

# LIS-5411

## Anonymity

# A working definition of privacy

Secrecy + Anonymity +

A belief in the first two.

# A working definition of privacy

Technical secrecy = Encryption.

Let's talk technical anonymity.

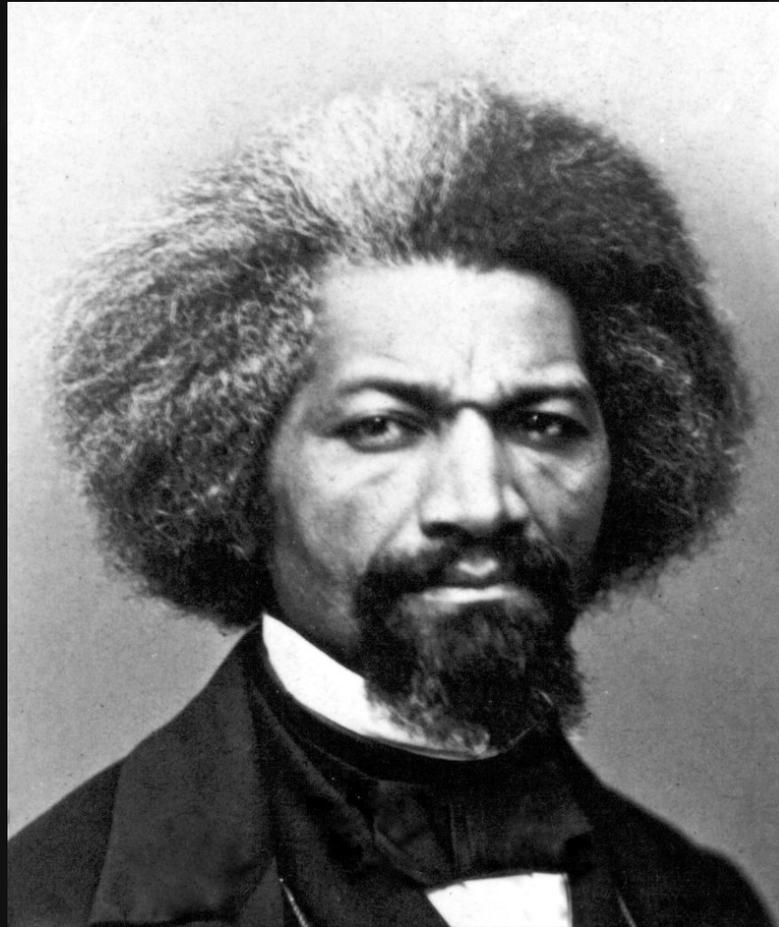
# Secrecy $\neq$ Anonymity

- They are related, but can be different.

Secrecy = hides the **contents of the message**

Anonymity = hides the **identity of the sender**

How did he learn he was a slave?



# Why Anonymity?

Shouldn't you always be personally responsible for what you say? I mean, youtube comments?

(similarly, why encryption? The following applies there too)

“Great invention..  
..can you disable the “bank robbery getaway” function?



# An argument “in favor” of Dangerous Technologies

- Yes, new dangers are created but...
- - there are legitimate needs
- - there will be a demand →
- Someone WILL have it, perhaps better to decentralize/democratize it.

Anonymity: these guys liked it...



# History of Anonymity

- “Silence Dogood”

Constitutional-ish

(it doesn't say “right to anonymity,” per se...  
..but it doesn't say “right to privacy” either..)

..and don't forget the most important  
anonymous speech of them all....

# VOTING!



We say “secret” ballot, but that's technically wrong....think about it.  
(what is hidden, content or identity?)

# Reduction of personal risk

- - whistleblowers
- - crime victims
- - (literal) minorities
  - sometimes good ideas are (really) unpopular.
- - it's part of the 1<sup>st</sup> amendment.

# Technical Anonymity (...is very hard)

- No magic math here, unlike encryption..
- But we can use **real life analogies**

So: You are a whistleblower, and need to get important information to the newspaper.

How?

