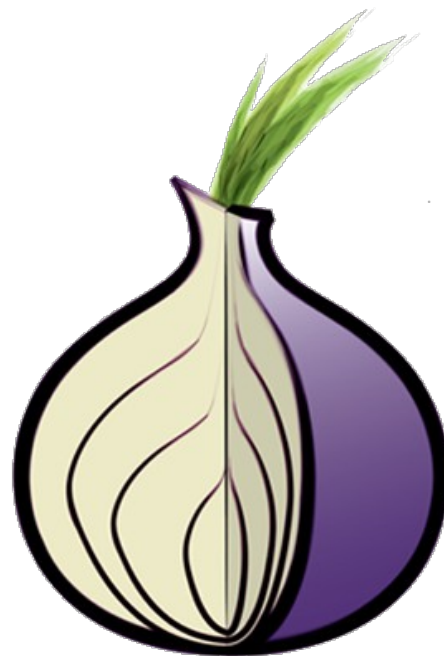# THE TOR PROJECT

ANONYMITY ONLINE

Erinn Clark
erinn@torproject.org
Codebits 2010

In the future everyone will be anonymous for 15 minutes
– Banksy

The Tor Project, Inc.

🧅 501(c)(3) non-profit dedicated to the research and development of tools for online anonymity and privacy

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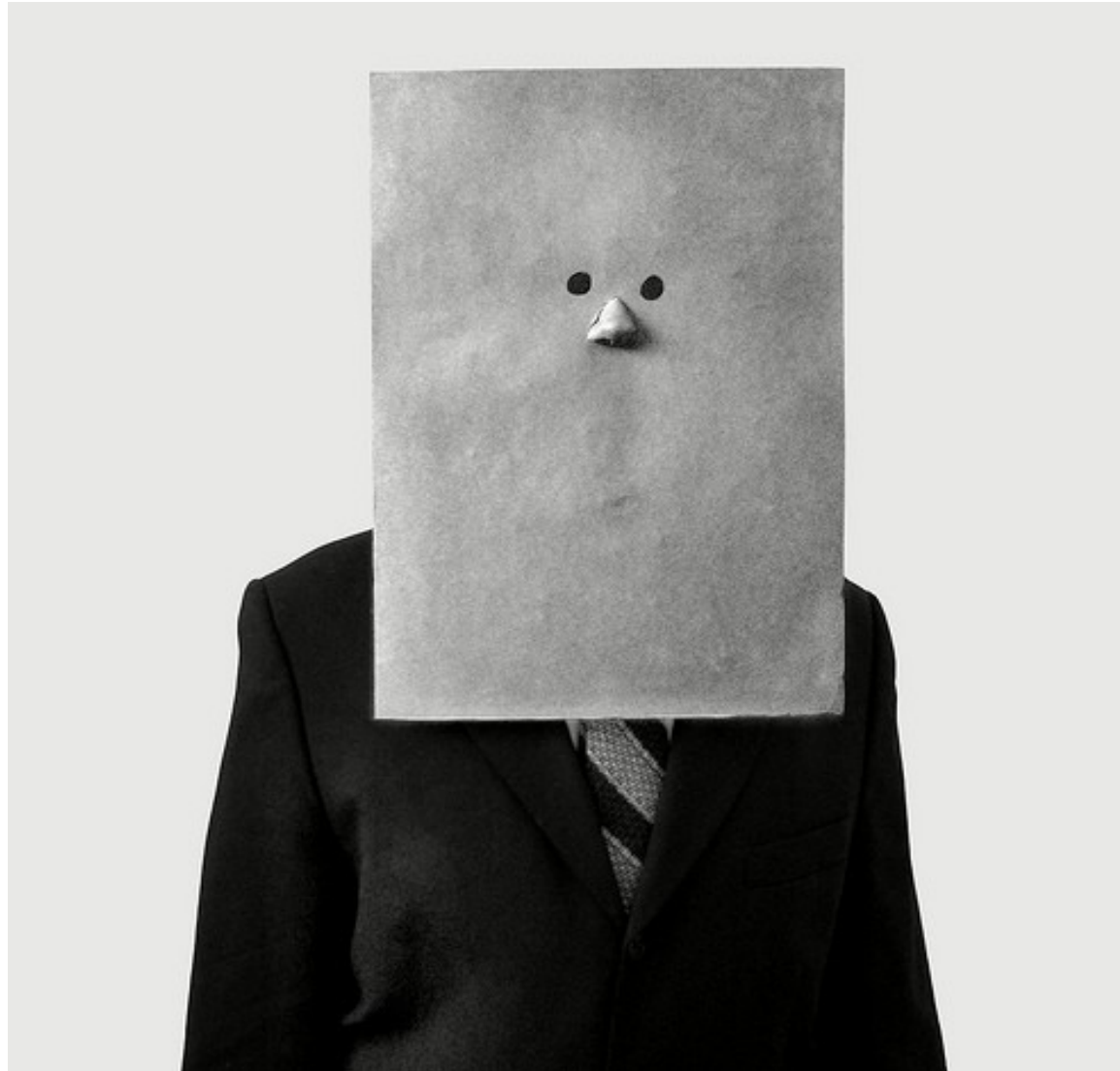
🧅 Dozens of volunteer developers

