



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.

What is Tor?

Online anonymity 1) open source software,
2) network, 3) protocol

Community of researchers, developers,
users, and relay operators

Funding from US DoD, Electronic Frontier
Foundation, Voice of America, Google,
NLnet, Human Rights Watch, NSF, US
State Dept, SIDA, Knight Foundation, ...

The Tor Project, Inc.

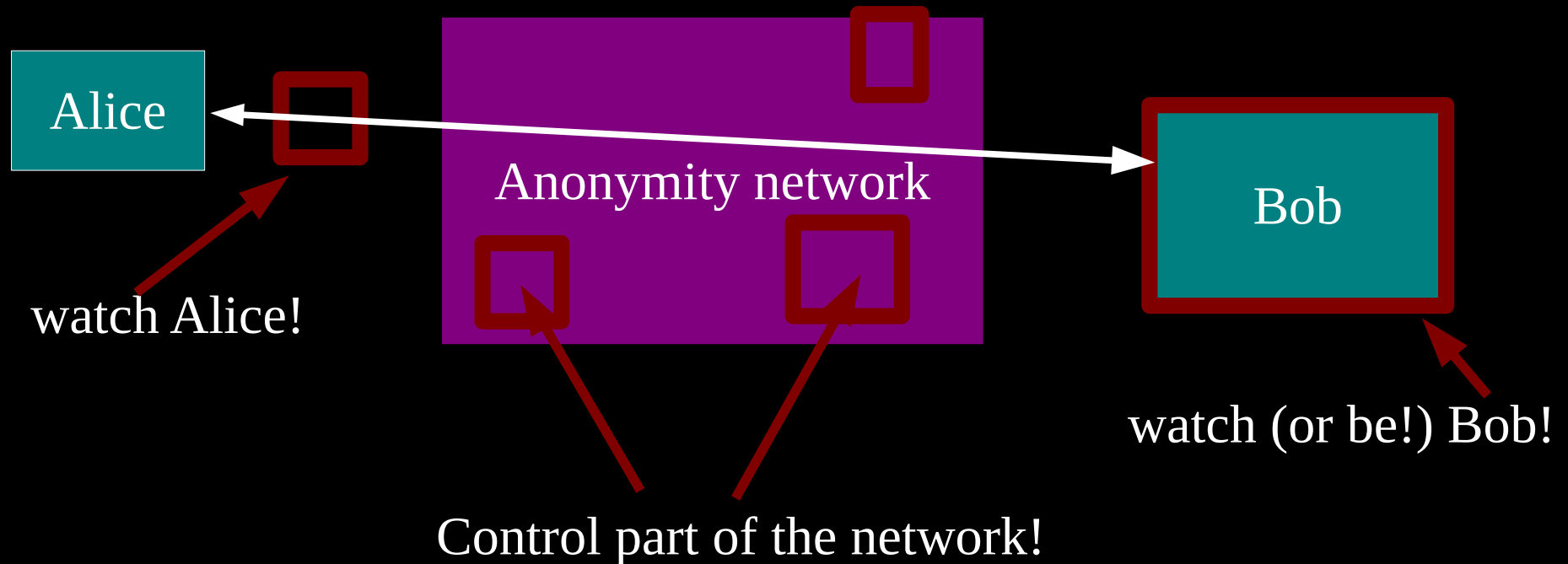


501(c)(3) non-profit organization dedicated to the research and development of tools for online anonymity and privacy

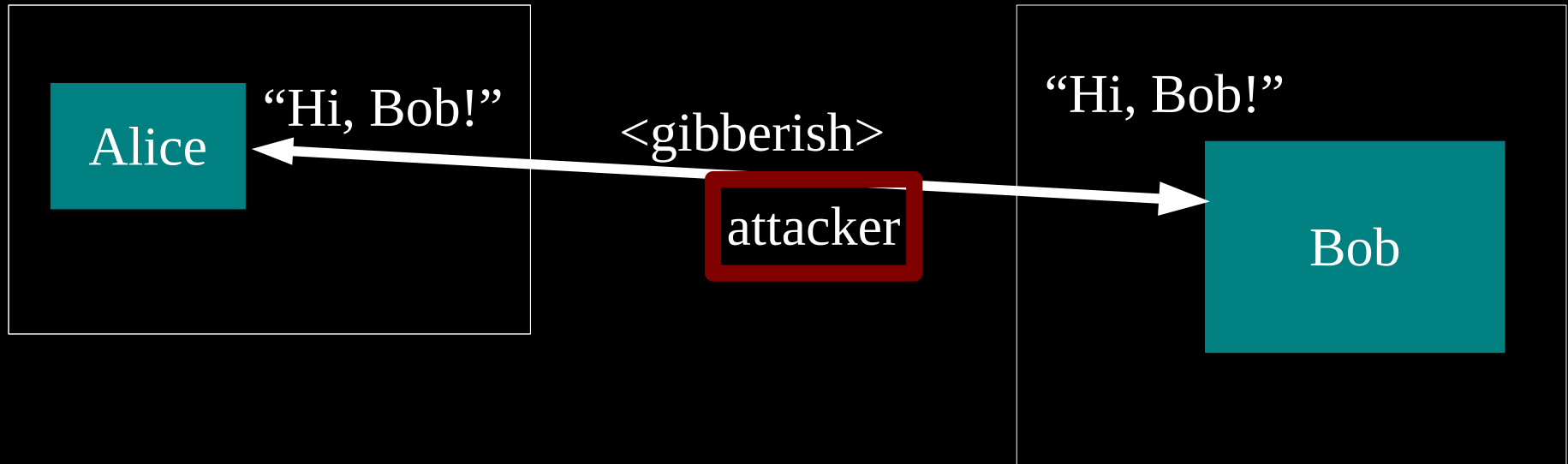
A photograph of a large, empty stadium with many rows of blue seats. The seats are arranged in a semi-circular pattern, and the stadium is completely devoid of people. The lighting is bright, and the overall tone is blue.

Estimated 2,000,000+
daily Tor users

Threat model: what can the attacker do?



Anonymity isn't encryption: Encryption just protects contents.



Anonymity isn't just wishful thinking...

“You can't prove it was me!”

“Promise you won't look!”

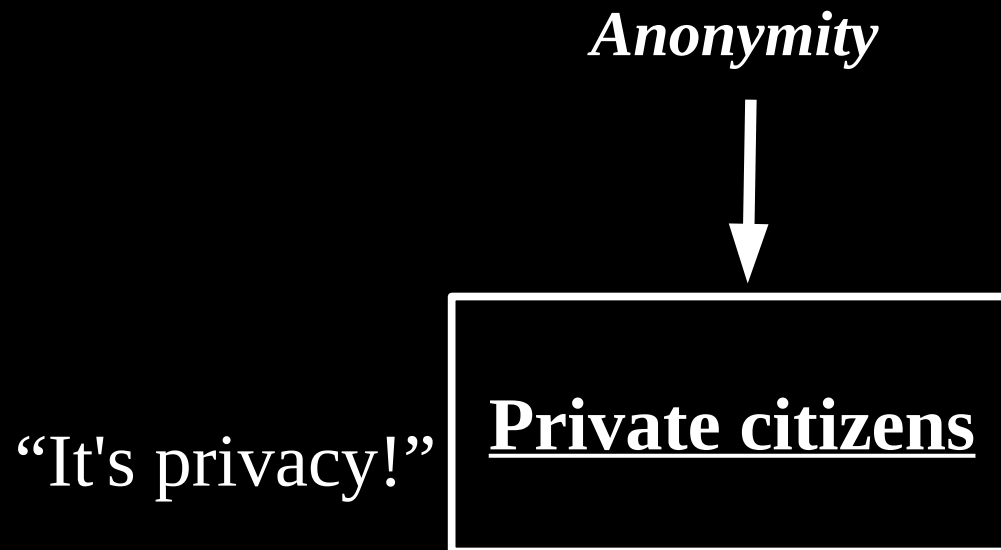
“Promise you won't remember!”

“Promise you won't tell!”

