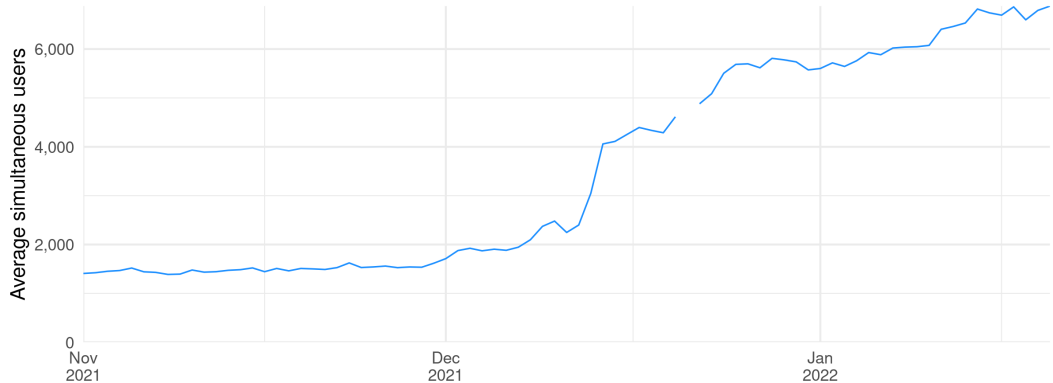


Lessons learned running Tor exit relays at an NREN

Roger Dingledine (The Tor Project)
Jessica Schumacher (Switch)



Daily users of the Tor Snowflake transport



Daily Snowflake users in 2022





باران !! توییت پین !!

@radfembaran

...

ایرانی‌های خارج نشین، می‌خواین کمک کنین؟
Snowflake رو نصب کنید، مثل یه پل
میمونه. من الان هیچکدوم از VPN هام کار
نمیکنن، Orbot رو نصب کردم و کانکت شدم
و به لطف بچه‌های خارج که Snowflake
نصب کردن توئیتر، تلگرام و واتسپ رو باز
کردم. #مهسا_امینی #Oplran
لینکش:

snowflake.torproject.org

Translate Tweet



Google Play Ranking: The Top Free Overall in Iran

Track the rankings of your Android apps for free with AppBrain. The rankings are refreshed daily from Google Play.

CSV		Top Free		Iran		Overall	
Rank		App		Category	Rating	Installs	
1	=		Tor Browser by The Tor Project	Communication	★★★★★ 4.4	10 M+	
2	▲1		Orbot: Tor for Android by The Tor Project	Communication	★★★★★ 4.2	10 M+	
3	▼1		HulaVPN - Fast Secure VPN by Hula Link	Tools	★★★★★ 4.2	1 M+	
4	=		VPN Fast - Secure VPN Proxy by Phone Master Lab	Tools	★★★★★ 4.7	10 M+	
5	=		Turbo VPN - Secure VPN Proxy by Innovative Connecting	Tools	★★★★★ 4.7	100 M+	
6	=		Ultrasurf - Fast Unlimited VPN by Ultrareach	Tools	★★★★★ 4.8	10 M+	

Ein Weg um staatliche Zensur - Snowflake - AStA der Universität des Saarlandes – Tor Browser

Ein Weg um staatliche Zensur: X A way around state censors: X +

https://asta.uni-saarland.de/ein-weg-um-staatliche-zensur-snowflake/

Tel.: +49 681 - 302 2900 | sekretariat@asta.uni-saarland.de

f t i

 DER ASTA THEMEN HILFE BEI... SERVICE EVENTS Semesterticket FAQ NEWS KONTAKT  

Ein Weg um staatliche Zensur – Snowflake

Home / Ein Weg um staatliche Zensur – Snowflake

> AStA-Stellungnahme zum Krieg in der Ukraine

> Sonderinformationen Ukraine

An vielen Orten der Welt wird der freie Datenverkehr im Internet eingeschränkt, sodass es dort nicht ohne weiteres möglich ist, Informationen zu erhalten, welche beispielsweise regierungskritisch sind.

Prominente Beispiele sind:

A way around state censorship - Snowflake - ASTa of Saarland University — Tor Browser

Ein Weg um staatliche Zensur X A way around state censorship X +

https://asta.uni-saarland-de.translate.google/ein-weg-um-staatliche-zensur-snowflake/?_x_tr_sl=auto&_x_tr_tj=en&_x_tr_hl=en-US&_x_tr_pto=wapp 120%

Google Translate German - detected → English Translation

Support for Ukraine. Letter to the World – Vytautas Magnus University in Kaunas (Lithuania) [DE, EN, LT, FR, SP, IT, UA, RU]

[A way around state censorship – Snowflake](#)

[Science for Ukraine](#)

[Petition: An open letter from Russian students against the war in Ukraine](#)

[Thematic portal on the current situation of the Saarland state government](#)

There are several options available to circumvent such censorship. The most well-known are a VPN or the connection via Tor.

