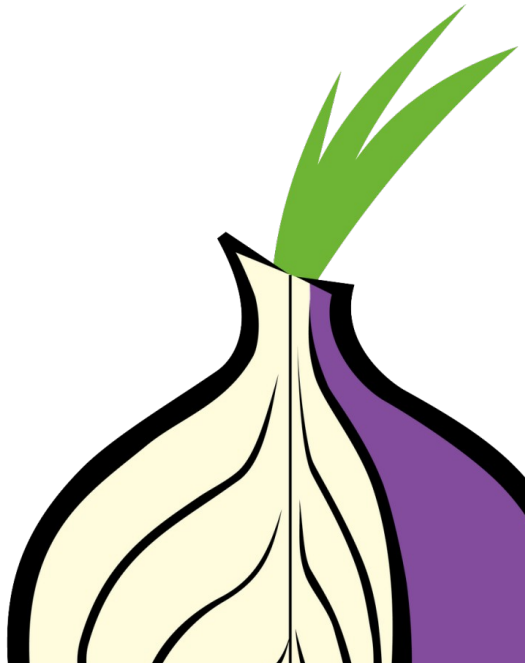
Tor
Baião com Cebola

CriptoBaião – Fortaleza, Brasil – 30 de Março de 2019

Vinícius Zavam
egypcio@torproject.org
13AC CF3E D4E3 B36F 626F D3AE 415C 6534 13B4 3475

agenda

- conceitos básicos sobre **Tor**
  - definições (resumo)
  - visão simplificada da rede
  - alternativas à gosto
- perguntas frequentes
  - quem usa?
  - por que usar?
  - mas ...
- esforços relacionados
- ferramentas extras
- informações adicionais sobre a rede
  - ingresso dos nós na rede
  - obtenção do navegador com uma ajudinha extra
  - pontes (nós de entrada)
  - obfuscadores de tráfego
- serviços acebolados
- gráficos e números interessantes (estatísticas)
- colaboração, suporte e pesquisa



