



# The Tor Project

*Our mission is to be the global resource for technology, advocacy, research and education in the ongoing pursuit of freedom of speech, privacy rights online, and censorship circumvention.*





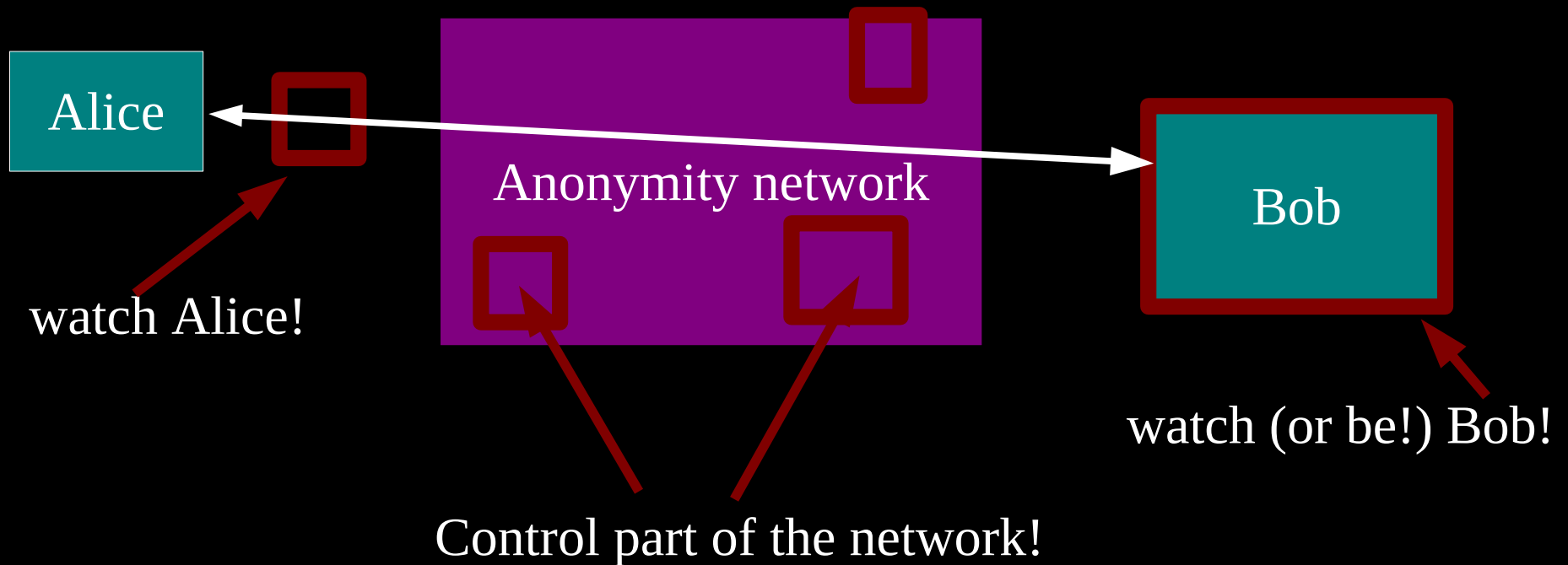
- Online Anonymity
  - Open Source
  - Open Network
- Community of researchers, developers, users and relay operators.
- U.S. 501(c)(3) non-profit organization



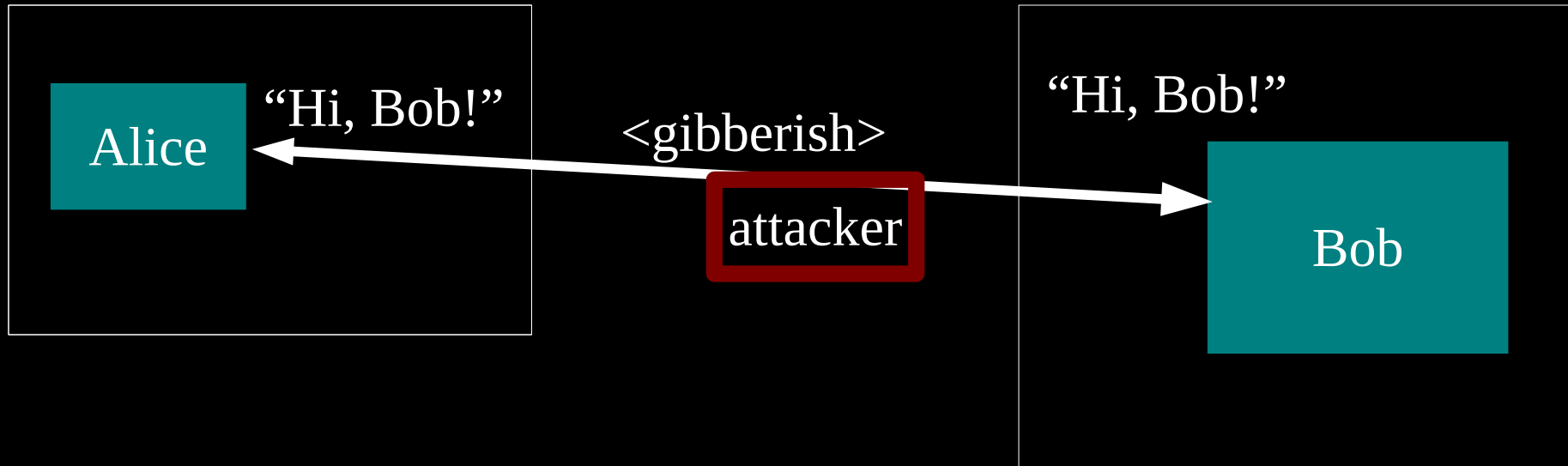
A photograph of a large, empty stadium with rows of blue seats. The seats are arranged in a semi-circular pattern, and the stadium is completely devoid of people. The lighting is bright, suggesting daytime.

Estimated 2,000,000 to 8,000,000  
daily Tor users

# Threat model: what can the attacker do?



# Anonymity isn't encryption: Encryption just protects contents.





# Metadata

*Data* about data

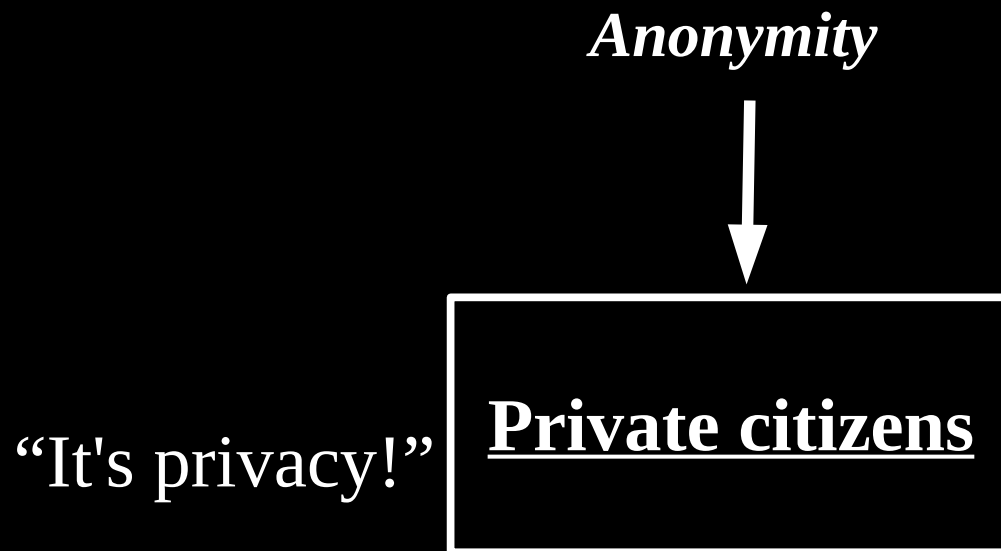
“Metadata was traditionally in the card catalogs of libraries”

– Wikipedia

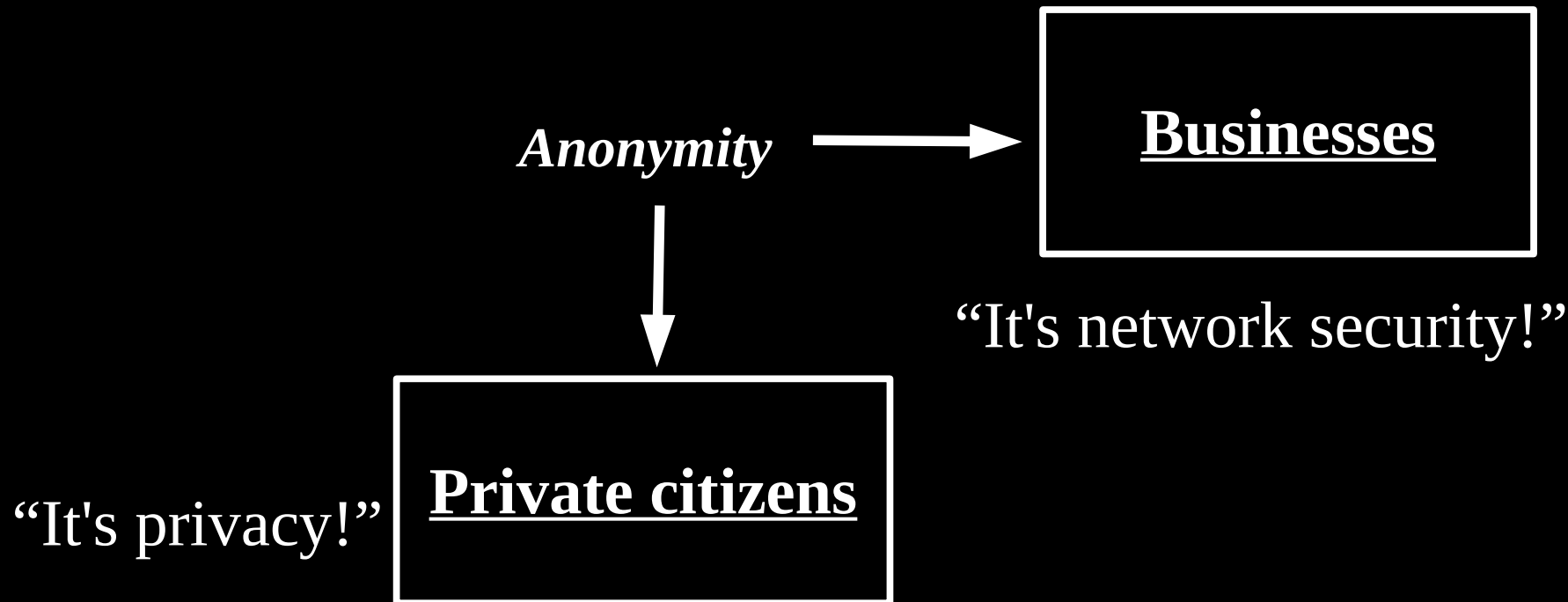


“We kill people based on metadata”

# Anonymity serves different interests for different user groups.



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# Anonymity serves different interests for different user groups.

“It's traffic-analysis resistance!”



*Anonymity*

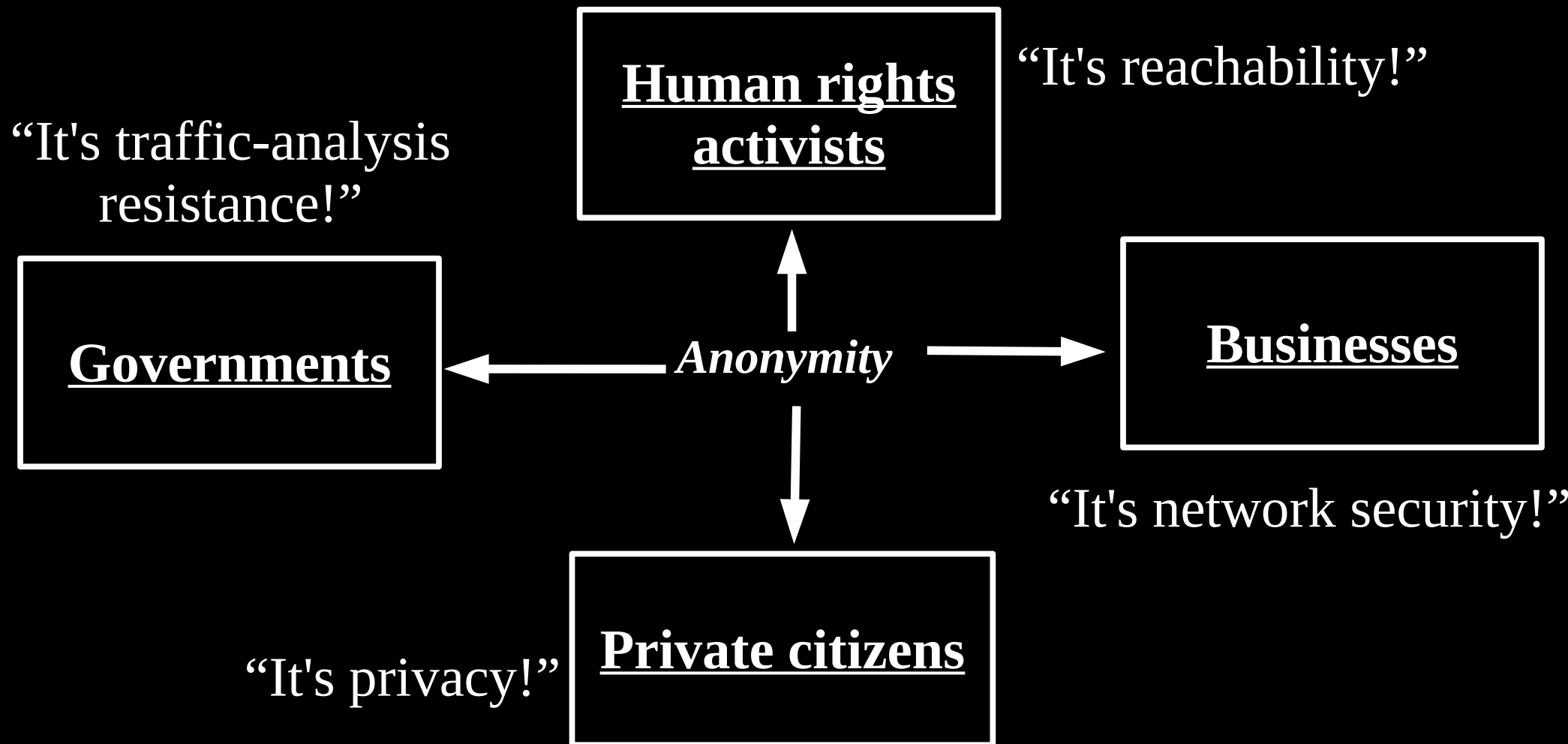


“It's network security!”