In such cases, the argument against a VPN (short for Virtual Private Network) is usually that the user's Internet activity is still logged by the provider, so that in the worst case scenario it can fall into the hands of the government. This would make the anonymity provided by VPN a thing of the past.

It is safer (in combination with a VPN) to use the Tor network. This is organized in a decentralized manner and, if used correctly, anonymous. However, this requires access points that have access to the free Internet. This is where **Snowflake** comes into play.

Snowflake is a browser extension for Firefox and Chrome that allows you to make your connection available with one click. You don't have to worry about which websites the connected person accesses. The connection cannot be traced back to you (the Snowflake) or to the user.

If you're wondering how you can help people who have limited access to information and news due to censorship, you can take a closer look and test Snowflake [here](#) . You can also find the documentation [here](#) , which provides a little more technical detail.

Mit Schneeflocken die Revolution im Iran unterstützen

🕒 6. Dezember 2022 📁 Allgemein



Als Juso Hochschulgruppe Freiburg stehen wir solidarisch zu allen mutigen Protestierenden

SUCHE ...

NEUESTE BEITRÄGE

Pressemitteilung – „Dem ewigen Deutschtum entgegen“ (Uni Freiburg)

Uniwahlen 2023 – Wir treten an!

JUSO-Kneipentour

Heraus zum 8. März! Auch in der Wissenschaft!

Mit Schneeflocken die Revolution im Iran unterstützen

Support the revolution in Iran with snowflakes - Juso University Group Freiburg — Tor Browser

Mit Schneeflocken die Revol... X Support the revolution in Iran X +

← → ↻ 🔒 🖼️ https://juso--hsg--freiburg-de.translate.google/2022/12/06/mit-schneeflocken-die-revolution-im-iran-unterstuetzen/?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_tl=en 150% ☆ 🔒 🔍 ⬇️ ☰

In the fight against the suppression of the protests, everyone can support the revolutionaries alongside expressions of solidarity and political activity. The organization of the protesters takes place largely via the Internet. This is precisely why the Iranian regime has been blocking free access to the Internet and establishing strict censorship for months.

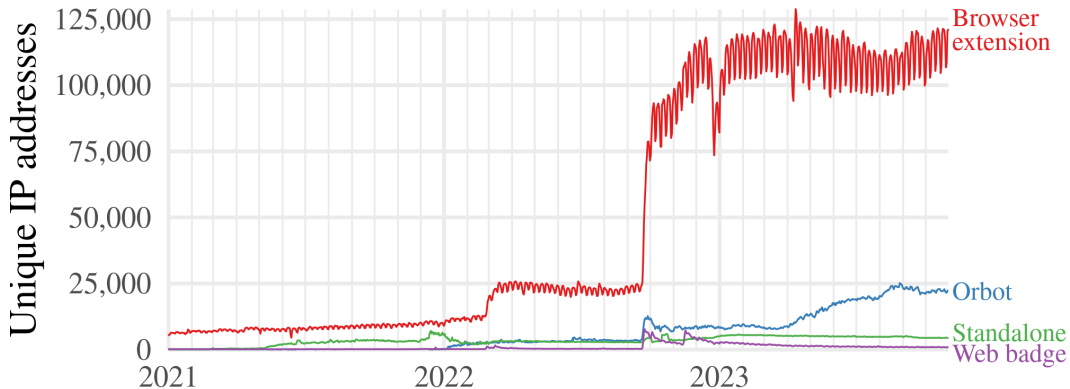
Free access to the Internet is therefore central to the success of the protests. With the browser extension "snowflake", people whose access to the Internet is not blocked can help those affected by censorship. With "Snowflake" a digital bridge to free internet access is being built. The more often "snowflake" is installed as a browser extension, the more people can avoid government censorship. The tool not only helps the protesters in Iran, but also all people in the world affected by censorship. For example in Russia or China. According to many data security experts, "snowflake" is safe for all users thanks to its encryption.

"Snowflake" is part of the international non-commercial "Tor Project", which promotes free and anonymous access to the Internet.