🧅 Between 7-15 paid developers at any given time

All personal life rested on secrecy, and possibly it was partly on that account that civilized man was so nervously anxious that personal privacy should be respected.
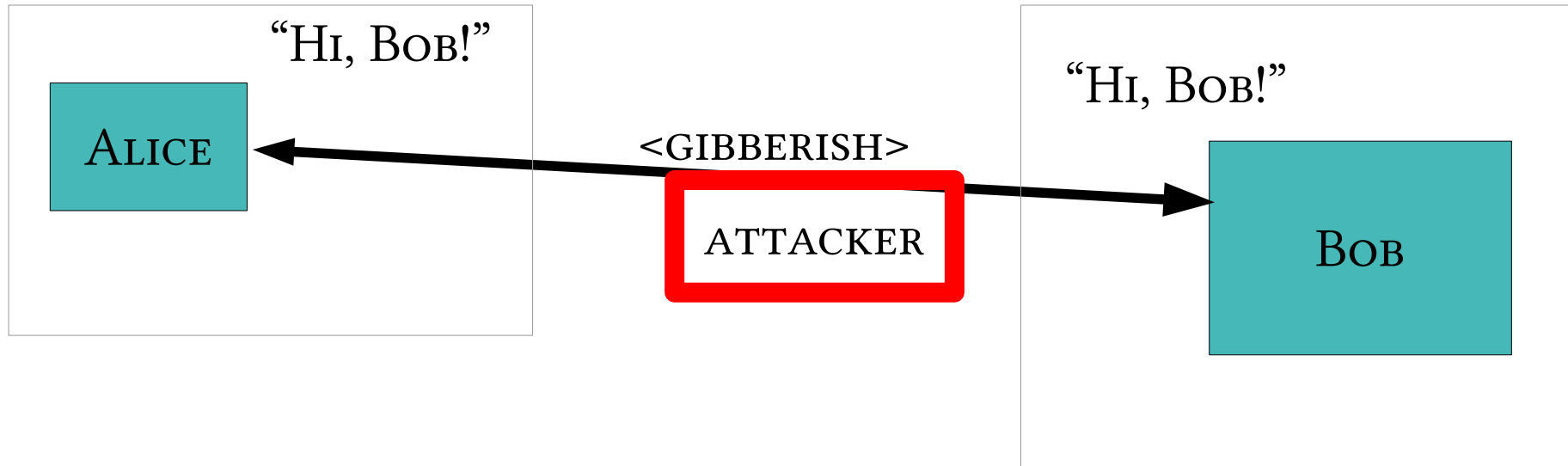
- Anton Chekhov

The Lady with the Little dog

WHAT IS ANONYMITY?

Anonymity isn't cryptography: Cryptography just protects contents

Anonymity isn't just wishful thinking...

"You can't prove it was me!"

"Promise you won't look!"

"Promise you won't remember!"

"Promise you won't tell!"

"I didn't write my name on it!"

"Isn't the Internet already anonymous?"

What is Tor?

🧄 Online anonymity: software, network, protocol

What is Tor?

- Online anonymity: software, network, protocol
- Free software

What is Tor?

- Online anonymity: software, network, protocol
- Free software
- Community of researchers, developers, and relay operators

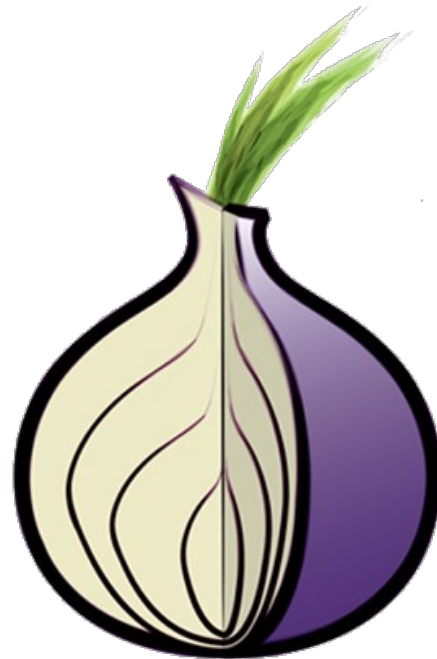# What is Tor?

- Online anonymity: software, network, protocol
- Free software
- Community of researchers, developers, and relay operators
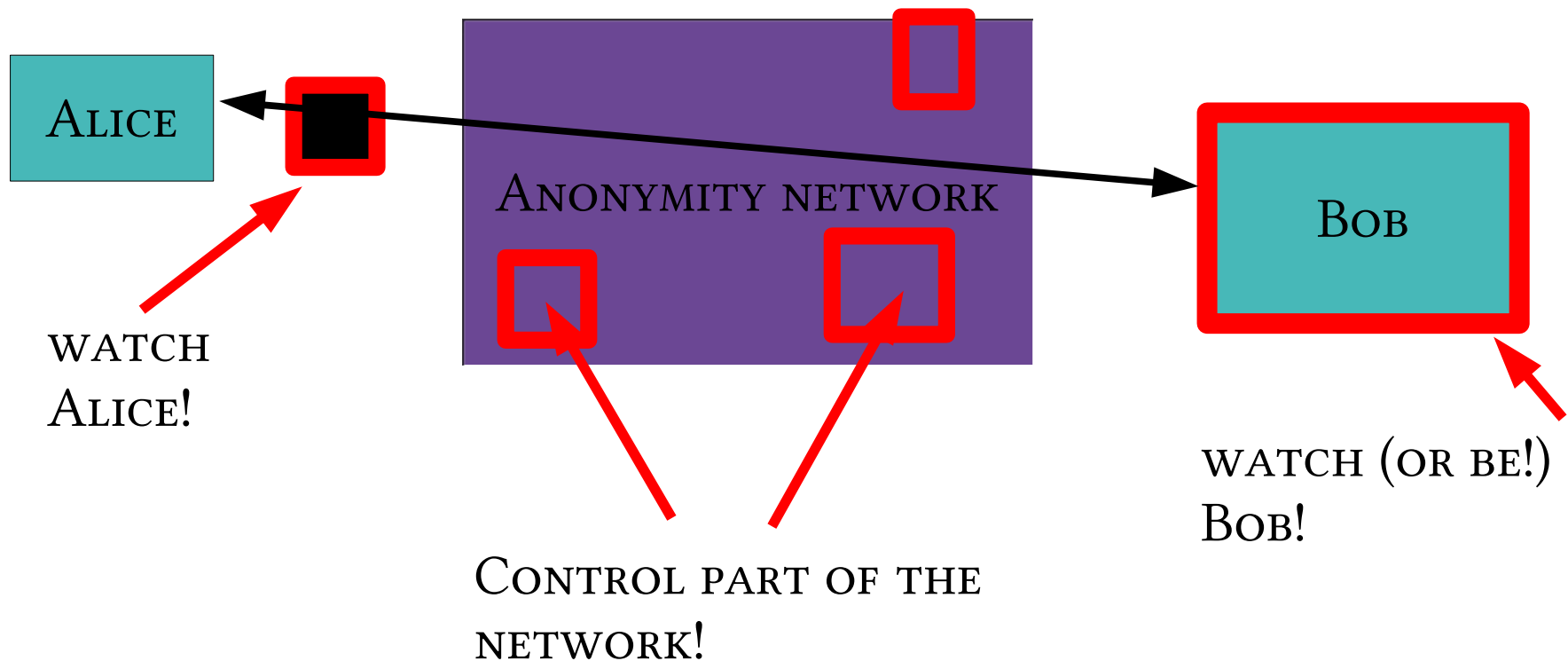- Funding from US DoD, EFF, Voice of America, Google, NLNet, Human Rights Watch, ...