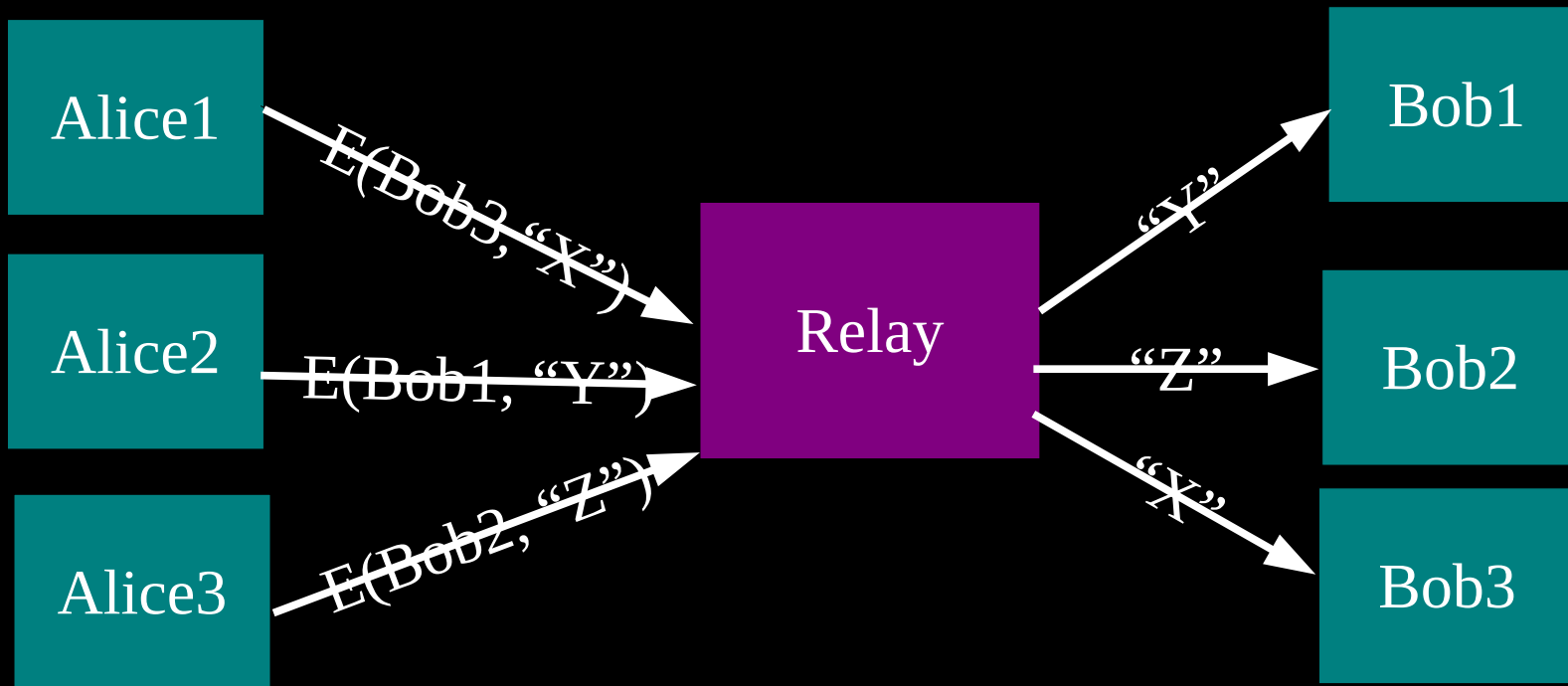
“It's privacy!”



# Anonymity serves different interests for different user groups.



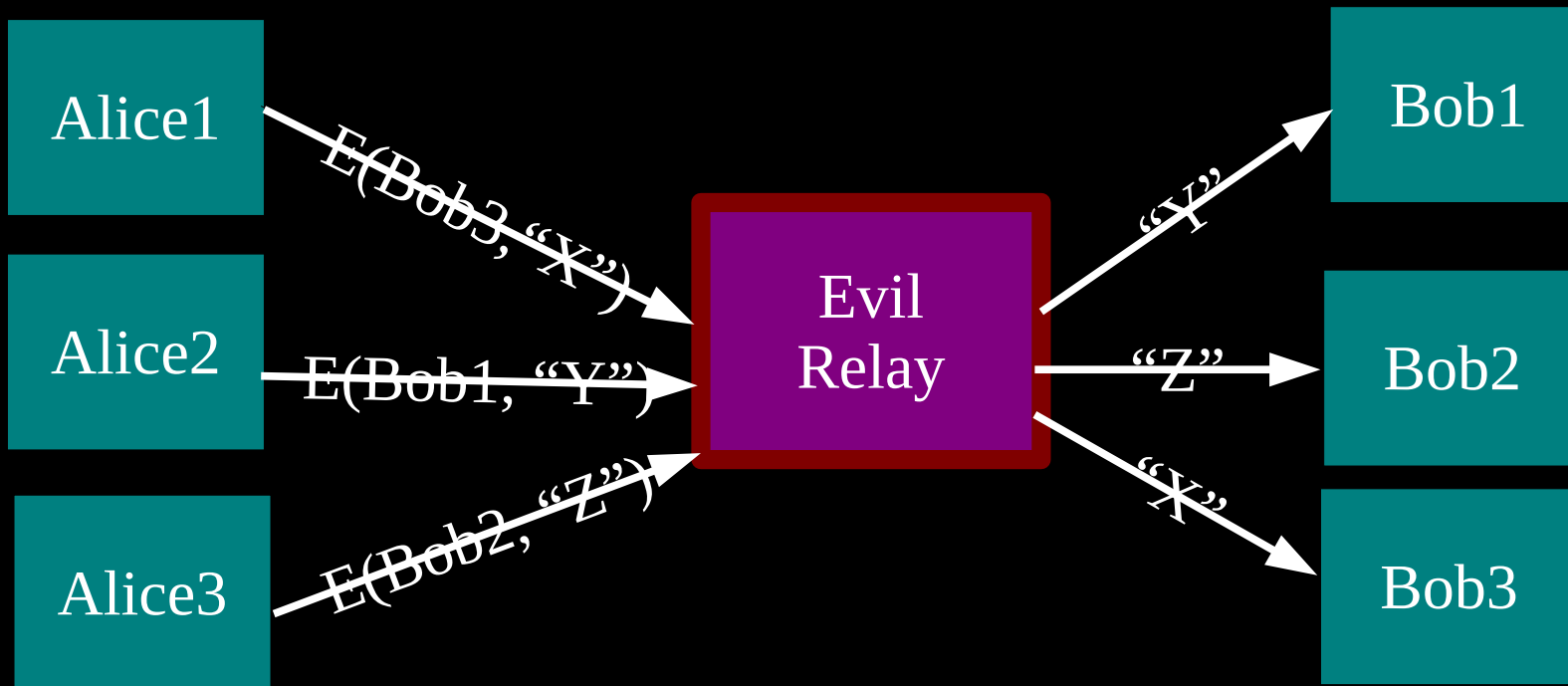
# The simplest designs use a single relay to hide connections.



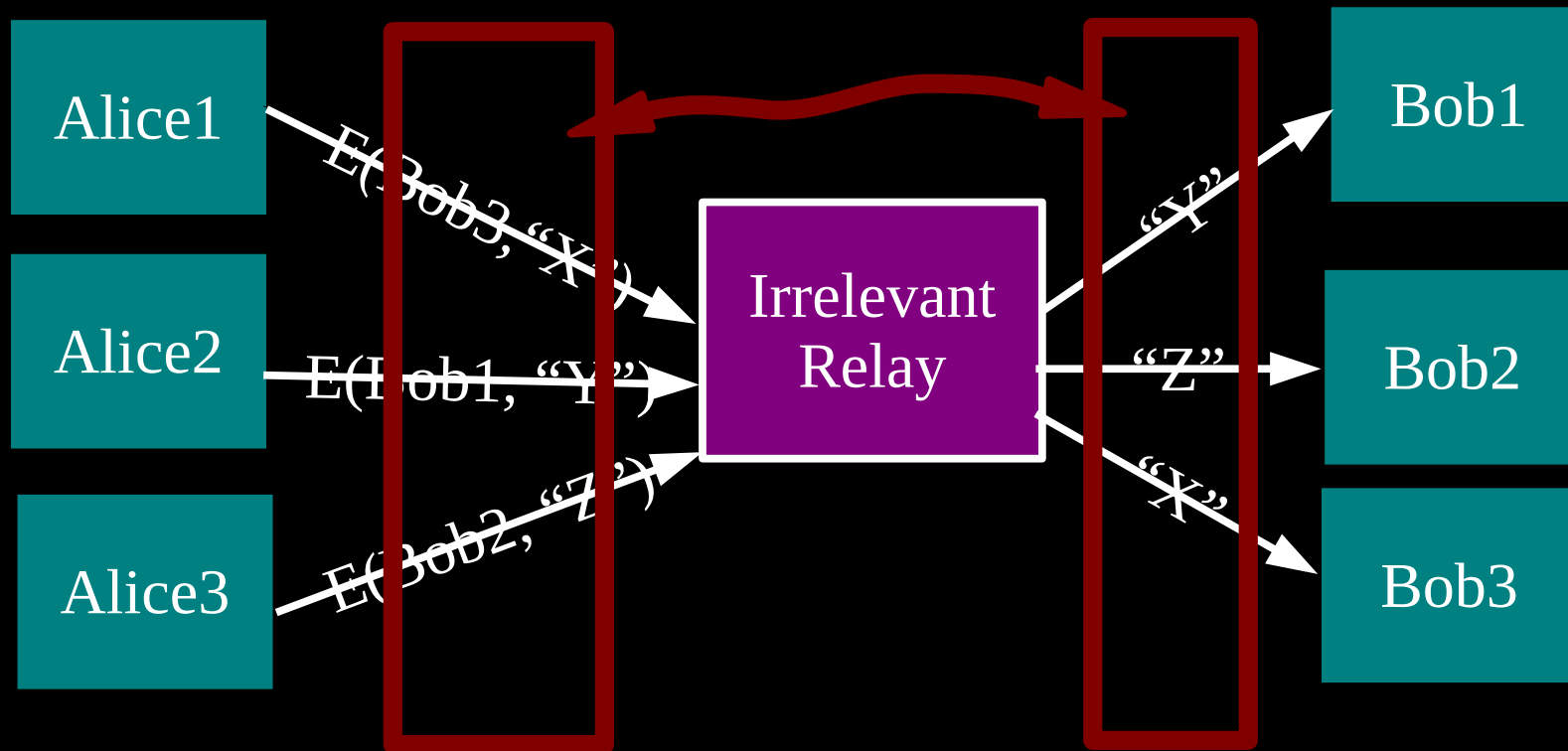
(example: some commercial proxy providers)



