



# 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.*





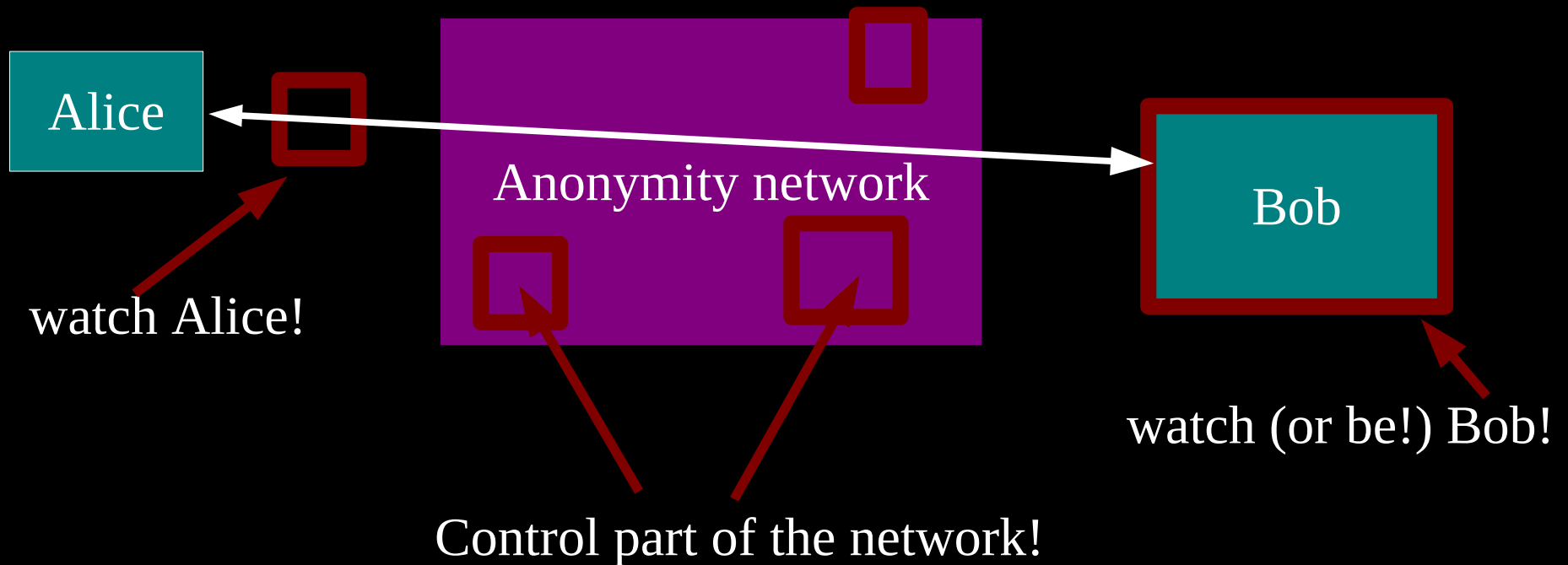
- Online Anonymity
  - Open Source
  - Open Network
- Community of researchers, developers, users and relay operators.
- U.S. 501(c)(3) non-profit organization



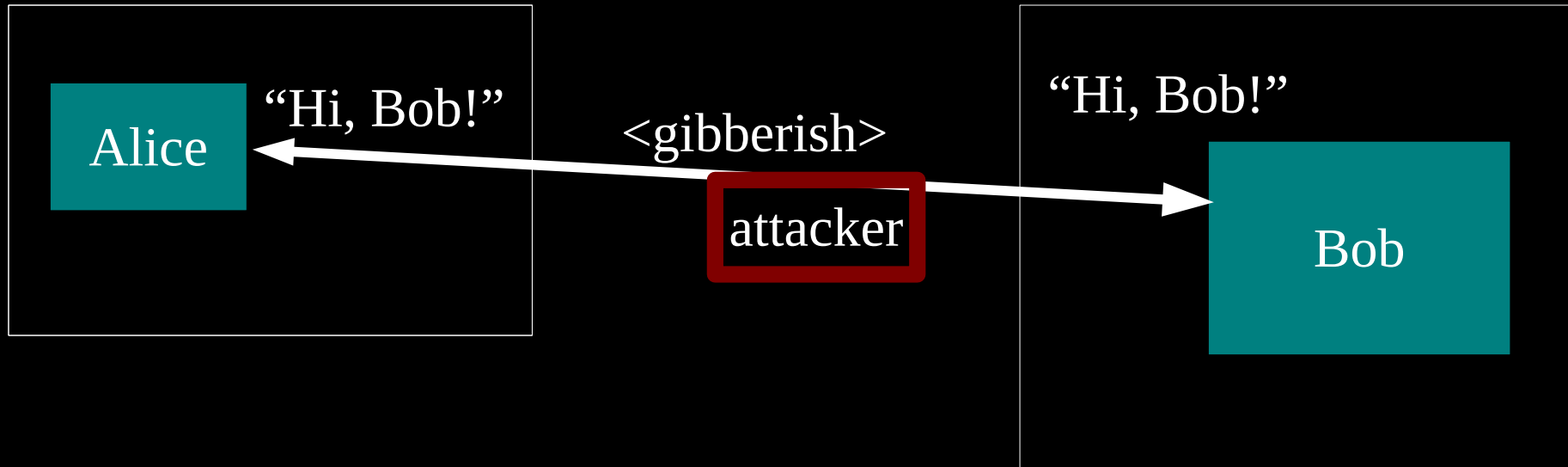


Estimated 2,000,000 to 8,000,000  
daily Tor users

# 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.**

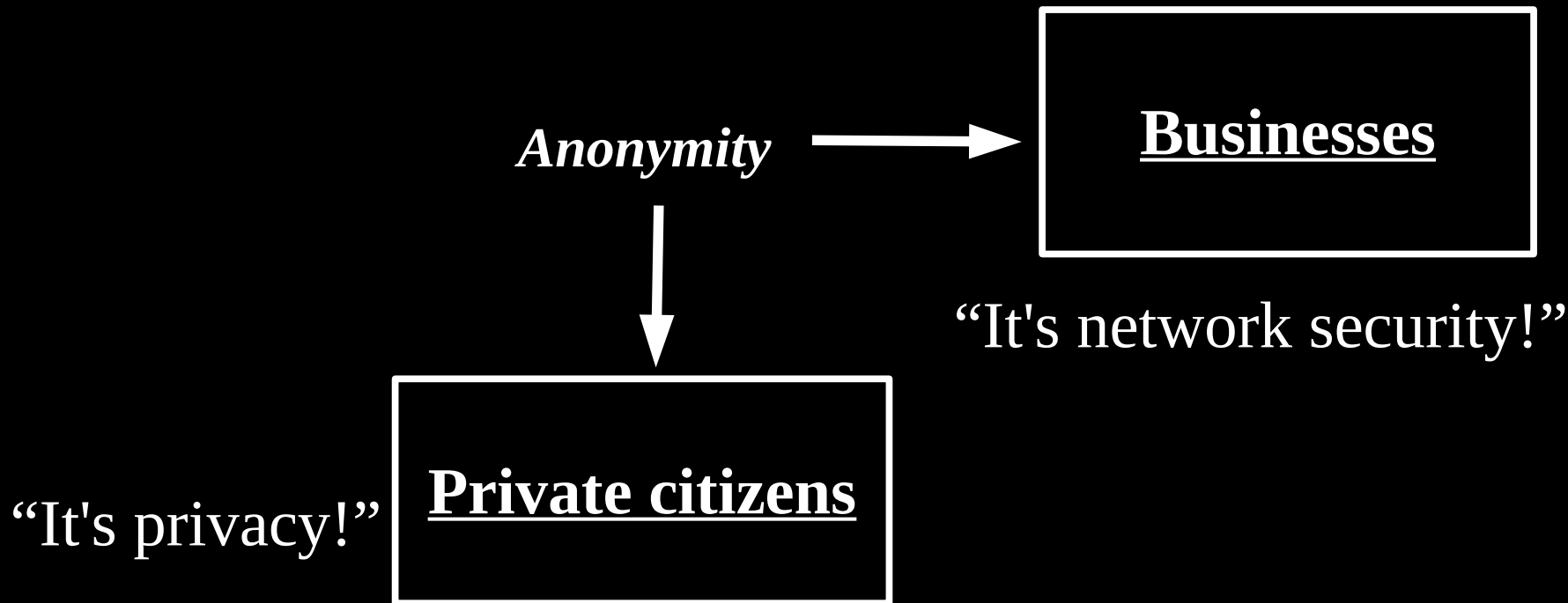
*Anonymity*



“It's privacy!”

**Private citizens**

# Anonymity serves different interests for different user groups.





# Anonymity serves different interests for different user groups.

“It's traffic-analysis resistance!”

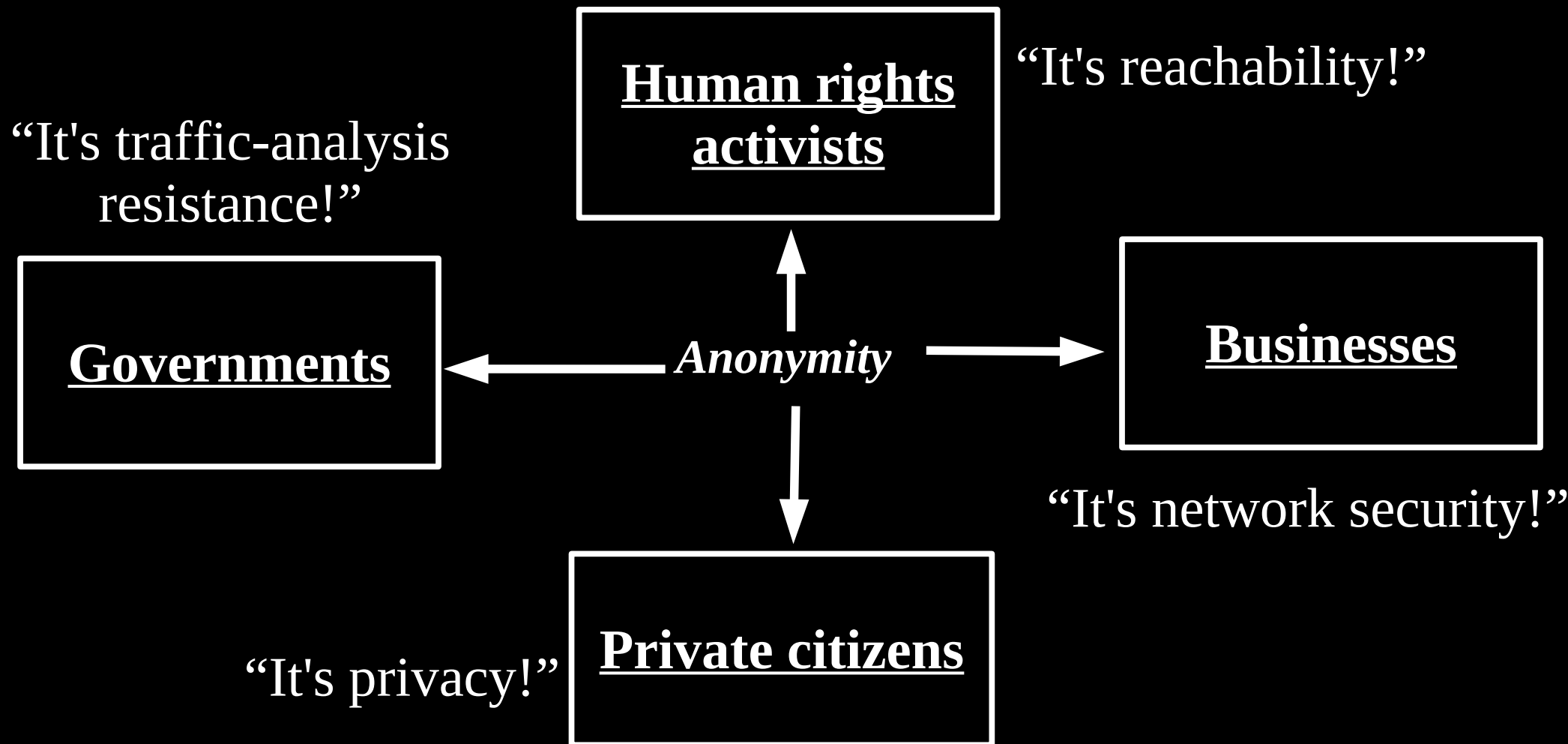


“It's network security!”

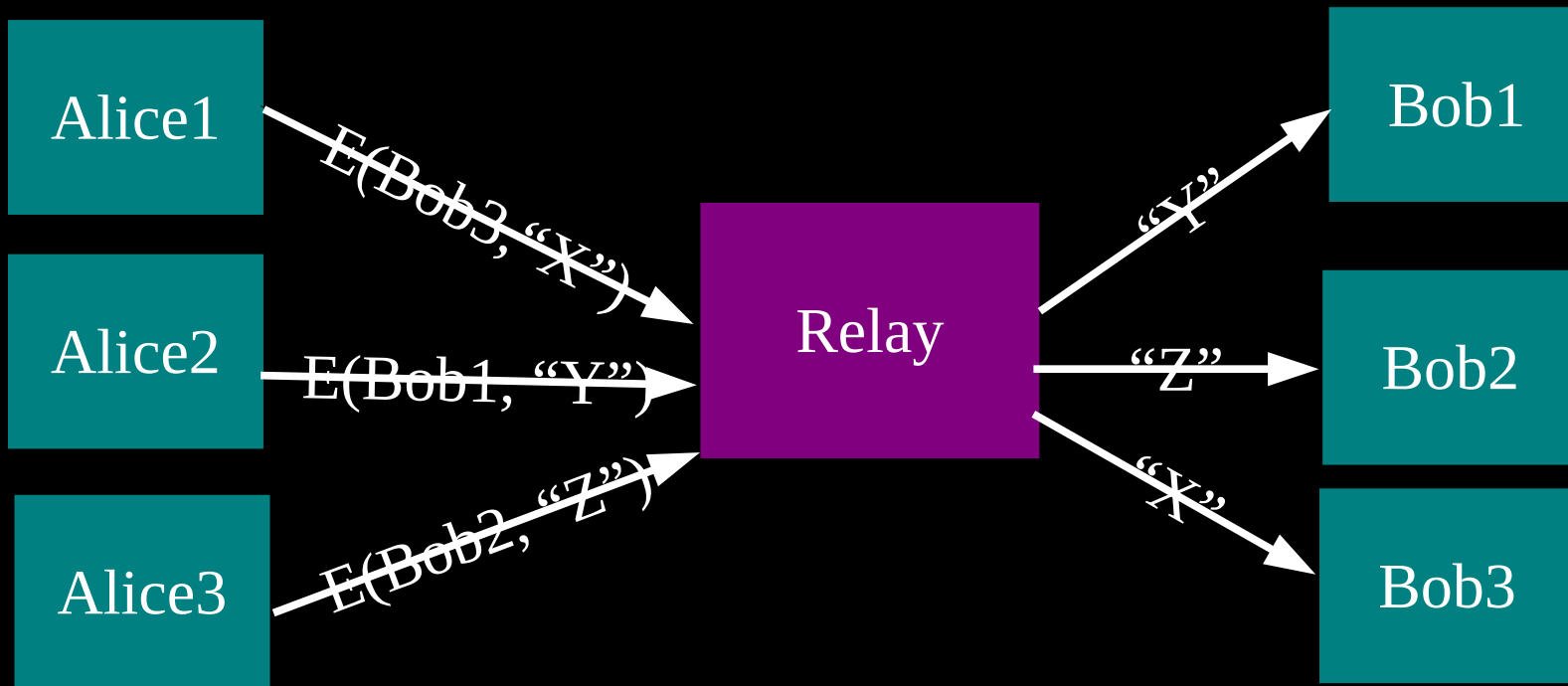
“It's privacy!”