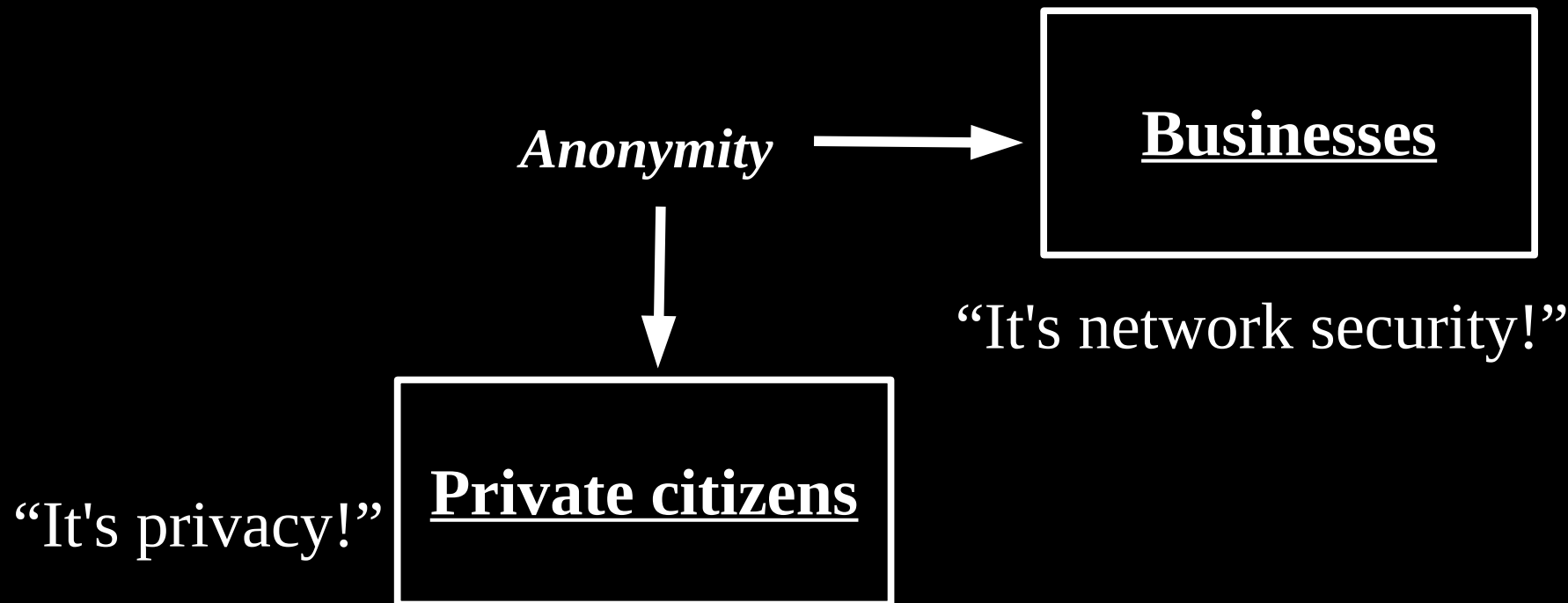
“I didn't write my name on it!”

“Isn't the Internet already anonymous?”

Anonymity serves different interests for different user groups.



Anonymity serves different interests for different user groups.



Anonymity serves different interests for different user groups.

“It's traffic-analysis resistance!”



Anonymity

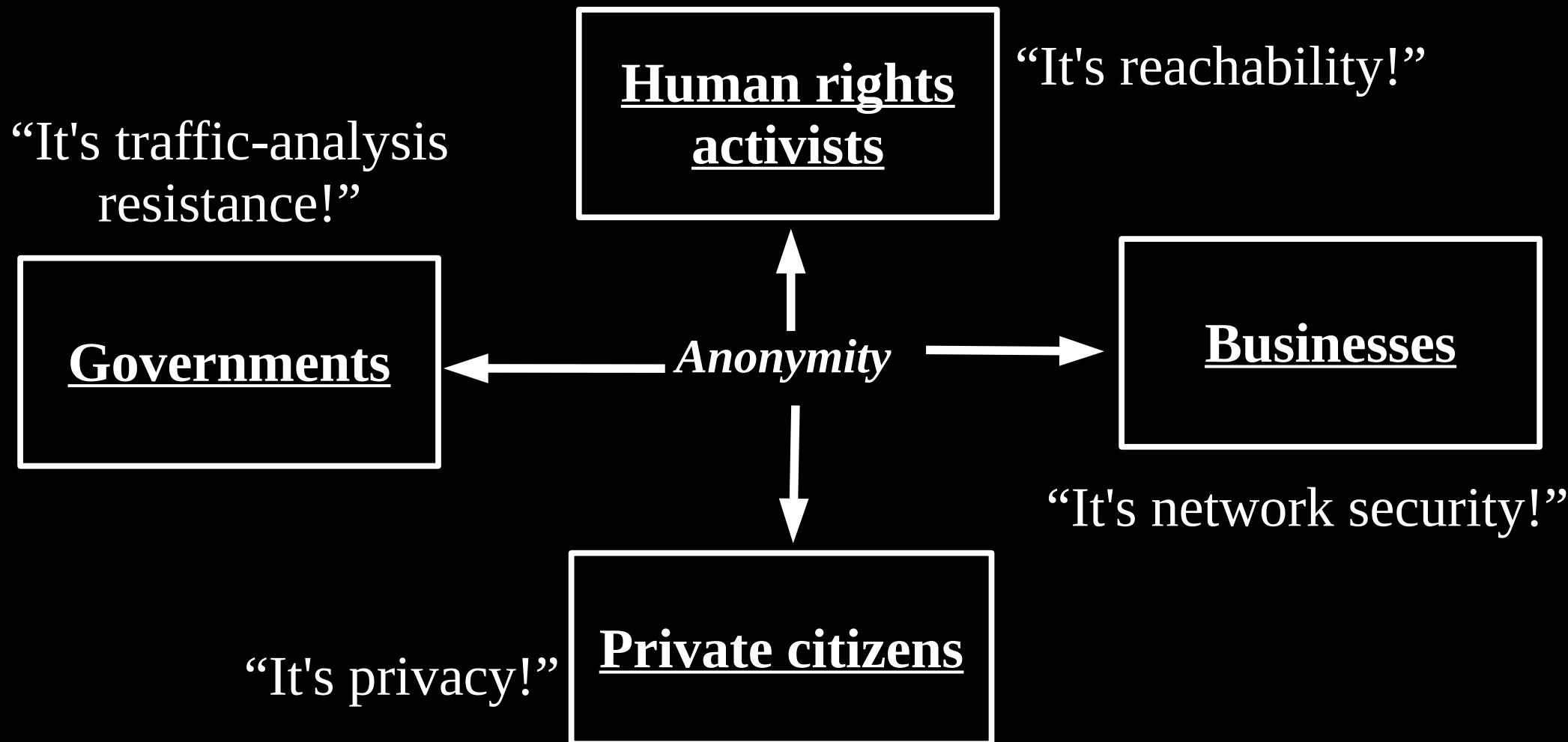


“It's network security!”

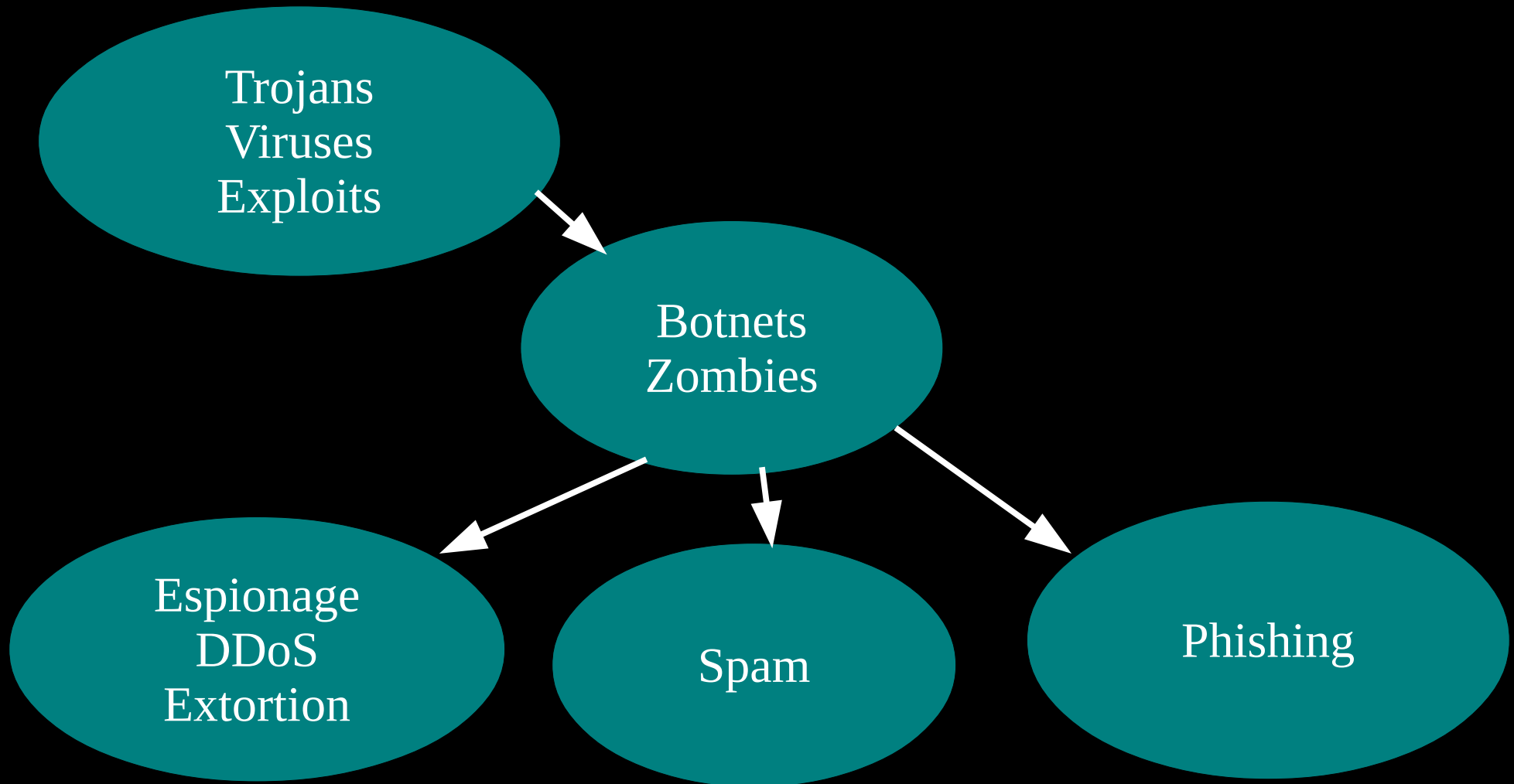
“It's privacy!”