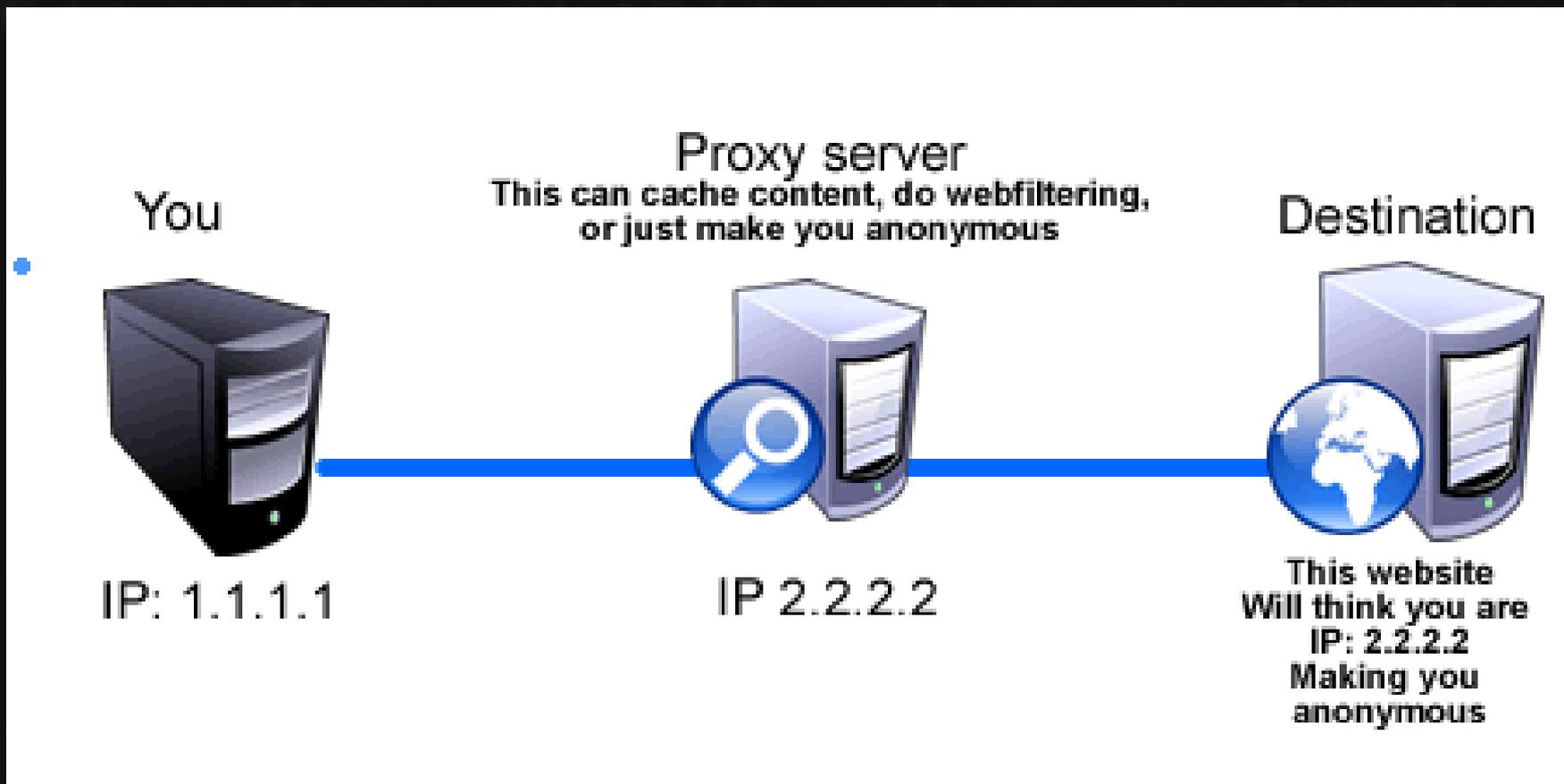
# A Trusted 3<sup>rd</sup> Party

- This is good --- but only as good as the 3<sup>rd</sup> party.

Stranger? Can you trust them?

- Close friend? But what about
  - - detection
  - - selling out
  - - endangering the friend?

# 3<sup>rd</sup> Parties online = Proxy



Is that like a VPN?

# Is that like a VPN?

Sigh. Yes.

Adventures in badly named things in computing.

# Is that like a VPN?

VPN. Virtual Private Network.

Network – A bunch of computers connected together.

(note – there is no technical difference whatsoever between this “network” and “cloud,” but I digress...

# Is that like a VPN?

VPN. Virtual Private Network.

Private Network – Think a bunch of computers connected together in the same room, only to one another. You know, privately.

Virtual Private Network – Same as above, but **virtualized** through the internet.

# Is that like a VPN?

So why do we call proxies that?

It's the same underlying technology (e.g OpenVPN or tinc) aka

”Encrypted/private connections between at least two computers for the purpose of hiding what’s happening in between”

(but in the case of the paid service proxy, to also provide anonymity)

# BUT. Proxies or VPNs

...there are always “endpoints,” and that’s your vulnerability. We need to go deeper...

# As promised, no new complexity

There's not much **math** here. A pretty simple concept, instead.

Instead of **one** middleman, use **MULTIPLE**.

Hide the payload by getting lost in a crowd.

..eg

“I am Spartacus!”