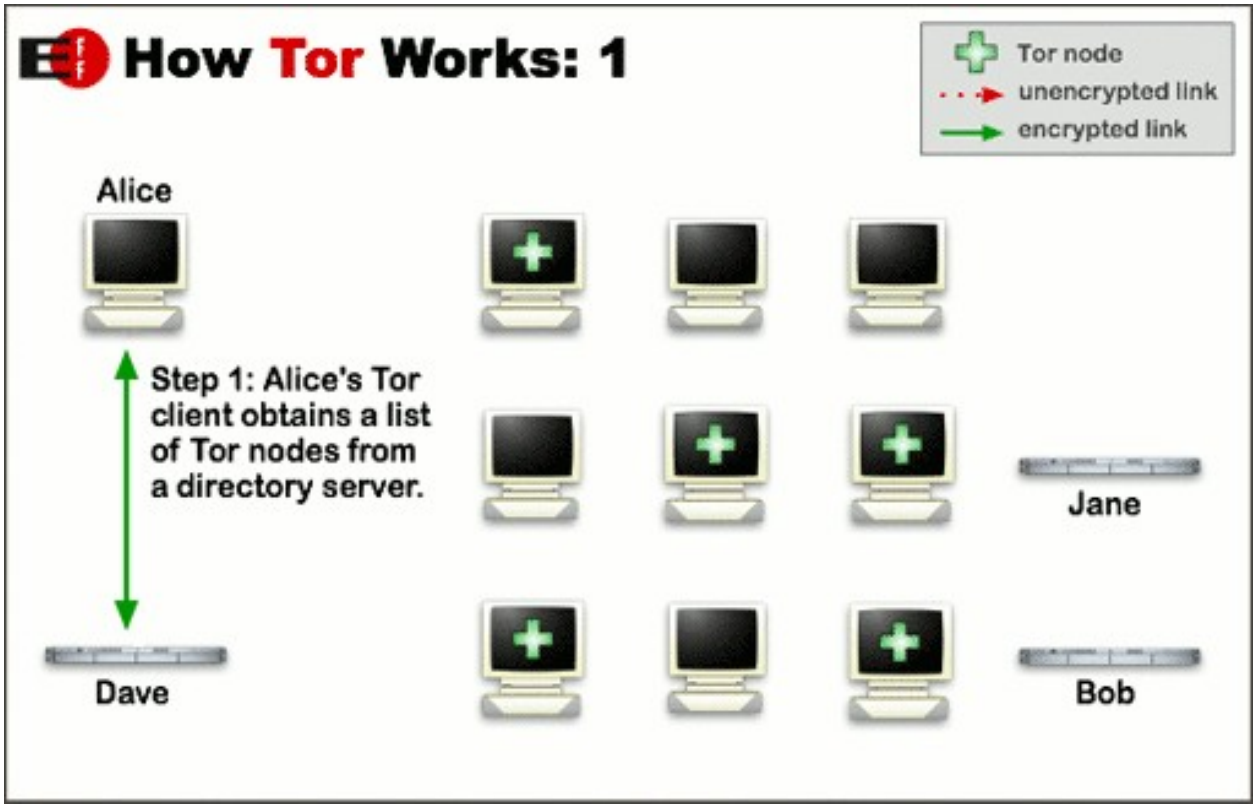
conceitos básicos sobre Tor

- definições (resumo)
  - organização sem fins lucrativos;
    - fundada nos EUA em 2006 (Cambridge, Seattle);
    - 501(c)(3); pesquisa e educação;
  - protocolos de comunicação;
    - software livre (gratuito); código aberto; ipv6;
    - primeira versão data de 2002; licença BSD;
  - rede de servidores, operados por voluntários;
    - pessoas físicas; cidadãos comuns;
    - empresas; instituições de ensino; fundações;
  - navegador web;
    - baseado no Mozilla Firefox.

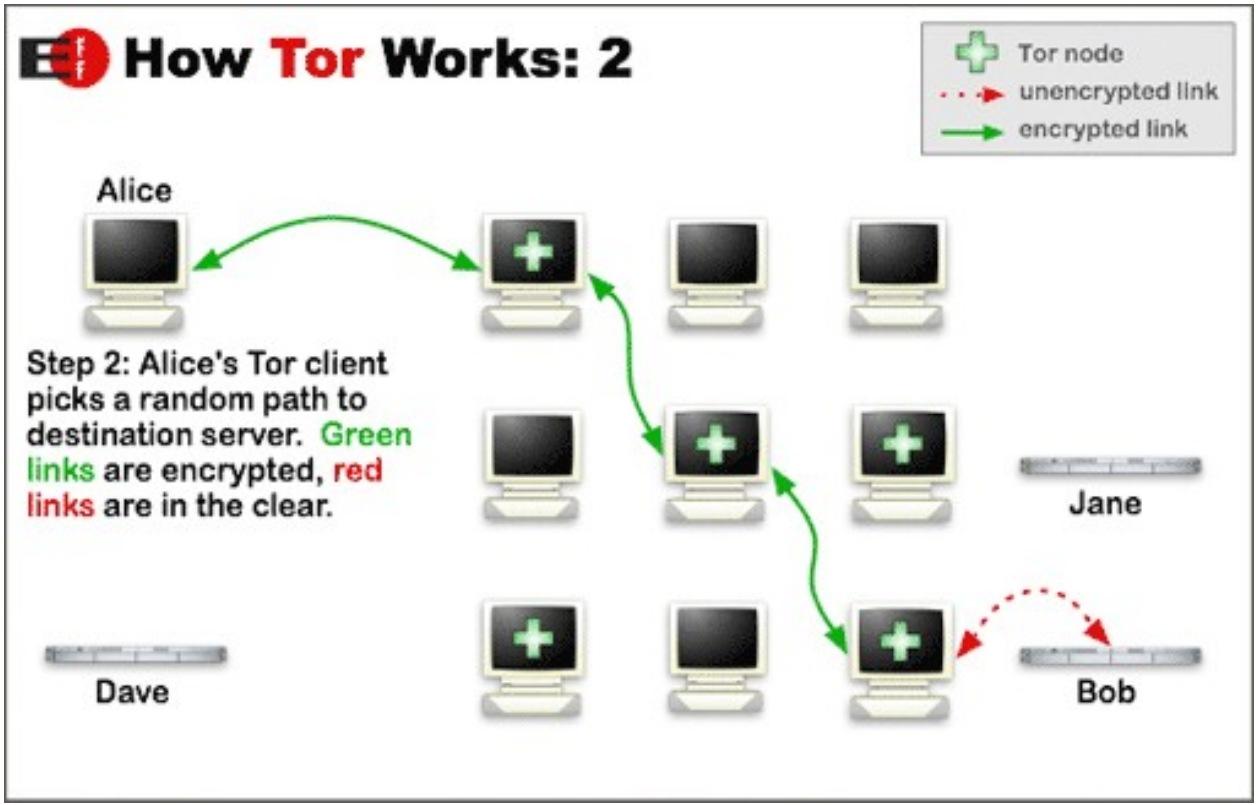
Isabela Bagueros, diretora executiva do projeto Tor

Roger Dingledine, criador e principal desenvolvedor do projeto Tor – junto com *Nick M.* e *Paul S.*