**But a central relay is  
a single point of failure.**

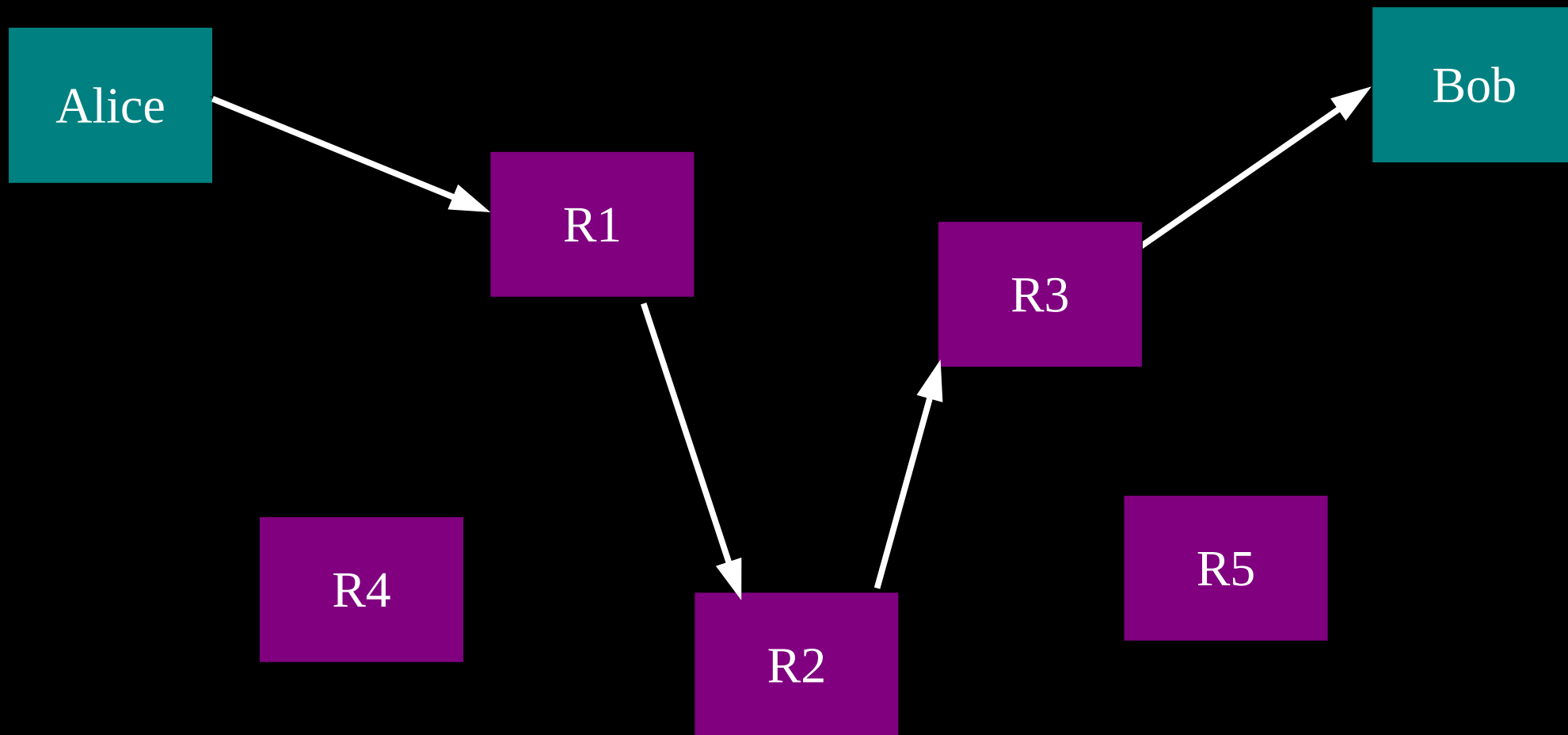


**... or a single point of bypass.**



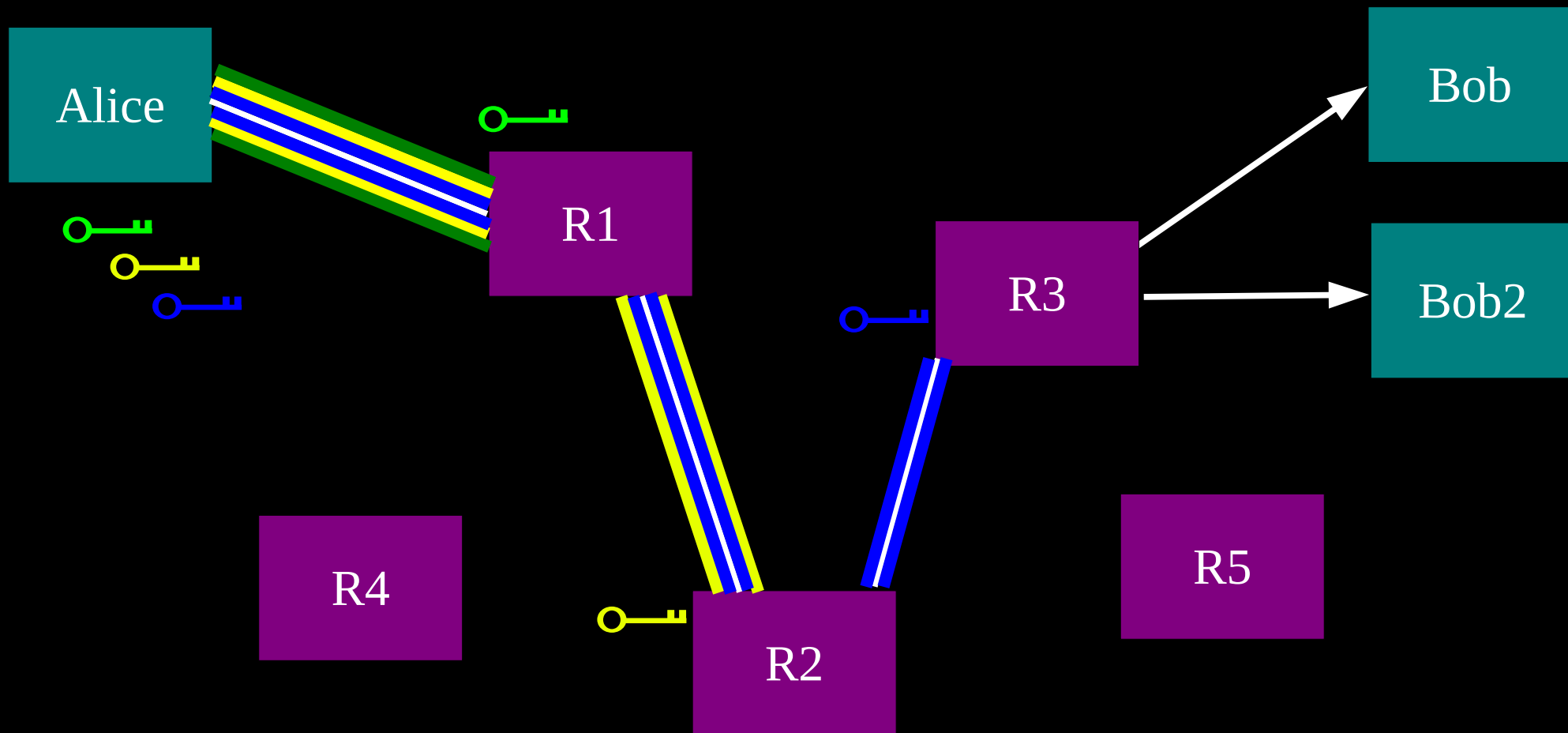
Timing analysis bridges all connections through relay  $\Rightarrow$  An attractive fat target

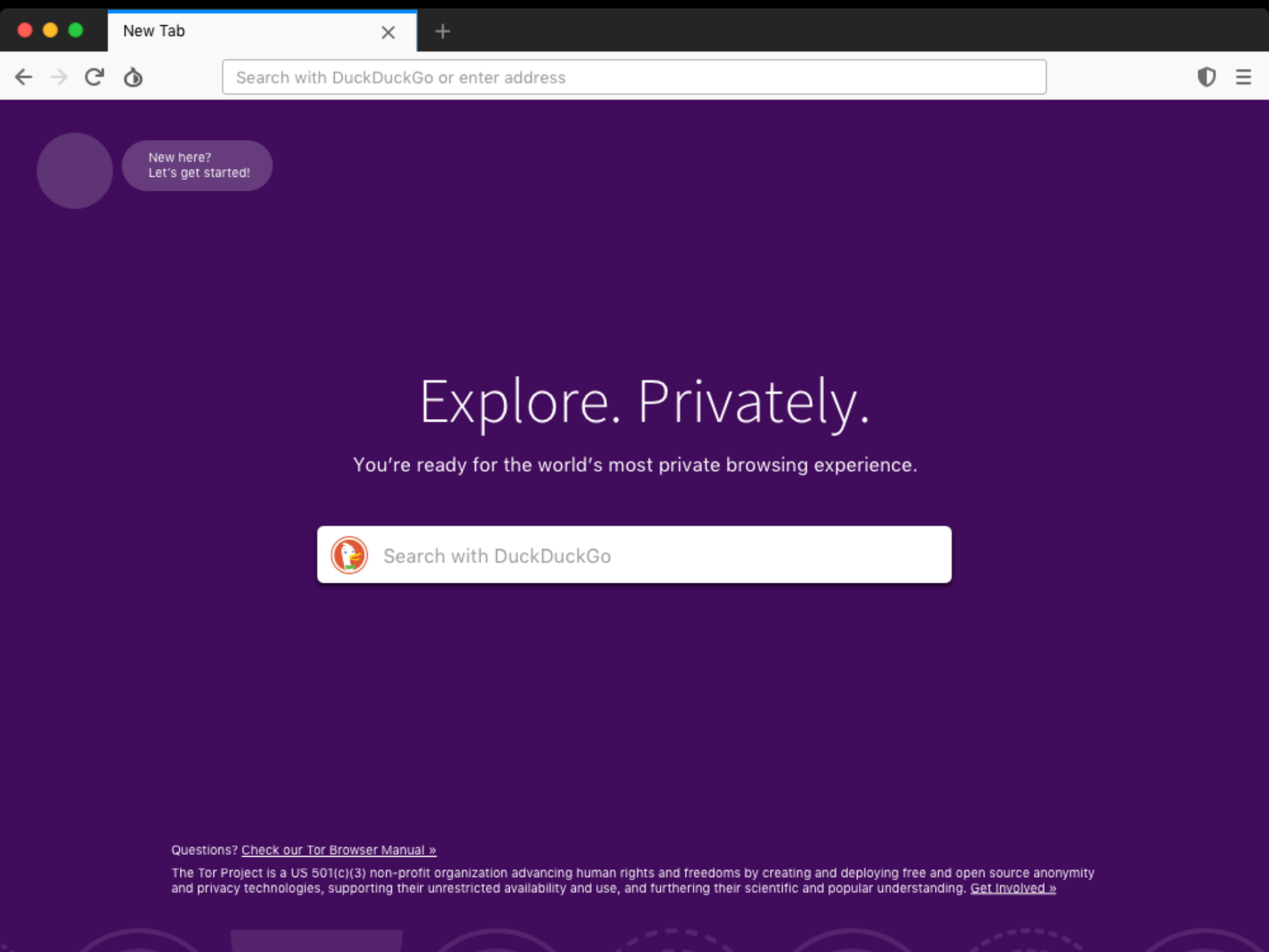
**So, add multiple relays so that no single one can betray Alice.**





**Alice makes a session key with R1  
...And then tunnels to R2...and to R3**





New here?  
Let's get started!

# Explore. Privately.

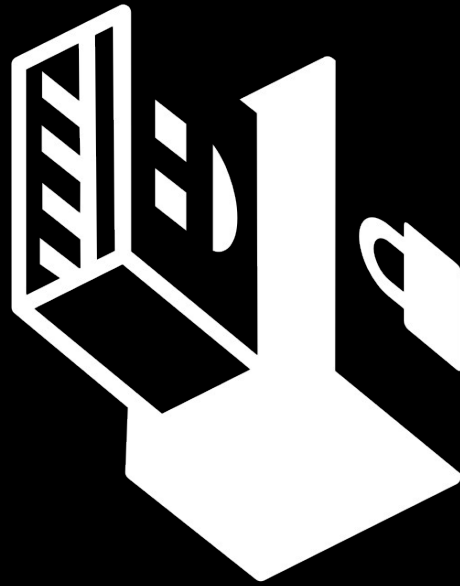
You're ready for the world's most private browsing experience.



Search with DuckDuckGo

Questions? [Check our Tor Browser Manual »](#)

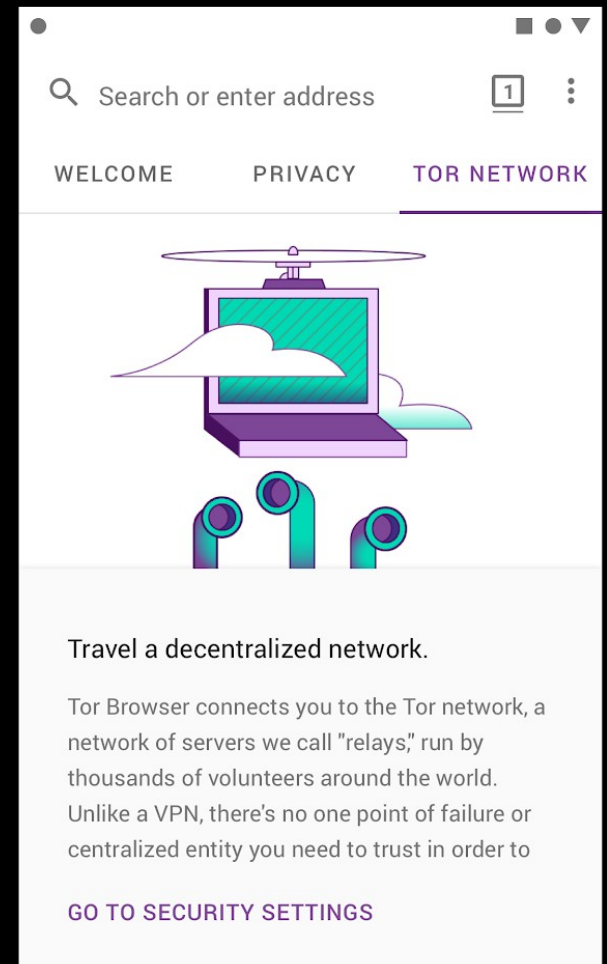
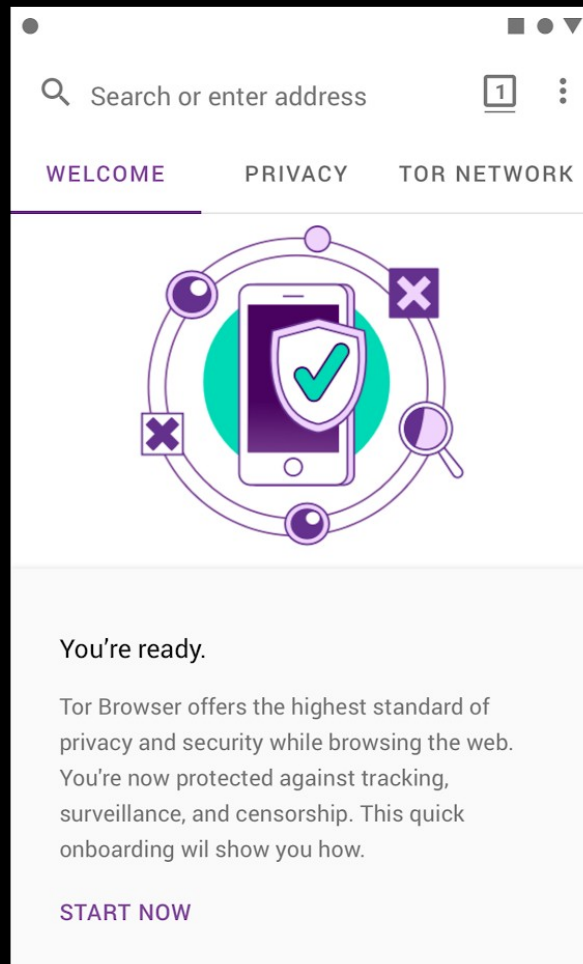
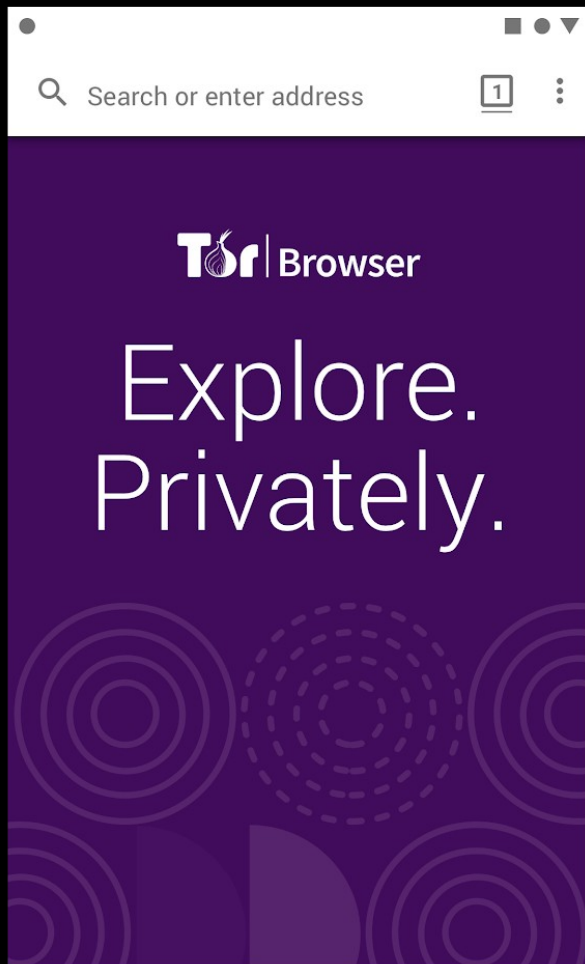
The Tor Project is a US 501(c)(3) non-profit organization advancing human rights and freedoms by creating and deploying free and open source anonymity and privacy technologies, supporting their unrestricted availability and use, and furthering their scientific and popular understanding. [Get Involved »](#)