You can easily download, install and activate the "Snowflake" extension for your browser [here](#) and find out more about the background. You can also find a journalistic classification from Bayerischer Rundfunk [here](#) and from "heise online" [here](#).



Snowflake volunteers



Outline

(0) Motivation / inspiration

(1) Intro to Tor and our values

(2) Connection to educational missions and NRENs

(3) Policy decisions you might face too

Tor Overview

Online anonymity: open source, open network

Community of devs, researchers, users, relay operators

US 501(c)(3) non-profit organization with 50ish staff

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

Part of larger ecosystems: internet freedom, free software, censorship resistance, anonymity research

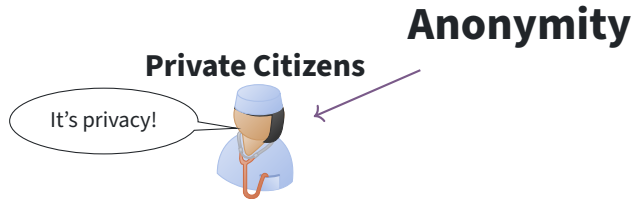
Communications Metadata



“We Kill People Based on Metadata.”

—Michael Hayden, former director, NSA.

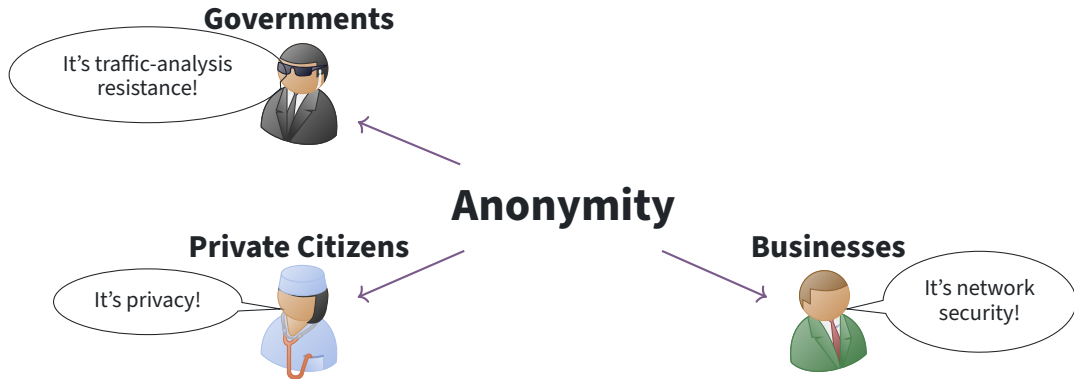
Anonymity is different for each use case



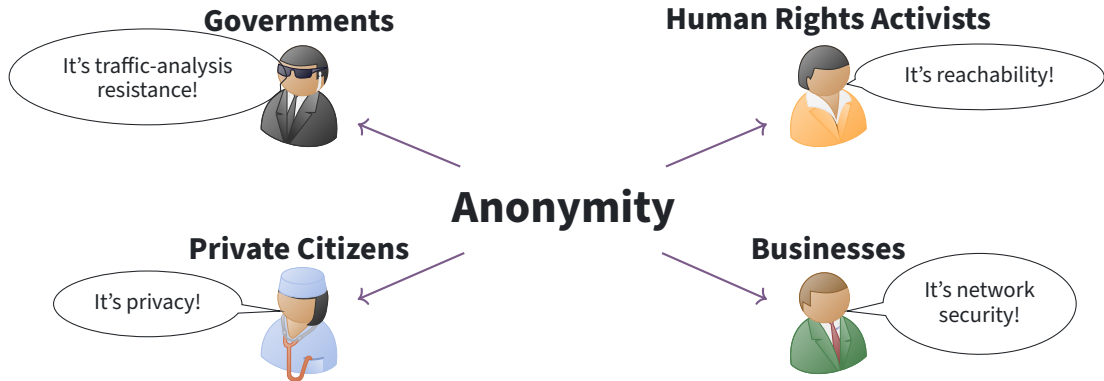
Anonymity is different for each use case