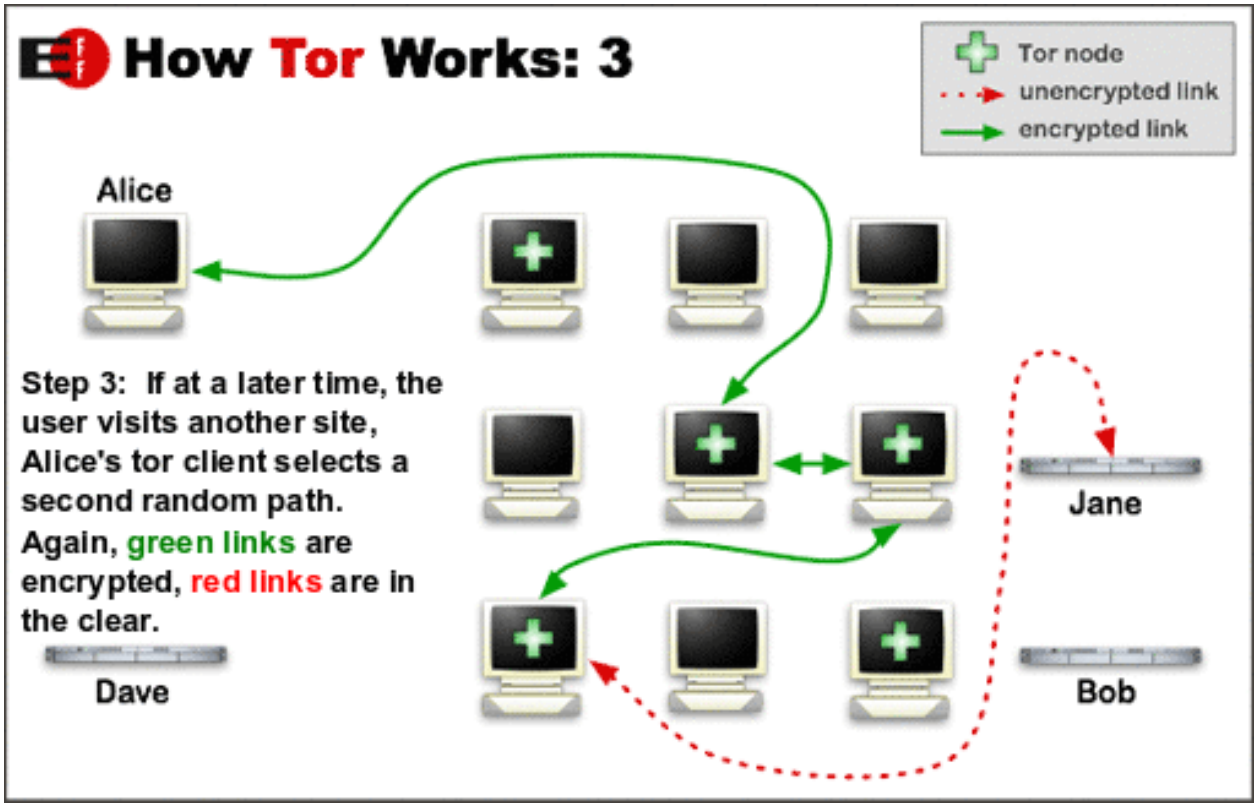
- visão geral


How Tor Works: 1
Tor node
unencrypted link
encrypted link
Alice
Step 1: Alice's Tor client obtains a list of Tor nodes from a directory server.
Jane
Dave
Bob

- visão geral


How Tor Works: 2
Tor node
unencrypted link
encrypted link
Alice
Step 2: Alice's Tor client picks a random path to destination server. Green links are encrypted, red links are in the clear.
Jane
Dave
Bob

- visão geral


How Tor Works: 3
Tor node
unencrypted link
encrypted link
Alice
Step 3: If at a later time, the user visits another site, Alice's tor client selects a second random path. Again, green links are encrypted, red links are in the clear.
Dave
Jane
Bob

Roger, descobrindo que ‘aquela’ foto foi usada para apresentá-lo como criador do Tor

- alternativas à gosto
  - modo privado;
  - extensões;
  - *proxy*;
  - outros navegadores;
  - rede virtual privada (vpn);
  - i2p; freenet.