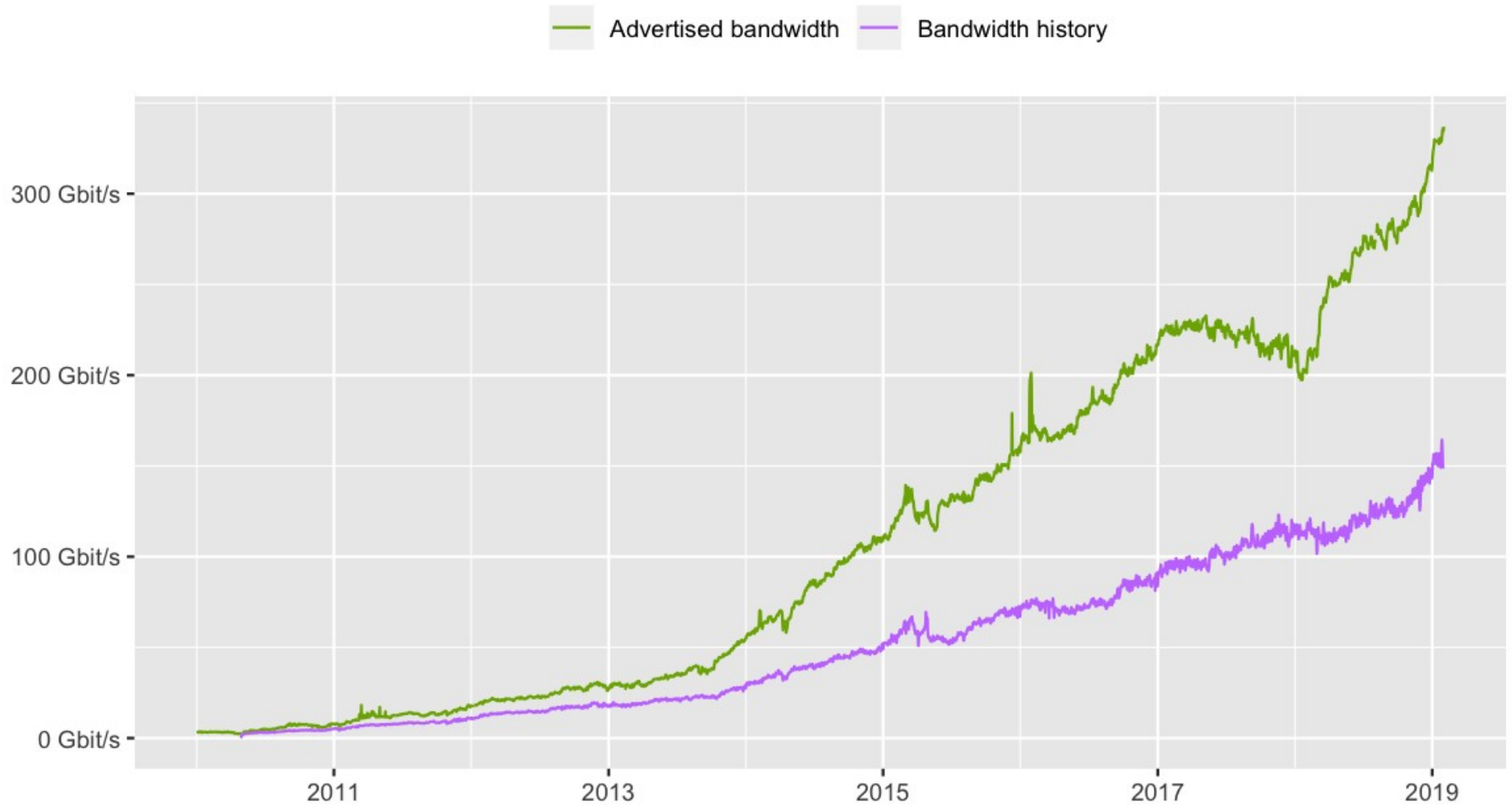
# Tails

the **amnesic** incognito **live** system





## Total relay bandwidth



The Tor Project - <https://metrics.torproject.org/>

# **Tor's safety comes from diversity**

- #1: Diversity of relays. The more relays we have and the more diverse they are, the fewer attackers are in a position to do traffic confirmation. (Research problem: measuring diversity over time)
- #2: Diversity of users and reasons to use it. 50000 users in Iran means almost all of them are normal citizens.

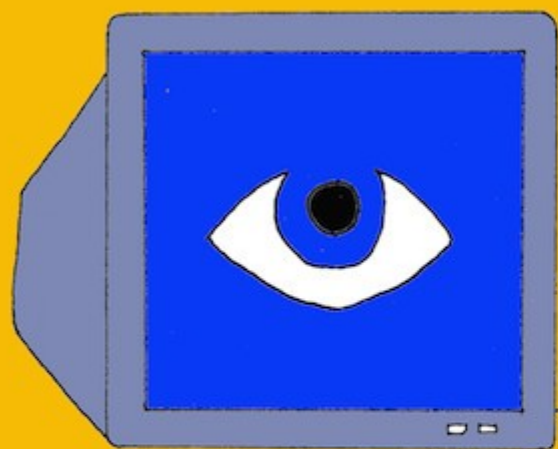
# Transparency for Tor is key

- Open source / free software
- Public design documents and specifications
- Publicly identified developers
- Not a contradiction:  
privacy is about choice!

## **But what about bad people?**

- Remember the millions of daily users.
- Still a two-edged sword?
- Good people need Tor much more than bad guys need it.





# Library Freedom Project



# خطراً!



## تصفح بأمان!

عذراً، هذا الموقع غير متاح في دولة الإمارات العربية المتحدة.

تشكل شبكة الإنترنت وسيلة للتواصل والمعرفة وخدمة متطلبات حياتنا اليومية. وقد تم حجب الموقع الذي ترغب بدخوله لاشتماله محتوى مدرج تحت "فئات المحتويات المخظورة" حسب تصنيف "السياسة التنظيمية لإدارة النفاذ للإنترنت" لهيئة تنظيم الاتصالات بدولة الإمارات العربية المتحدة.

إذا كانت لديك وجهة نظر مختلفة، الرجاء انقر هنا.

## Surf Safely!

This website is not accessible in the UAE.

The Internet is a powerful medium for communication, sharing and serving our daily learning needs. However, the site you are trying to access contains content that is prohibited under the "Internet Access Management Regulatory Policy" of the Telecommunications Regulatory Authority of the United Arab Emirates.

If you believe the website you are trying to access does not contain any such content, please [click here](#).

© 2004 Lernberg IT LLC.

Your request was denied because of its content.



على اللوائح والقوانين  
مع [unblock.kw@kw.zain](mailto:unblock.kw@kw.zain)

# يالله بالسستر...!



ببابة المتحدة.

وخدمة متطلبات  
بدخوله لاشتماله  
ة" حسب تصنيف  
ة تنظيم الاتصالات

## Surf Safe

This website is

The Internet is a powerful medium for communication, sharing and serving our daily learning needs. However, the site you are trying to access contains content that is prohibited under the "Internet Access Management Regulatory Policy" of the Telecommunications Regulatory Authority of the United Arab Emirates.

<http://torproject.org/>

<http://torproject.org/>

## Notice...

تم حظر هذا الموقع بسبب احتوائه على محتويات تتعارض مع قوانين السلطنة. عليه يرجى تعبئة الاستمارة أدناه إذا كنت تعتقد بأن الموقع لا يتضمن أي من هذه المحتويات.

This site has been blocked due to content that is contrary to the laws of the Sultanate. If you believe that the website you are trying to access does not contain any such content, please fill in and submit the form below:

WebSite\*

<http://www.torproject.org/>

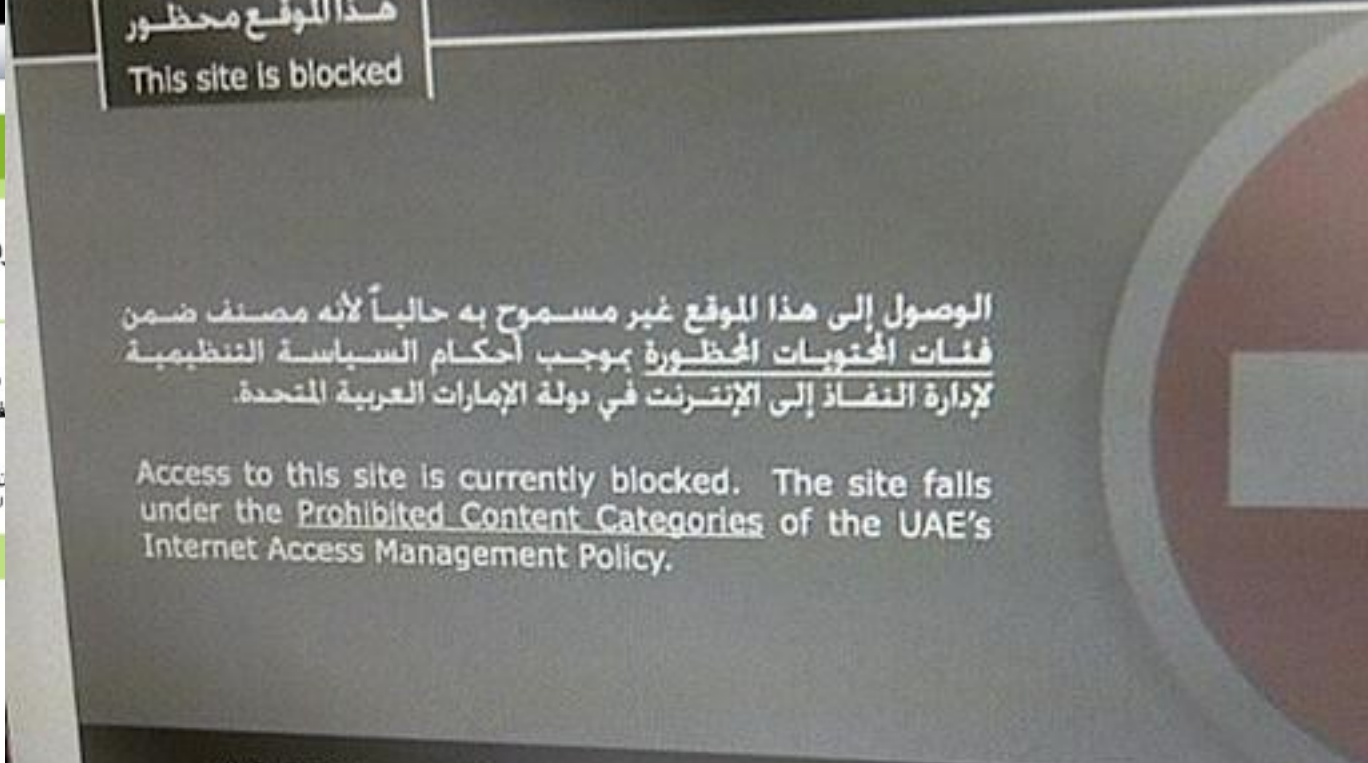
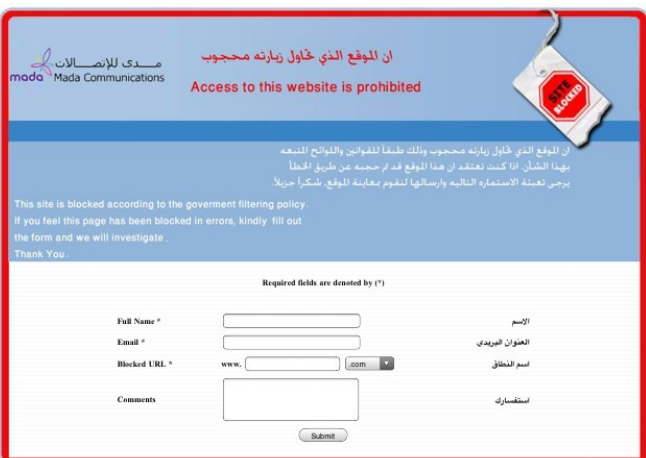
Email Address\*