# Anonymity serves different interests for different user groups.



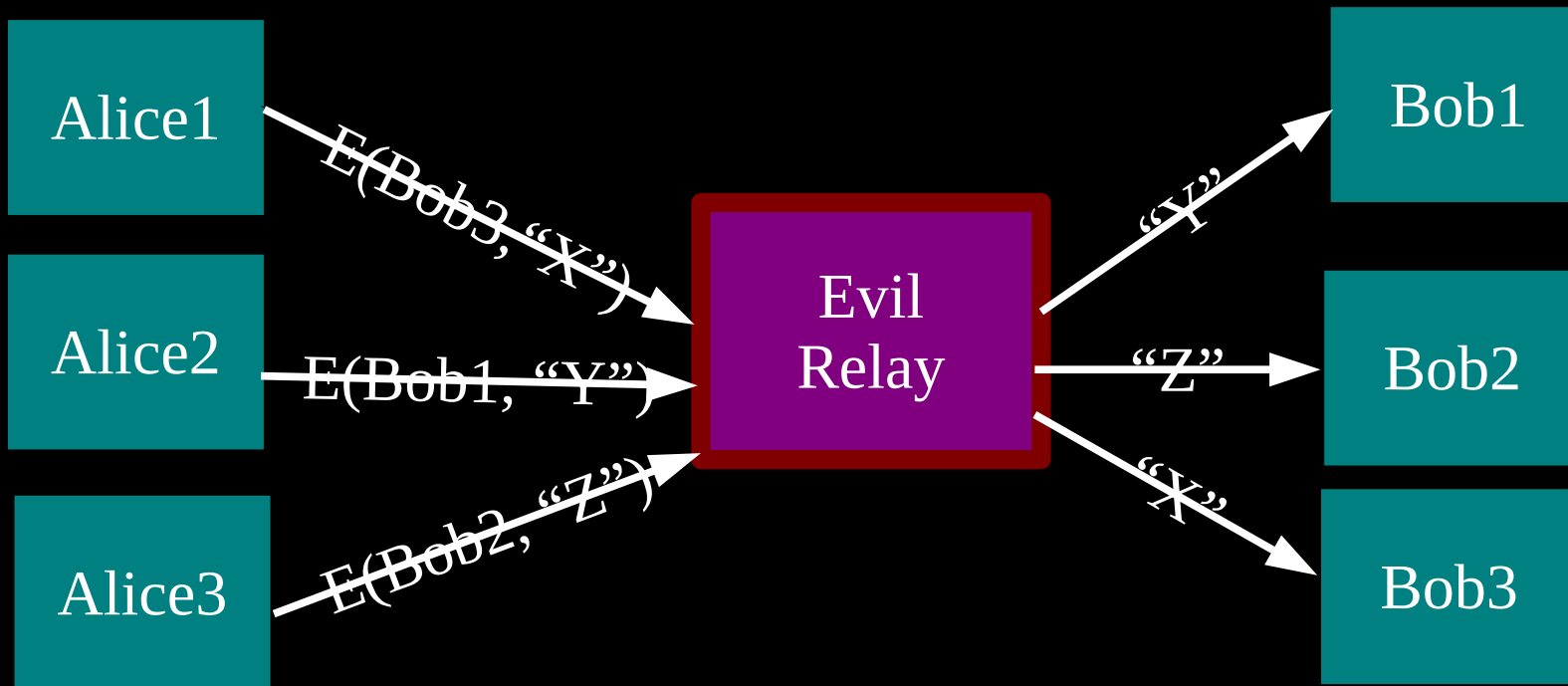
# The simplest designs use a single relay to hide connections.



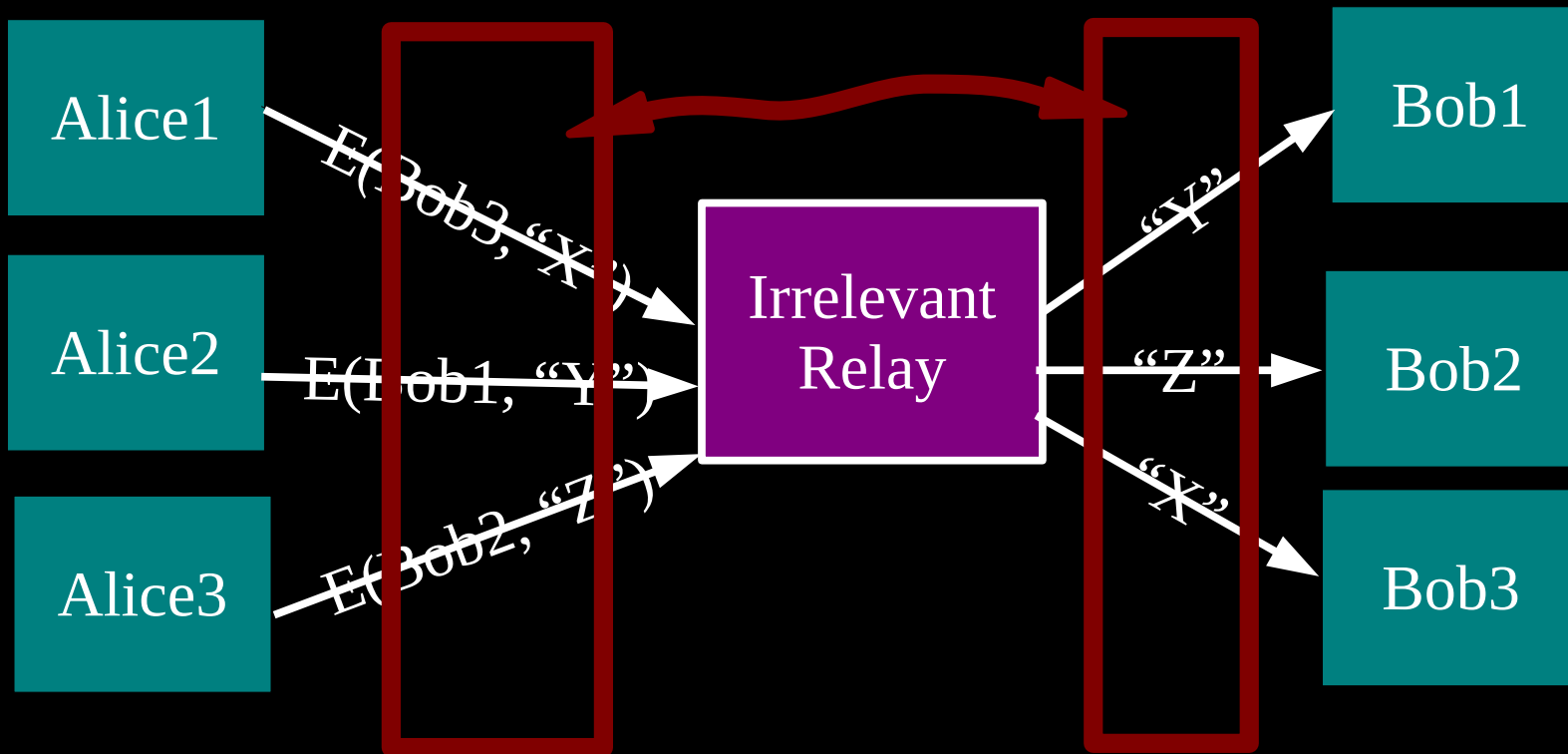
(example: some commercial proxy providers)



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

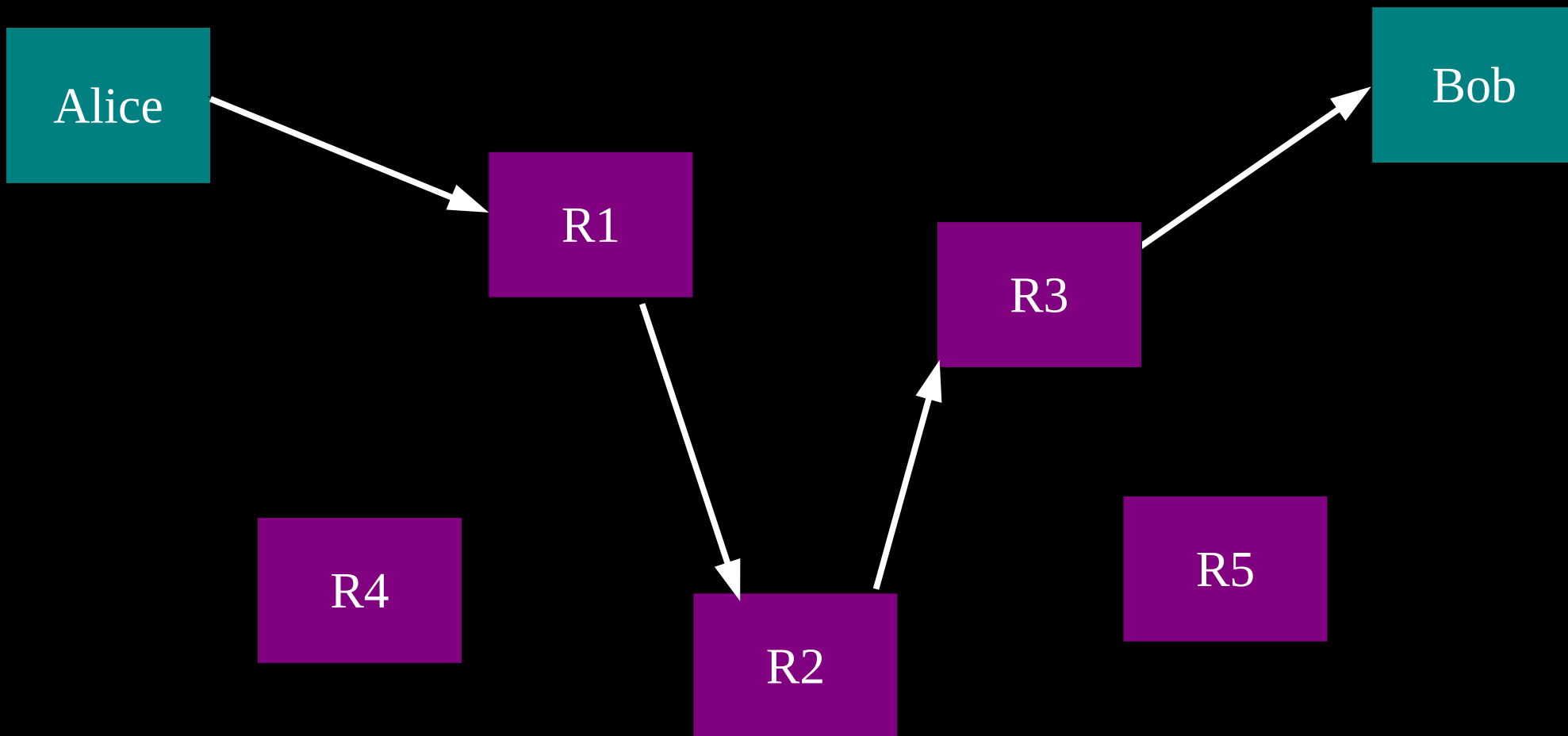


... or a single point of bypass.



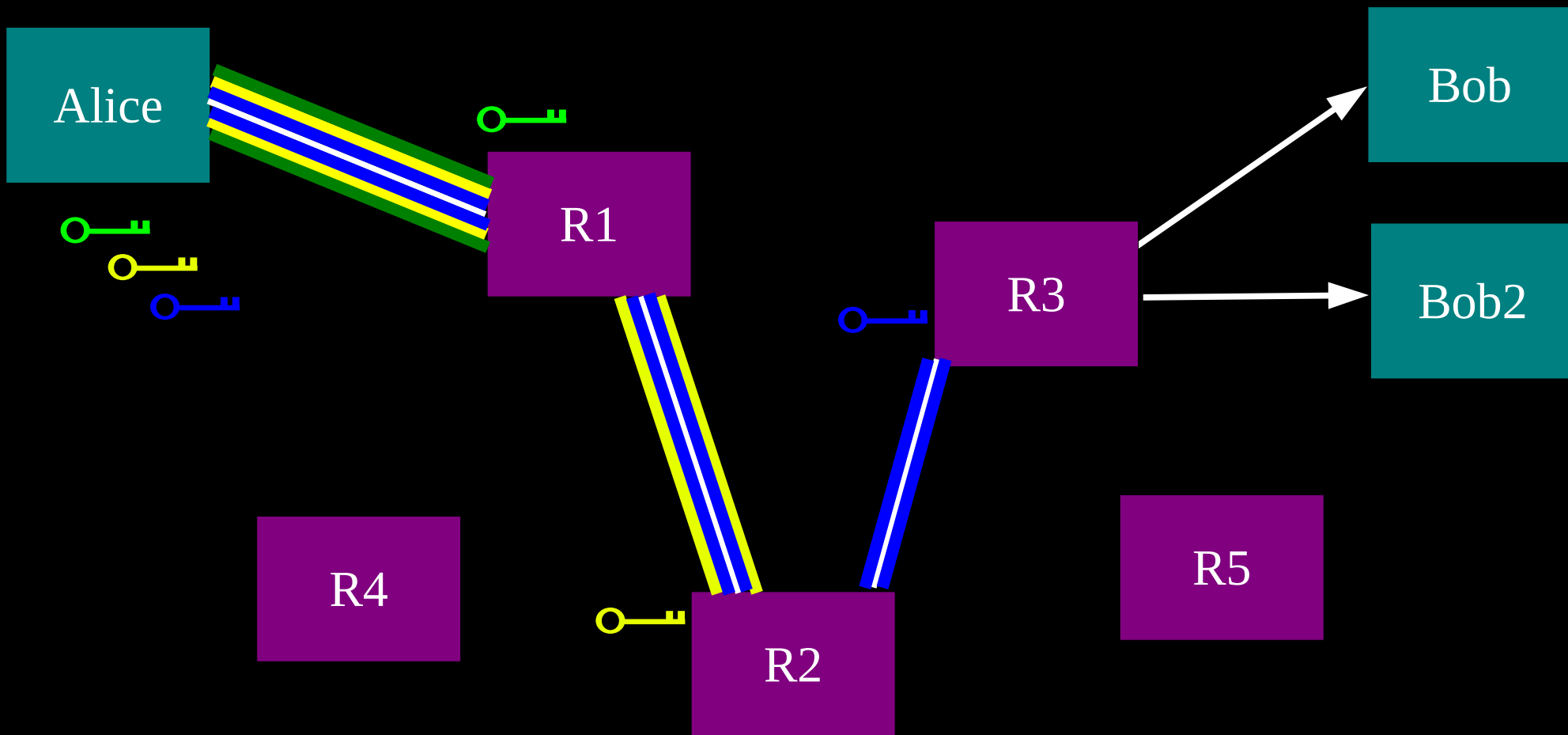
Timing analysis bridges all connections through relay  $\Rightarrow$  An attractive fat target

**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.

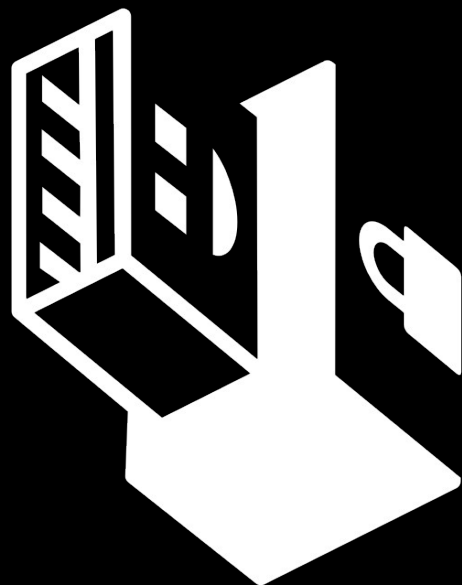
You're ready for the world's most private browsing experience.