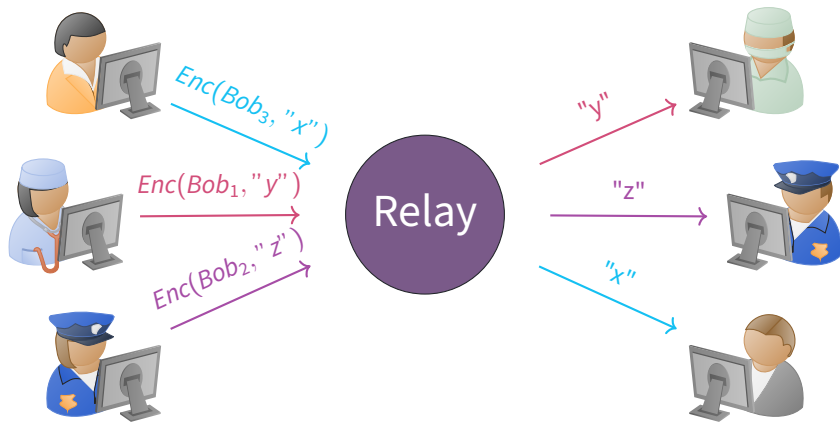
Anonymity is different for each use case



Anonymity is different for each use case

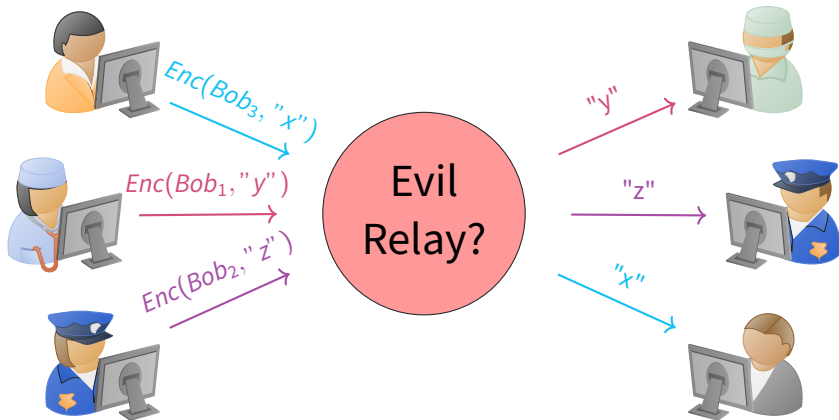


A Simple Design

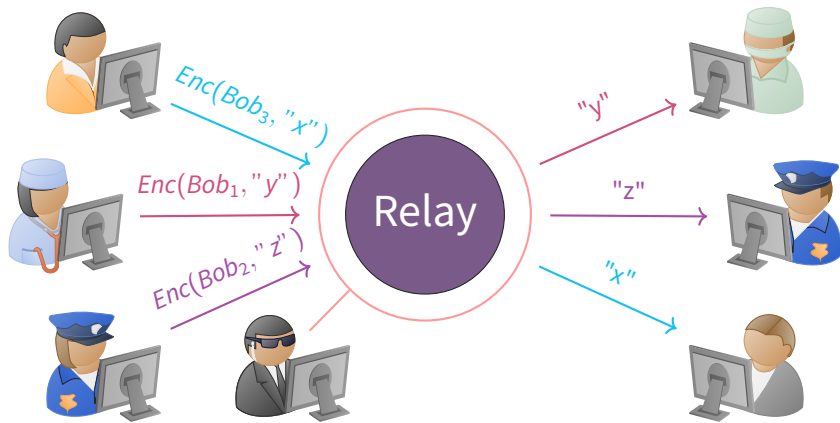


Equivalent to most commercial proxy/VPN providers.

A Simple Design

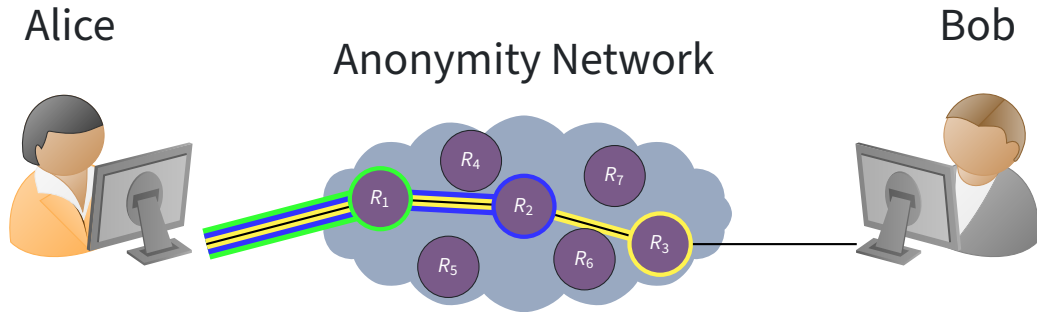


A Simple Design



Timing analysis lets an observer match up connections.

The Tor Design



Multiple relays so no single relay can link Alice to Bob.

I'm a political activist, part of a semi-criminalized minority.