Comments\*

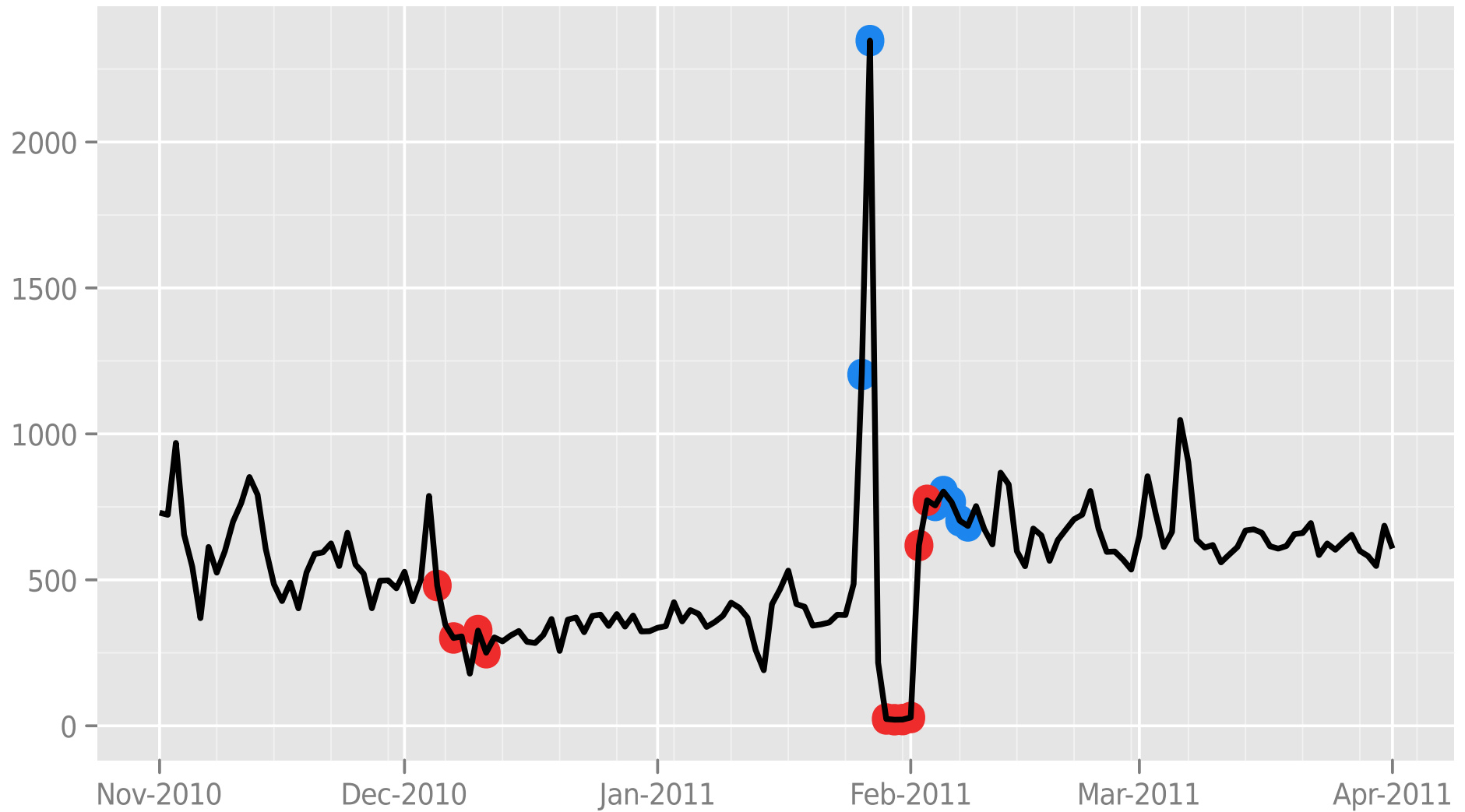
غير متاح.

يحي أن لا تُحجب

المملكة العربية  
[www.internet.gov](http://www.internet.gov)