“Don't worry bout the law  
they can't arrest us all”



“Don't worry bout the law  
they can't arrest us all”



Maybe if you're trying to hide someone else



Maybe if you're trying to hide someone else  
(sorry couldn't help it)



# Tor

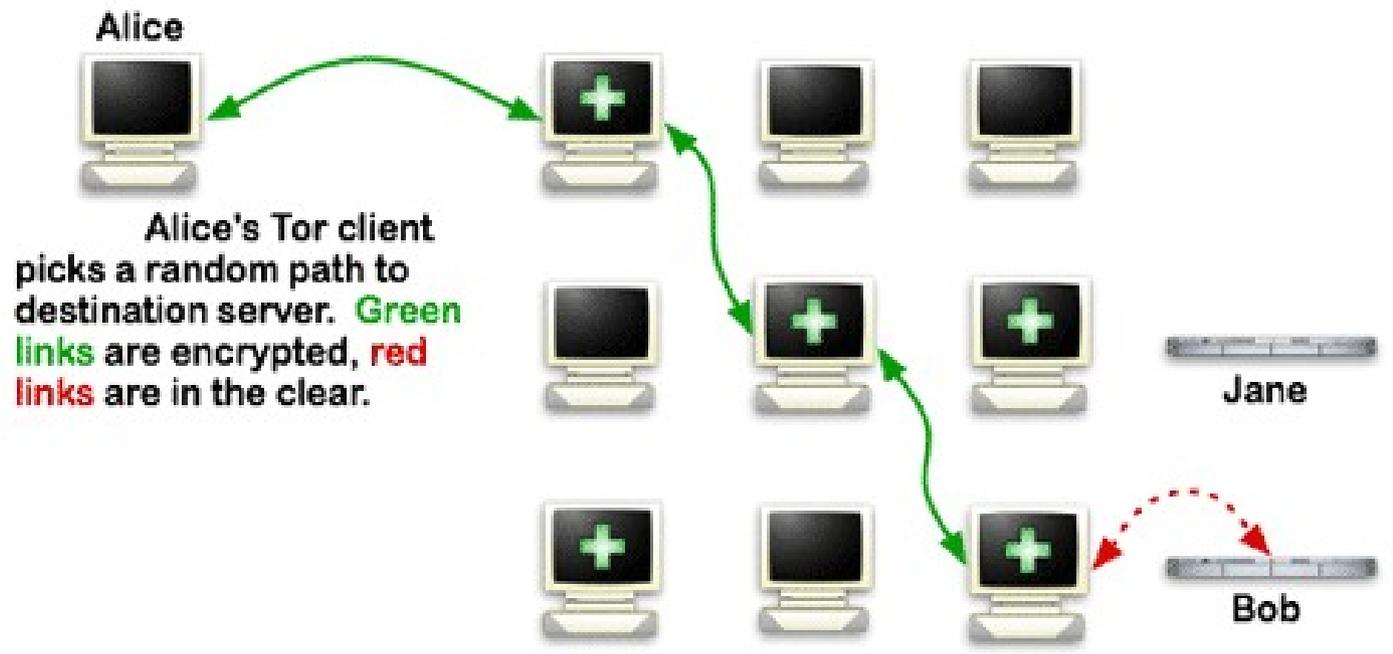
## How Tor Works

+

— Tor node

--- unencrypted link

— encrypted link



# More on Tor

- Why allowed? Military needs it too.(who invented it?)
- NOT fully encrypted by itself (but you can just add it)
- MANY other possible attacks (cookies, js)
- Exit Nodes are dangerous
- Like encryption, yes, the bad guys will use it too.

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# Dark Web

- .onion sites
- The (former) Silk Road

# Practical Online Anonymity

...would require a substantially different “web,”

because the web we use keeps **logs**.

Of everything, because that's sound IT practice. Boring and practical...

..but ends up making anonymity **EXTREMELY** difficult.

# Practical Online Anonymity

All the services and sites keep logs.

To an (unfortunate) extent, we will have to rely on policy and practices of the providers.

Be **vigilant** – because....

So far, we've been thinking about “speaking”

But what about:

“hearing?”

“reading?”

“watching?”

...and “social media-ing?”

## Back to Frederick Douglass...

Sophie Auld, who was bored one day,  
taught Frederick to read.

Quick side note  
(that happens to be literally the most important thing)

Reading, presently, is the only way to become smarter.

Also, you only TRULY control one thing in your life.

(See, also, “This is Water” – David Foster Wallace, Kenyon Commencement Speech)

## Back to Frederick Douglass...

Sophie Auld, who was bored one day,  
taught Frederick to read, **ILLEGALLY.**

From there, he traded for, scammed, and  
stole books.

(though the books weren't necessarily kept forever...Perhaps we should  
say he “illegally downloaded them...”

## Back to Frederick Douglass...

Luckily – books don't talk. They don't squeal on you, they don't run back to their owners and tell the owner who read them, and when, and how.

