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The State of the Law: 2016

Real World Crypto

Nate Cardozo, EFF

783A 8CC4 166D 1768 4E8E DAFD 2D76 4786 4AE6 3181

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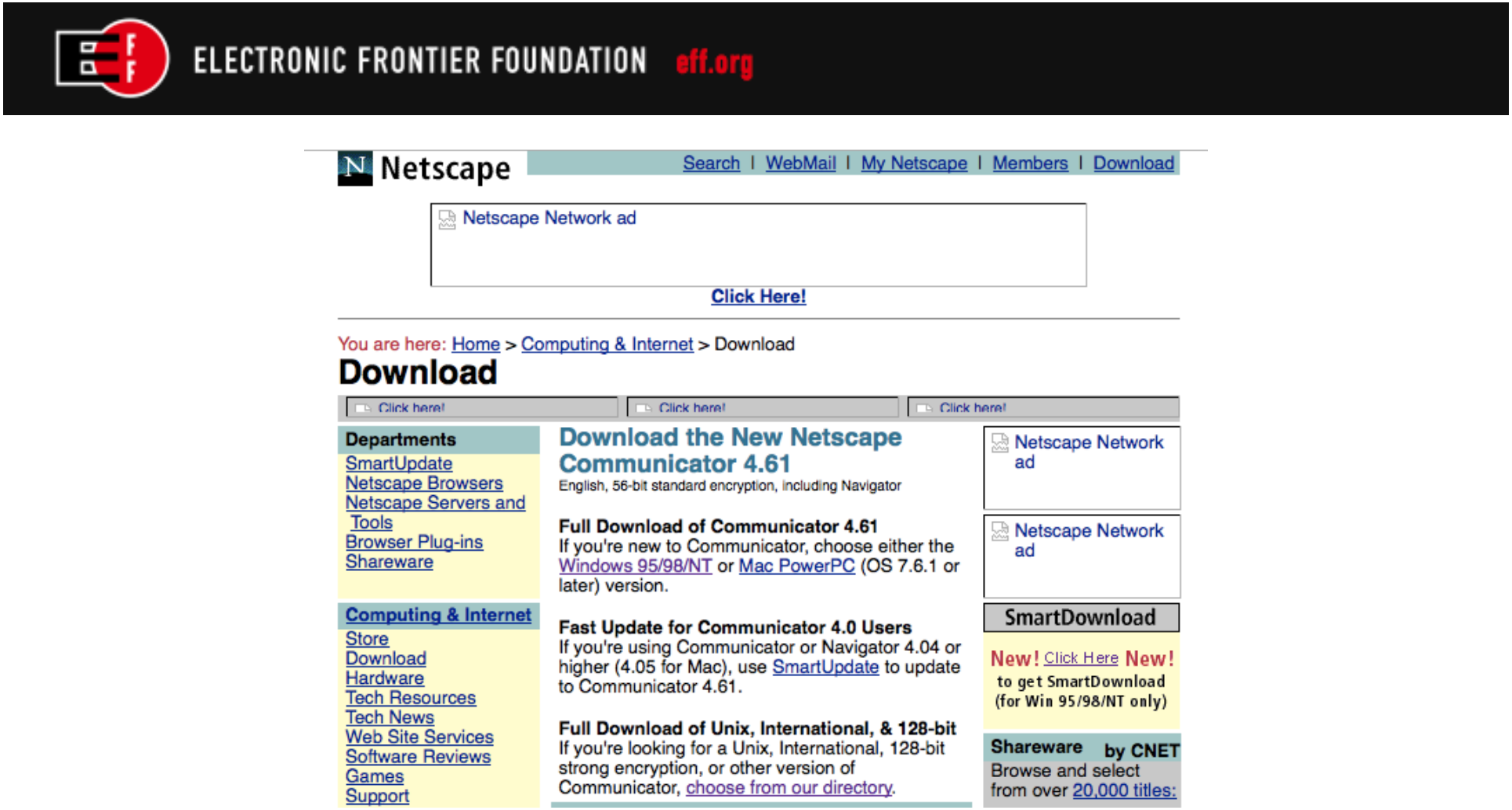
"*The Net interprets censorship as damage and routes around it.*"