Though he flick my shoulders with his whip
I will not tell him which way the fox ran
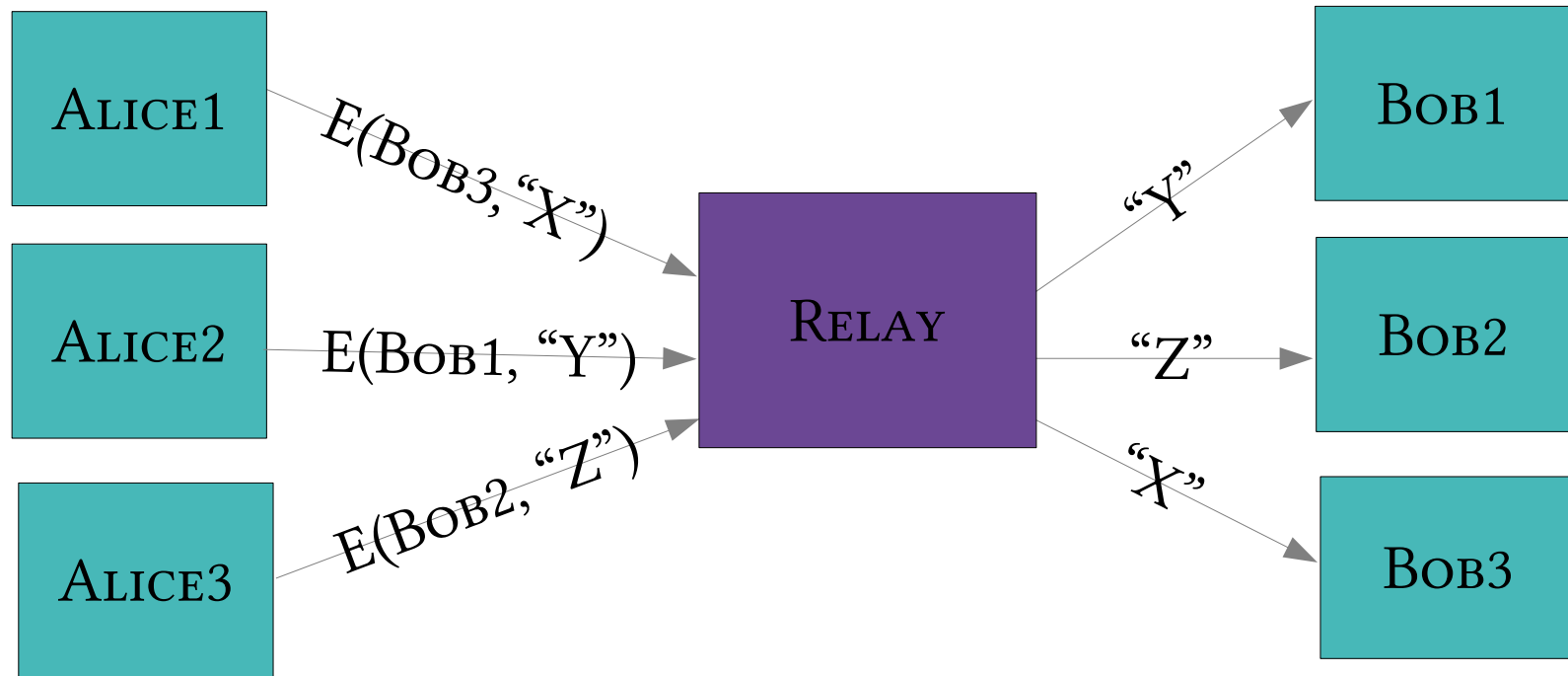   - Edna St. Vincent Millay

                    Conscientious Objector

THREAT MODEL: WHAT CAN THE ATTACKER DO?

ALICE

Anonymity network

BOB

WATCH ALICE!

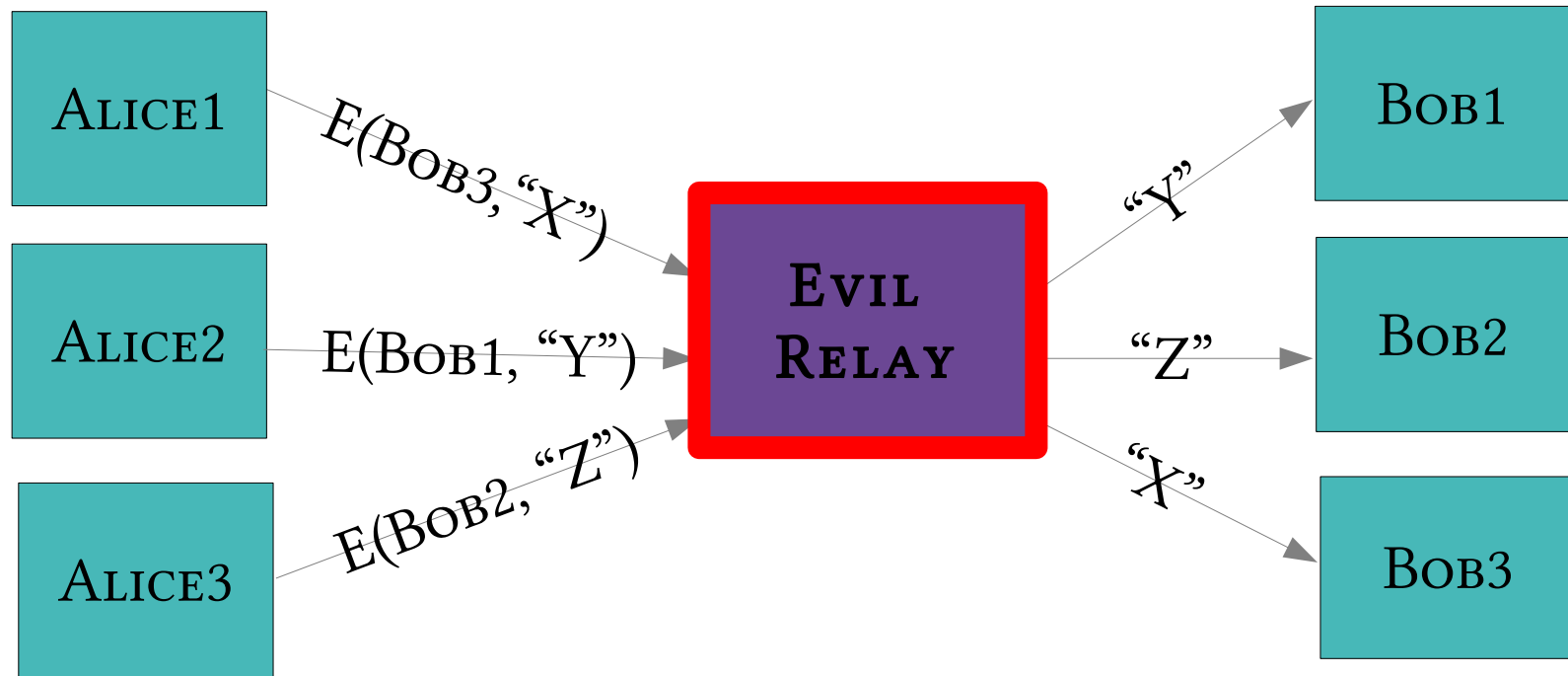CONTROL PART OF THE NETWORK!