In my younger years I entered the public debate openly, and as a result got harassed by government agencies. I later tried to obfuscate my identity, but I found that my government has surprisingly broad powers to track down dissidents.

Only by using anonymizing means, among which Tor is key, can I get my message out without having police come to "check my papers" in the middle of the night. **Tor allows me freedom to publish my message to the world without being personally persecuted for it.**

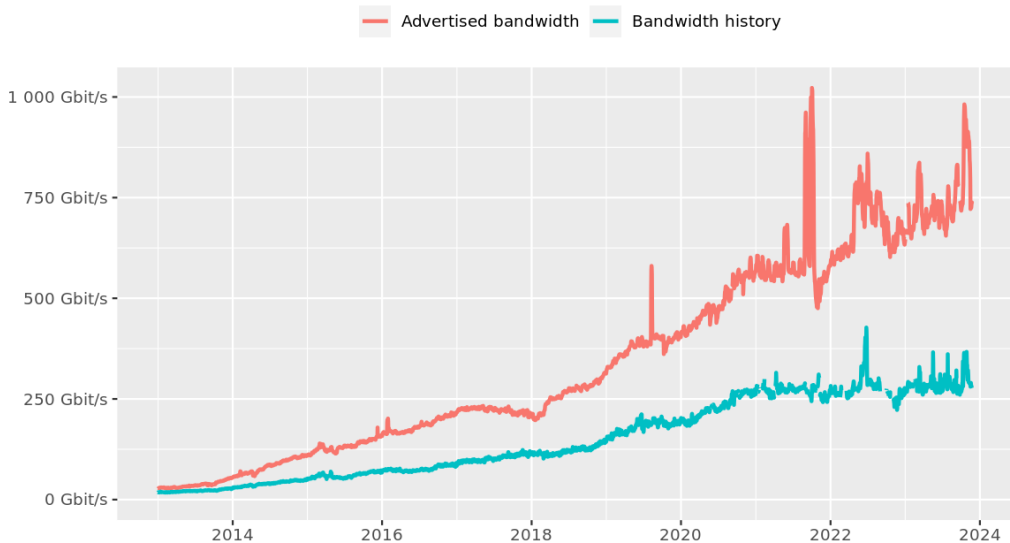
—Anonymous Tor User

I'm a doctor in a very political town. I have patients who work on legislation that can mean billions of dollars to major telecom, social media, and search concerns.

When I have to do research on diseases and treatment or look into aspects of my patients' histories, I am well aware that my search histories might be correlated to patient visits and leak information about their health, families, and personal lives. **I use Tor to do much of my research when I think there is a risk of correlating it to patient visits.**