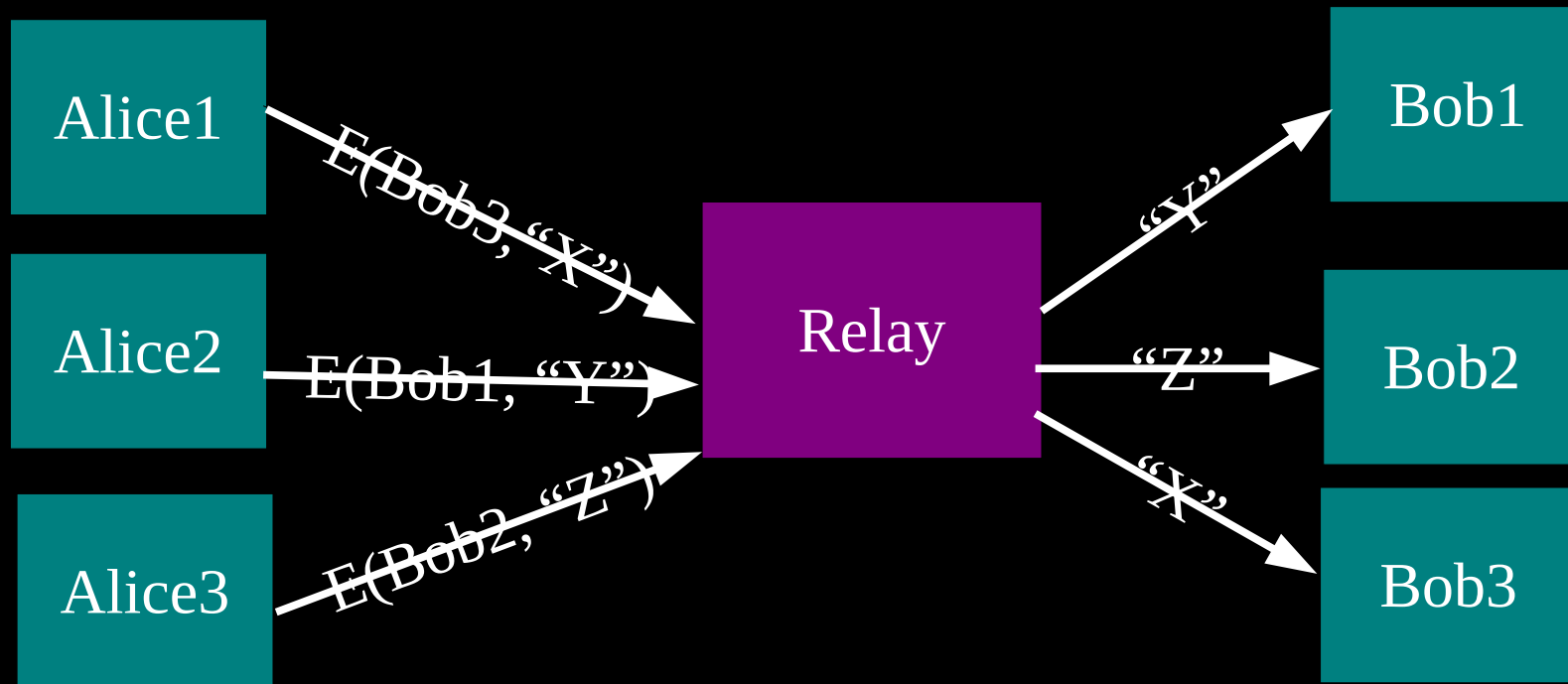
Anonymity serves different interests for different user groups.



Current situation: Bad people on the Internet are doing fine

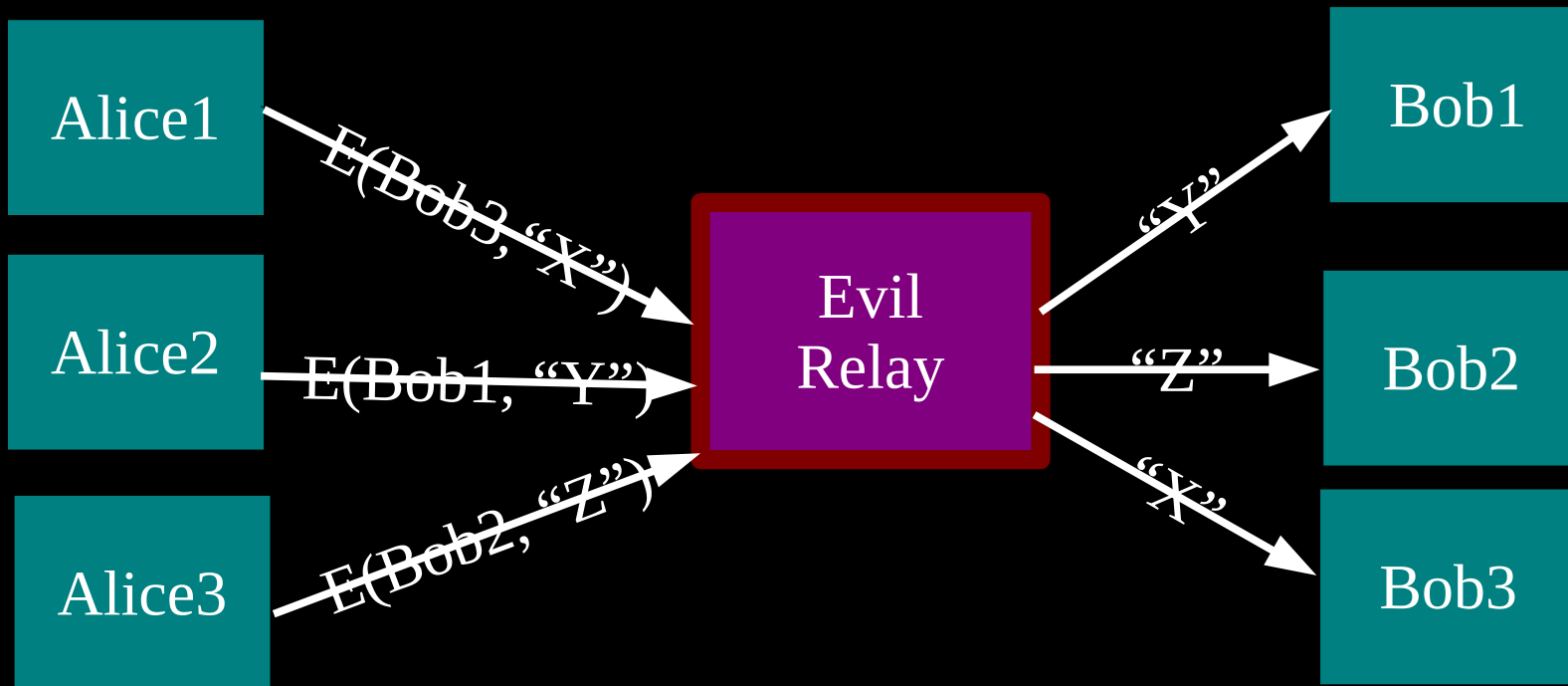


The simplest designs use a single relay to hide connections.