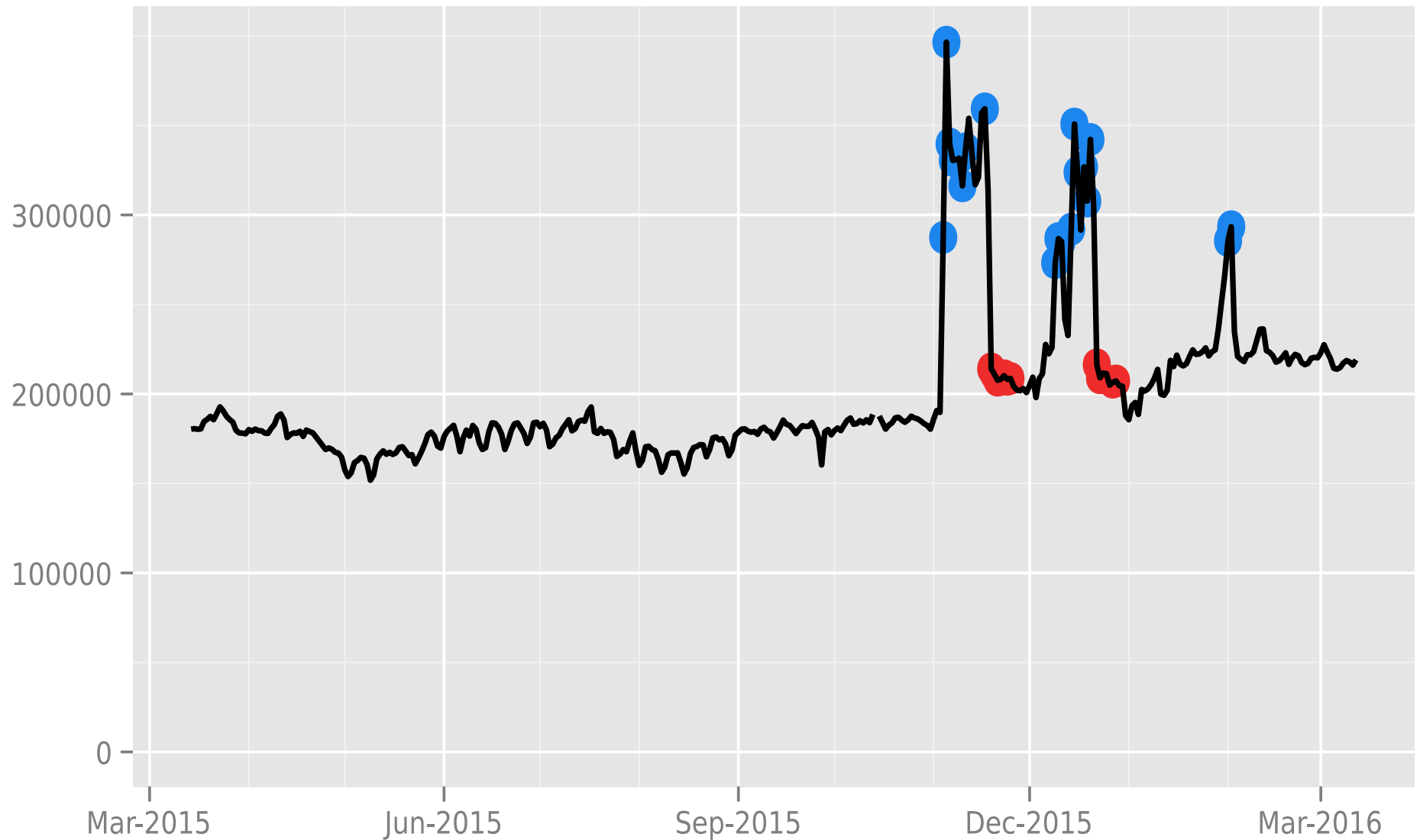


## Directly connecting users from Egypt

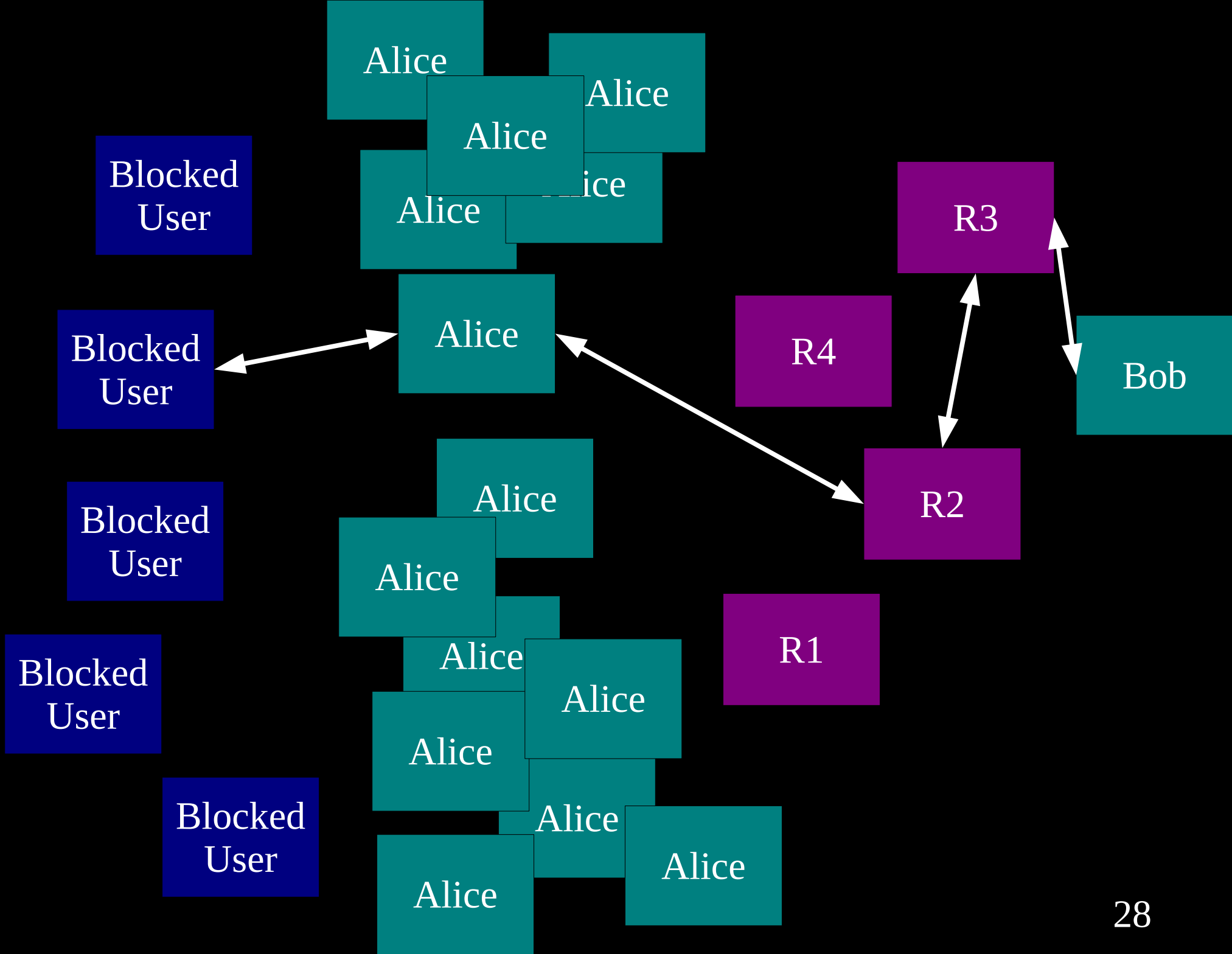


The Tor Project - <https://metrics.torproject.org/>

## Directly connecting users from Russia

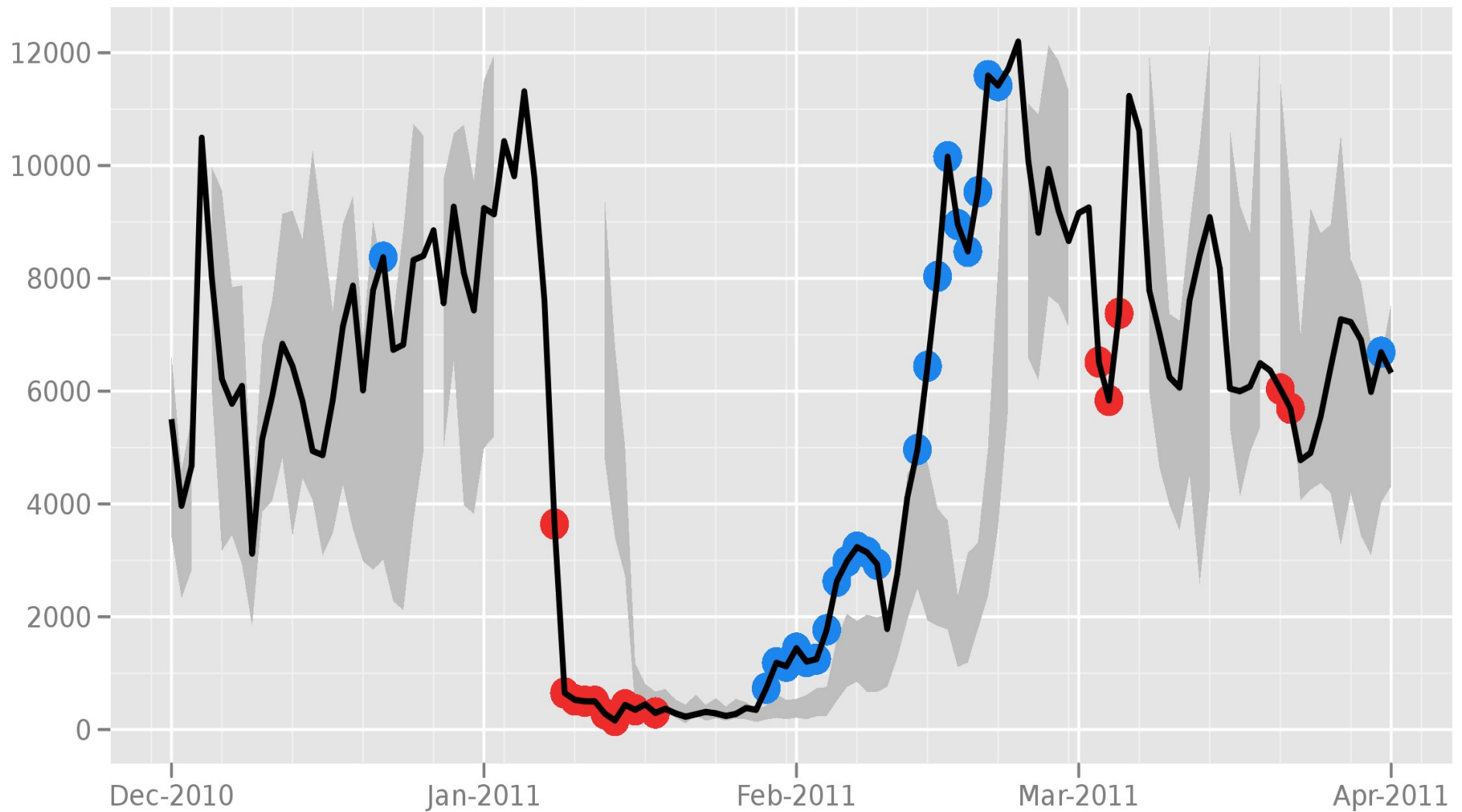


The Tor Project - <https://metrics.torproject.org/>



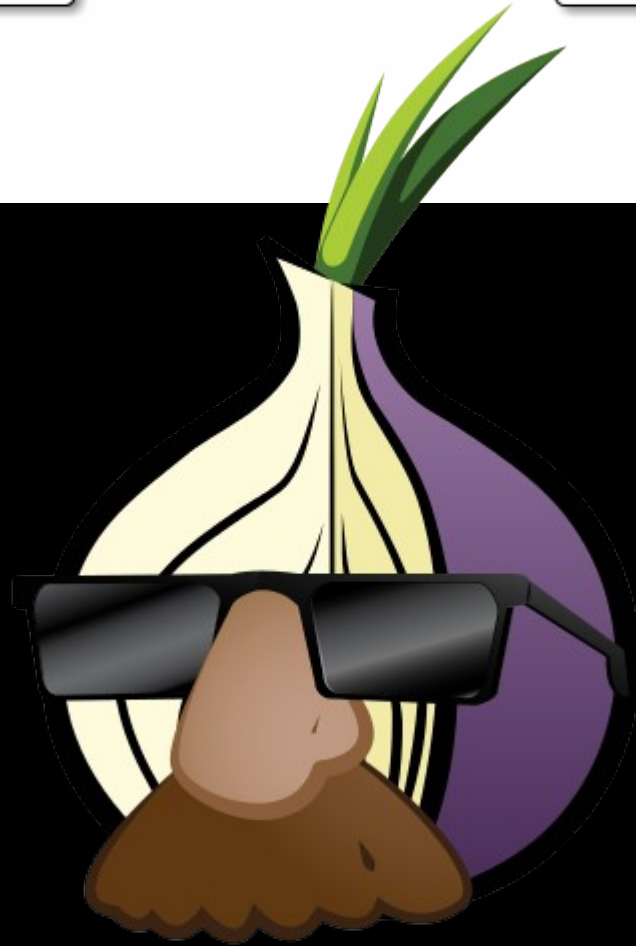
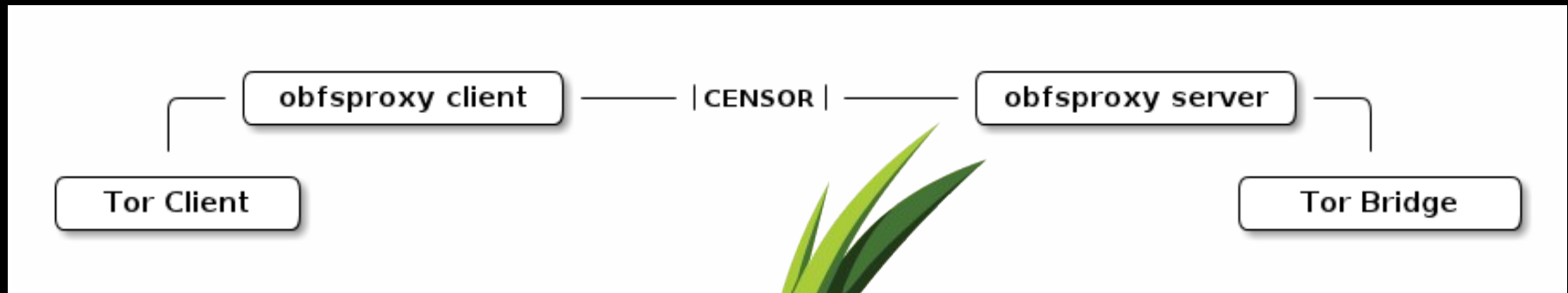


## Directly connecting users from the Islamic Republic of Iran



The Tor Project - <https://metrics.torproject.org/>

# Pluggable transports



# Pluggable transports

- Flashproxy (Stanford), websocket
- FTEProxy (Portland St), http via regex
- Stegotorus (SRI/CMU), http
- Skypemorph (Waterloo), Skype video
- uProxy (Google), webrtc
- ScrambleSuit (Karlstad), obfs-based
- Telex (Michigan/Waterloo), traffic divert

A line of diverse people, including men and women of various ages and ethnicities, stands in a row, facing forward. They are positioned in the foreground, with their arms crossed or hands on hips. Behind them, a vast crowd of people fills a valley, stretching towards a range of mountains in the distance. The sky is overcast and grey. The overall tone is serious and authoritative.

MESS WITH ONE OF US.  
MESS WITH ALL OF US.

Supporting totalitarian regimes is our business.  
Sleep safe Assad, Blue Coat is here.

Blue  Coat



I CAN HAZ  
FREEDOM?











# Stinks <sub>(U)</sub>

[REDACTED]  
CT SIGDEV  
[REDACTED]

JUN 2012

Derived From: [REDACTED]  
Dated: [REDACTED]  
On: [REDACTED]





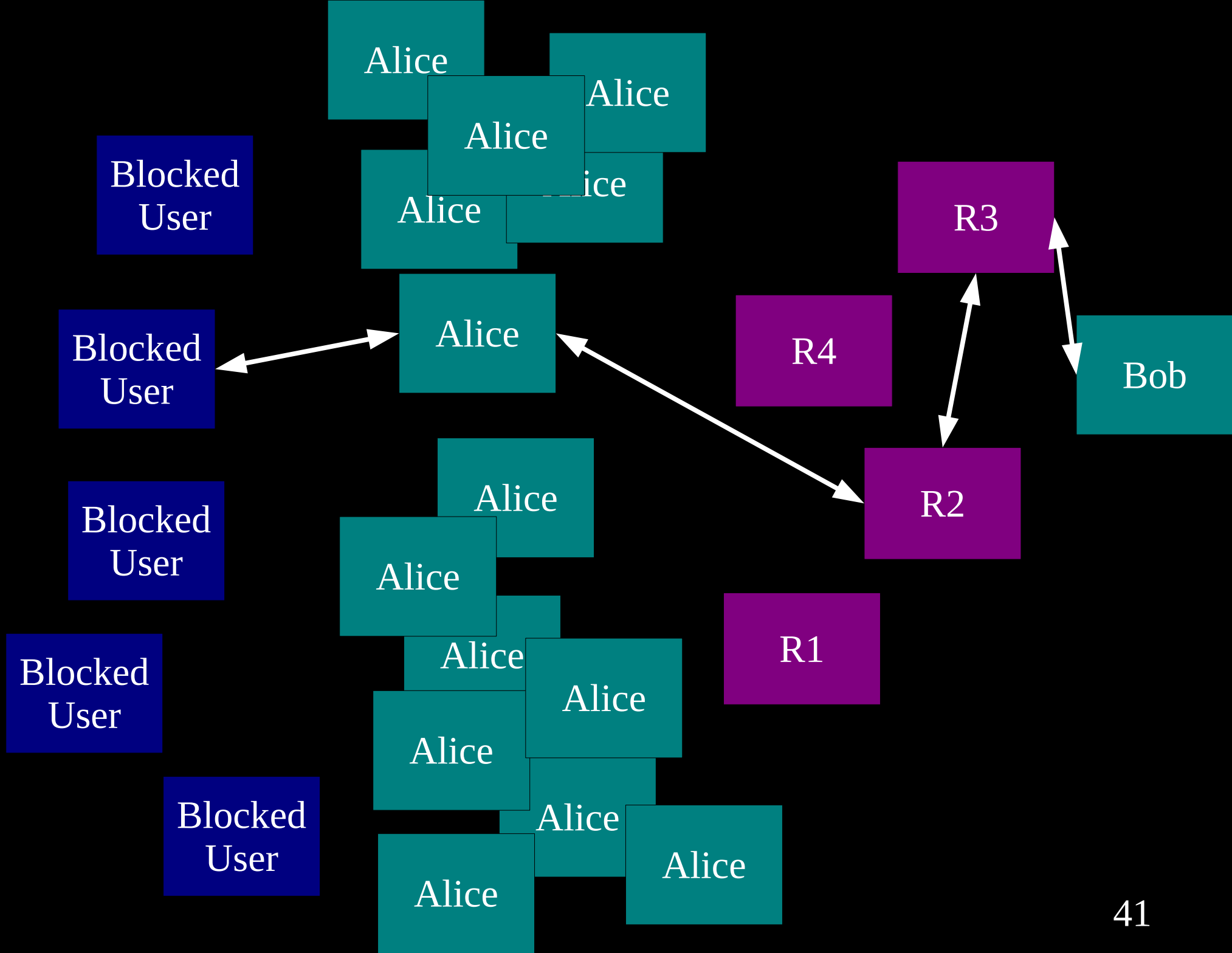




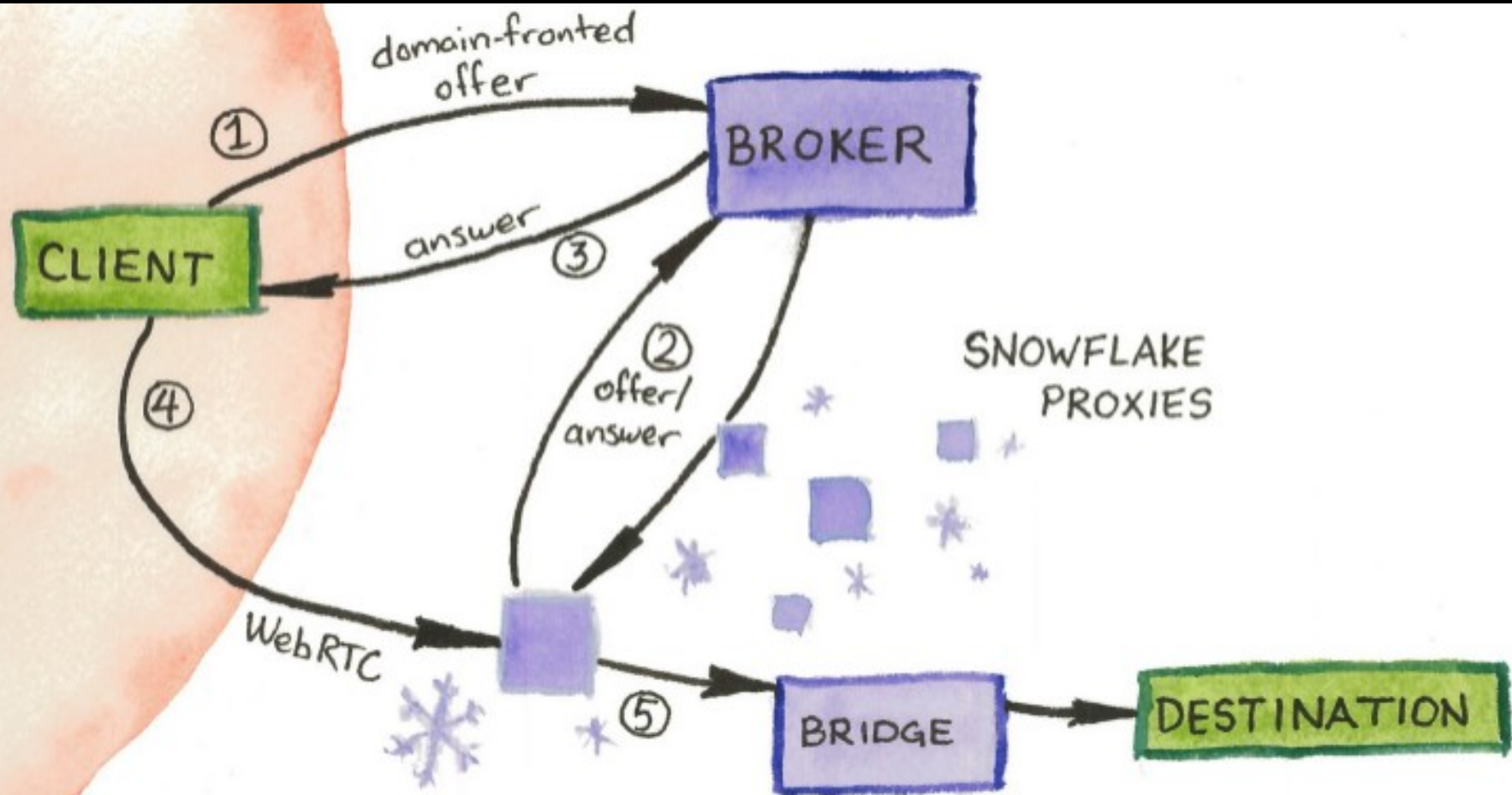
“Still the King of high secure,  
low latency Internet Anonymity”

Contenders for the throne:

- None







# Snowflake Options

This page enables you to use your web browser as a proxy to help other Internet users in censored places. When you click yes, your browser will act as a censorship circumvention proxy as long as you are viewing a page with the snowflake badge.