WATCH (OR BE!) BOB!

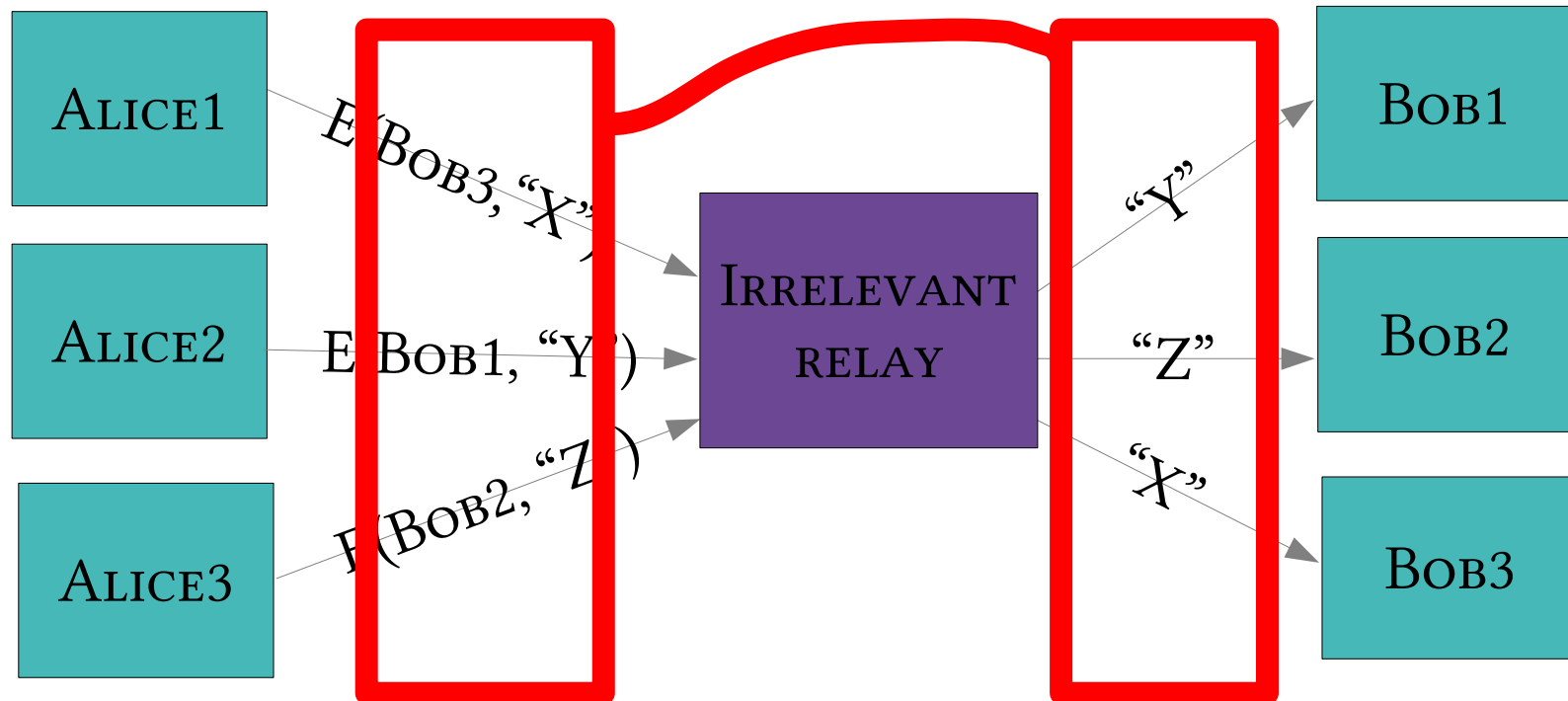# THE SIMPLEST DESIGNS USE A SINGLE RELAY TO HIDE CONNECTIONS

(EXAMPLE: SOME COMMERCIAL PROXY PROVIDERS)