Search with DuckDuckGo

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

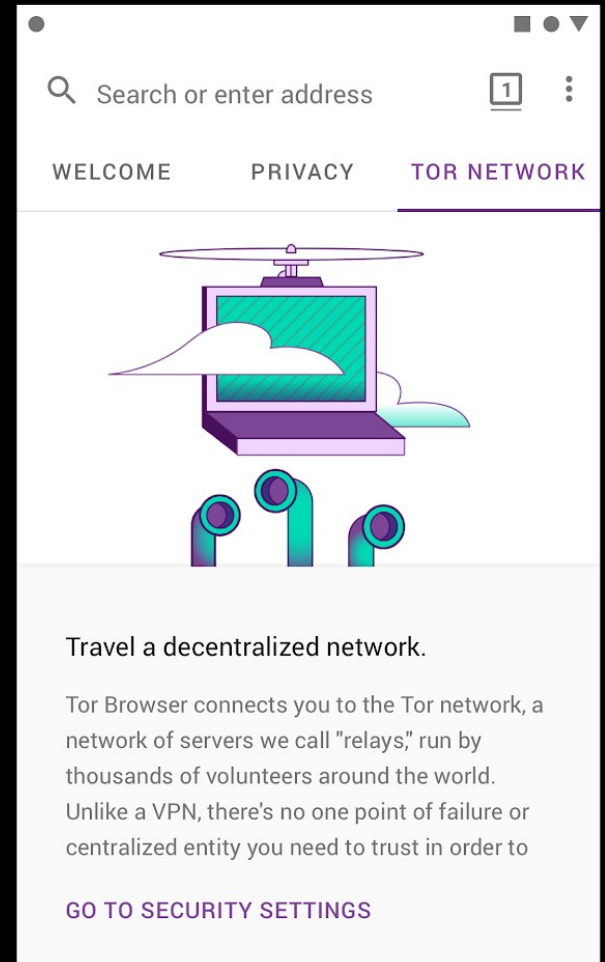
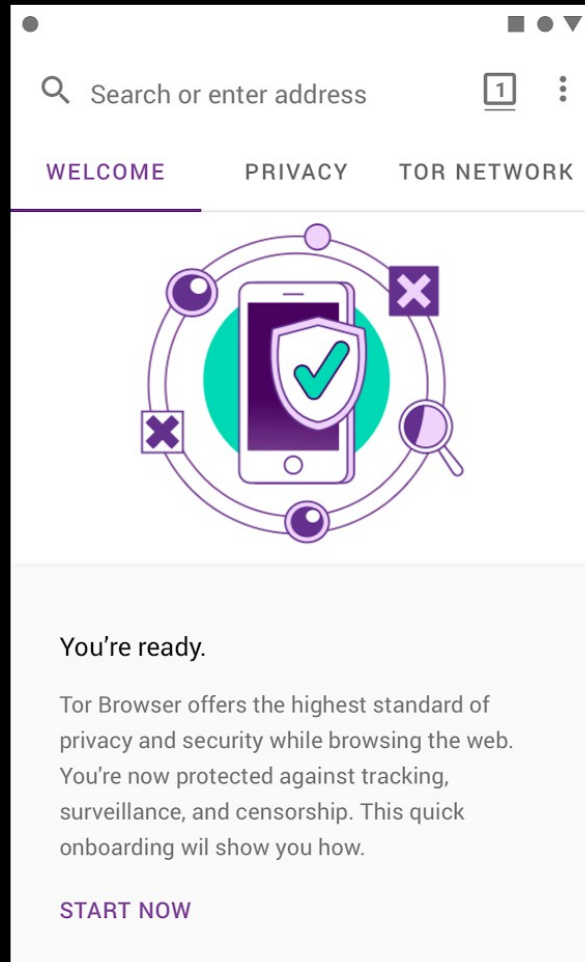
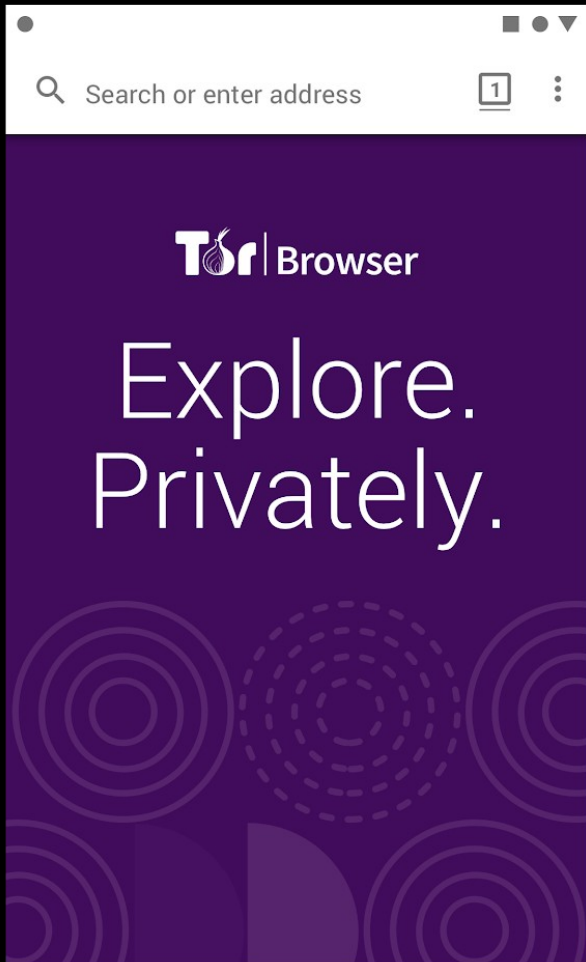
The Tor Project is a US 501(c)(3) non-profit organization advancing human rights and freedoms by creating and deploying free and open source anonymity and privacy technologies, supporting their unrestricted availability and use, and furthering their scientific and popular understanding. [Get Involved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



# Tails

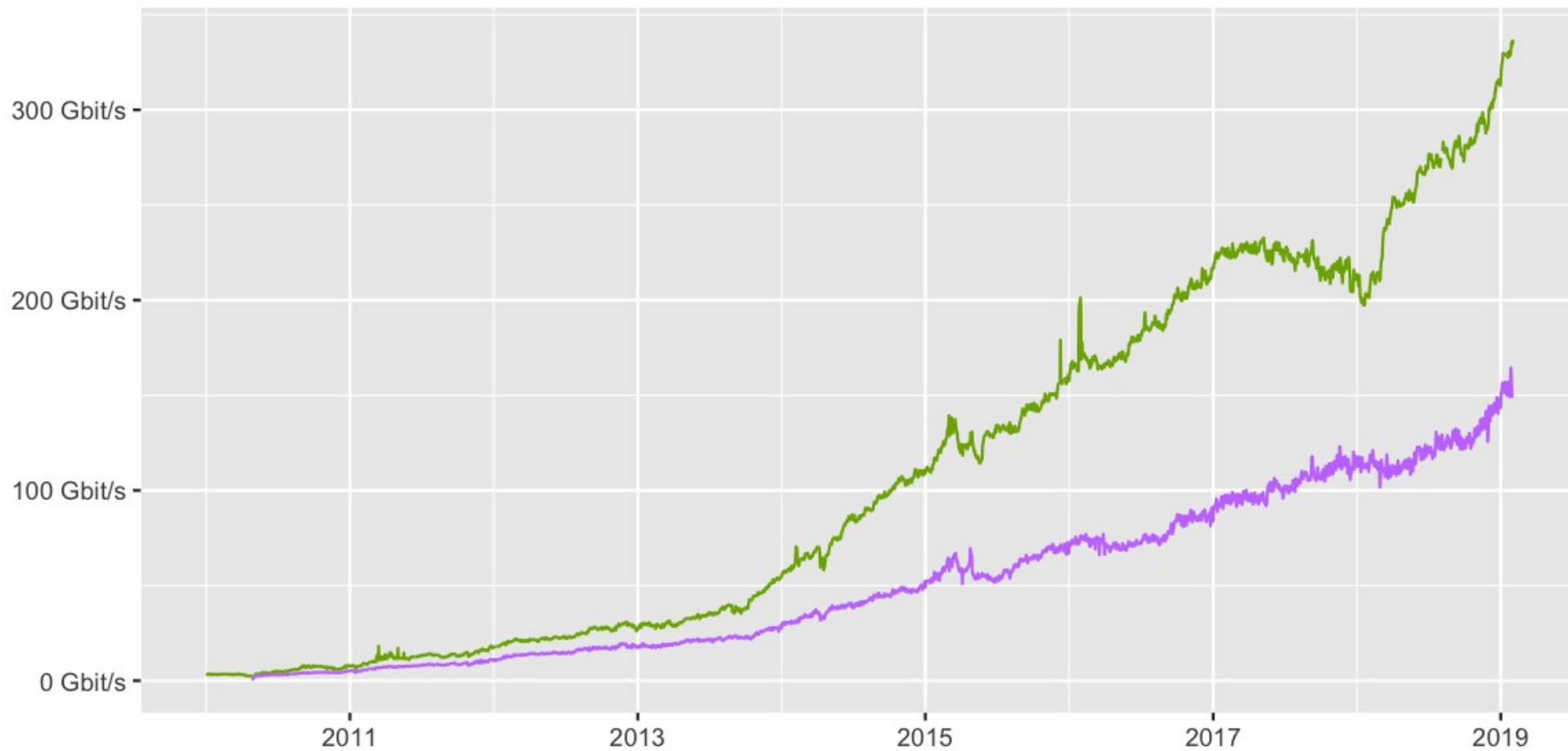
the **amnesic** incognito **live** system





## Total relay bandwidth

— Advertised bandwidth — Bandwidth history



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

# Tor's safety comes from diversity

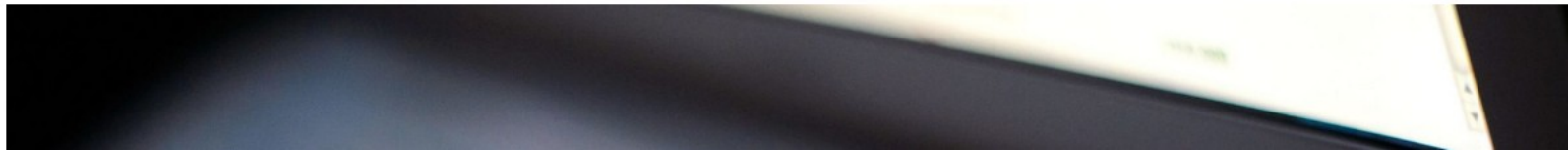
- #1: Diversity of relays. The more relays we have and the more diverse they are, the fewer attackers are in a position to do traffic confirmation. (Research problem: measuring diversity over time)
- #2: Diversity of users and reasons to use it. 50000 users in Iran means almost all of them are normal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

# Technology Intelligence

Gadgets | Innovation | Big Tech | Start-ups | Politics of Tech | Gaming

Home > Technology Intelligence

## Dozens of US spies killed after Iran and China uncovered CIA messaging service using Google



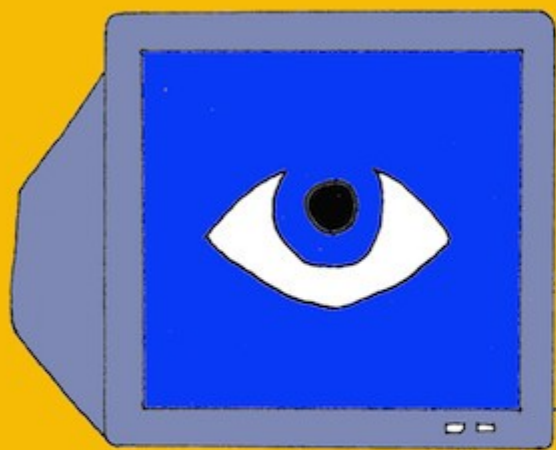
# Transparency for Tor is key

- 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 المحظورة" حسب تصنيف "السياسة التنظيمية لإدارة الفضاء الإلكتروني" 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](#).

© 2011 Iamuhub IT LLC.

# يالله بالستر...!



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.

Your request was denied because of its content.



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

<http://torproject.org/>

<http://torproject.org/>

## Notice...

تم حظر هذا الموقع بسبب احتوائه على محتويات تعارض 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*	<input type="text" value="http://www.torproject.org/"/>
Email Address*	<input type="text"/>
Comments*	<input type="text"/>

غير متاح.

بي أن لا تُحجب

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

10:00 AM

Blocked URL

Sorry, the requested page is unavailable.

قاع المطلوب غير متاح.

If you believe the requested page should not be blocked please [click here](#).

هذه الصفحة ينبغي أن لا تُحجب فضل بالضغط هنا.

For more information about internet service in Saudi Arabia, please click here: [www.internet.gov.sa](http://www.internet.gov.sa)

للمزيد من معلومات عن خدمة الإنترنت في المملكة العربية السعودية، انقر هنا: [www.internet.gov.sa](http://www.internet.gov.sa)

KT WATA... 9:21 ص 87%

Tweet Blocked by Mada Com...

مدي للإصالات mada Mada Communications

ان الموقع الذي حاول زيارته محجوب

Access to this website is prohibited

ان الموقع الذي حاول زيارته محجوب وذلك طبقاً للقوانين واللوائح للتدعيم بهذا الشأن اذا كنت تعتقد ان هذا الموقع قد تم حجبه عن طريق الخطأ يرجى تعبئة الاستمارة التالية وارسالها لتقوم بمعالجة الموقع. شكراً جزيلاً

This site is blocked according to the government filtering policy. If you feel this page has been blocked in errors, kindly fill out the form and we will investigate. Thank You.