perguntas frequentes

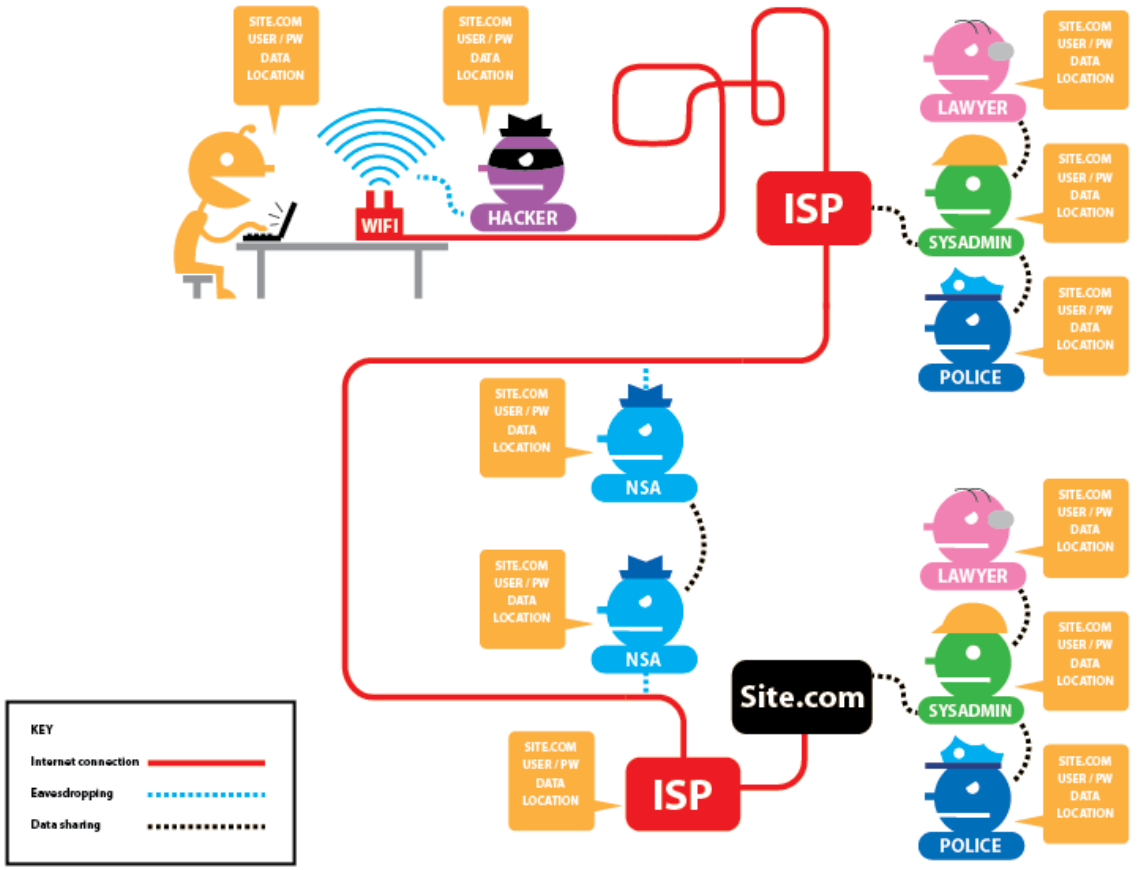
- quem usa?
  - eu (pessoas comuns);
  - famílias inteiras;
  - jornalistas; {ciber}ativistas;
  - denunciantes (delatores);
  - militares (exército, marinha, aeronáutica, ...);
  - investigadores, empresários/executivos;
  - cientistas, pesquisadores, estudantes, professores;
  - hotéis/pousadas/albergues/livrarias;
  - público especializado.

https://twitter.com/AphexTwin/status/501383043643621376

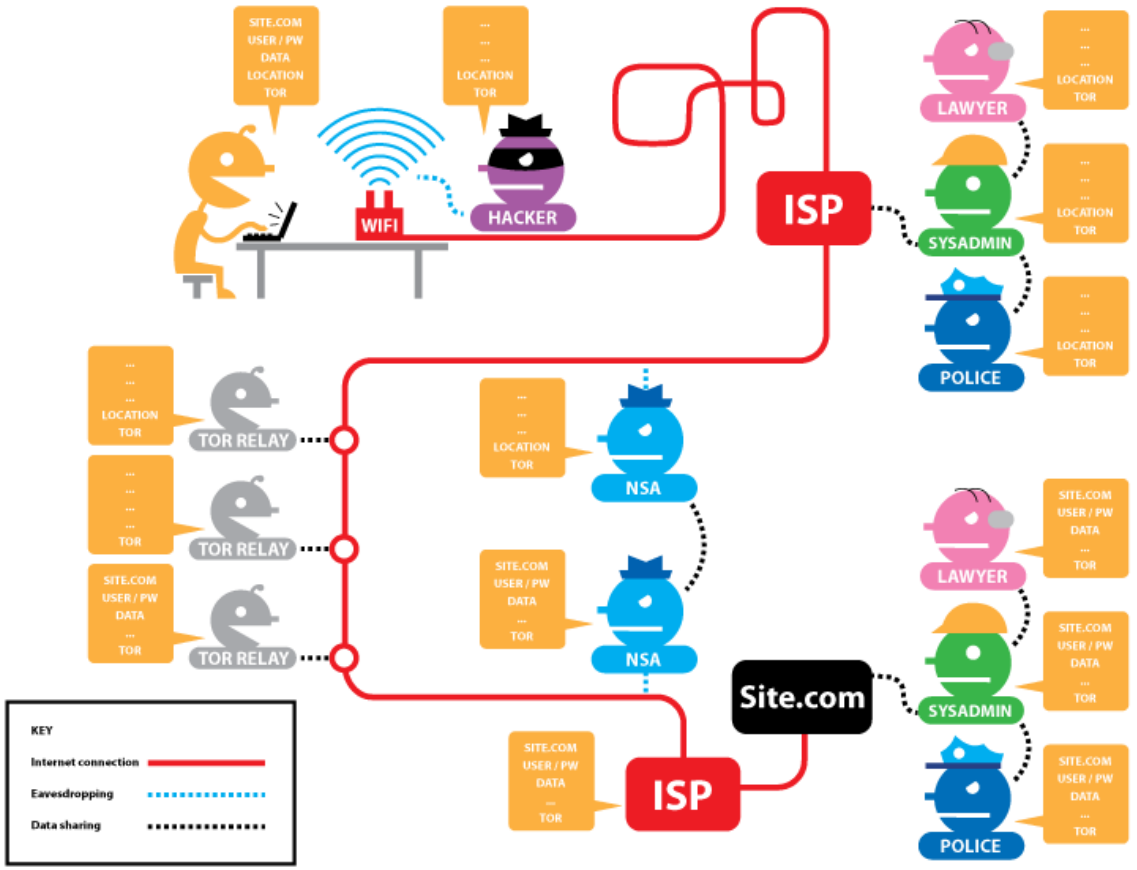
- por que usar?
  - venda de cliques;
  - análise de perfis sociais;
  - geo localização (proteção de integridade física);
  - imprensa livre (liberdade de expressão);
  - denúncias (delações).

