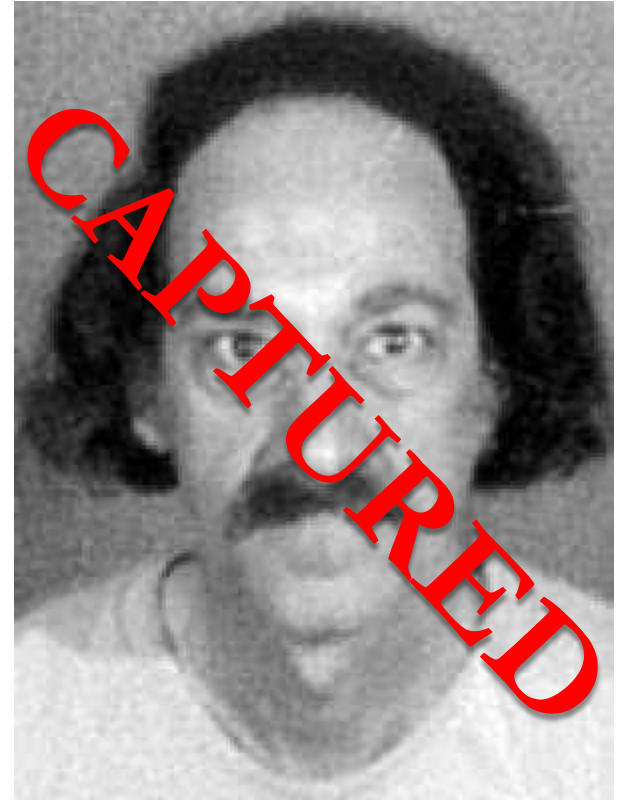



This guy





Uses your cloud
service provider...



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*“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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Richard.Goldberg@GoldbergLawDC.com