John Gilmore, ~1993

The First Crypto Wars

```
#!/usr/local/bin/perl -s do
'bigint.pl';($_,$n)=@ARGV;s/^.(..)*$/0$&/;($k=unpack('B*',pack('H*',$_)))=~
s/^0*//;$x=0;$z=$n=~s/./$x=&badd(&bmul($x,16),hex$&)/ge;while(read(STDIN,$_,$w
=((2*$d-1+$z)&~1)/2)){$r=1;$_=substr($_."\0"x$w,$c=0,$w);s/.|\n/$c=&badd(&bmul
($c,256),ord$&)/ge;$_=$k;s/./$r=&bmod(&bmul($r,$r),$x),$&?$r=&bmod(&bmul($r,$c
),$x):0,""/ge;($r,$t)=&bdiv($r,256),$_=pack(C,$t).$_ while$w--+1-2*$d;print}
```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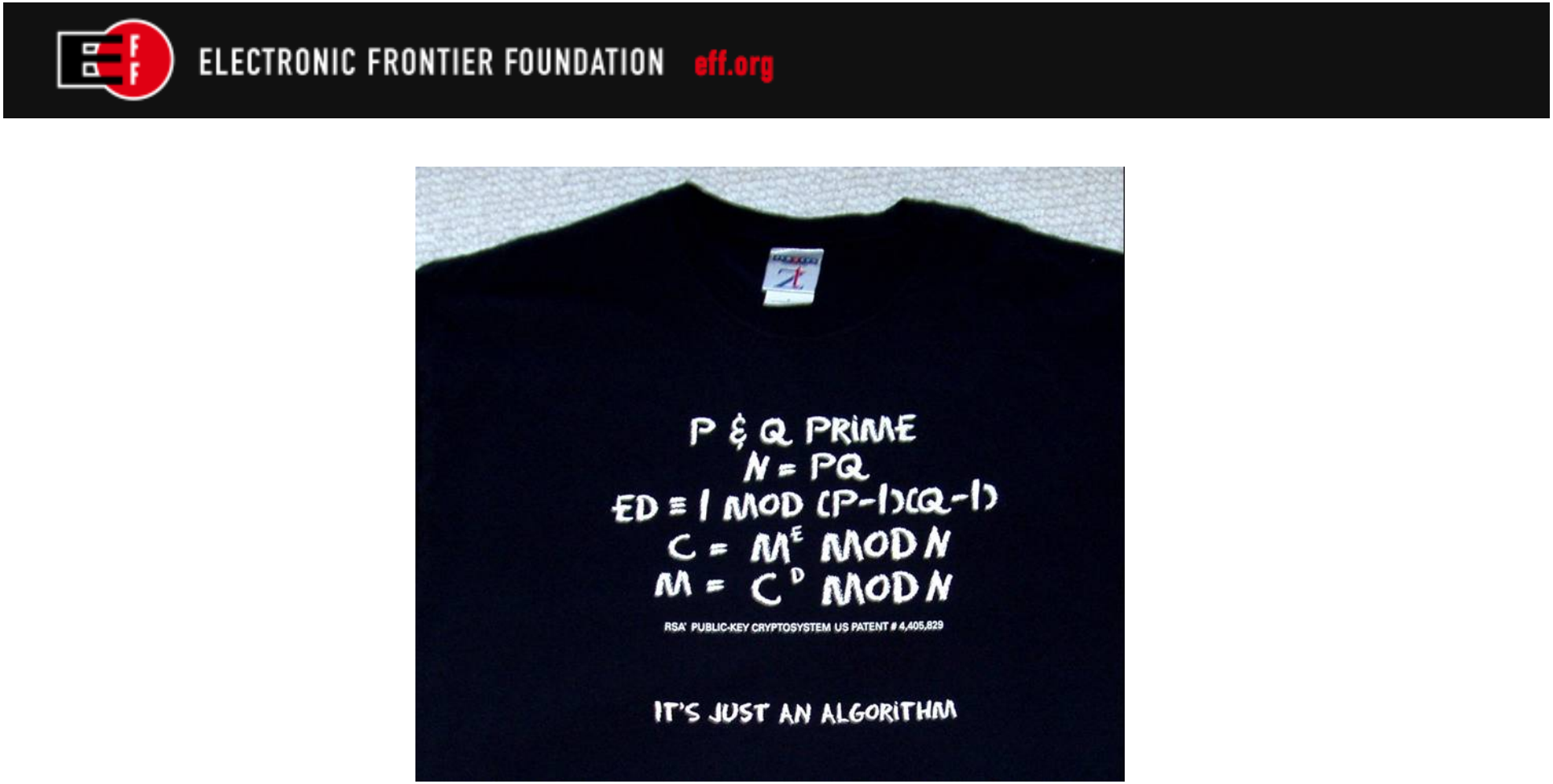
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P & Q PRIME
N = PQ
ED ≡ 1 MOD (P-1)(Q-1)
C = M^E MOD N
M = C^D MOD N
RSA' PUBLIC-KEY CRYPTOSYSTEM US PATENT # 4,405,829
IT'S JUST AN ALGORITHM