Required fields are denoted by (\*)

Full Name \*  الاسم

Email \*  العنوان الإلكتروني

Blocked URL \*  www.  .com اسم النطاق

Comments  استفسارك

Submit

هذا الموقع محظور

This site is blocked

الوصول إلى هذا الموقع غير مسموح به حالياً لأنه مصنف ضمن فئات المحتويات المحظورة بموجب أحكام السياسة التنظيمية لإدارة النفاذ إلى الإنترنت في دولة الإمارات العربية المتحدة.

Access to this site is currently blocked. The site falls under the Prohibited Content Categories of the UAE's Internet Access Management Policy.

www.kingnet.ae

Oops رفا

لقد تم منع الدخول إلى هذا الموقع

This site has been blocked

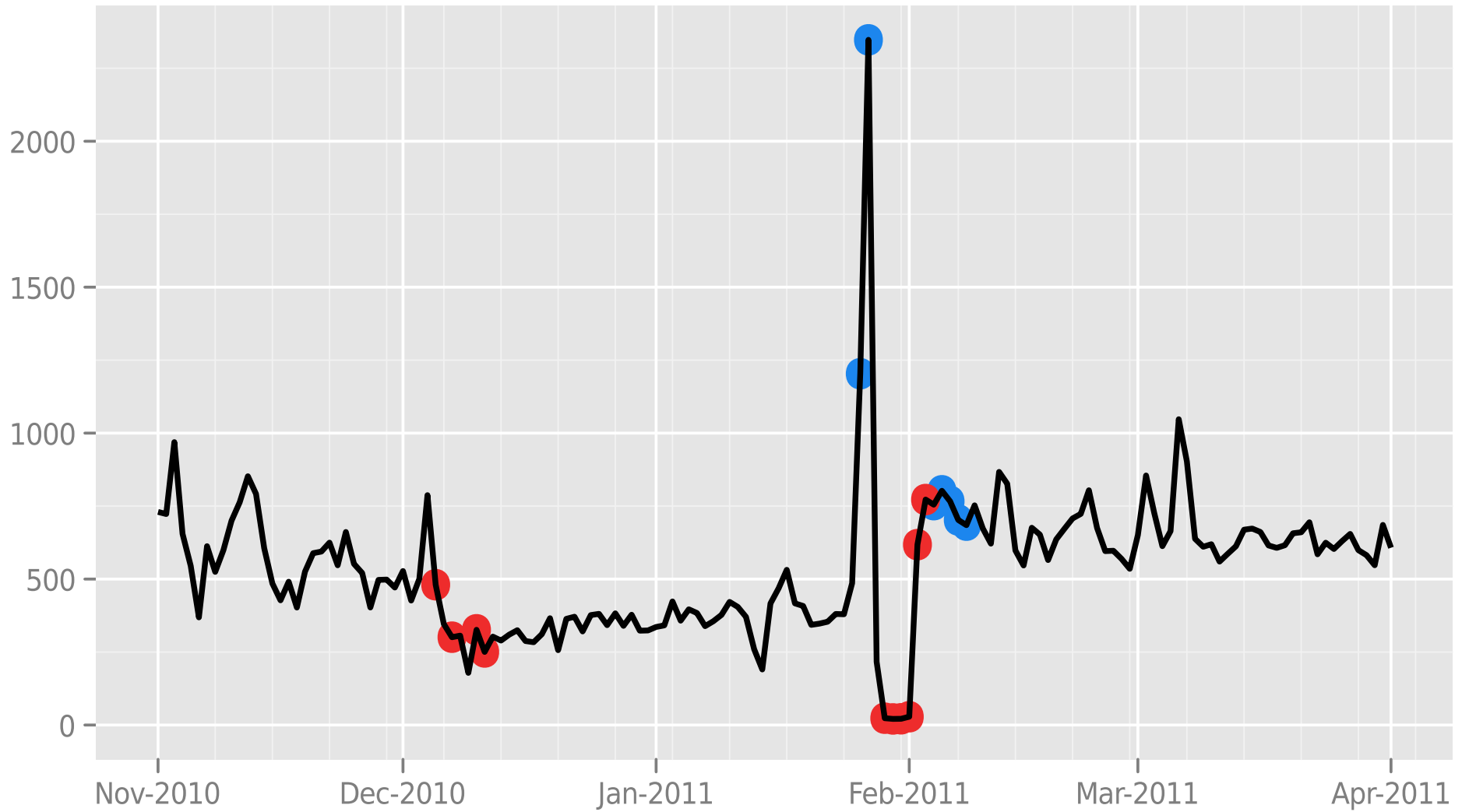
تم إيقاف عملية الدخول إلى الموقع الذي تحاول زيارته نظراً لاحتوائه على محتويات محظورة

The web page you are trying to access has been blocked as the content contains prohibited materials

إذا كنت ترى أن هناك خطأ في ذلك - يرجى إرسال رسالة بريد إلكتروني إلى [help@isp.qa](mailto:help@isp.qa)

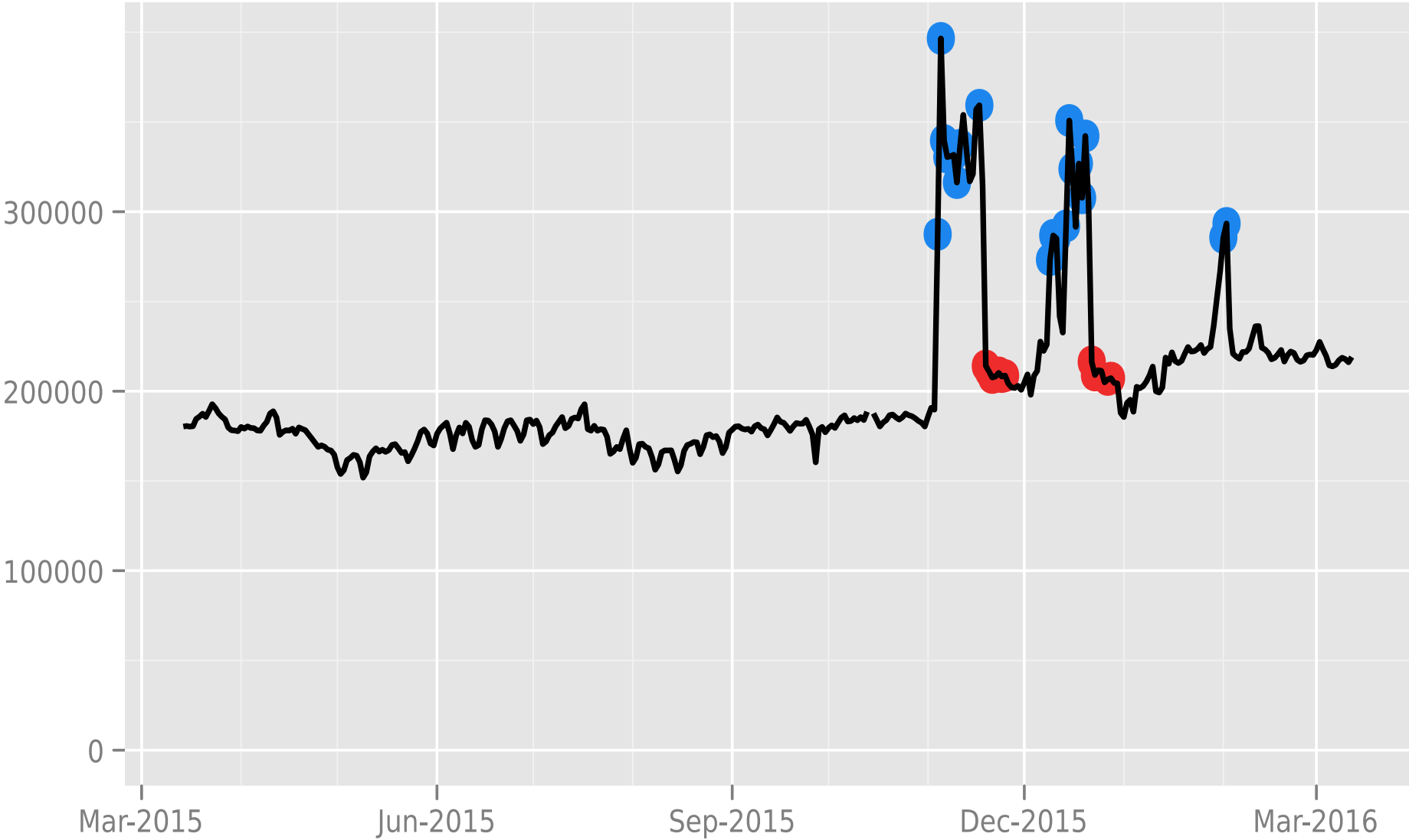
if you feel this is an error then please send