—Anonymous Tor User

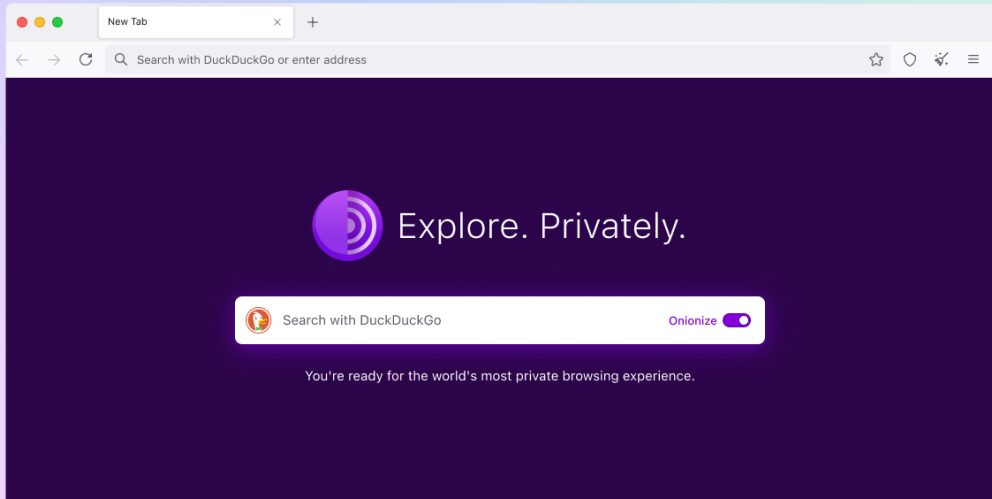
Total relay bandwidth

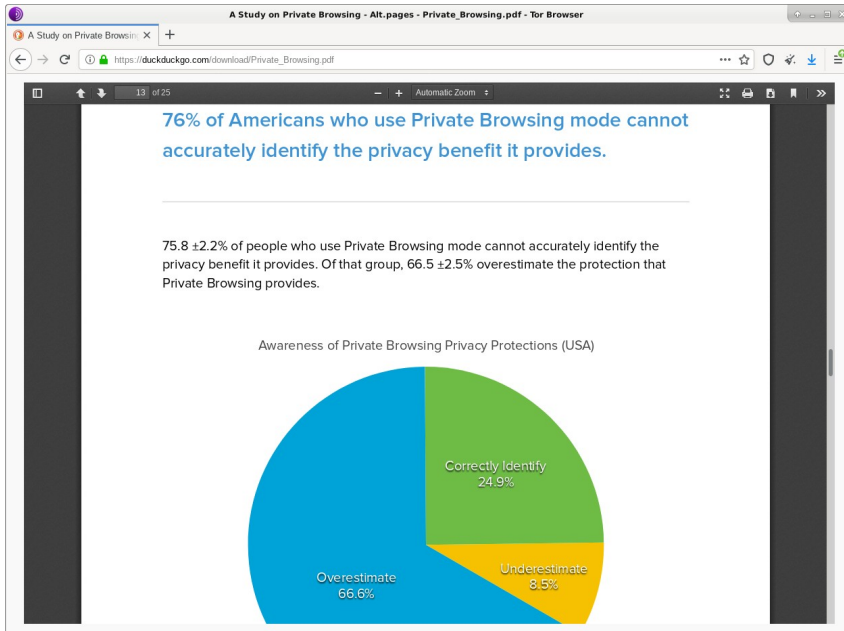


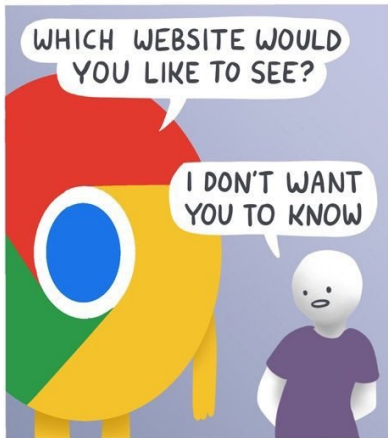
Tor's **safety** comes from **diversity**

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.
2. Diversity of users and reasons to use it. 50000 users in Iran means almost all of them are normal citizens.

Tor Browser







@SKELETON_CLAW



SKELETONCLAW.COM

Ways to volunteer in the Tor network

- Exit relays
- Non-exit relays
- Unlisted bridges (for censorship)
- Pluggable transport components like Snowflake

Privacy is essential for freedom of learning

At-risk populations, including in Europe, who need freedom from tracking/surveillance in order to be comfortable participating on the internet

These values are part of larger discussions

Privacy rights are tied to bigger societal decisions:

- data retention
- can citizens be trusted with end-to-end encryption
- should journalists be able to protect their sources
- internet blocking, commercial spyware, human rights

Relay Search



Aggregated results

Show entries

Country	Autonomous System	Consensus Weight	Advertised Bandwidth	Guard Probability	Middle Probability	Exit Probability	Relays	Guard	Exit
Germany	(112 distinct)	31.6115%	23421.3 MiB/s	31.4126%	32.9141%	29.9309%	1744	1045	453
United States	(203 distinct)	17.2111%	15059.65 MiB/s	19.9077%	17.8162%	12.1830%	1503	717	311
Netherlands	(93 distinct)	12.4885%	8986.73 MiB/s	7.9075%	8.8504%	25.0051%	805	379	466
Finland	(19 distinct)	6.2293%	4835.52 MiB/s	7.9175%	8.4809%	0.2298%	234	143	6
France	(33 distinct)	4.2801%	3335.11 MiB/s	4.7192%	4.5379%	3.2189%	299	212	65
Canada	(32 distinct)	2.9479%	2521.25 MiB/s	4.5630%	2.8972%	0.5655%	169	112	17
Poland	(29 distinct)	1.8752%	1920.12 MiB/s	1.5666%	1.2427%	3.3084%	337	218	266
United Kingdom	(47 distinct)	2.6527%	1805.49 MiB/s	2.9950%	3.6754%	0.5743%	171	84	10
Switzerland	(27 distinct)	2.1590%	1736.96 MiB/s	2.1752%	2.6755%	1.3477%	151	88	43
Sweden	(33 distinct)	1.7634%	1464.26 MiB/s	1.7912%	1.4971%	2.1266%	149	108	49
Luxembourg	(6 distinct)	1.6252%	1351.31 MiB/s	0.4852%	0.3325%	5.3298%	130	121	106
Austria	(18 distinct)	1.5959%	1226.34 MiB/s	0.3729%	0.3718%	5.3225%	185	14	106
Romania	(21 distinct)	1.3526%	1060.06 MiB/s	0.7158%	1.2209%	2.5229%	149	77	94
Czech Republic	(26 distinct)	1.3438%	969.5 MiB/s	2.0649%	1.1847%	0.4879%	59	38	14
Italy	(22 distinct)	1.1680%	802.48 MiB/s	1.3409%	1.4750%	0.4371%	80	43	10