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Luckily – books don't talk. They don't squeal on you, they don't run back to their owners and tell the owner who read them, and when, and how.....

Well, they used to not do that, anyway :)

# Back to Frederick Douglass...



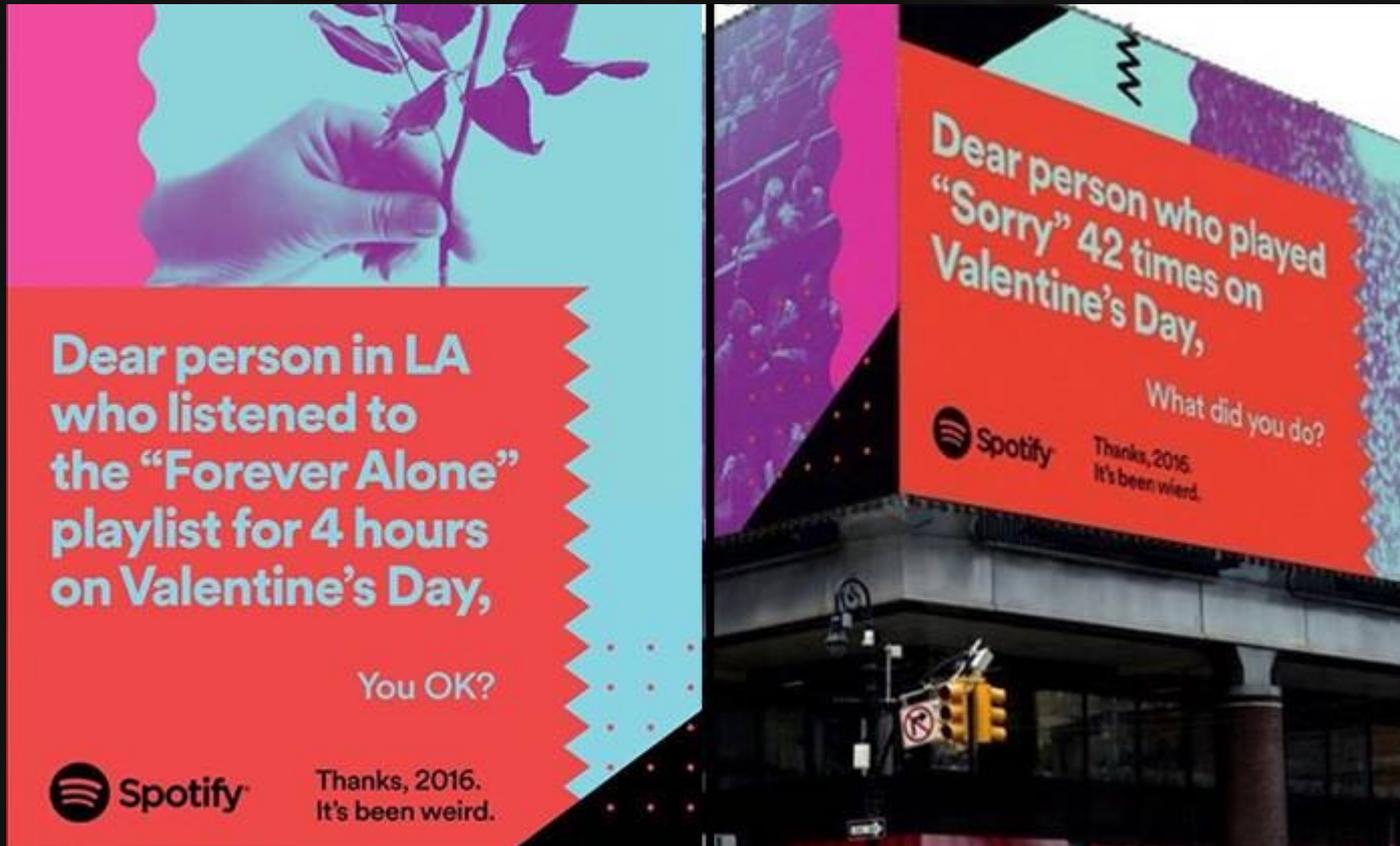
# Consider - “creeping de-anonymization of consumption”

If you're using:

- Amazon Books
- Netflix/Hulu
- Pandora/Spotify

... your stuff is reading you, too.

# AND NOW THEY THINK ITS CUTE



And social media?

That's the business model.

Watch everything you do and “monetize” it.

## Julie Cohen, “Copyright Management in Cyberspace”

*“A fundamental assumption underlying our discourse about the activities of reading, thinking, and speech is that individuals in our society are guaranteed the freedom to form their thoughts and opinions in privacy, free from intrusive oversight by governmental or private entities.”*

# How to harmonize this week and last week?

Consider the difference between

- The tech “breaking” vs.
- The tech working exactly as intended