## Directly connecting users from Egypt

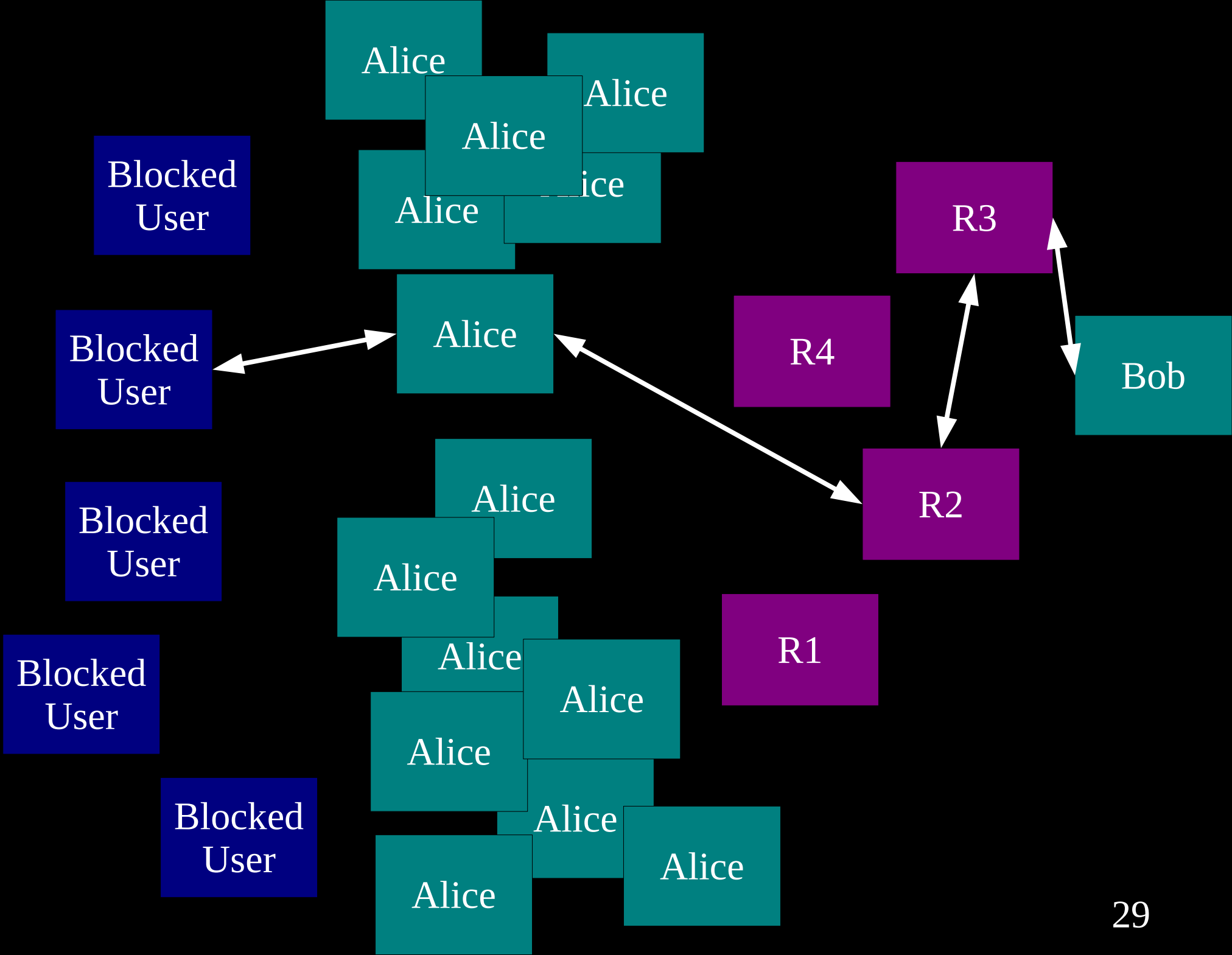


The Tor Project - <https://metrics.torproject.org/>

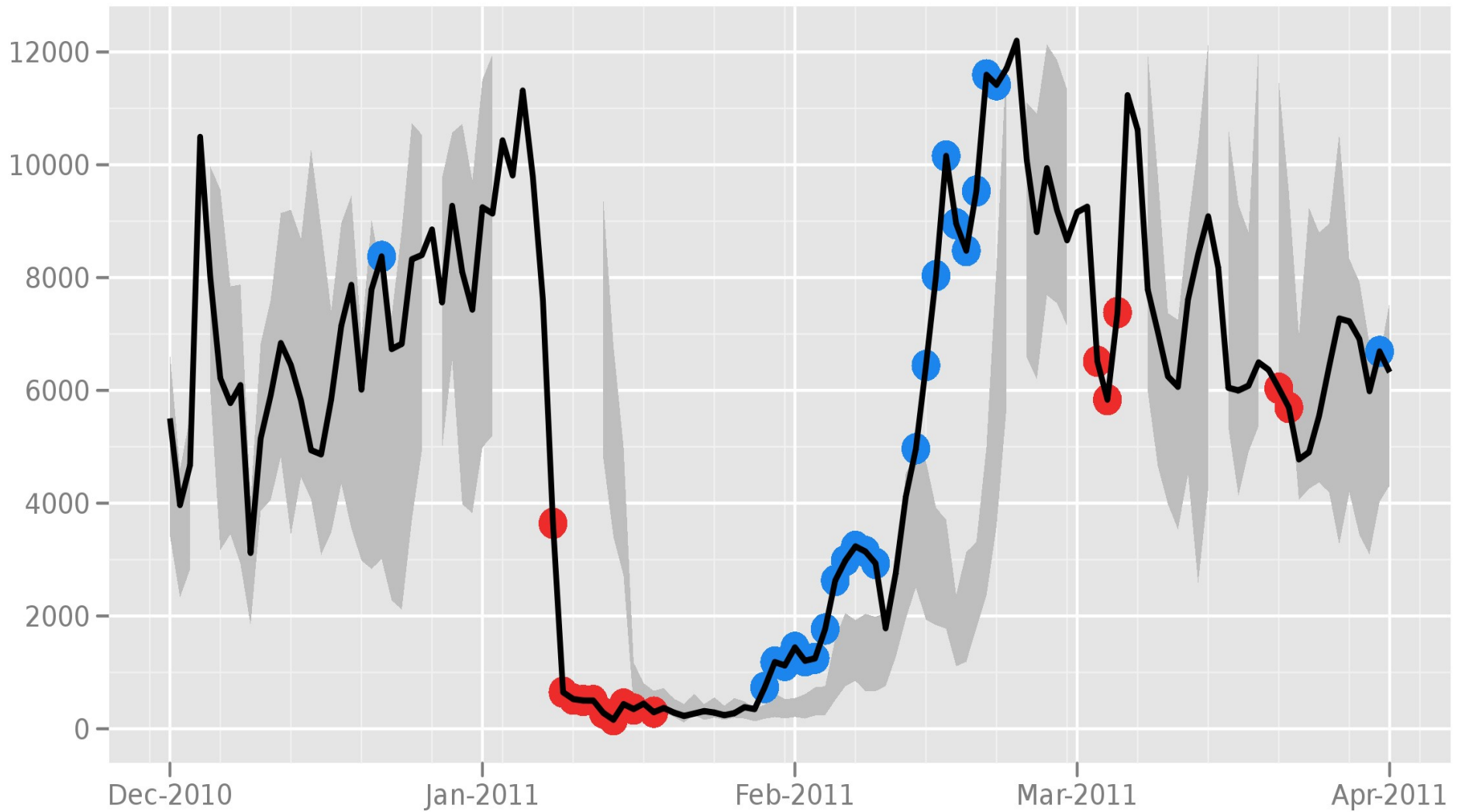
# Directly connecting users from Russia





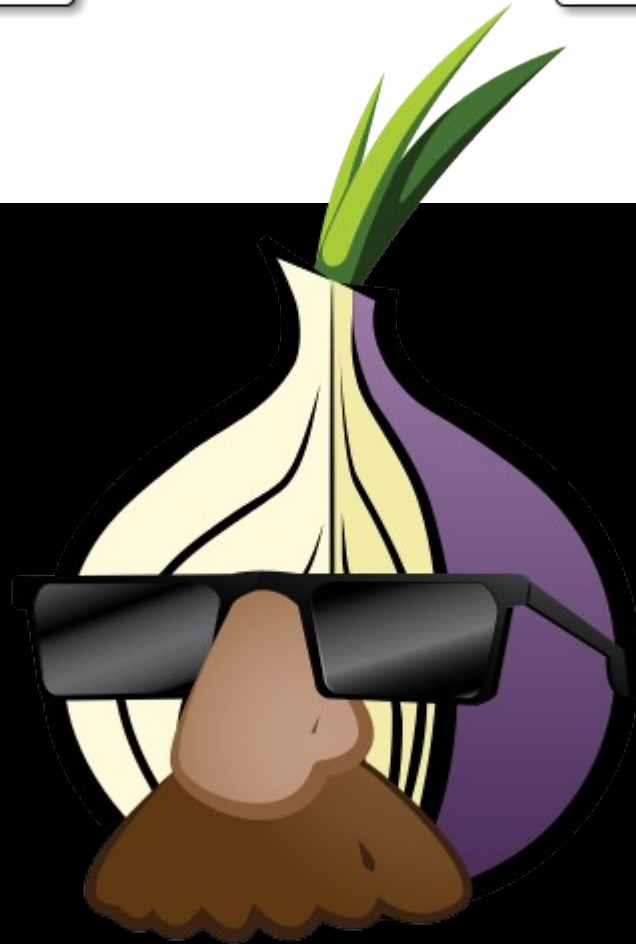
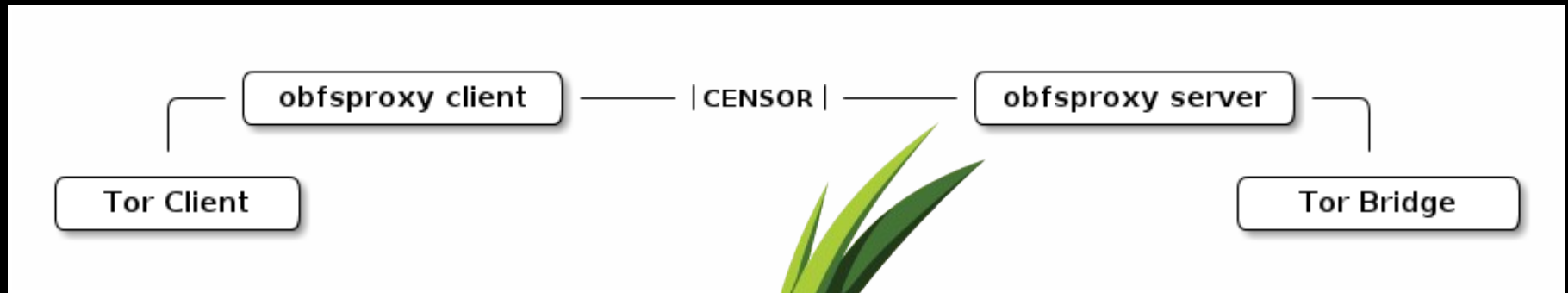


# Directly connecting users from the Islamic Republic of Iran



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 ethnicities, standing in a field with mountains in the background. The people are dressed in a mix of business and casual attire. The scene is set against a dramatic, cloudy sky.

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

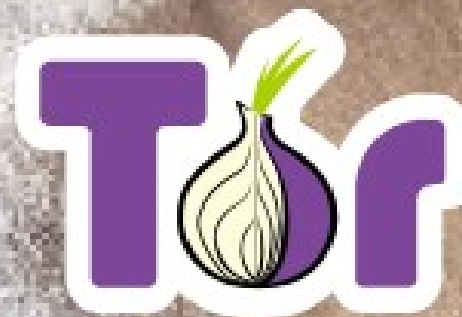
Supporting totalitarian regimes is our business.  
Sleep safe Assad, Blue Coat is here.

**Blue**  **Coat**





I CAN HAZ  
FREEDOM?



[TorProject.org](https://torproject.org)







Stinks (U)



CT SIGDEV



JUN 2012

Derived From: \_\_\_\_\_  
Dated: \_\_\_\_\_  
On: \_\_\_\_\_







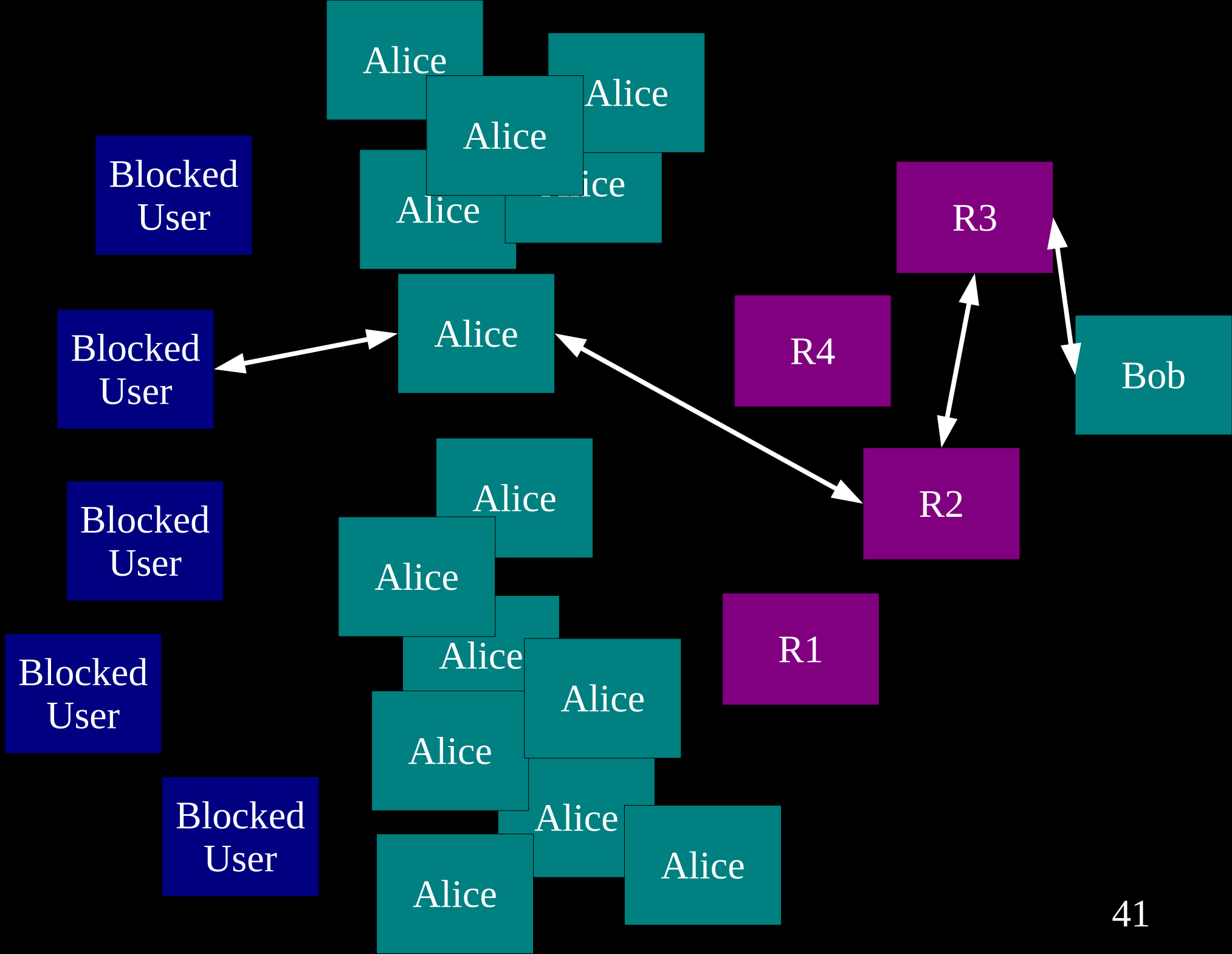


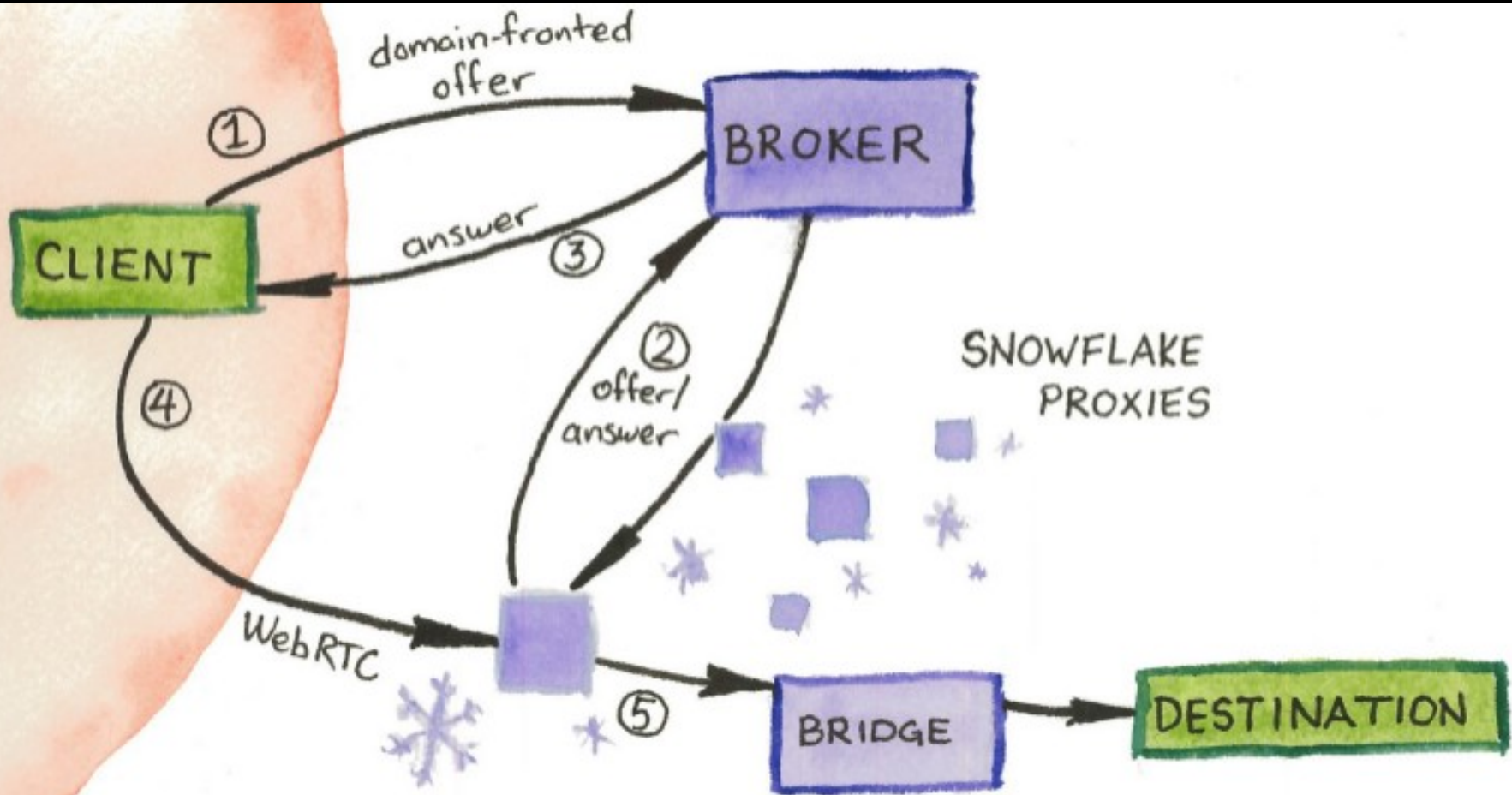
“Still the King of high secure,  
low latency Internet Anonymity”