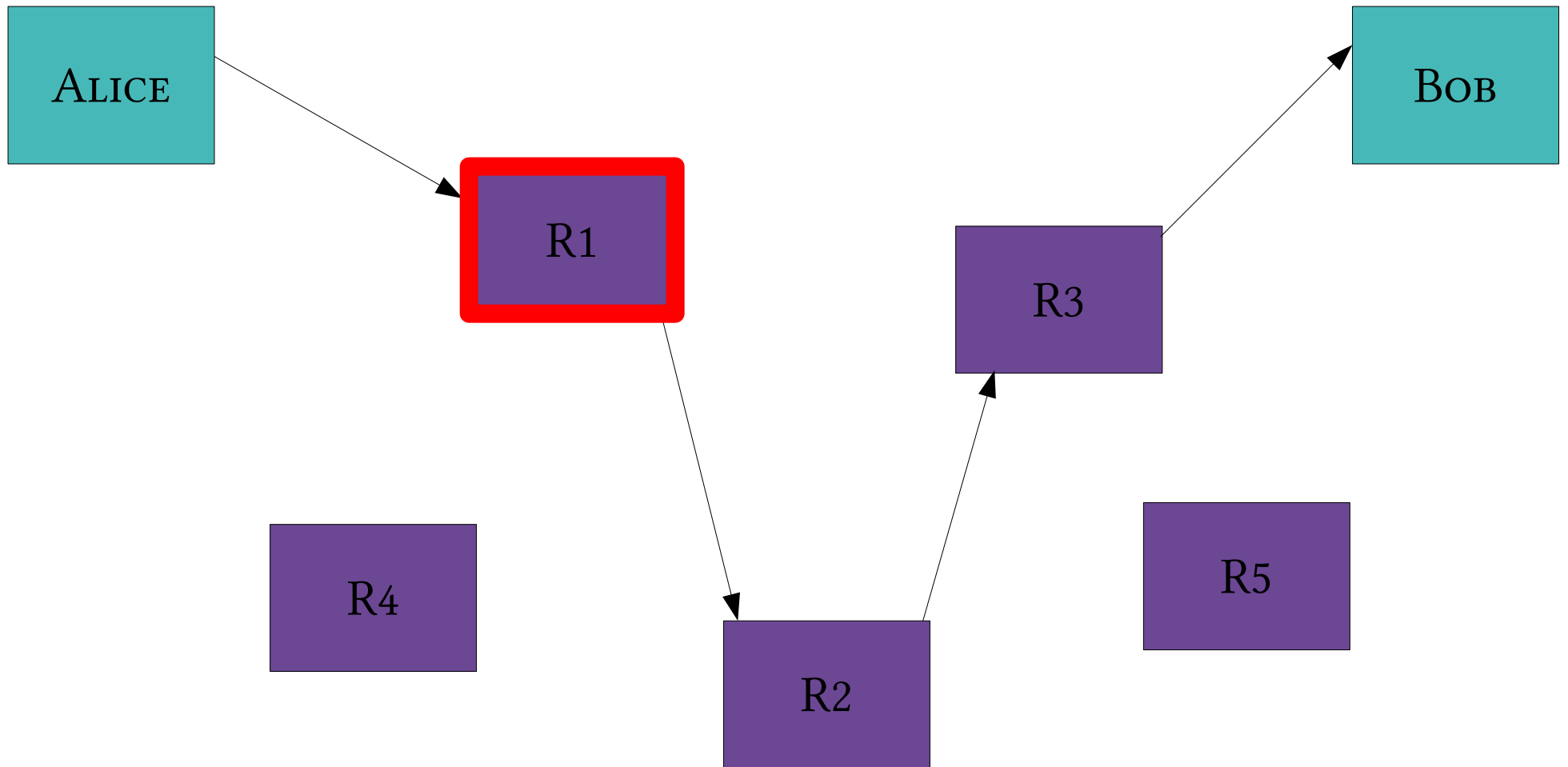# But a single relay (or eavesdropper!) is a single point of failure

... OR A SINGLE POINT OF BYPASS

Alice1

Alice2

Alice3

E(Bob3, "X")

E(Bob1, "Y")

E(Bob2, "Z")

Irrelevant relay
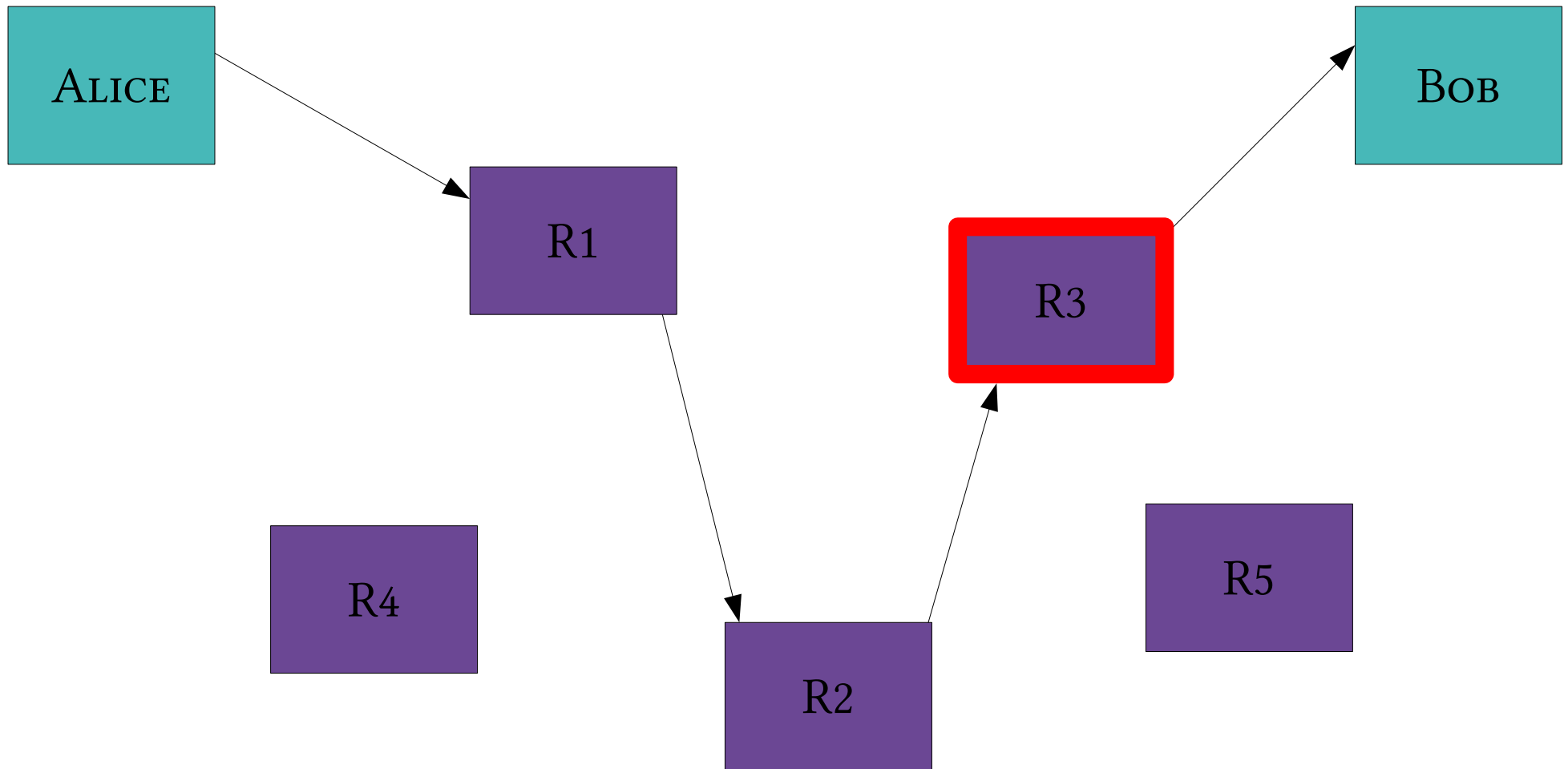
"Y"