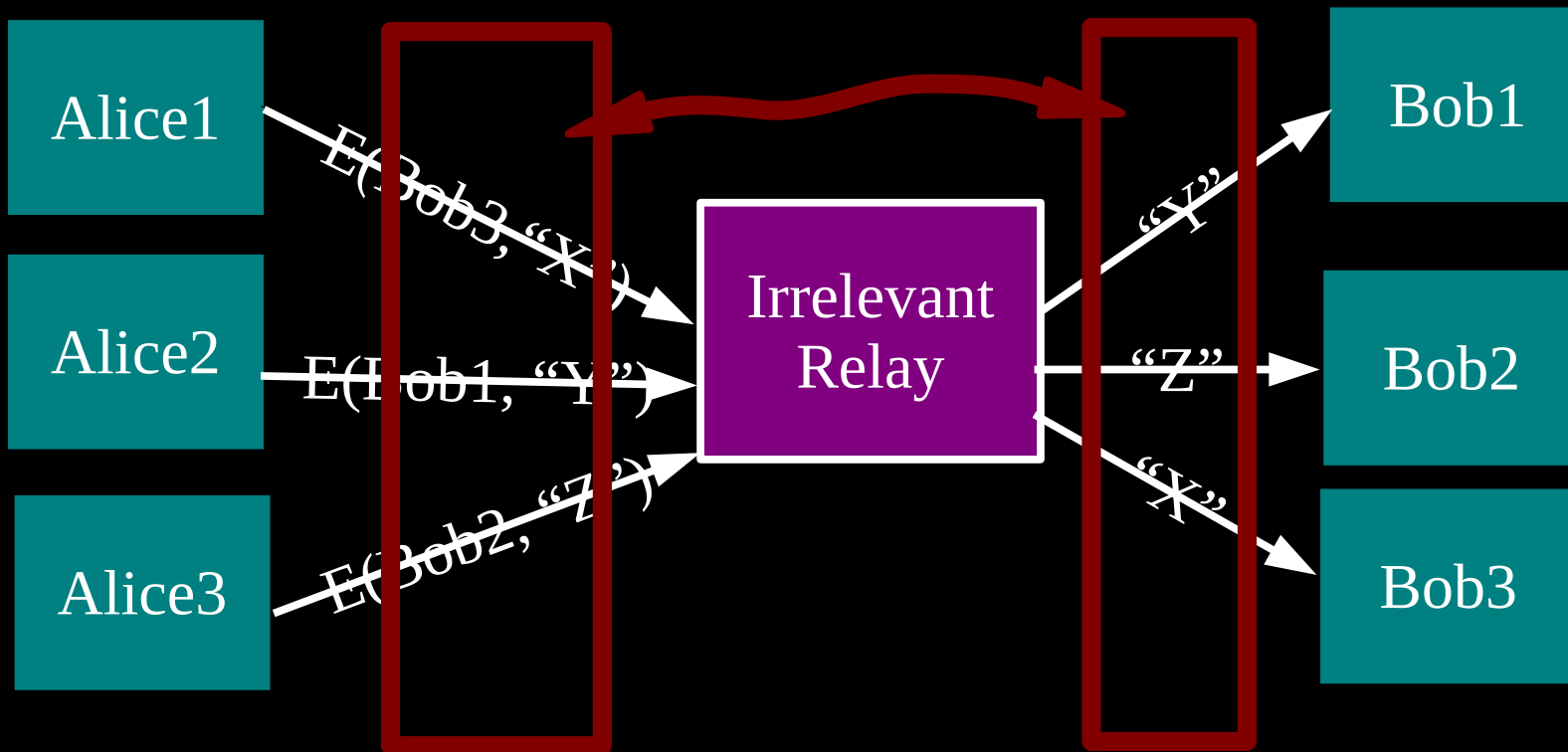


(example: some commercial proxy providers)

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

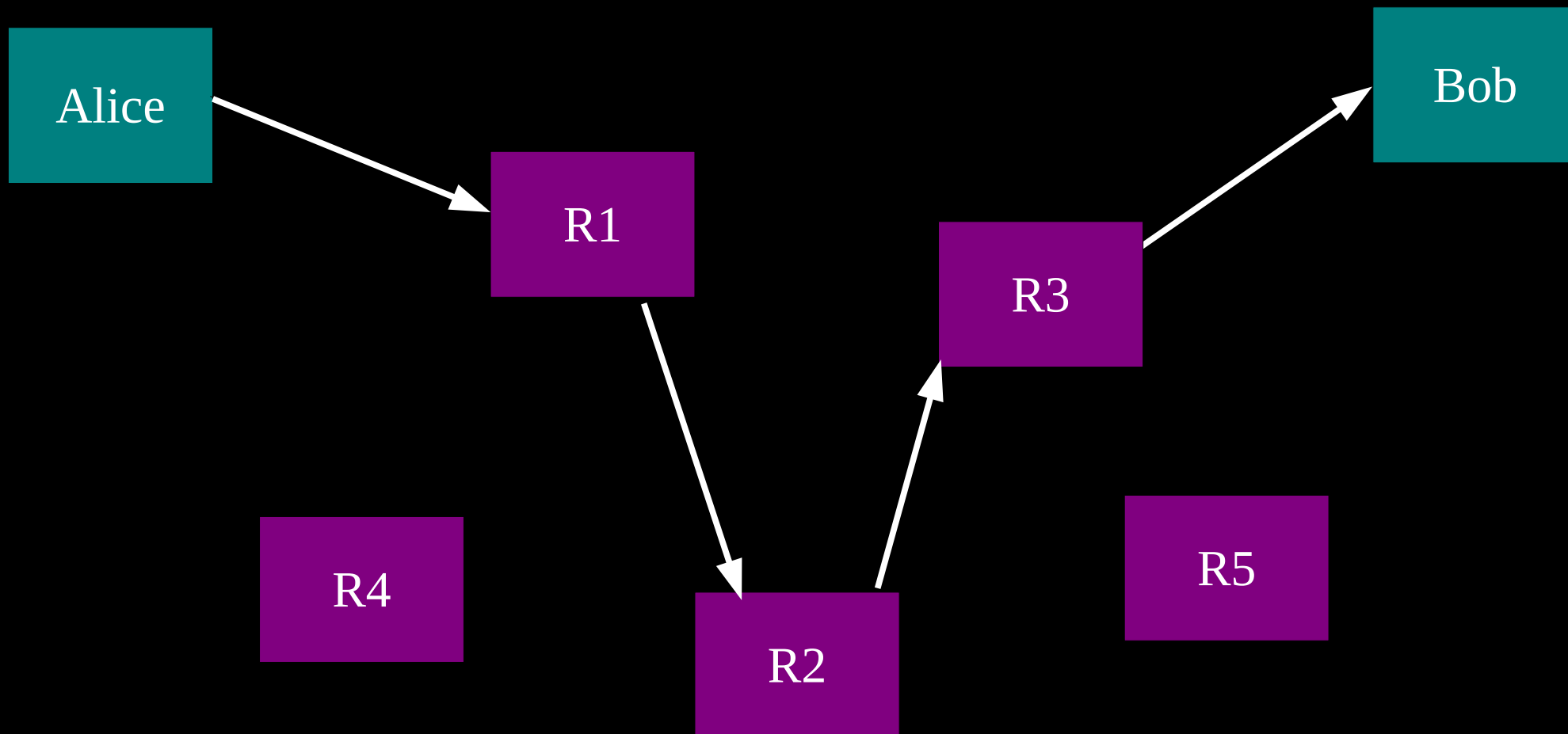


... or a single point of bypass.