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OpenBSD


WWW.SEALANDGOV.COM
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SEALAND


VLSI
9351AS456432
VM06578-B
MYK-78T
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If all you have is a hammer…

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If all you have is a hammer…

Daniel J. BERNSTEIN, Plaintiff,

v.

UNITED STATES DEPARTMENT OF STATE, et al., Defendants.

No. C–95–0582 MHP.

United States District Court, N.D. California.

April 15, 1996.

Mathematician sought declaratory and injunctive relief against enforcement of the Arms Export Control Act (AECA) and the International Traffic in Arms Regulations (ITAR) on the grounds that they were unconstitutional on their face and as applied to mathematician's cryptographic computer source code. On government's motion to dismiss for lack of justiciability, the District Court, Patel, J., held that: (1) cryptographic computer source code is "speech" protected by First Amendment, and (2) colorable constitutional challenges to statute and regulations were justiciable.

how to make the encryption algorithm (the idea) functional. U.S.C.A. Const.Amend. 1.

See publication Words and Phrases for other judicial constructions and definitions.

3. Federal Civil Procedure ⇐1773

Motion to dismiss will be denied unless it appears that plaintiff can prove no set of facts which would entitle him or her to relief. Fed.Rules Civ.Proc.Rule 12(b)(6), 28 U.S.C.A.

4. Federal Civil Procedure ⇐1829, 1835

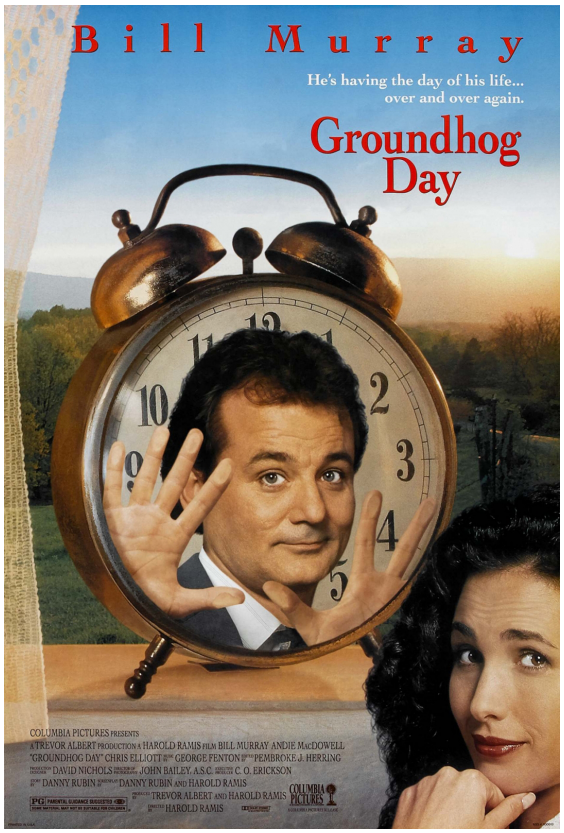
On motion to dismiss, all material allegations in complaint will be taken as true and construed in light most favorable to plaintiff. Fed.Rules Civ.Proc.Rule 12(b)(6), 28 U.S.C.A.