"Z"

"X"

Bob1

Bob2

Bob3

SO, ADD MULTIPLE RELAYS SO THAT NO SINGLE ONE CAN BETRAY ALICE
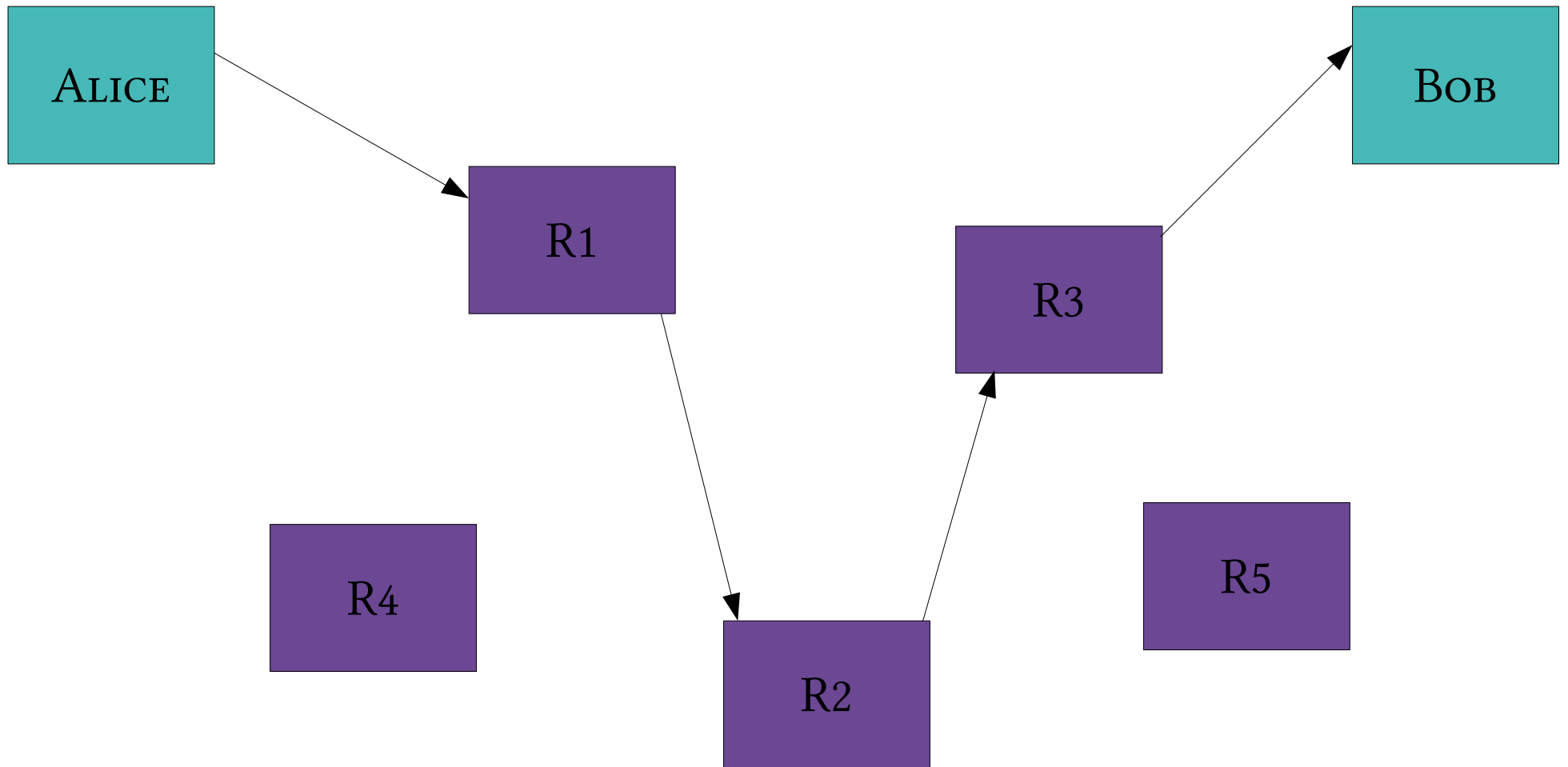
A corrupt first hop can tell that Alice is talking, but not to whom

A corrupt final hop can tell that somebody is talking to Bob, but not who

But the network layer is not the only problem

🧅 Browsers and plugins can de-anonymize you too

  🧅 Browsers are unique

  🧅 Plugins almost always ignore proxy settings

  🧅 Plaintext over Tor still plaintext

Torbutton

- Firefox extension (Chrome in-process)

- Enables/disables Tor use in the browser

- Disables plugins by default

WHO USES TOR AND WHY?

Who uses Tor and why?