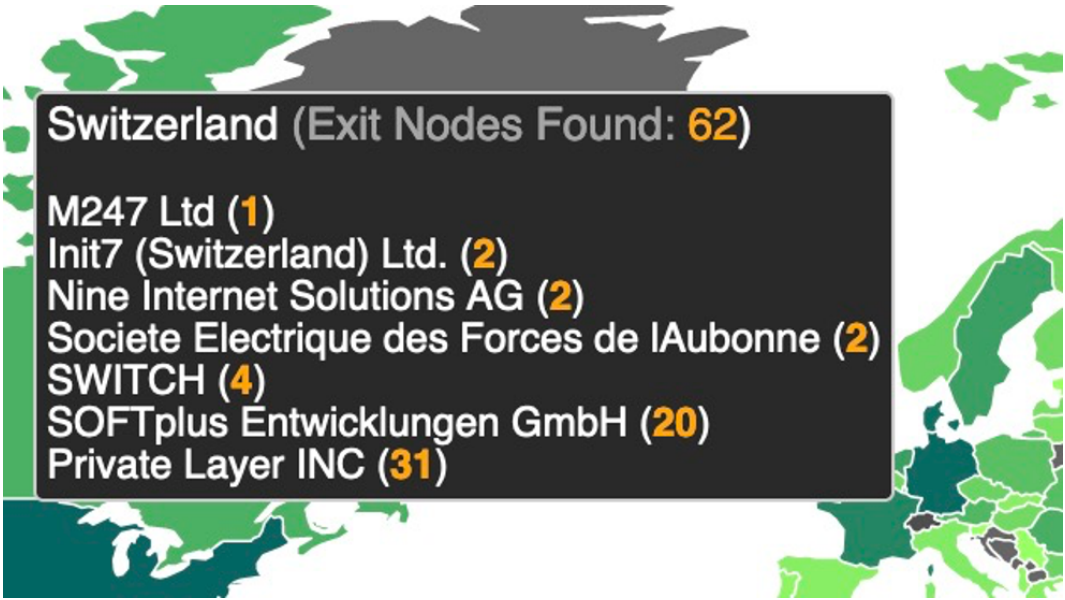
Outline

- (0) Motivation / inspiration
- (1) Intro to Tor and our values
- (2) Connection to educational missions, NRENs**
- (3) Policy decisions you might face too

Freedoms are in our mission

«Freedom of research
and teaching is guaranteed»

–Article 20, Federal Constitution of the Swiss
Confederation



Switzerland (Exit Nodes Found: 62)

M247 Ltd (1)

Init7 (Switzerland) Ltd. (2)

Nine Internet Solutions AG (2)

Societe Electrique des Forces de l'Aubonne (2)

SWITCH (4)

SOFTplus Entwicklungen GmbH (20)

Private Layer INC (31)

ABOUT US

The Digital Society is a non-profit and broad-based association for citizen and consumer protection in the digital age. As a civil society organization, we have been committed to a sustainable, democratic and free public since 2011. We defend fundamental rights in a digitally networked world.

The Digital Society informs and advises individuals and institutions on consumer and legal issues in the digital space. The **non-profit** organization assesses the impact of technology with regard to the possible impact on fundamental and human rights and offers services, software projects and workshops for digital self-defense.