For more information on this system click [here](#).

Do you want your browser to act as a proxy?

Snowflake Proxy is ACTIVE

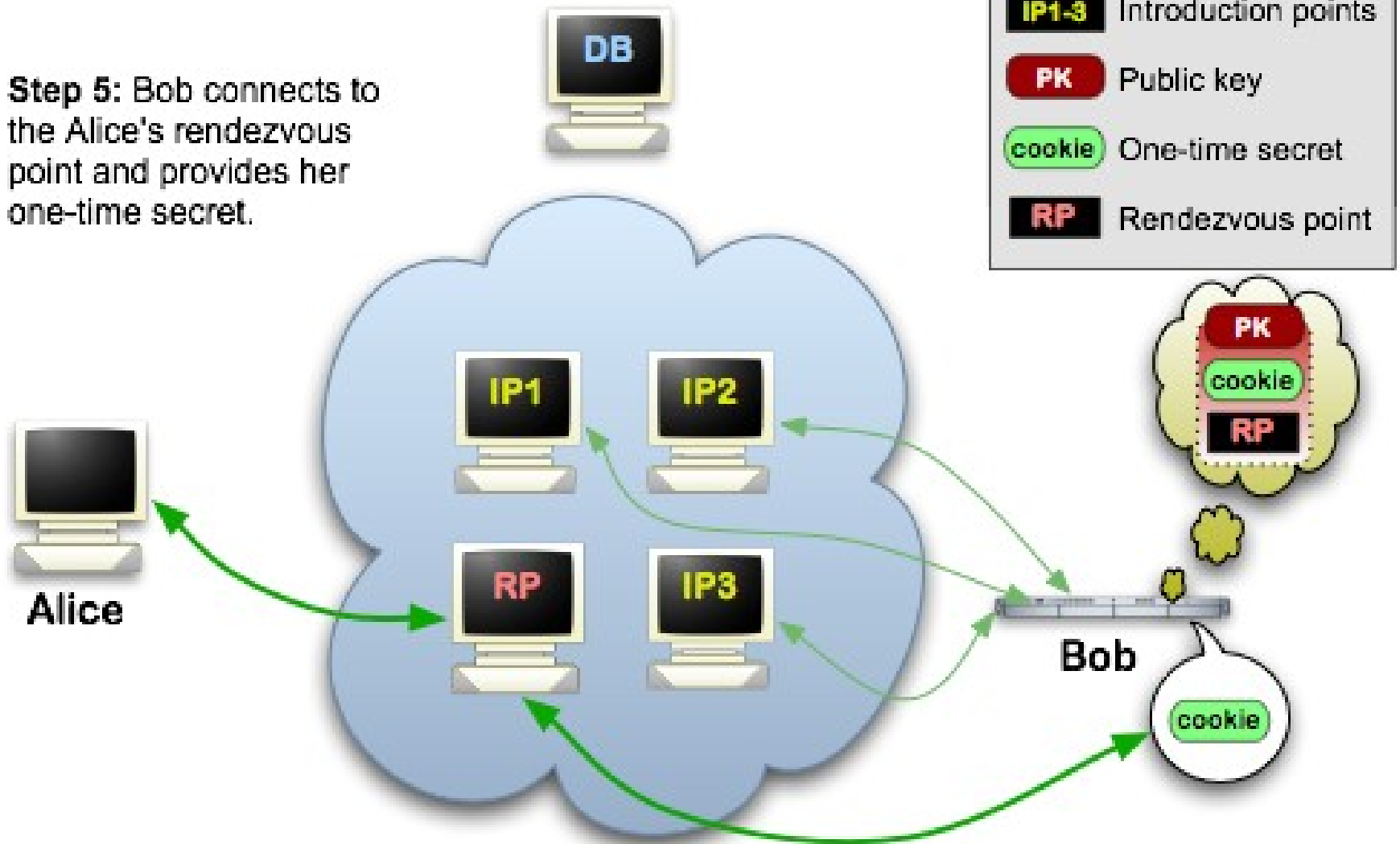
Thank you for contributing to internet freedom!

# Arms races

- Censorship arms race is bad
- Surveillance arms race is worse
  - And centralization of the Internet makes it worse still

## Tor Hidden Services: 5

**Step 5:** Bob connects to the Alice's rendezvous point and provides her one-time secret.





riseup.net



# Welcome to Riseup Black

This is the home of the Riseup "Black" services, our new enhanced security VPN and (soon) Encrypted application.

**Important:** To avoid possible issues, you will need to create a new account (this means a new username and password) for these services. But don't fear, you will be later able to use your current username if you want.

[Download Bitmask](#)[Log In](#)

Log in to change your account settings or create support tickets for Riseup Black services.

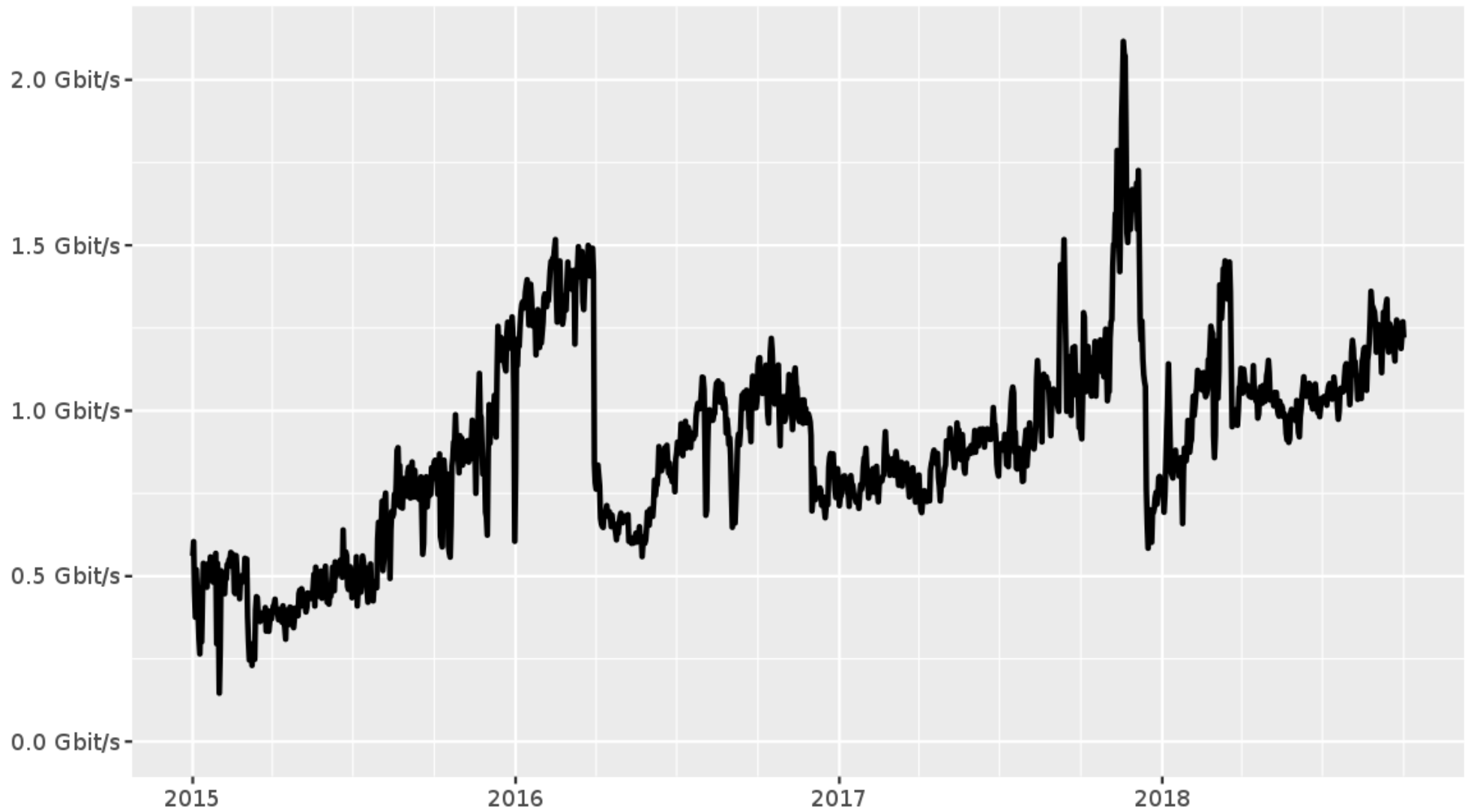
[Sign Up](#)

Create a new user account for Riseup Black. For greater security, we strongly recommend you create your account via the Bitmask application instead. Remember: to avoid possible issues, you cannot use your current riseup.net username at this stage. But don't fear, you will be able to do it later.

## Onion service properties

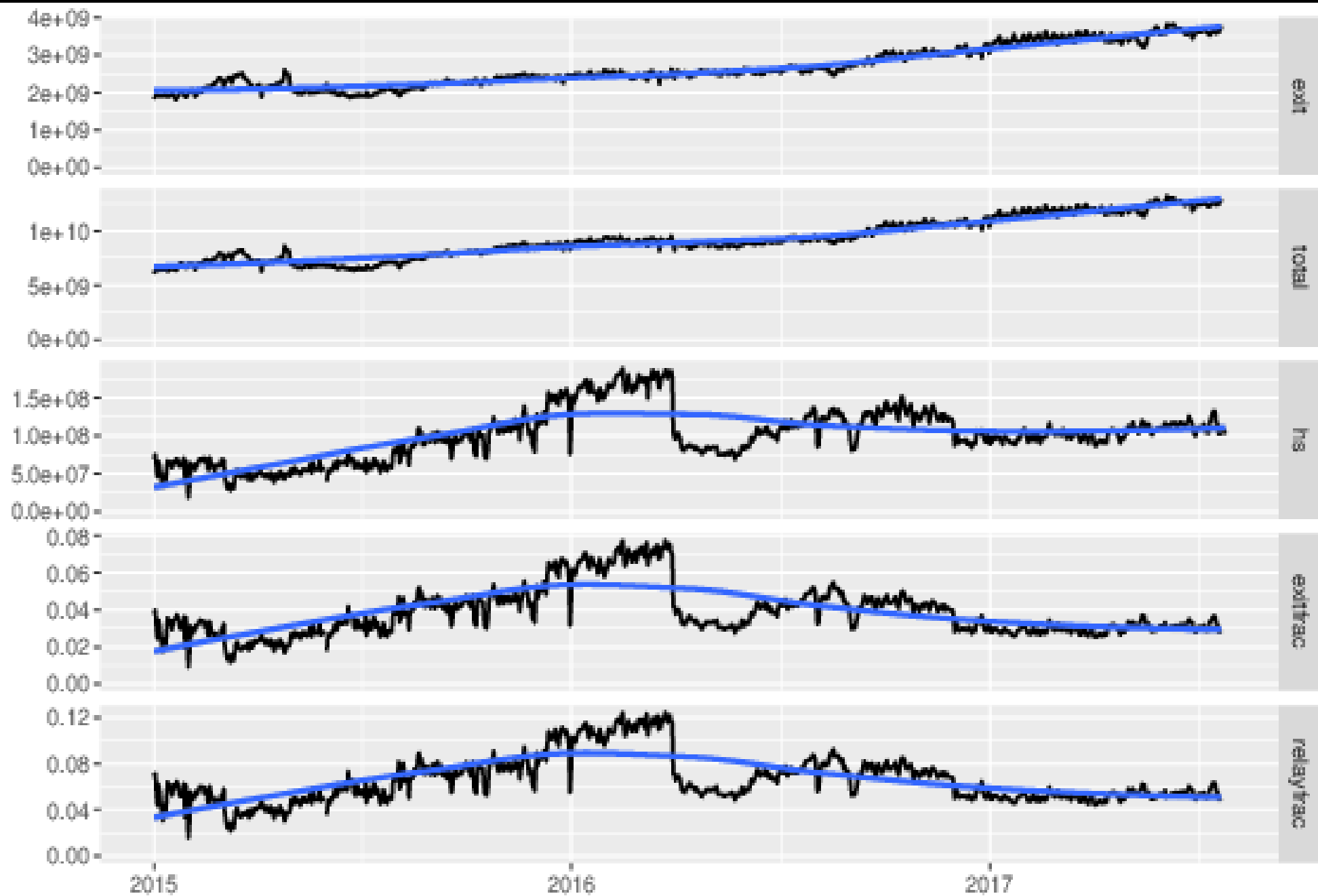
- Self authenticated
- End-to-end encrypted
- Built-in NAT punching
- Limit surface area
- No need to “exit” from Tor

## Onion-service traffic



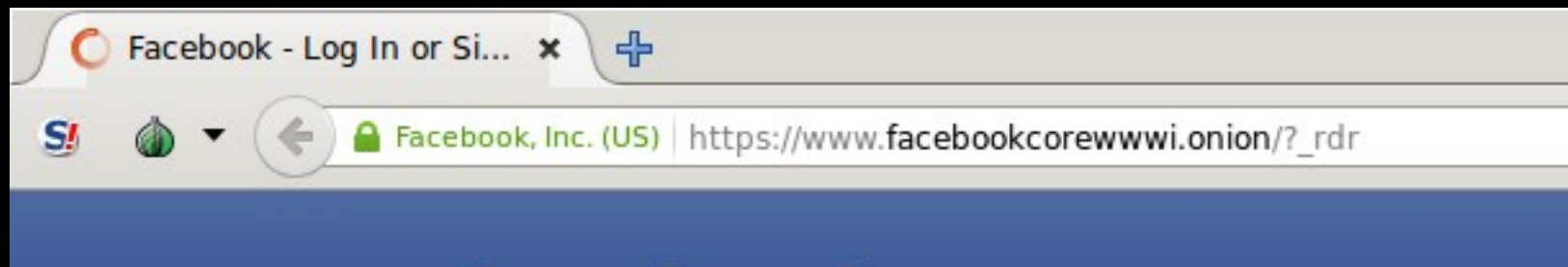
The Tor Project - <https://metrics.torproject.org/>