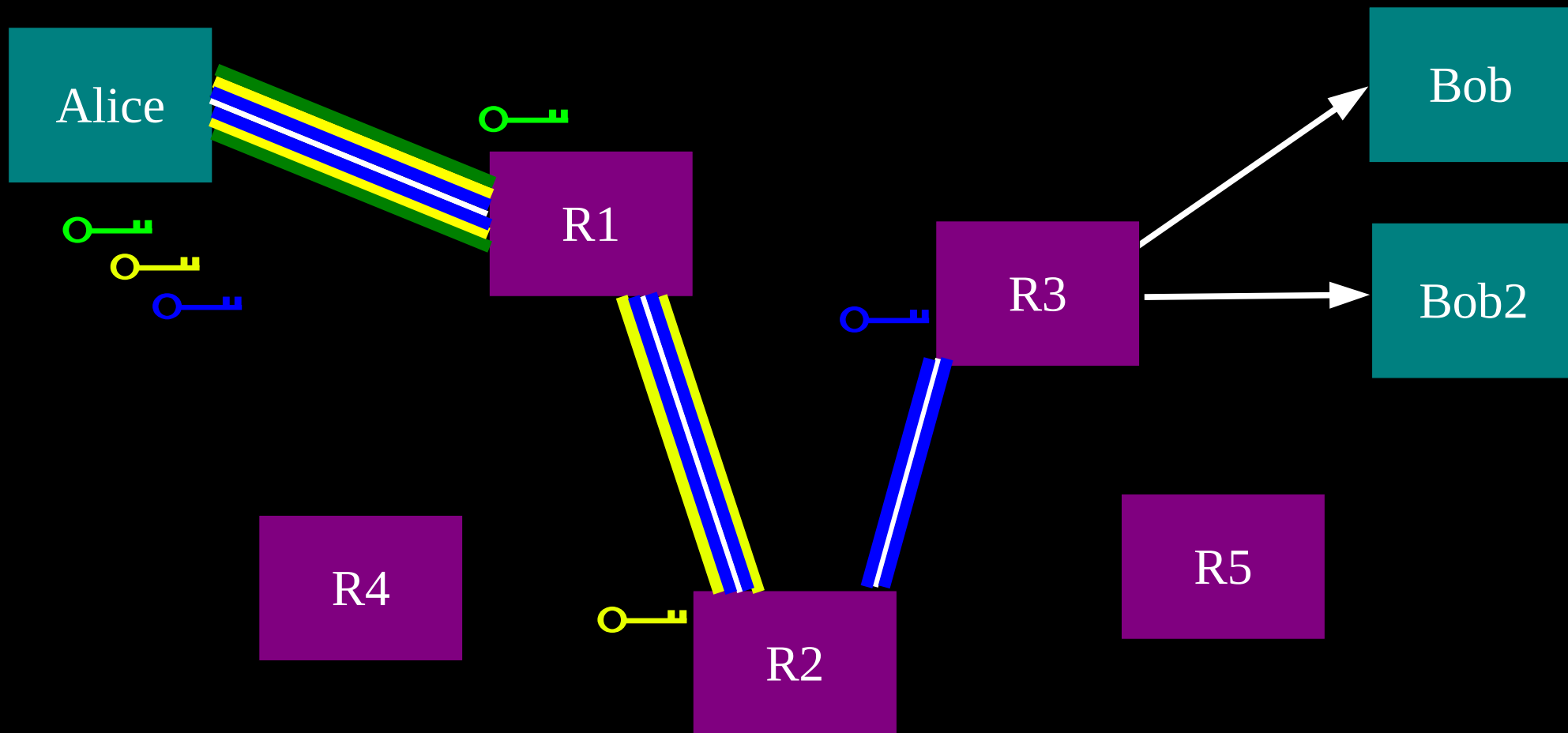


Timing analysis bridges all connections through relay \Rightarrow An attractive fat target

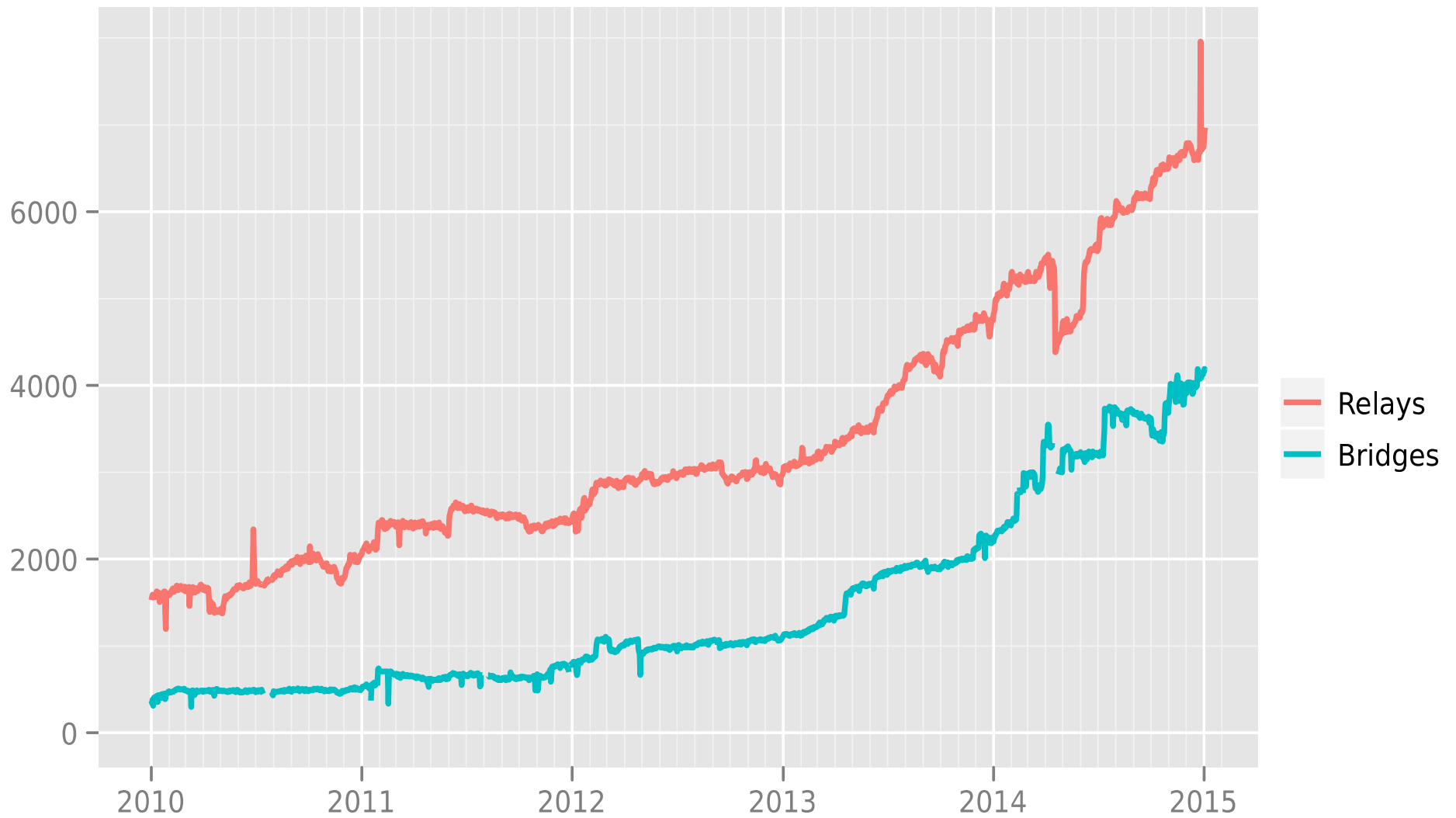
**So, add multiple relays so that
no single one can betray Alice.**