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

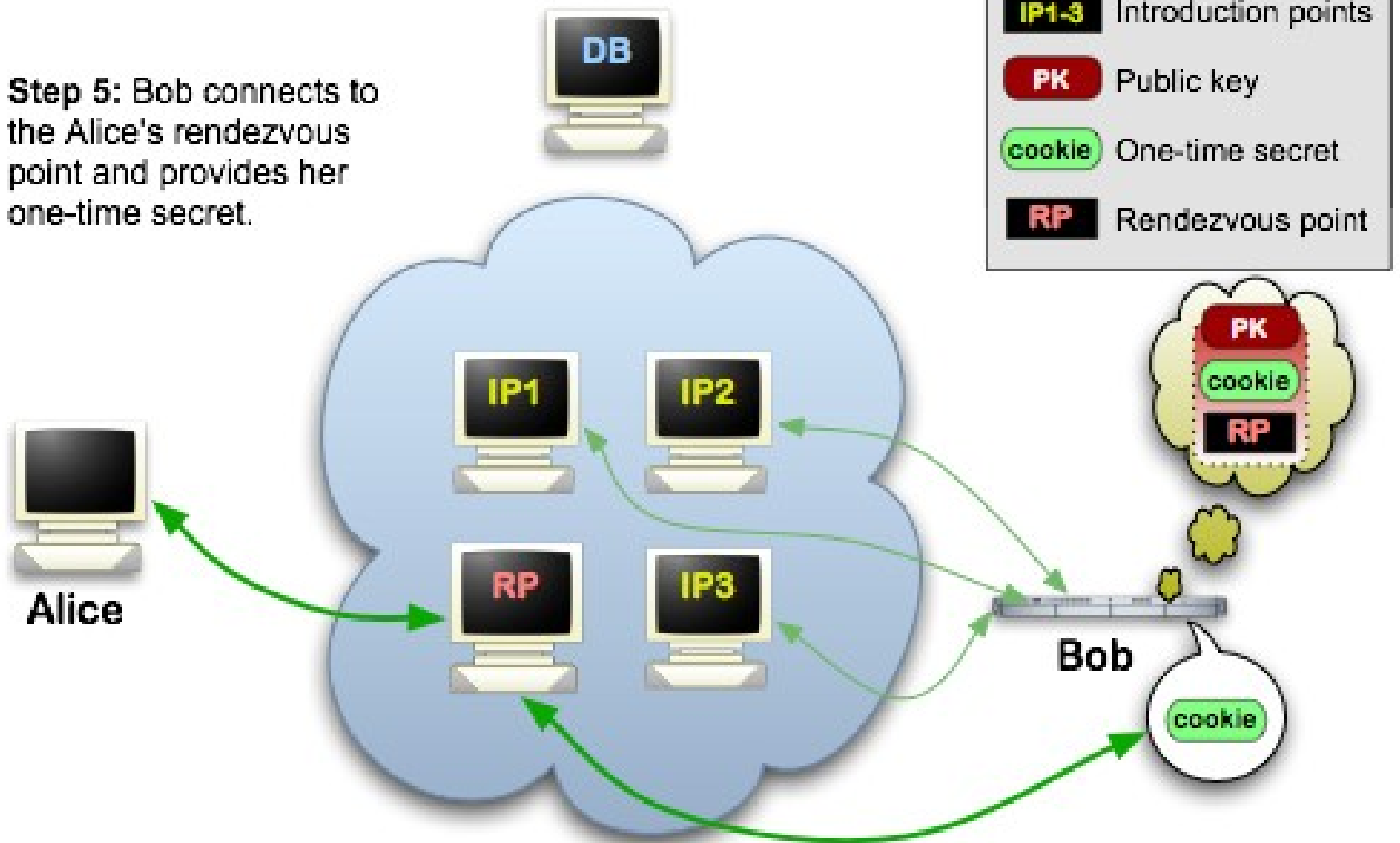
Thank you for contributing to internet freedom!

# 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](#)

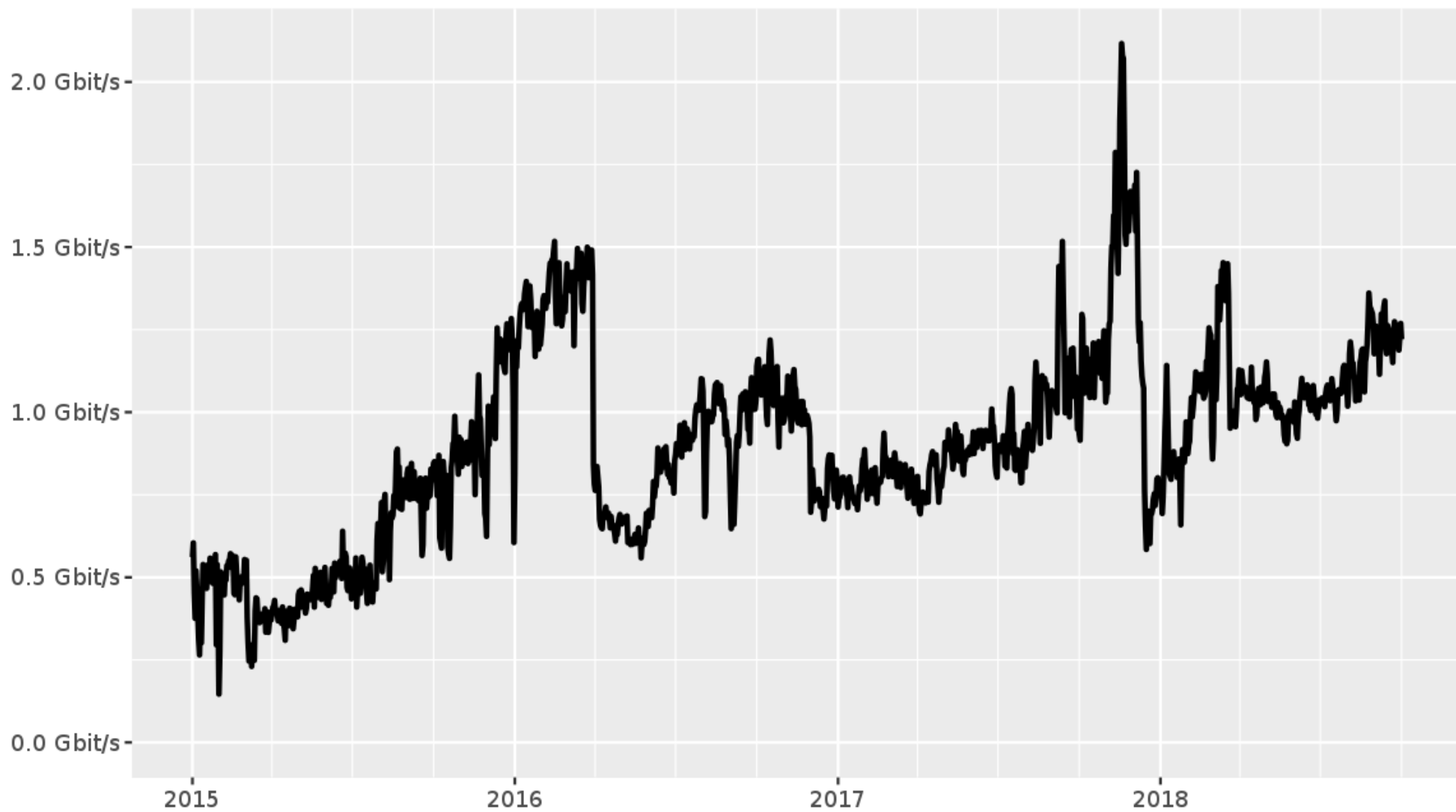
Create a new user account for Riseup Black. For greater security, we strongly recommend you create your account via the Bitmask application instead. Remember: to avoid possible issues, you cannot use your current riseup.net username at this stage. But don't fear, you will be able to do it later.

## Onion service properties

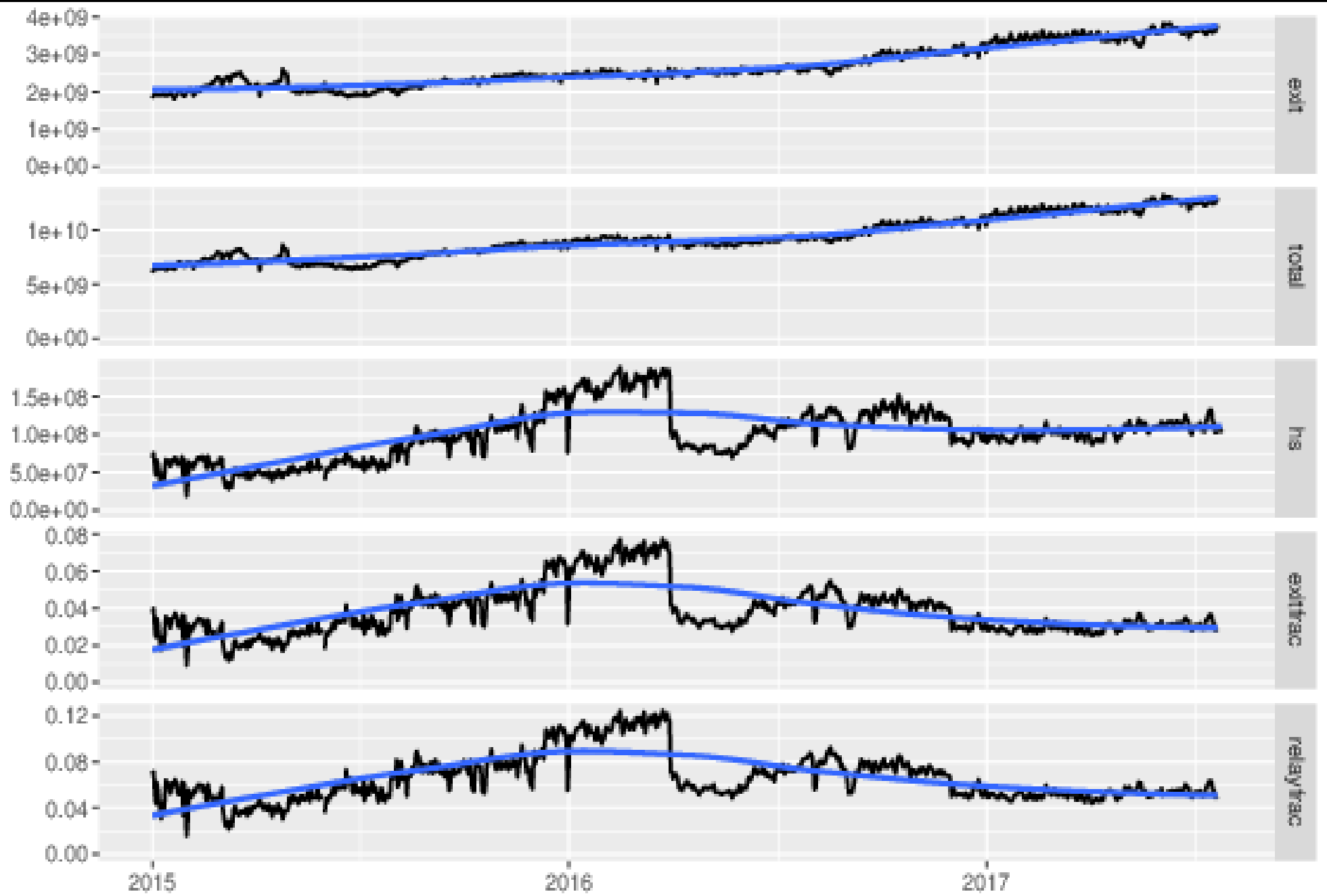
- Self authenticated
- End-to-end encrypted
- Built-in NAT punching
- Limit surface area
- No need to “exit” from Tor



## Onion-service traffic



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

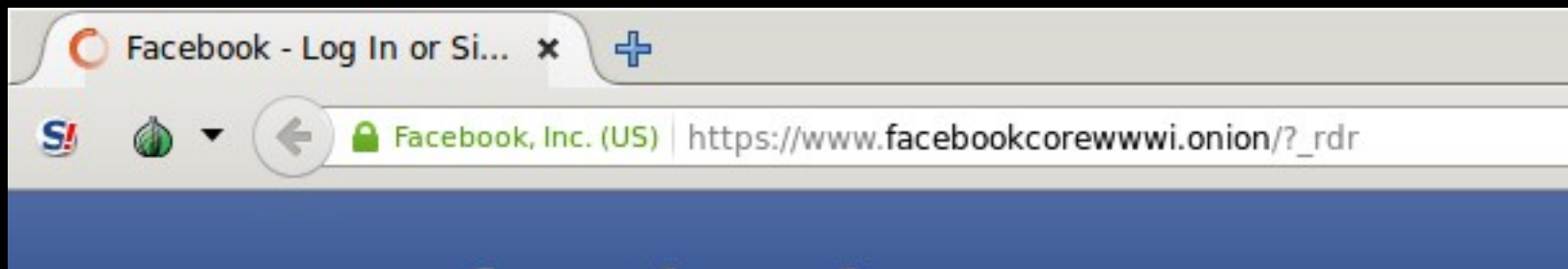




**World Wide Web**

**Deep Web**

**Dark Web**



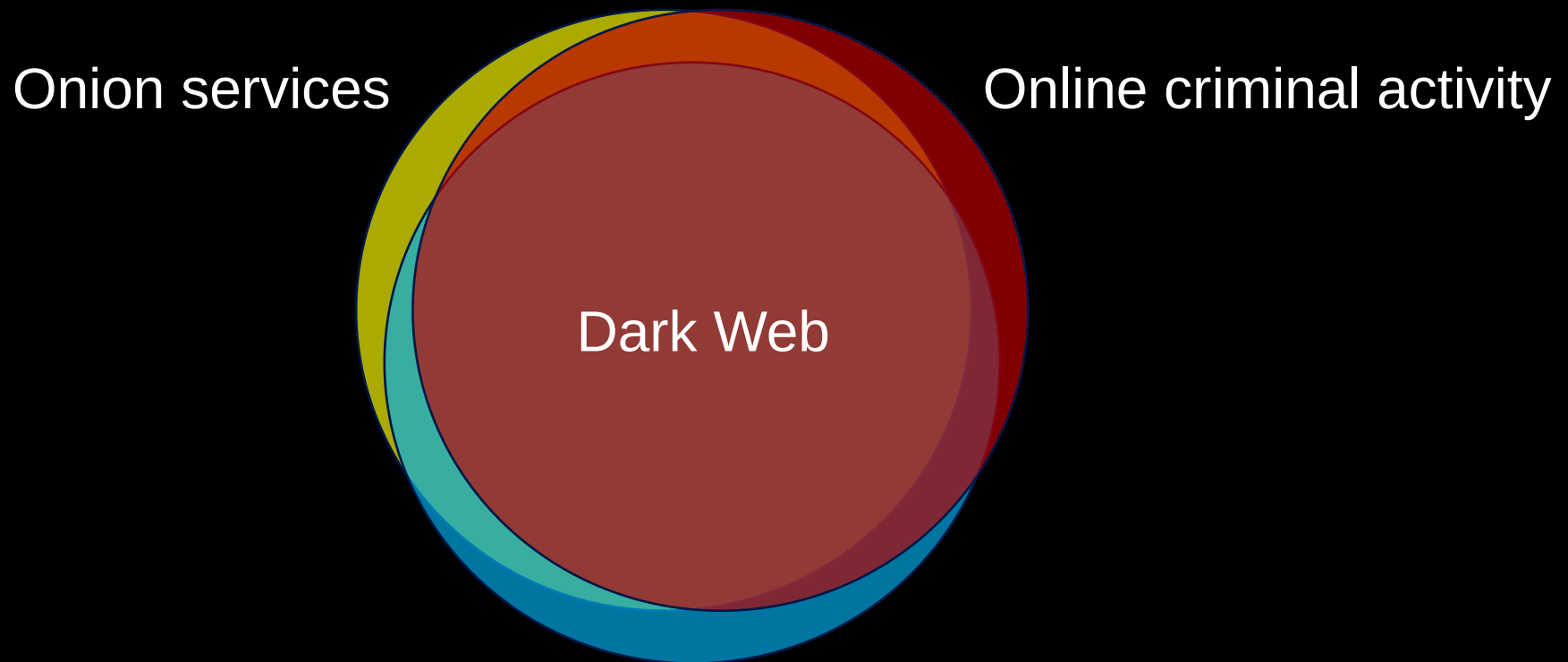
# 1 Million People use Facebook over Tor

 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](#).