- 🧅 Normal people
- 🧅 Law enforcement
- 🧅 Human rights activists
- 🧅 Business executives
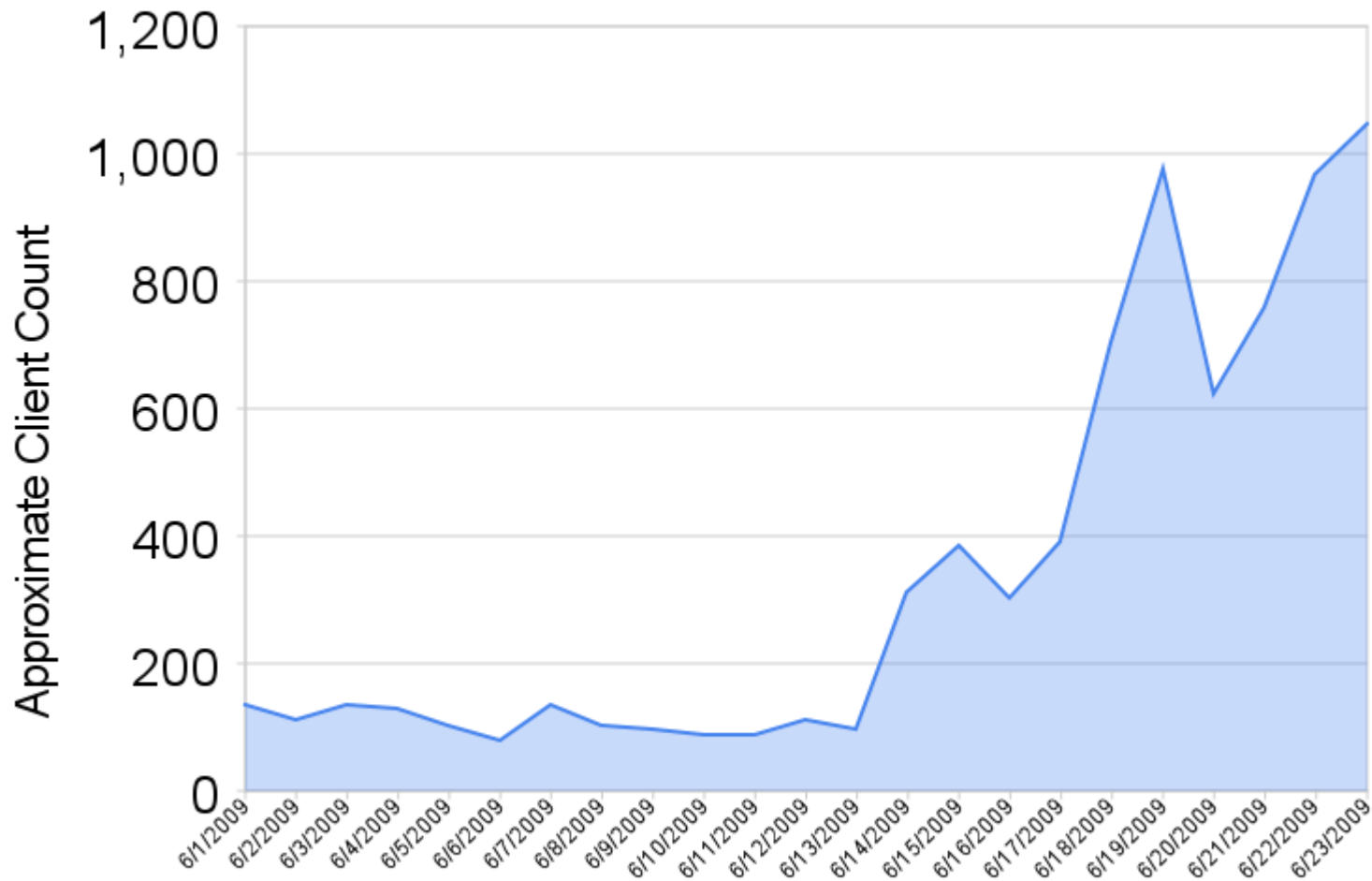- 🧅 Militaries
- 🧅 Abuse victims
- 🧅 Whistleblowers

Estimated 500,000 daily Tor users

TOR AND CIRCUMVENTION

New Tor Clients from Iranian IP Space

https://torproject.org/

TOR AND CIRCUMVENTION

Tor Clients from Iranian IP Space (port 443)

https://torproject.org/
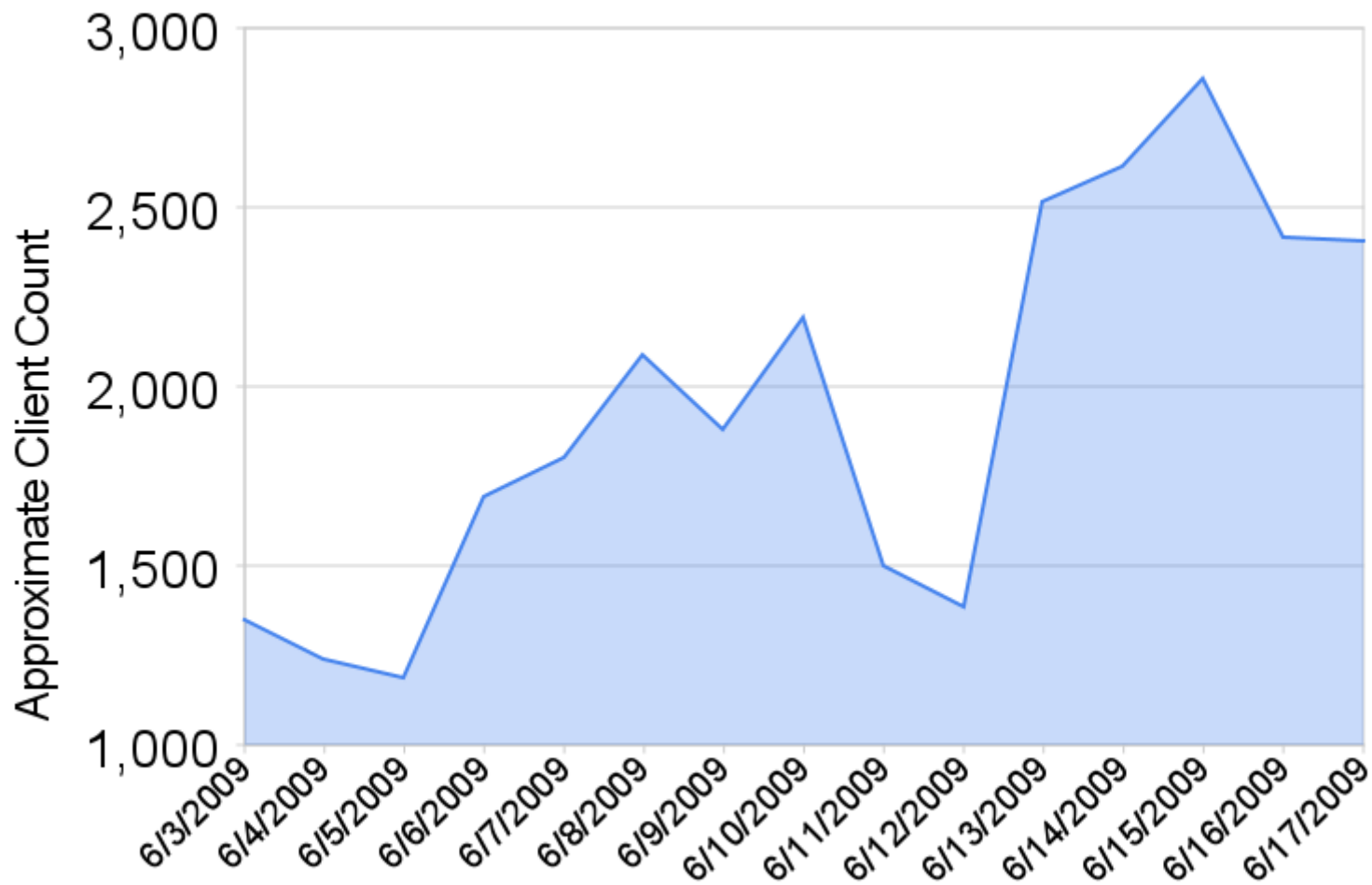
TOR AND CIRCUMVENTION