- por que usar?
  - pesquisa acadêmica;
  - trocas de contexto (sessões no navegador);
  - censura;
  - boicote;
  - investigações;
  - troca de informações sigilosas;
  - *pentest*.

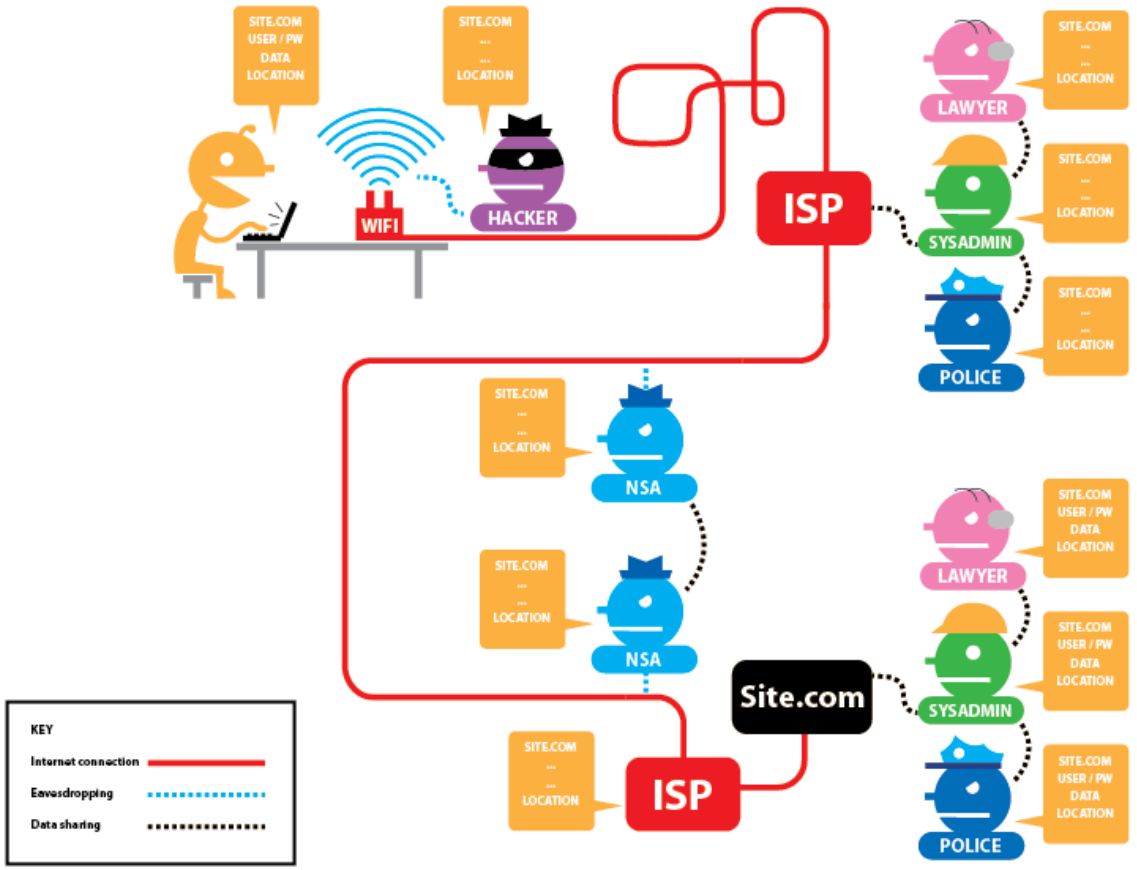
sem Tor, sem HTTPS



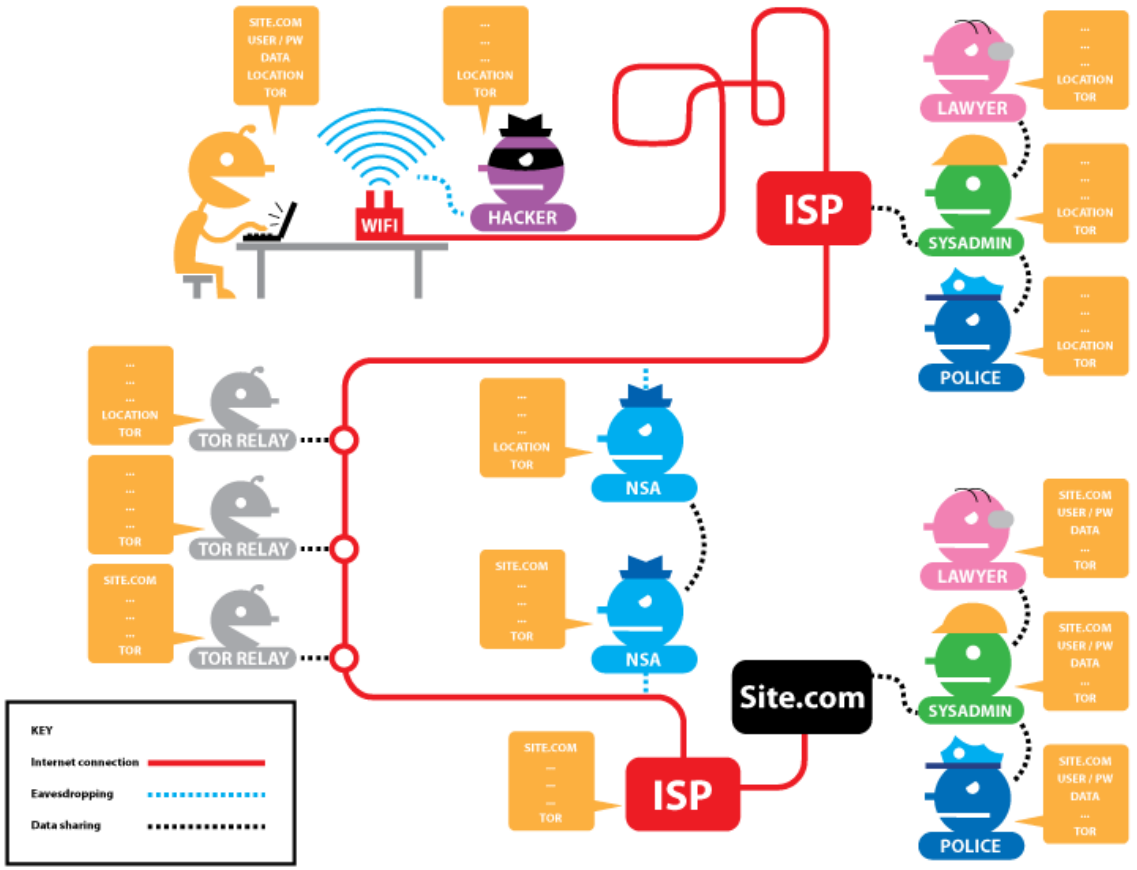
com Tor, sem HTTPS



sem Tor, com HTTPS



com Tor, com HTTPS



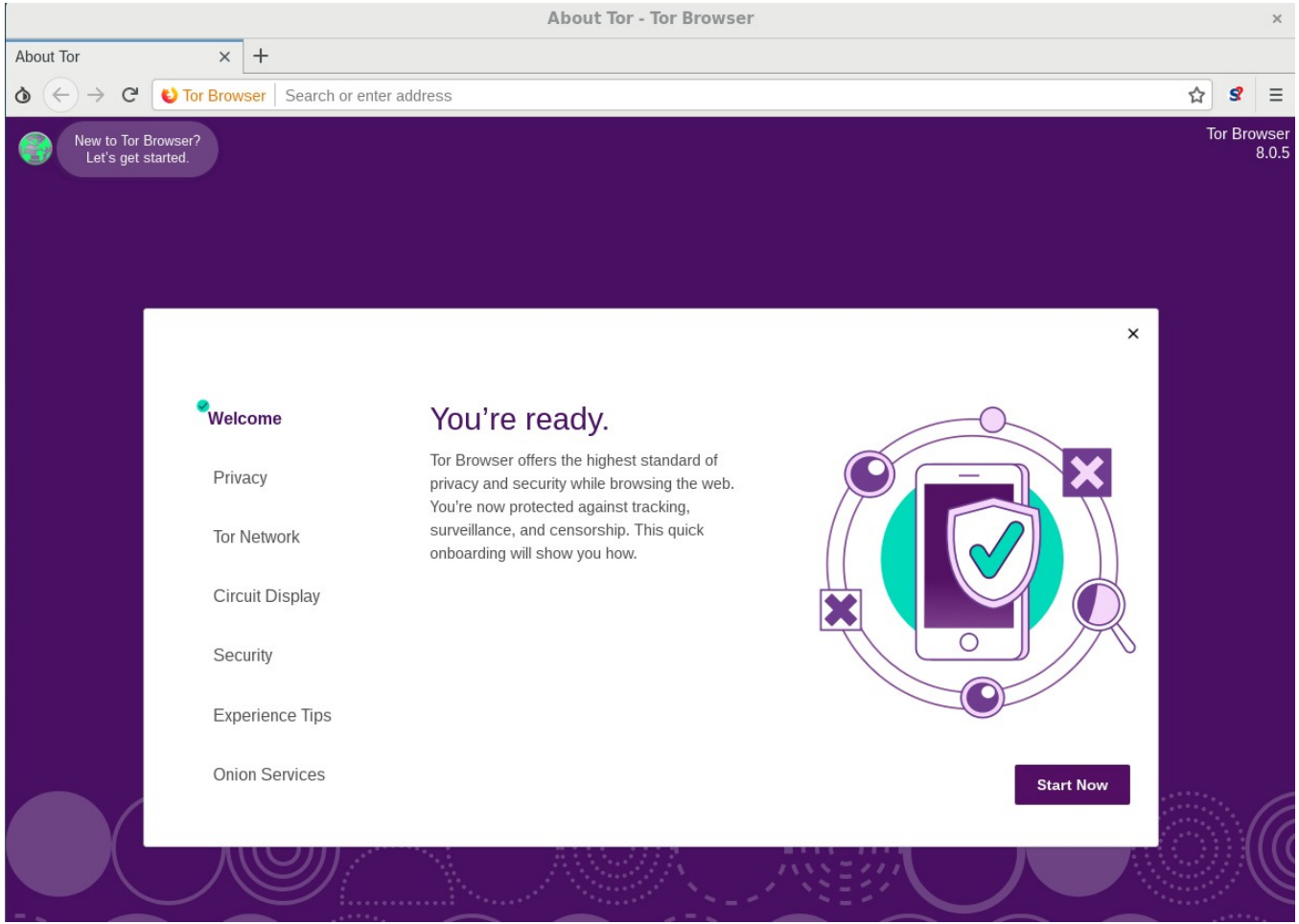