5. Federal Civil Procedure ⇐1832

Although, on motion to dismiss, court is generally confined to consideration of allegations in the pleadings, when complaint is accompanied by attached documents, such documents are deemed part of the complaint and may be considered in evaluating merits of motion. Fed.Rules Civ.Proc.Rule 12(b)(6),

And the Internet was a safer place for it!

- We thought we had solved the field…
  - But thanks to Comey
  - More work remains


Bill Murray
He's having the day of his life...
over and over again.
Groundhog Day
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COLUMBIA PICTURES

- FBI Director Comey in 2014:

"We also need a regulatory or legislative fix to create a level playing field, so that all communication service providers are held to the same standard and so that those of us in law enforcement, national security, and public safety can continue to do the job…"

2015

- Conversation started with device encryption, but quickly moved to end-to-end encryption.
- UK PM Cameron: “Are we going to allow a **means of communications** which it simply isn't possible to read?”

“Only a Business Model”

- Government have been downplaying corporate support for encryption
  - Comey: “plenty of companies” can read users' data and unlock encrypted phones.
  - “Encryption isn’t just a technical feature; it’s a marketing pitch”
- Combined with backroom pressure

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"Secure Back Door" Proposals

- Most common is some variation on key escrow
- E.g. Message sent with symmetric key
- Encrypt symmetric key twice
  - Recipient's public key and
  - Escrow agent's public key

For more see *Keys Under Doormats*, https://dspace.mit.edu/bitstream/handle/1721.1/97690/MIT-CSAIL-TR-2015-026.pdf

What if we re-named back doors?

- Comey: “We aren’t seeking a **back-door** approach. We want to use the **front door**”
- Washington Post “a **back door** can and will be exploited by bad guys, too. However, with all their wizardry, perhaps Apple and Google could invent a kind of **secure golden key**”

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Legislation

- Many countries around the world are considering legislation that would either
  - mandate backdoors,
  - mandate access to plaintext or
  - endanger encryption.

UK Snooper's Charter

- Purports to regulate telecommunications operators all around the world
- § 189(4)(c): Operators may be obligated to remove "electronic protection" if they provided
  - Could be interpreted to require weakening encryption, holding a key or banning end-to-end

UK Snooper's Charter

- Latest version resented to Parliament in November
  - Currently in committee, which is accepting evidence.
  - Industry and civil society submitted comments

Australia's Defence Trade Controls Act

- Prohibits the "intangible supply" of encryption technologies.
- Many ordinary teaching and research activities could be subject to unclear export controls with severe penalties.
- International Association for Cryptologic Research organized petition against, signed 100s of experts

India Considers An Encryption Policy

- In September, India released a draft National Encryption Policy
  - Everyone required to store plain text
  - Info kept for 90 days
  - Made available to law enforcement agencies as and when demanded
- Withdrawn after criticism

China's Anti-Terrorism Law

- Passed last month
- Draft version required tech companies to hand over **encryption codes**
- Final version: "shall provide technical interfaces, **decryption** and other technical support"

US: No Bill to Require Backdoors

- **Yet**. Obama "will not —**for now**—call for legislation requiring companies to decode messages for law enforcement."
- Senate Intelligence Committee likely to introduce bill in the coming spring

Trans-Pacific Partnership

- Some report that TPP could contain good news on encryption?
  - Alas, no.
- Provider may not be compelled to give key
  - Only “as a condition of sale”
- But provider must still give decrypted content
- TPP still has huge problems throughout

2016

- But what is actually likely?
  - Key escrow mandate
    - If it happens, it's going to be double-bagged.
    - But I don't think this is actually going to happen.
  - We don't care how, just make plaintext available.
    - Now I will go into prediction mode.

2016

- But what is actually likely?
  - Informal pressure
  - No ban will reach FOSS crypto
  - CALEA-like mandate
  - India/Australia/Kazakhstan may do dumb things
  - It's not going to stop anyone with even a modicum of sophistication from "going dark"

2016

Defaults, not primitives

Backdoor pressure, not backdoor mandates

Any mandate will affect only the masses

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Questions?

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