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



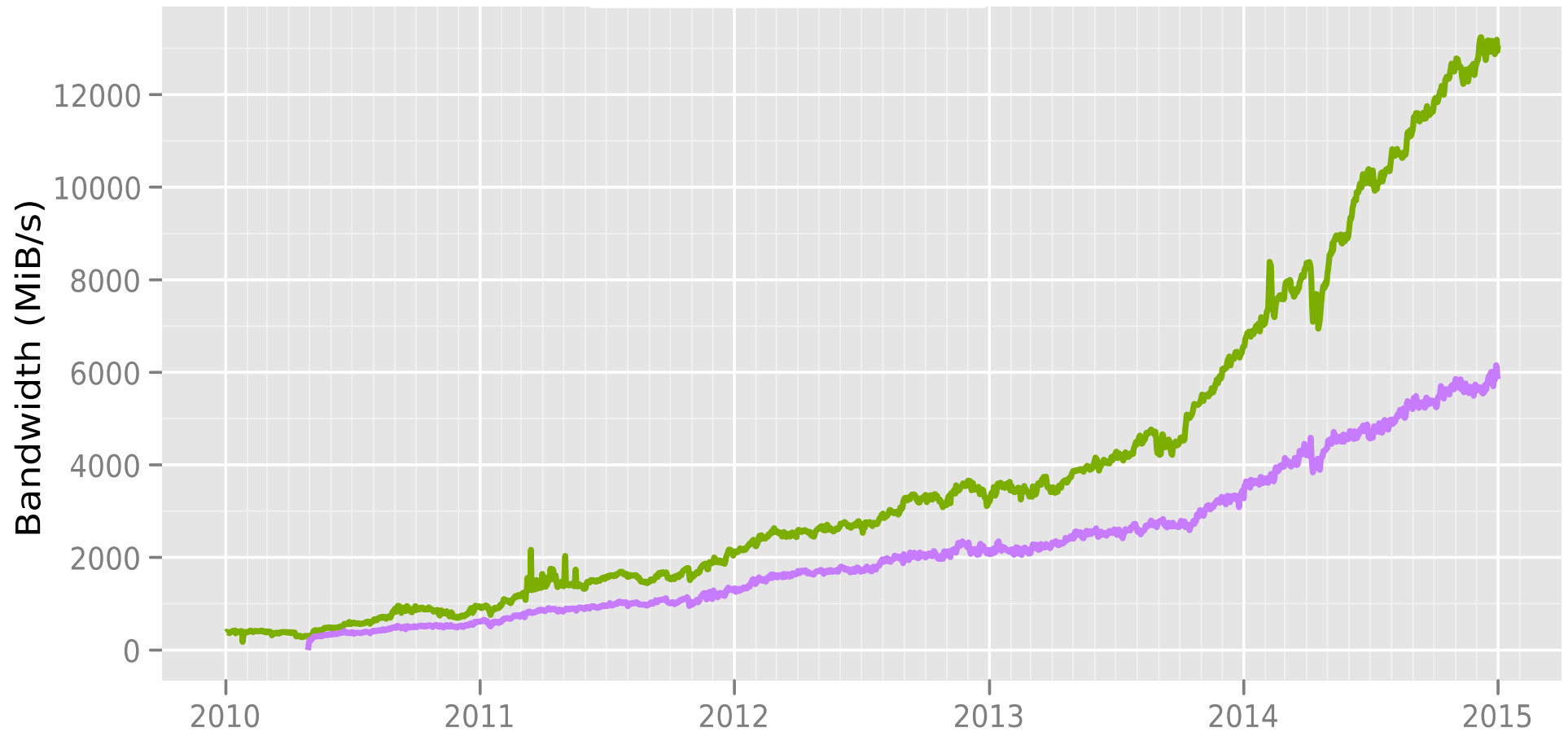
Number of relays



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

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.

New Identity

Cookie Protections

Preferences...

About Torbutton...

Open Network Settings...

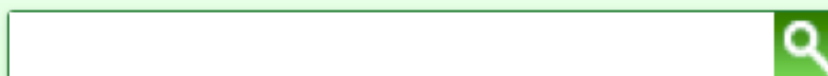
Tor Browser
3.5-Linux

Congratulations!

This browser is configured to use Tor.

You are now free to browse the Internet anonymously.

[Test Tor Network Settings](#)



Search [securely](#) with [Startpage](#).

What Next?

Tor is NOT all you need to browse anonymously! You may need to change some of your browsing habits to ensure your identity stays safe.

[Tips On Staying Anonymous »](#)

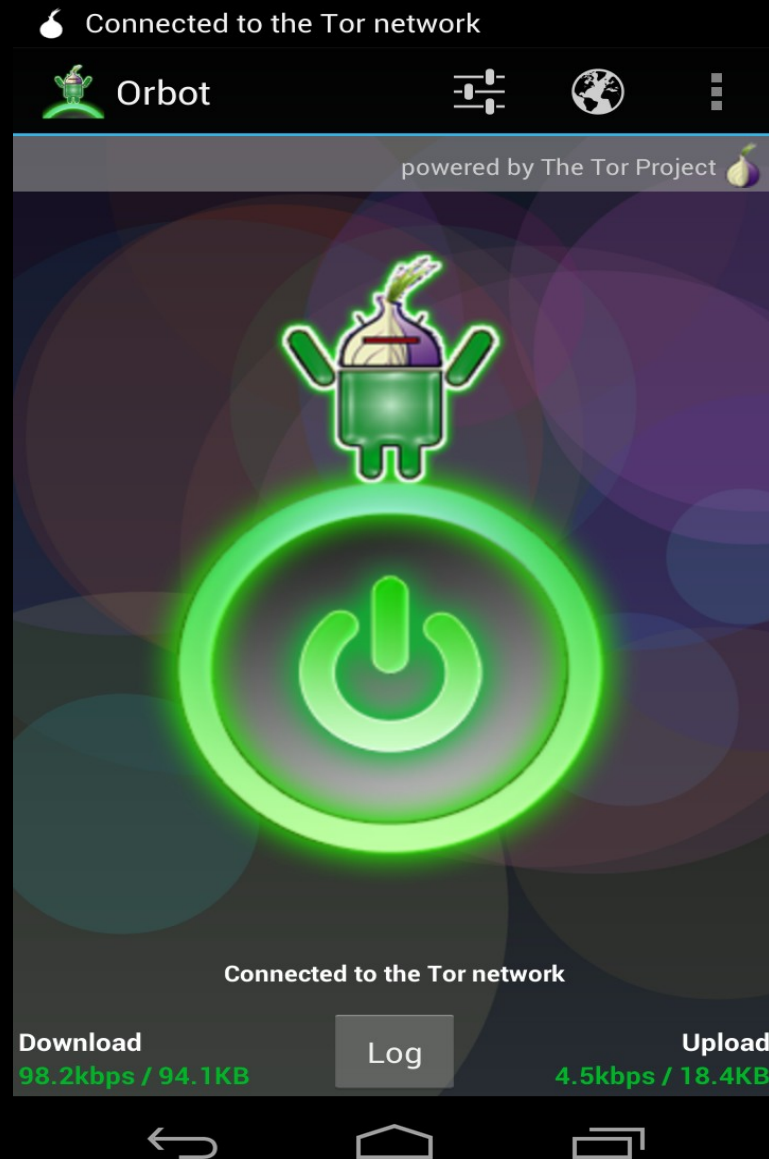
You Can Help!

There are many ways you can help make the Tor Network faster and stronger:

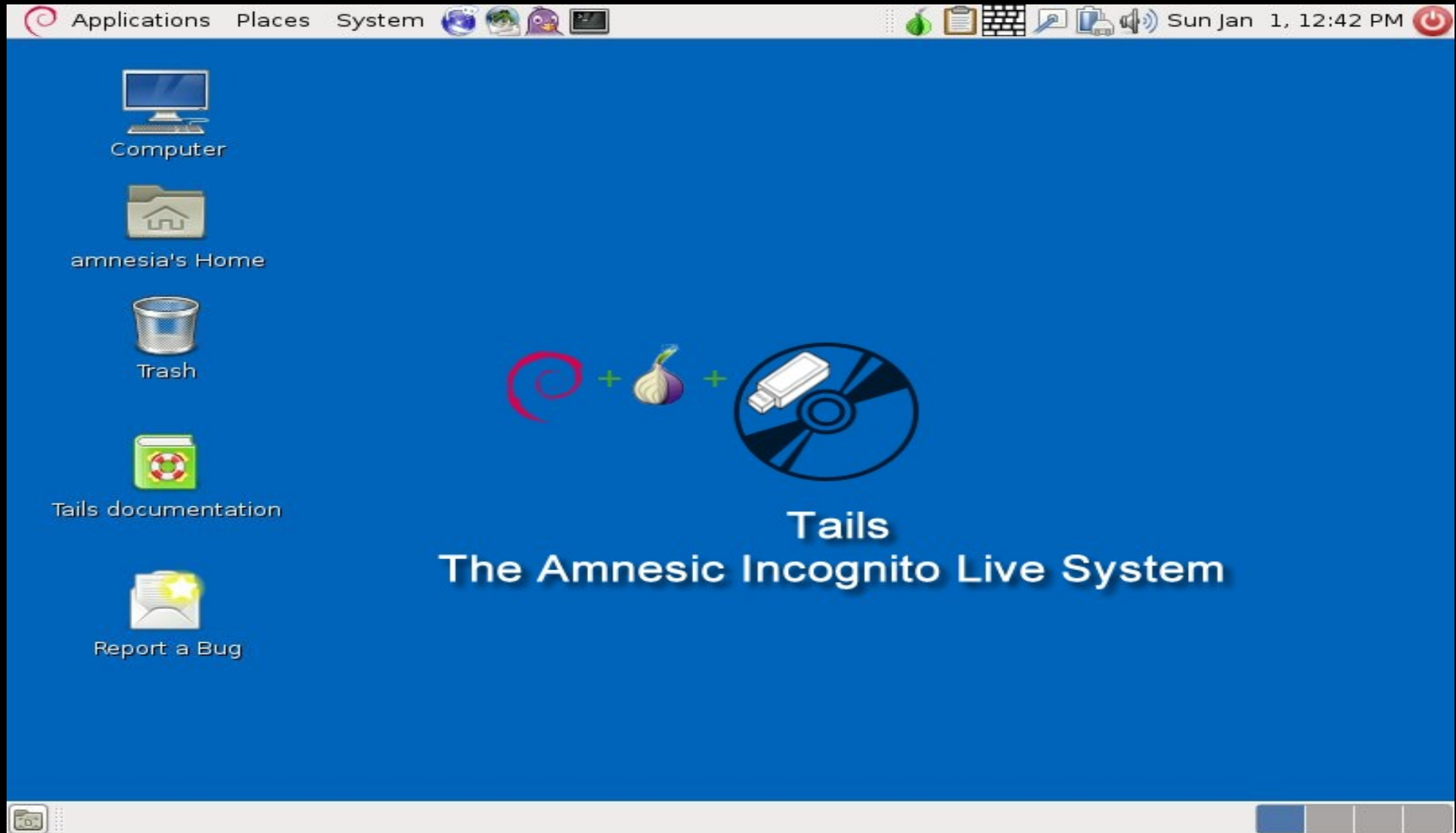
- [Run a Tor Relay Node »](#)
- [Volunteer Your Services »](#)
- [Make a Donation »](#)