- *mas ...*
  - criminosos? *hackers*? *trolls*?
  - ataques distribuídos de negação de serviço?
  - minha rede de IRC favorita?
  - colabora com envio de *SPAM*?
  - pode ser distribuido livremente?
  - **tor**? **Tor**? TOR? Thor? t0r? T0r?
  - financiado por militares?
  - vírus? *backdoor*?
  - aplicações compatíveis?
  - problemas por colaborar?

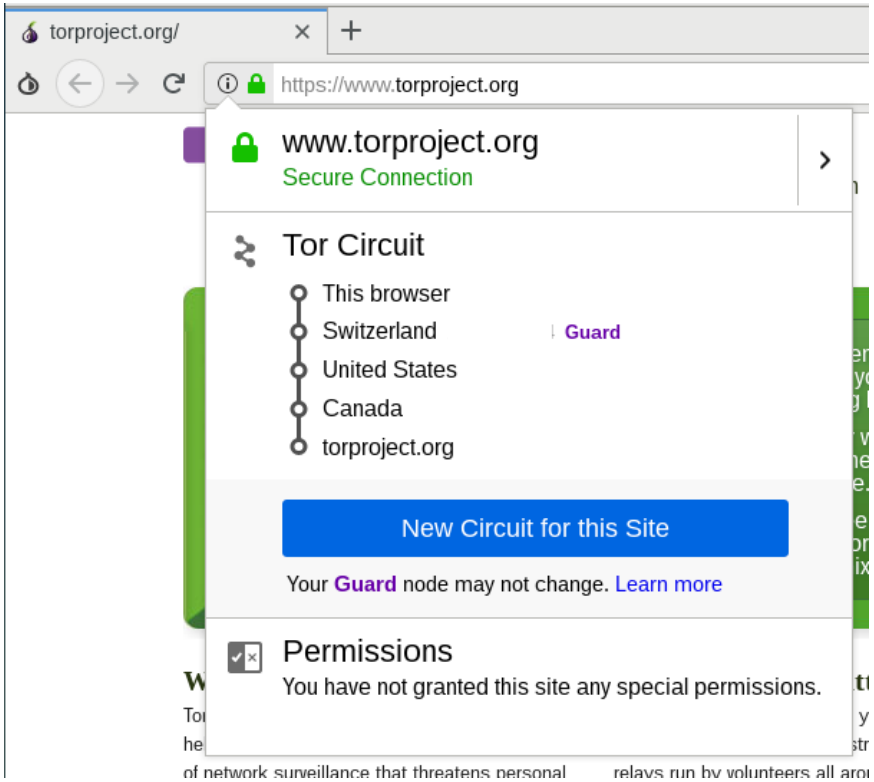
- *mas ...*
  - necessito de um hardware específico?
  - não poderia ser mais rápida? (quero assistir *Netflix*)
  - bloqueio de certos conteúdos ou sítios web?
  - mais saltos = mais privacidade! como não pensaram nisso?!
  - publicar lista de nós?
  - compartilhamento de arquivos na rede?
  - **tor**? **Tor**? TOR? Thor? t0r? T0r?
  - gostei! como colaborar? **<3**