We do not do this in a dry and abstract way, but rather convey information in an accessible manner, develop concrete proposals and have the fundamentals clarified in court

**FÜR UNSERE FREIHEITSRECHTE
IN EINER VERNETZTEN WELT!**

→ **Wir engagieren uns für**

■ **WINTER
KONGRESS**

→ **UNTER-
STÜTZEN**

NEWSLETTER

Name (optional)

e-mail

Subscribe unsubscribe

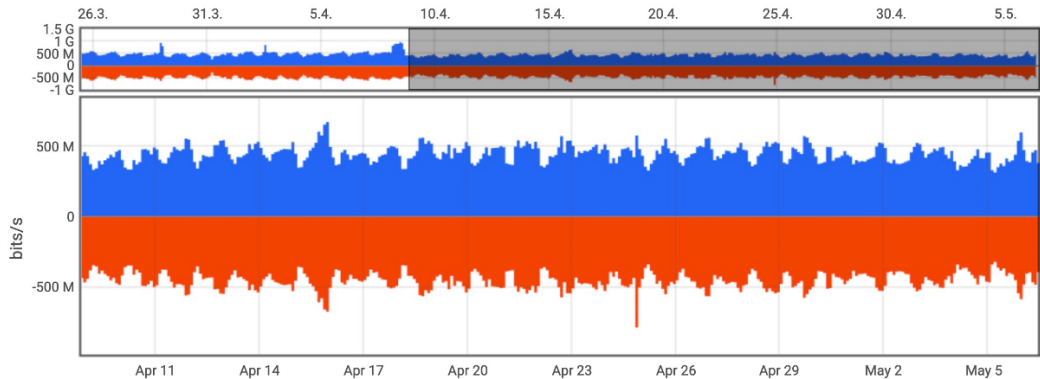
Abuse handling

```
% This is the RIPE Database query service.
% The objects are in RPSL format.
%
% Abuse contact for '195.176.3.16 - 195.176.3.31' is 'abuse-ripe@digitale-gesellschaft.ch'

inetnum:        195.176.3.16 - 195.176.3.31
netname:        DIGITALEGESELLSCHAFT-NET
descr:          Verein Digitale Gesellschaft
country:        CH
[...]

role:           Digitale Gesellschaft
address:        CH-4000 Basel
remarks:        -----
remarks:        We operate privacy enhancing technologies,
remarks:        including Tor exit nodes. In case of abuse
remarks:        or other emergencies, contact ONLY
remarks:        abuse[at]digitale-gesellschaft.ch
remarks:        -----
remarks:        Please check the information given on
remarks:        http://www.digitale-gesellschaft.ch/abuse
remarks:        -----
nic-hdl:        DG11277-RIPE
```



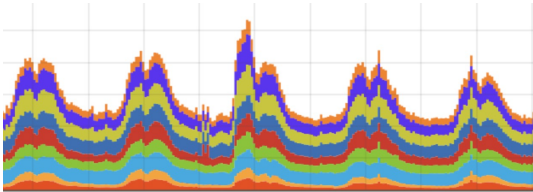


from TOR nodes



to TOR nodes

Switch CERT use cases



PassiveDNS

ANY



Reverse Query

☐

And Switch isn't alone

SURF (Netherlands), SUNET (Sweden), GRNET (Greece), DEIC (Denmark), CARNET (Croatia) host or run Tor relays in similar ways.

And individual universities in Austria, Belgium, England, Germany, Netherlands, Romania, Sweden run relays too.



I WANT TO RUN A RELAY

YOU'LL NEED TO DO THE FOLLOWING

1

CHOOSE A RELAY

2

FIND ALLIES

3

GET A PRIZE

1

CHOOSE YOUR RELAY



Why relays at universities?

Education: hands-on cyber-security experience; teaching students about civil society; helping refine privacy advocacy skills.

Why relays at universities?

Education: hands-on cyber-security experience; teaching students about civil society; helping refine privacy advocacy skills.

Community: Connecting student groups to professors; supporting freedom of speech and freedom of learning; and increasing the capacity of the Tor network.

Why relays at universities?

Education: hands-on cyber-security experience; teaching students about civil society; helping refine privacy advocacy skills.

Community: Connecting student groups to professors; supporting freedom of speech and freedom of learning; and increasing the capacity of the Tor network.

Research: Helping the Tor network stay strong so people can use it for research; attracting good students; giving researchers access to their own Tor relay.

Outline

- (0) Motivation / inspiration
- (1) Intro to Tor and our values
- (2) Connection to educational missions and NRENs
- (3) Policy decisions you might face too**

Policy/society decisions

Tor relays in your country? Exit relays?

Tor relays hosted at your NREN? Run by your NREN staff?

Students in your country / at your university able to connect to the Tor network?

Webservers in your country / at your university willing to serve content to Tor users?

Calls to action

Understand the risks of centralized architectures

Participate in privacy / censorship research:

<https://petsymposium.org/>

<https://foci.community/>

both in Bristol (England) (+ virtual) in July

Help relays, bridges, and snowflakes in your country

Protect freedom of research, learning, and teaching