# The “Dark Web” as popularly depicted

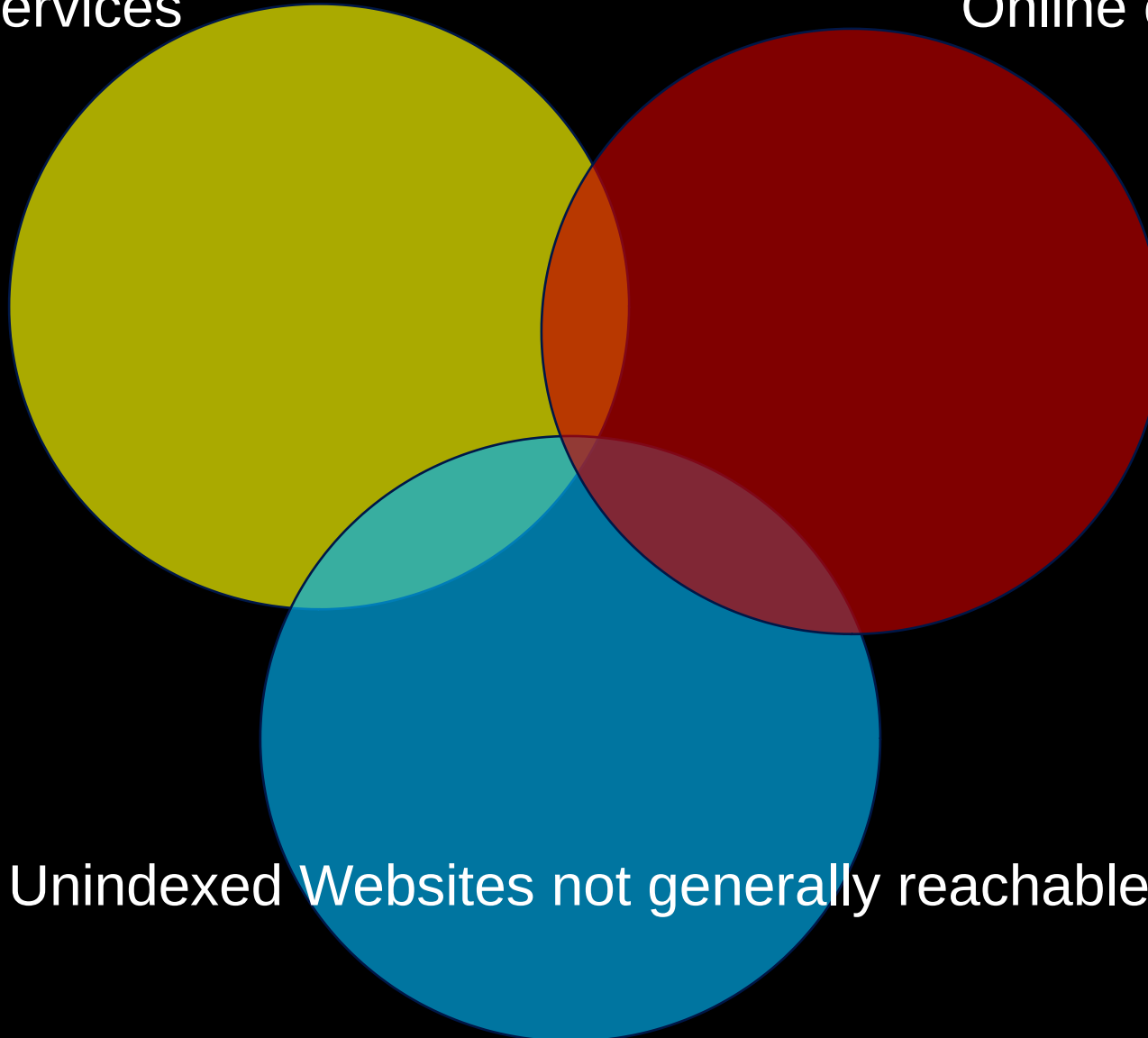


Unindexed Websites not generally reachable

# Reality

Onion services

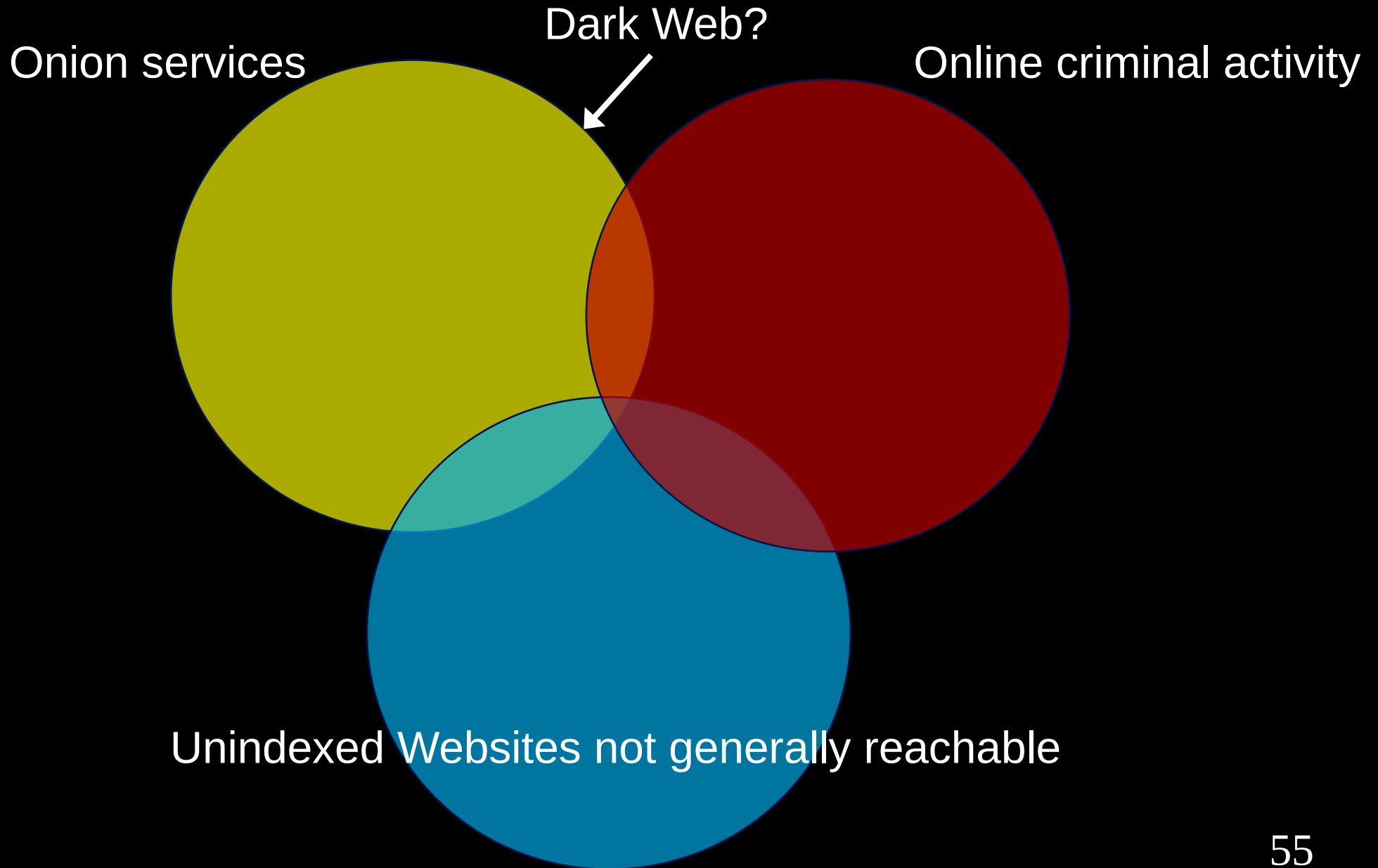
Online criminal activity



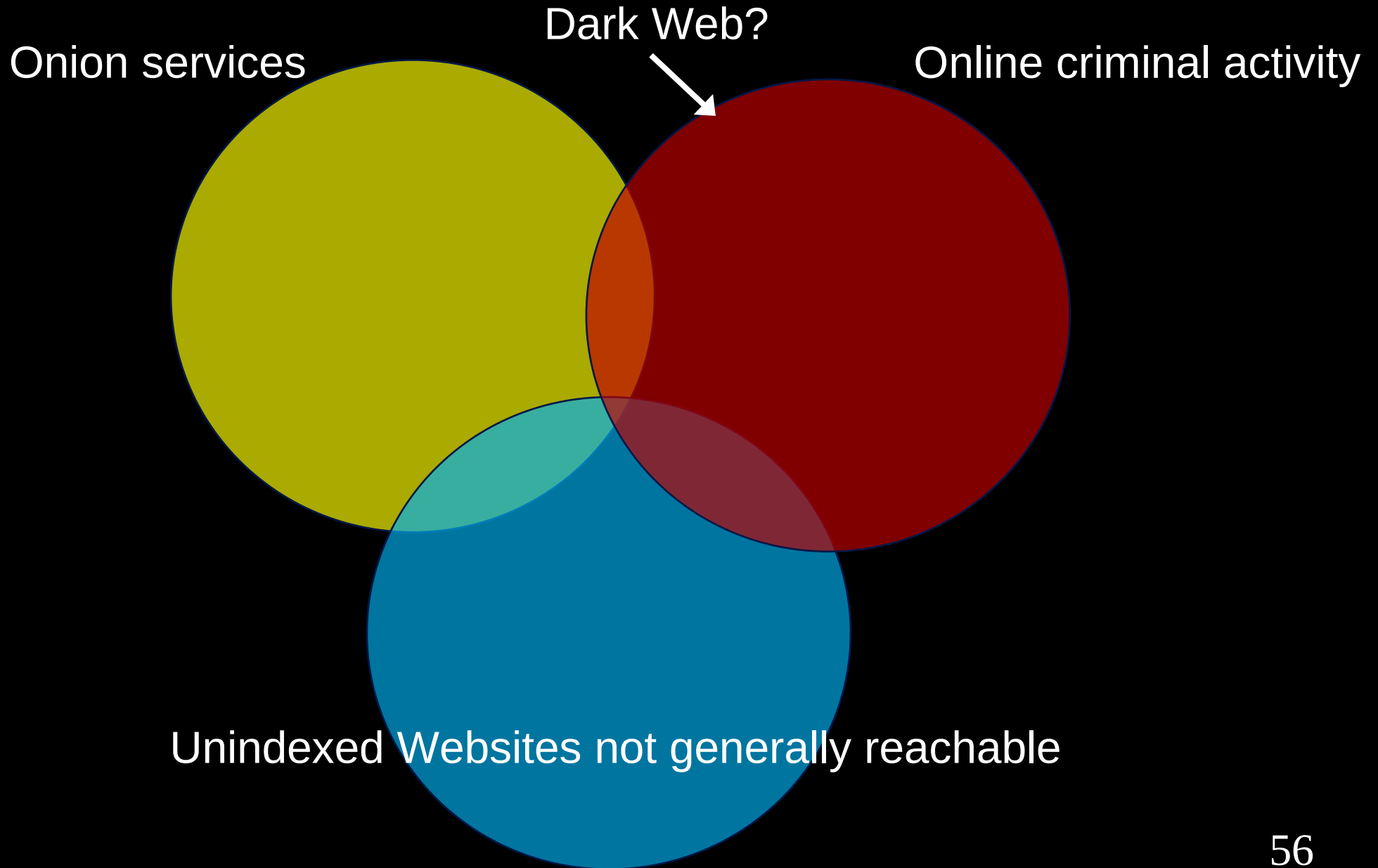
Unindexed Websites not generally reachable