WHAT HAPPENED AROUND SEPTEMBER 25TH, 2009?

TOR AND CIRCUMVENTION

WHAT HAPPENED AROUND SEPTEMBER 25TH, 2009?

CHINA BLOCKED MOST OF THE TOR NETWORK IN ANTICIPATION OF THE CCP 60TH ANNIVERSARY
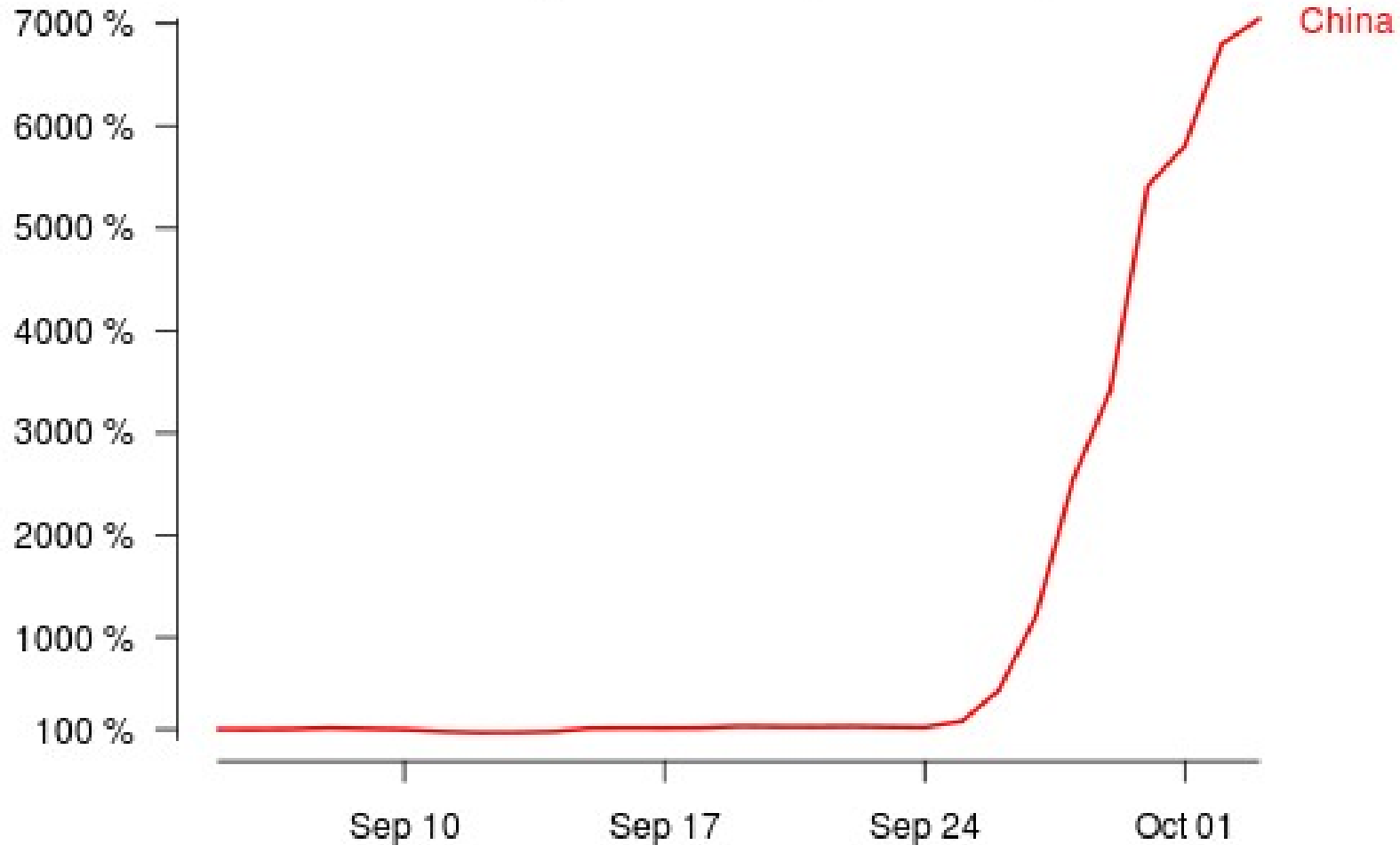
TOR AND CIRCUMVENTION

Number of directory requests to directory mirror trusted

https://torproject.org

TOR AND CIRCUMVENTION

Number of bridge users compared to September 6

China

https://torproject.org

WANT TO HELP?

- RUN A BRIDGE

- RUN A RELAY

- HELP US HACK ON STUFF!

MORE INFORMATION AT https://www.torproject.org/

CREDITS AND LINKS

🧅 IRVING PENN / STEINBERG IN NOSE MASK RECREATION: SUMMER LUU VIA FLICKR

HTTP://WWW.FLICKR.COM/PHOTOS/SUMMERLUU/2388805263/

🧅 "HOW UNIQUE IS YOUR BROWSER?"

HTTPS://PANOPTICLICK.EFF.ORG/BROWSER-UNIQUENESS.PDF

🧅 TOR METRICS PORTAL

HTTPS://METRICS.TORPROJECT.ORG/