The Tor Project is a US 501(c)(3) non-profit dedicated to the research, development, and education of online anonymity and privacy. [Learn more about The Tor Project »](#)

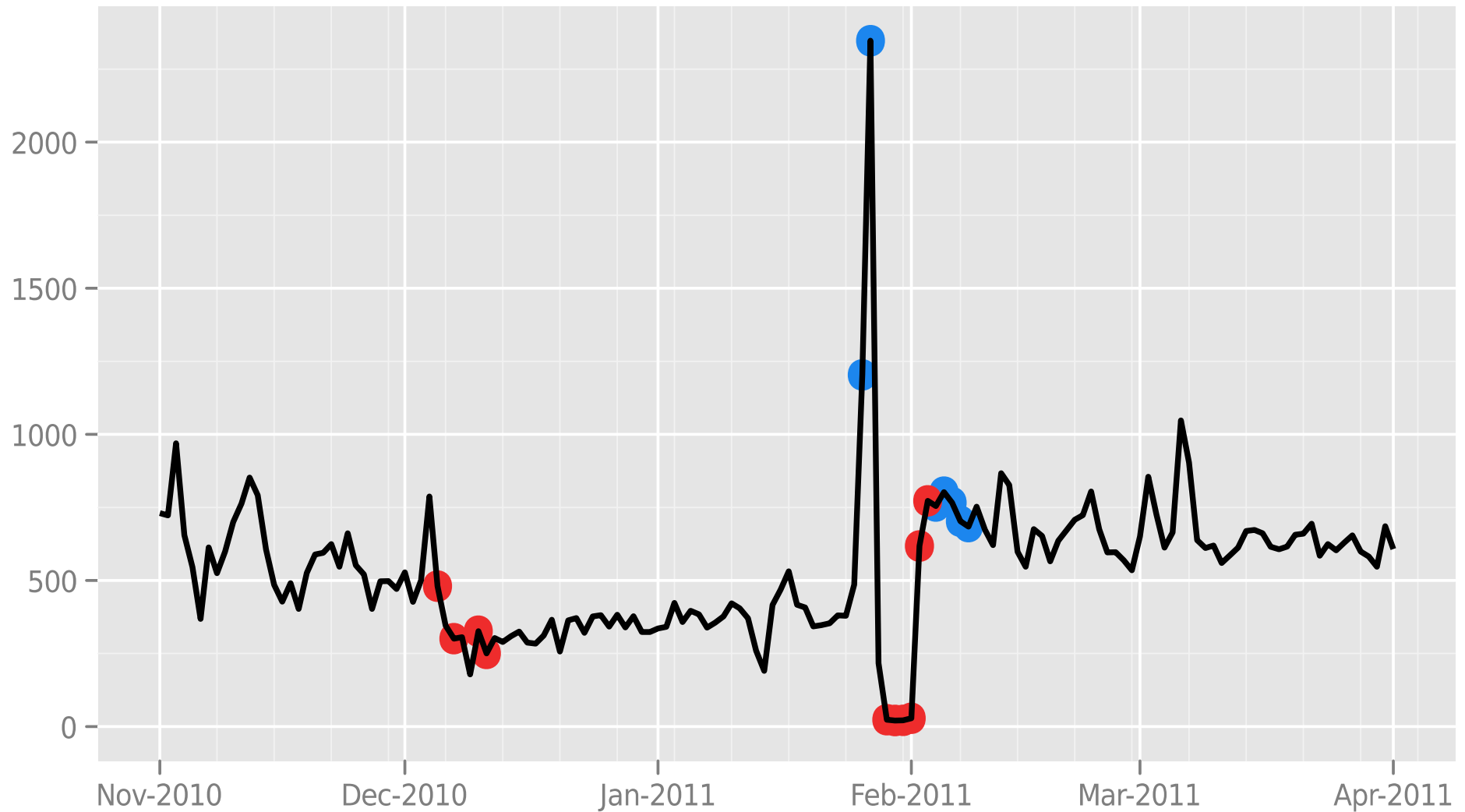
Orbot



Tails LiveCD



Directly connecting users from Egypt



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

Attackers can block users from connecting to the Tor network

- 1) By blocking the directory authorities
- 2) By blocking all the relay IP addresses in the directory, or the addresses of other Tor services
- 3) By filtering based on Tor's network fingerprint
- 4) By preventing users from finding the Tor software (usually by blocking website)

خطرا!



تصفح بأمان!

عذرا، 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 بدفعه للاشتراك محتوي مدرج تحت "فئات المحتويات المحظورة" 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 International IT UC

Your request was denied because of its content.



ء على اللوائح والقوانين
unblock.kw@kw.zain

يا لله بالسستر...!

بيّة المتحدّة.

وخدمة متطلبات
بدخوله لاشتماله
ة" حسب تصنيف
تنظيم الاتصالات

Surf Safe

This website is

The Internet is a powerful tool for
serving our daily needs. Our
access contains confidential information.



 <http://torproject.org/>

Notice...

تم حظر هذا الموقع بسبب احتوائه على محتويات تتعارض مع قوانين السلطنة. عليه يرجى تعبئة الاستمارة أدناه اذا كنت تعتقد بان 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.

يَا أَنْ لَا تُحْجِبْ

المملكة العربية
www.internet.go

Site Blocked

eb site has been blocked for violating
tions and laws of Kingdom of Bahrain.

نوائین فی حملہ

believe the requested page should be blocked please [click here](#).

الحبيب تفضل بالضغط

10:00 AM

Blocked URL

Sorry, the requested page is unavailable.

قاع المطلوب غير متاح.

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

للموقع التالي: www.internet.gov.sa

KT WATA... 9:21 ص 87%

Tweet Blocked by Mada Com...

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.

مدى 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 المعمول بها بشأن اذا كنت تعتقد ان هذا الموقع قد تم حجبه عن طريق الخطأ يرجى تعبئة الاستمارة التالية وإرسالها 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 *