# 1 Million People use Facebook over Tor



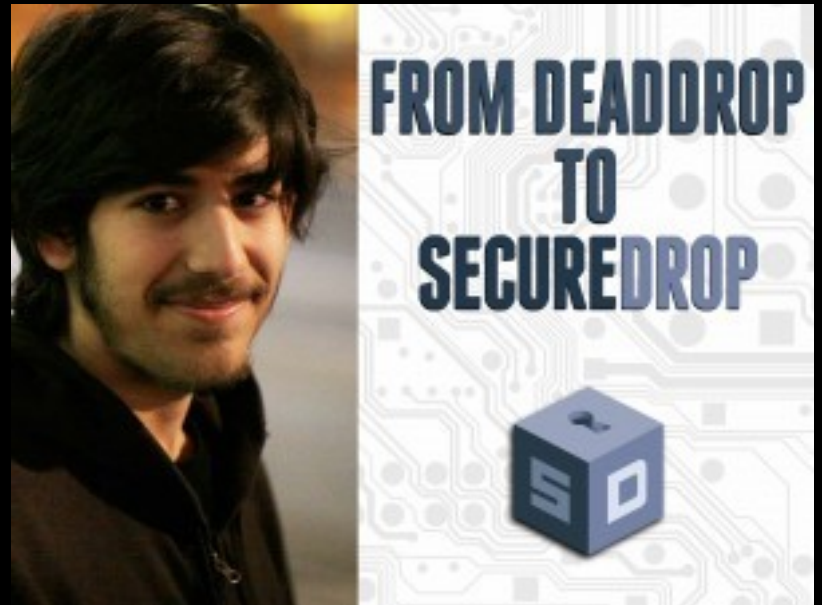
FACEBOOK OVER TOR · FRIDAY, APRIL 22, 2016

People who choose to communicate over Tor do so for a variety of reasons related to privacy, security and safety. As we've [written previously](#) it's important to us to provide methods for people to use our services securely – particularly if they lack reliable methods to do so.

This is why in the last two years we built [the Facebook onion site](#) and [onion-mobile site](#), helped [standardise the “.onion” domain name](#), and implemented Tor connectivity [for our Android mobile app](#) by enabling connections through [Orbot](#).

# SecureDrop

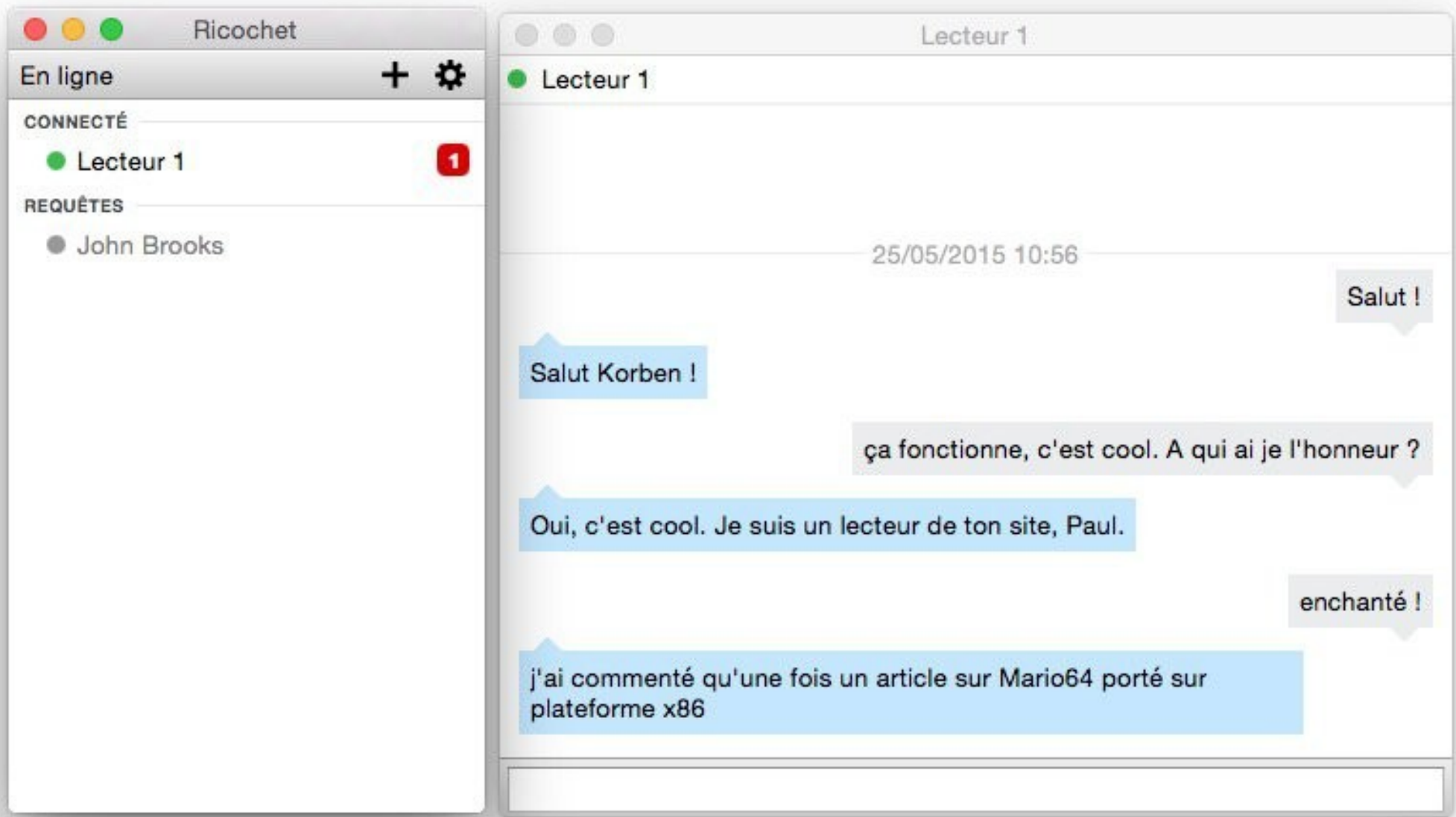
THE NEW YORKER  
**STRONGBOX**



Today, 30+ organizations use SecureDrop

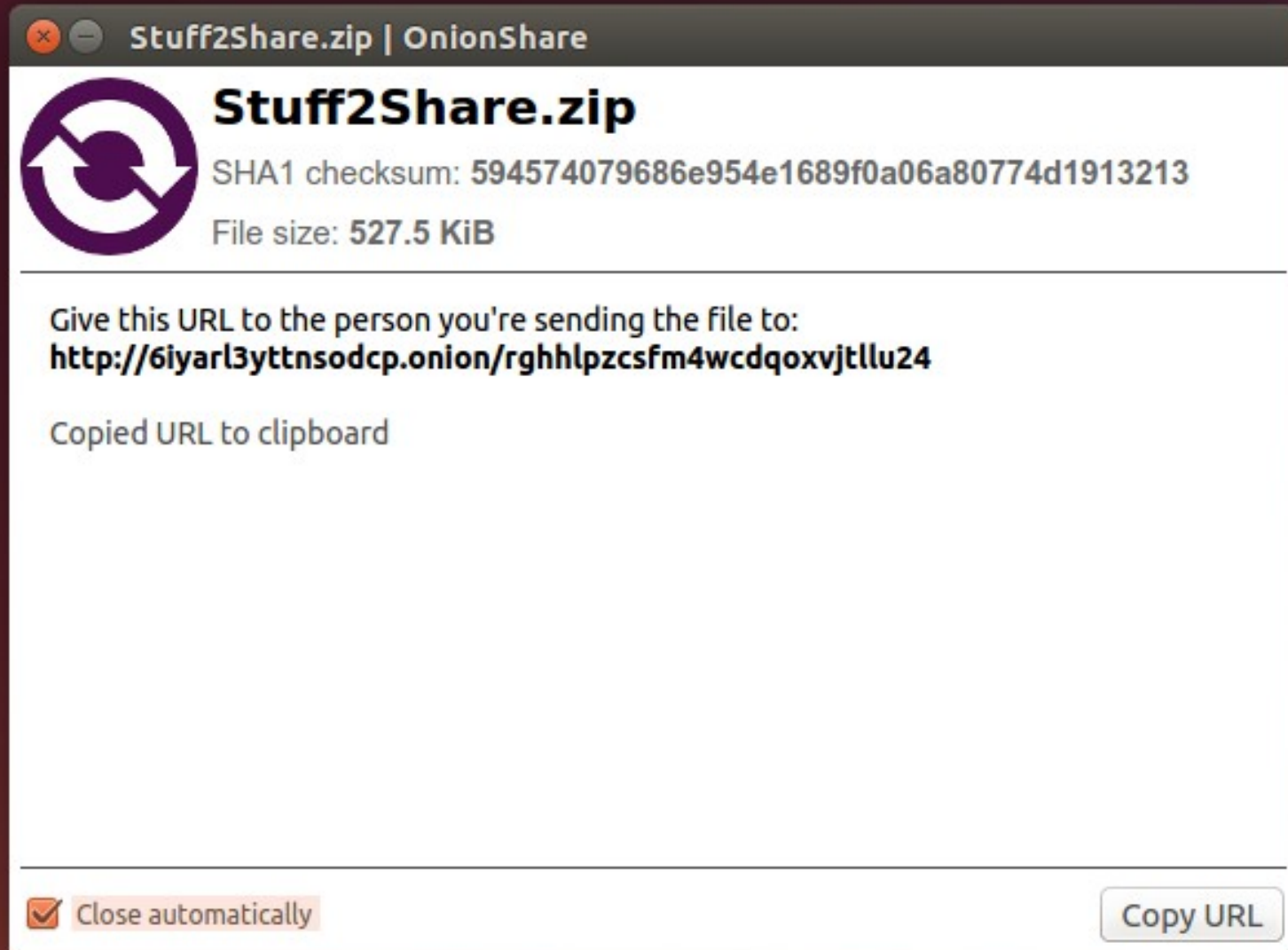
<https://securedrop.org/directory>

# Ricochet





# OnionShare





# Tor isn't foolproof

- Opsec mistakes
- Browser metadata fingerprints
- Browser exploits
- Traffic analysis

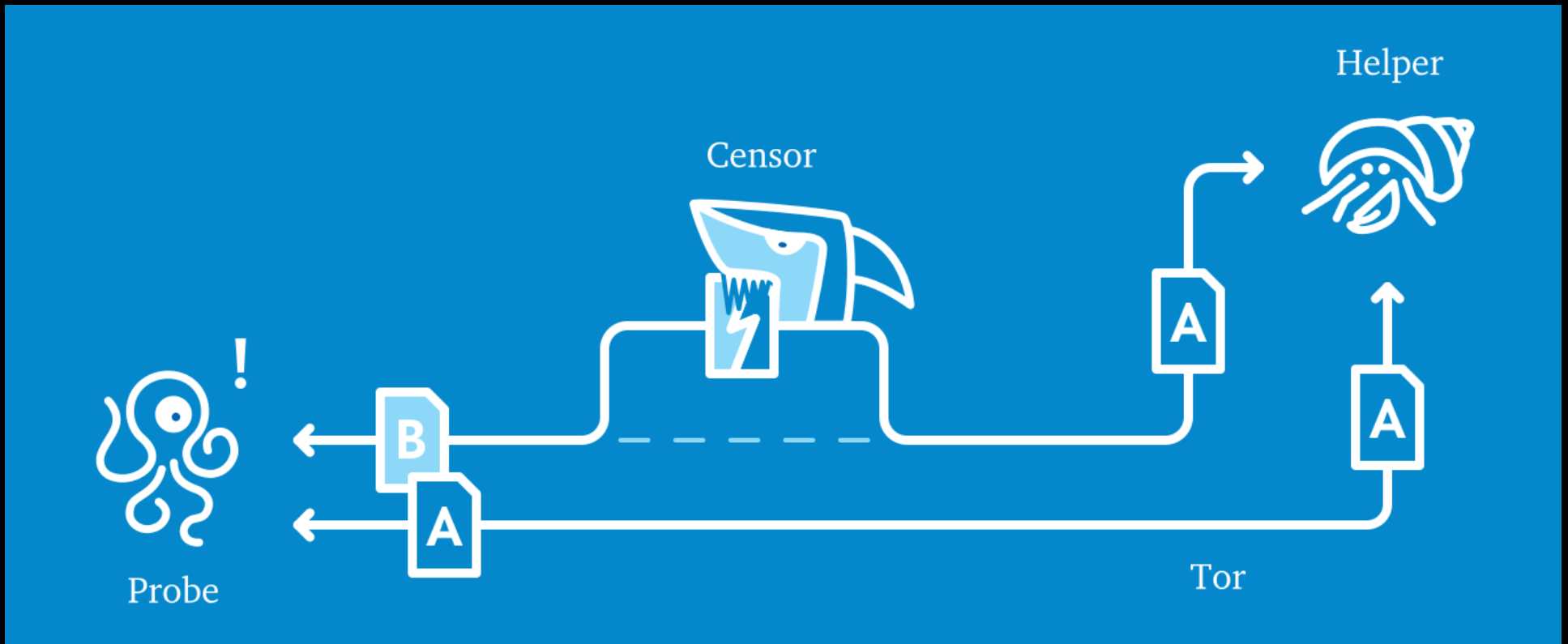
# How can you help?

- Run a relay (or a bridge)
- Teach your friends about Tor, and privacy in general
- Help find -- and fix -- bugs
- Work on open research problems ([petsymposium.org](http://petsymposium.org))
- [donate.torproject.org](http://donate.torproject.org)

Relay operator meetup, today

15:00 today in room H.3244

ooni.torproject.org



# explorer.ooni.torproject.org



OONI Explorer

World

Explorer

Highlights

About

## World Map