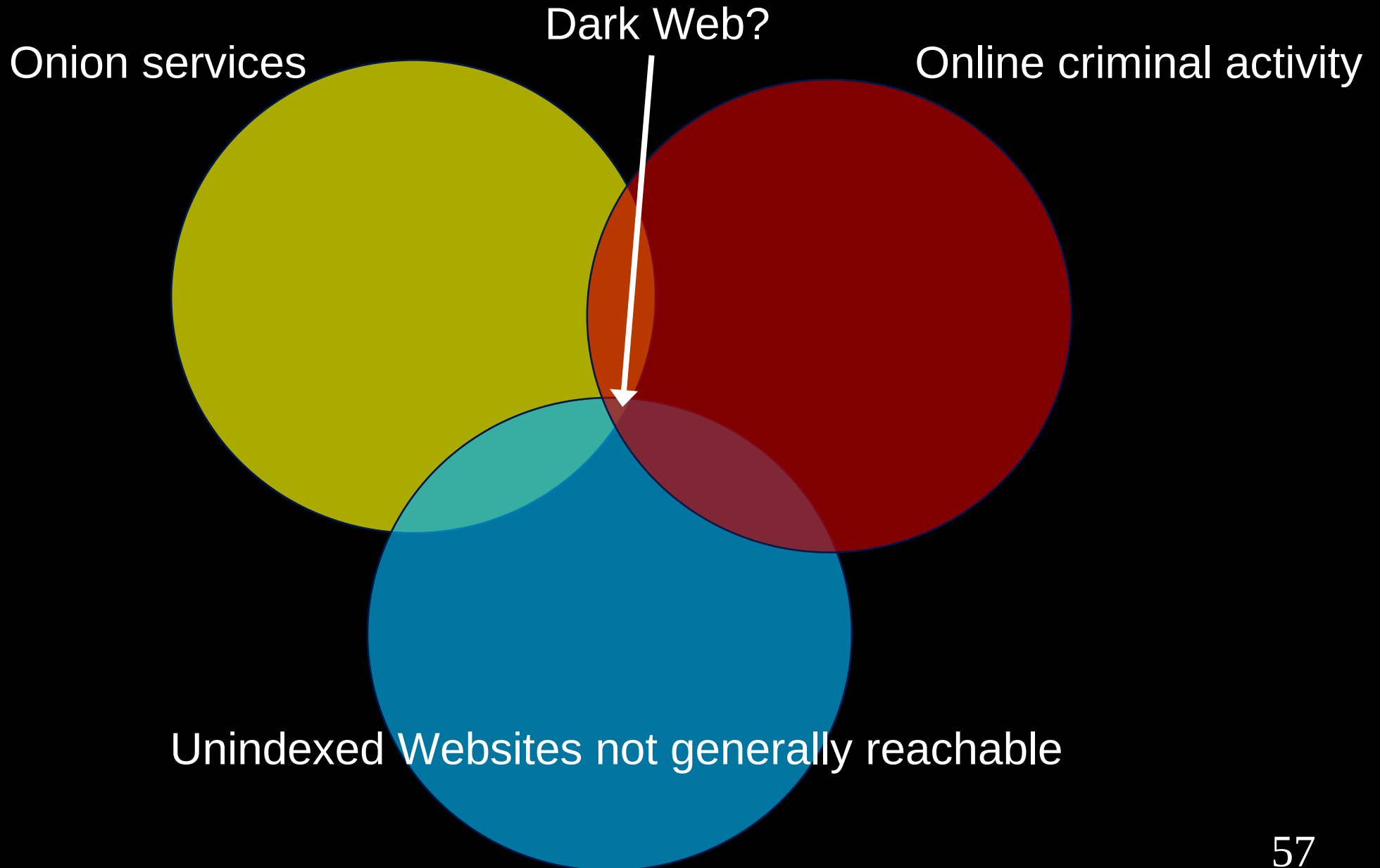
# Reality



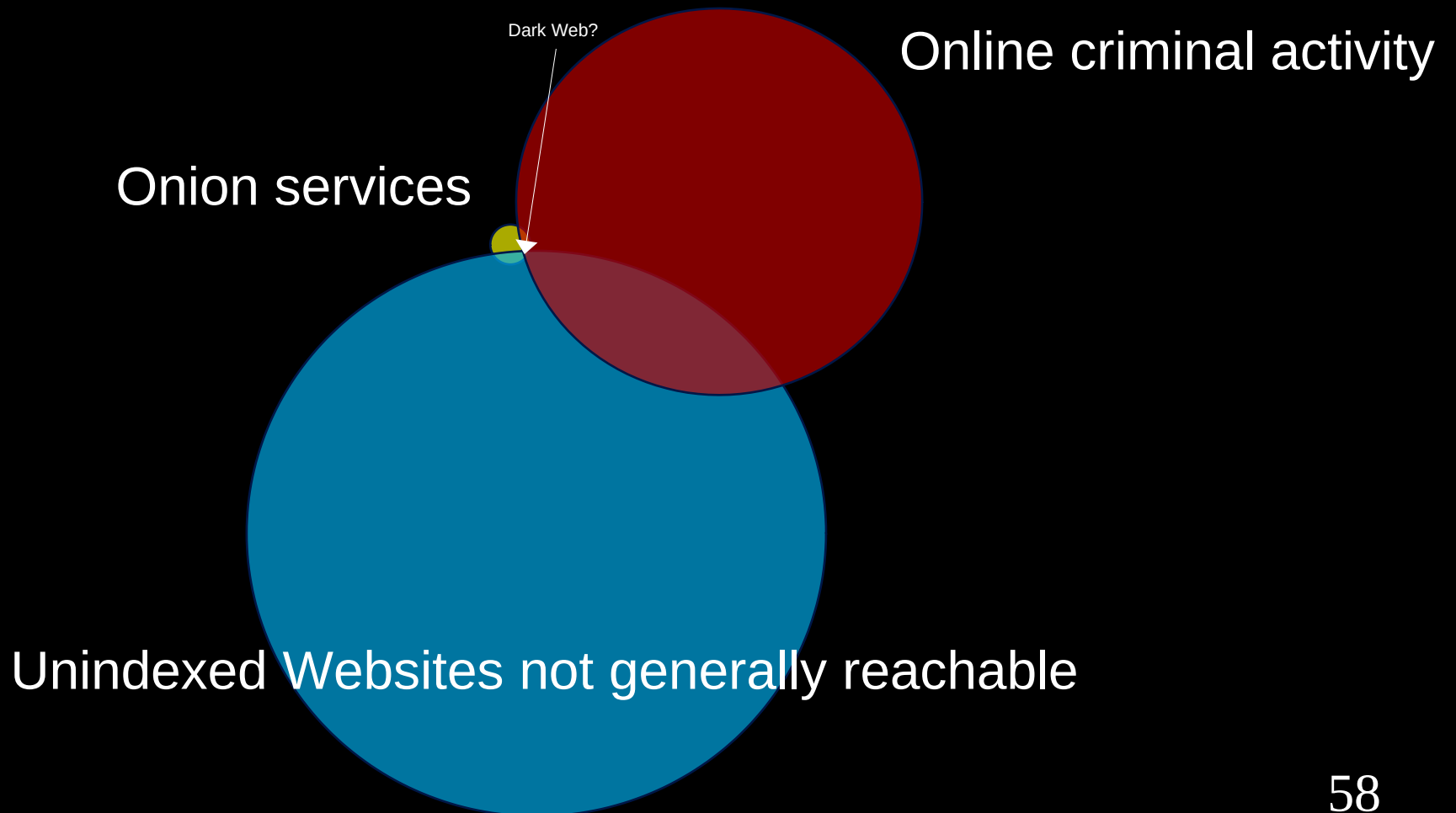
# Reality



# Reality

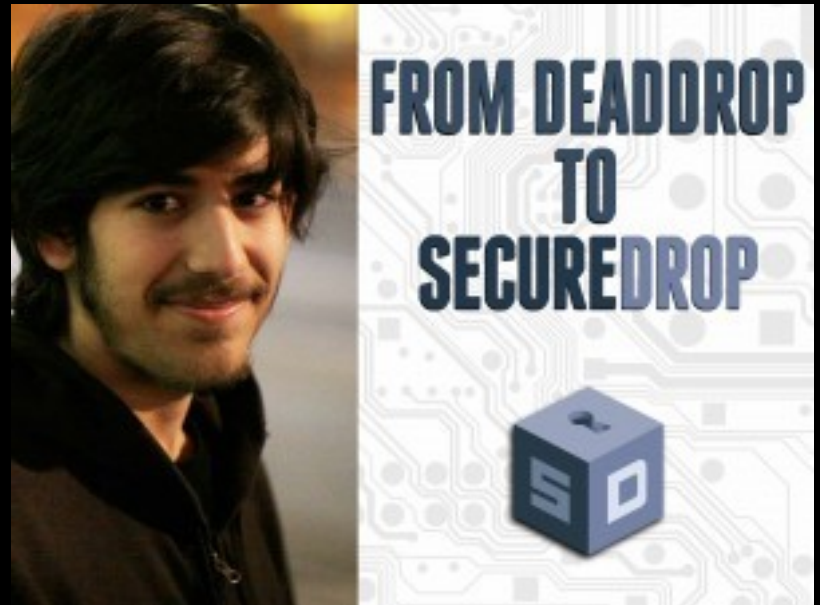


## Scale also matters



# SecureDrop

THE NEW YORKER  
**STRONGBOX**



Today, 75+ organizations use SecureDrop

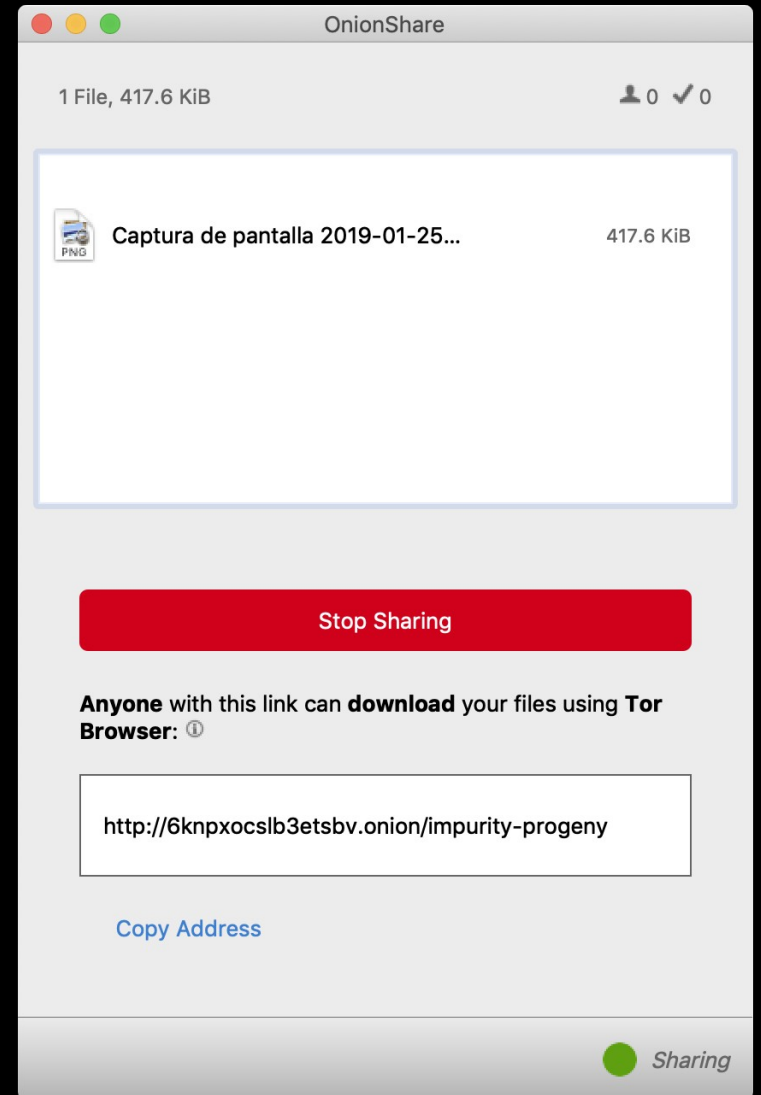
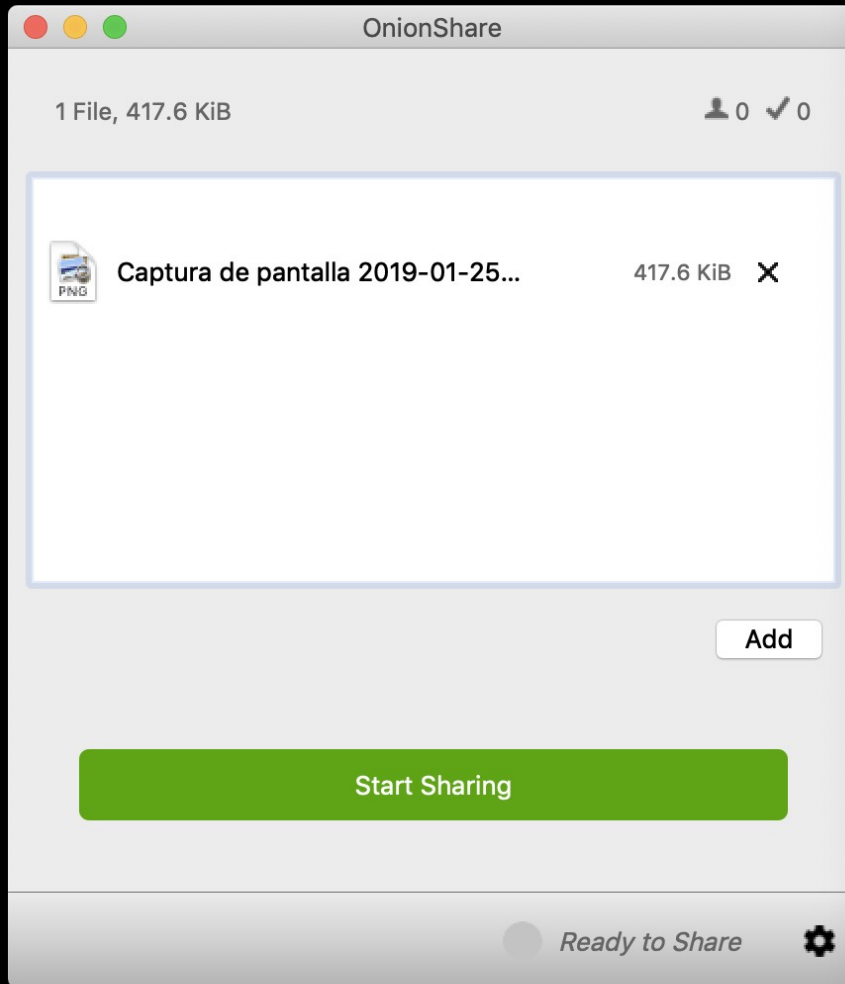
<https://securedrop.org/directory>

# Ricochet





# OnionShare



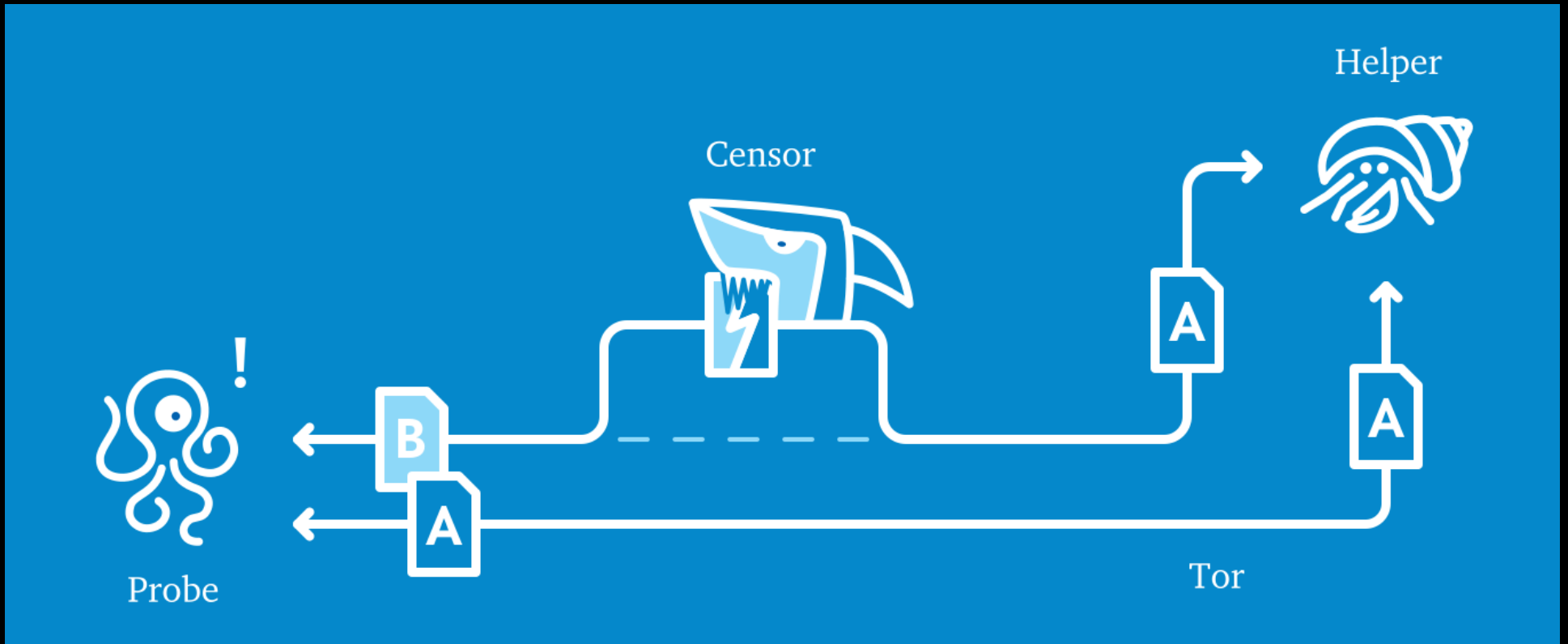
# Tor isn't foolproof

- 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)

# ooni.torproject.org



# explorer.ooni.torproject.org



OONI Explorer

World

Explorer

Highlights

About

## World Map