Email *

Blocked URL * .com

Comments

الاسم
العنوان الإلكتروني
اسم النطاق
استفسارك

Submit

Oops رفا

لقد تم منع الدخول إلى هذا الموقع
This site has been blocked

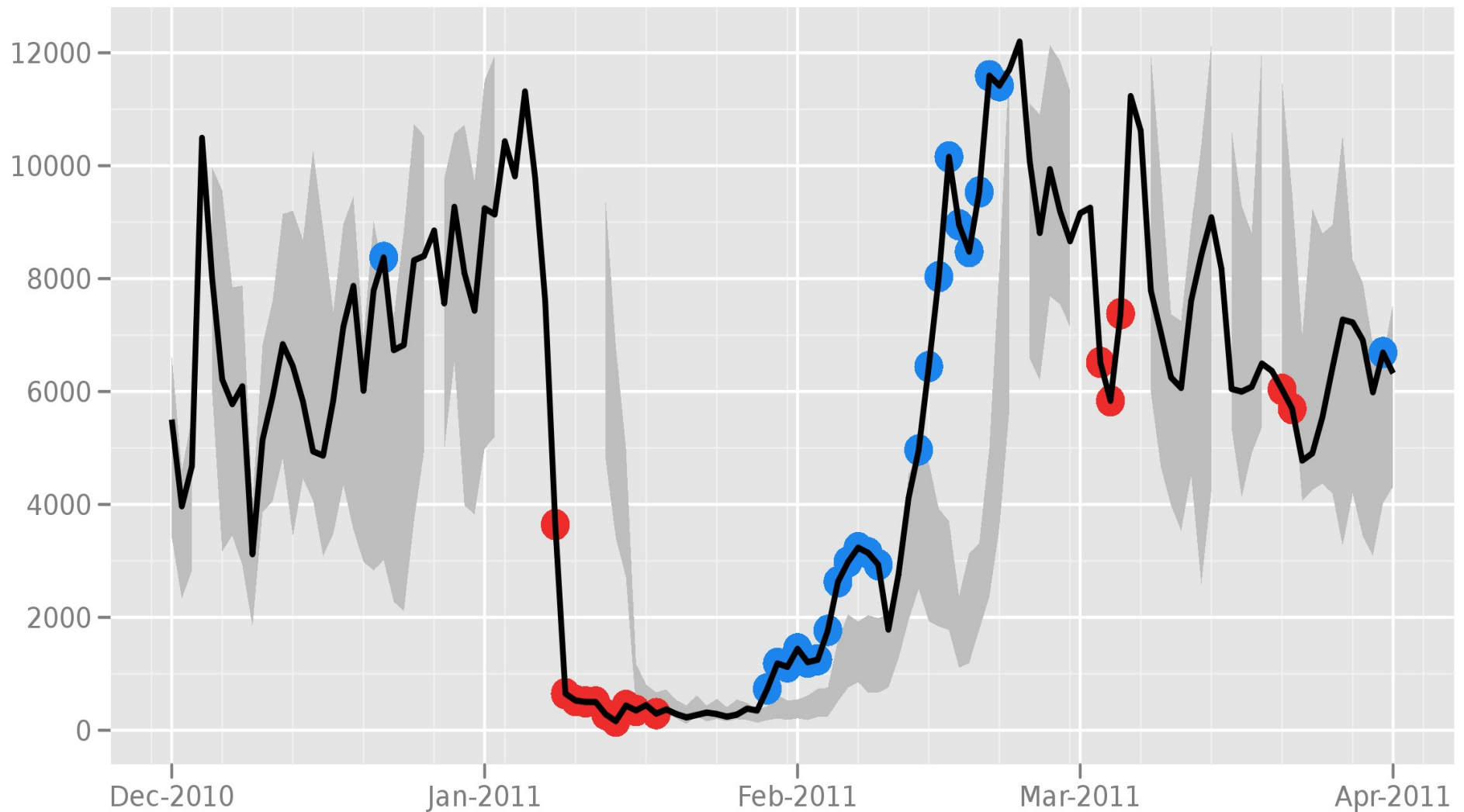
تم إيقاف عملية الدخول إلى الموقع الذي تحاول زيارته نظراً لاحتوائه على محتويات محظورة

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

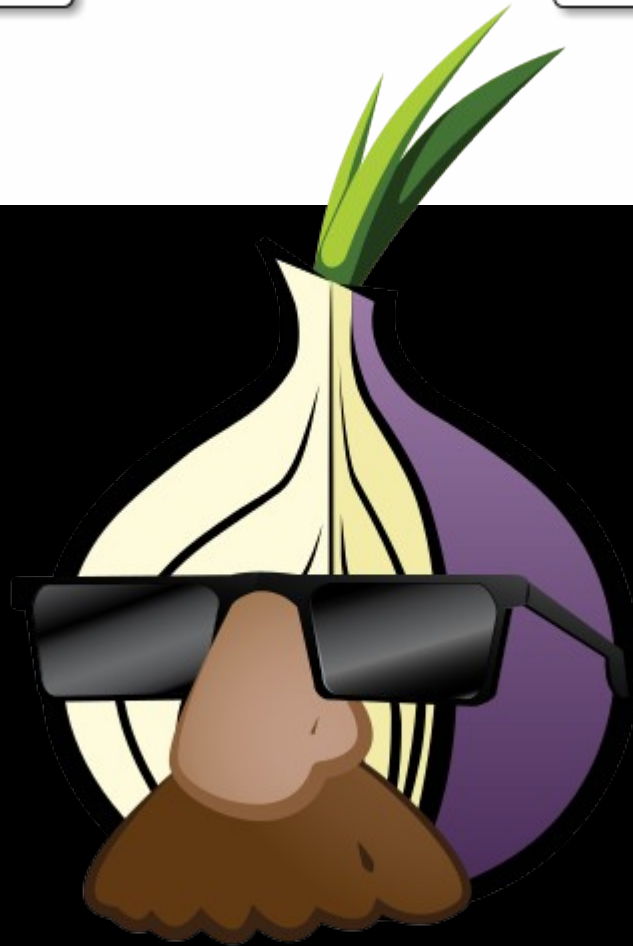
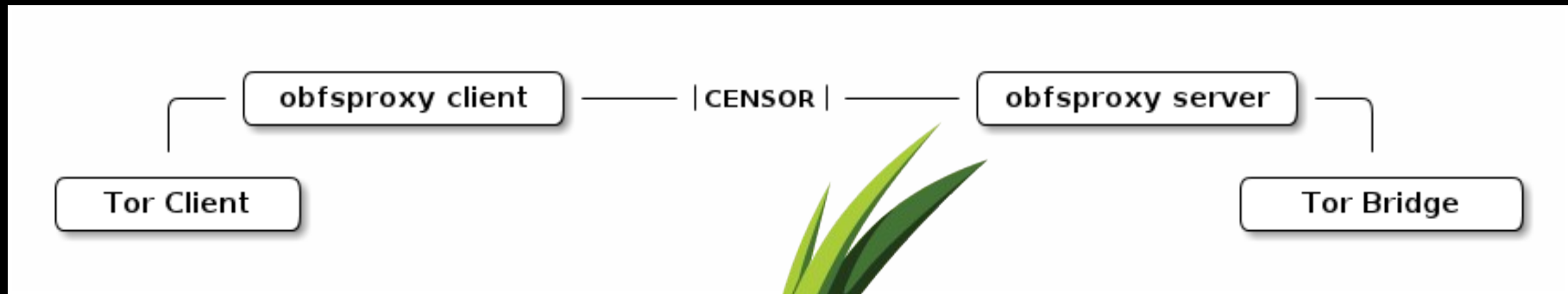
If you feel this is an error then please send

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
- Lantern (BNS), social network based
- ScrambleSuit (Karlstad), obfs-based
- Telex (Michigan/Waterloo), traffic divert₃₀





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

Contenders for the throne:

- None

NSA targets the privacy-conscious

von J. Appelbaum, A. Gibson, J. Goetz, V. Kabisch, L. Kampf, L. Ryge

One of NSA's German targets is 212.212.245.170. The string of numbers is an IP address assigned to Sebastian Hahn, a computer science student at the University of Erlangen. Hahn operates the server out of a grey high-security building a few kilometers from where he lives. Hahn, 28 years old and sporting a red beard, volunteers for the Tor Project in his free time. He is especially trusted by the Tor community, as his server is not just a node, it is a so-called Directory Authority. There are nine of these worldwide, and they are central to the Tor Network, as they contain an index of all Tor nodes. A user's traffic is automatically directed to one of the directory authorities to download the newest list of Tor relays generated each hour.

```
// START_DIRECTORY
//
// * Fingerprint Tor authoritative directories awaiting the directory protocol.
//
// Fingerprint('anonymous/tor/node/authority') = $tor_authority
and ($tor_directory or preapplet/anonymous/tor/directory())
// END_DIRECTORY
```

Hahn's predecessor named the server Gabelmoo, or Fork Man, the nickname of a local statue of Poseidon. After a look at the NSA source code, Hahn quickly

Nächster Sendetermin

Do, 08.01. 2015 | 21:45

WEITERE INFORMATIONEN



03.07.14 | 17:15 Uhr

Quellcode entschlüsselt: Be für NSA-Spionage in Deuts

Deutsche, die sich mit Verschl
lung im Internet beschäftigen
den gezielt vom US-Geheimdi
NSA ausgespäht. | [mehr](#)

Only a piece of the puzzle

We hope the users aren't attacked by their hardware and software

No spyware installed, no cameras watching their screens, etc

Users can fetch a genuine copy of Tor?

Some open questions: how do we...

- Measure Tor's safety?
- Prevent censors from blocking Tor?
- Safely (and usefully) measure Tor?
- Learn the state of surveillance adversaries
 - (and defeat them)
- Teach everybody about all these issues?