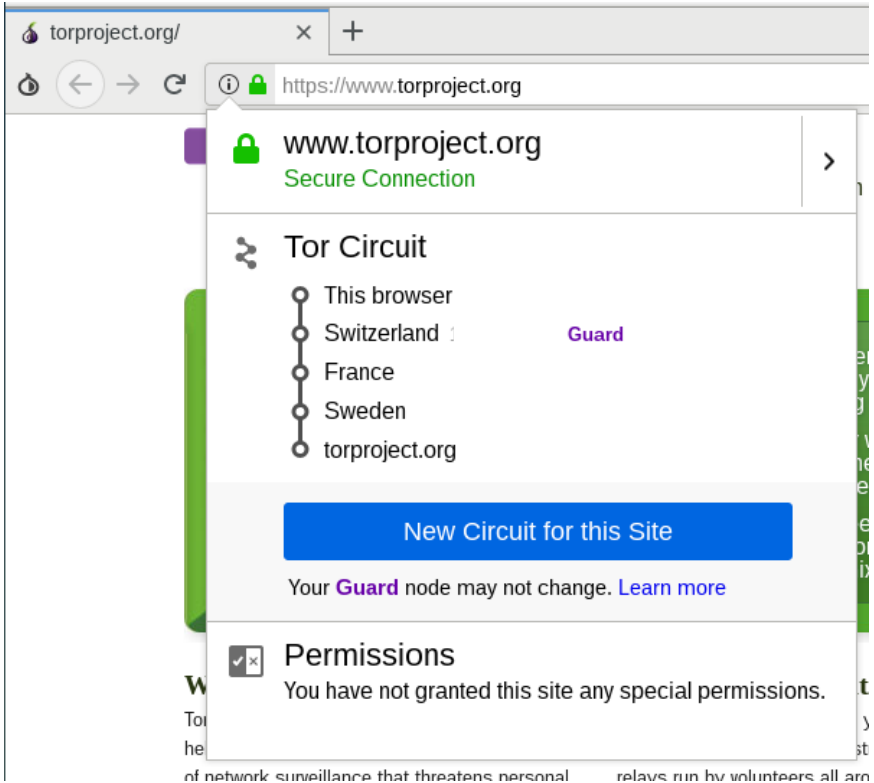
- mas como abordar e conversar sobre anonimato?
  - CIDADÃO; privacidade.
  - EMPRESAS; segurança.
  - GOVERNOS; resistência à análise de tráfego.
  - ATIVISTAS; drible à censura.

esforços relacionados


BROWSER


About Tor - Tor Browser
About Tor
Tor Browser
Search or enter address
New to Tor Browser?
Let's get started.
Tor Browser
8.0.5
Welcome
Privacy
Tor Network
Circuit Display
Security
Experience Tips
Onion Services
You're ready.
Tor Browser offers the highest standard of privacy and security while browsing the web. You're now protected against tracking, surveillance, and censorship. This quick onboarding will show you how.
Start Now


torproject.org/
https://www.torproject.org
www.torproject.org
Secure Connection
Tor Circuit
This browser
Switzerland
Guard
United States
Canada
torproject.org
New Circuit for this Site
Your Guard node may not change. Learn more
Permissions
You have not granted this site any special permissions.


torproject.org/
https://www.torproject.org
www.torproject.org
Secure Connection
Tor Circuit
This browser
Switzerland
Guard
France
Sweden
torproject.org
New Circuit for this Site
Your Guard node may not change. Learn more
Permissions
You have not granted this site any special permissions.

evita repasse do seu endereço IP

previne análise de tráfego local

mitiga revelar sua geolocalização

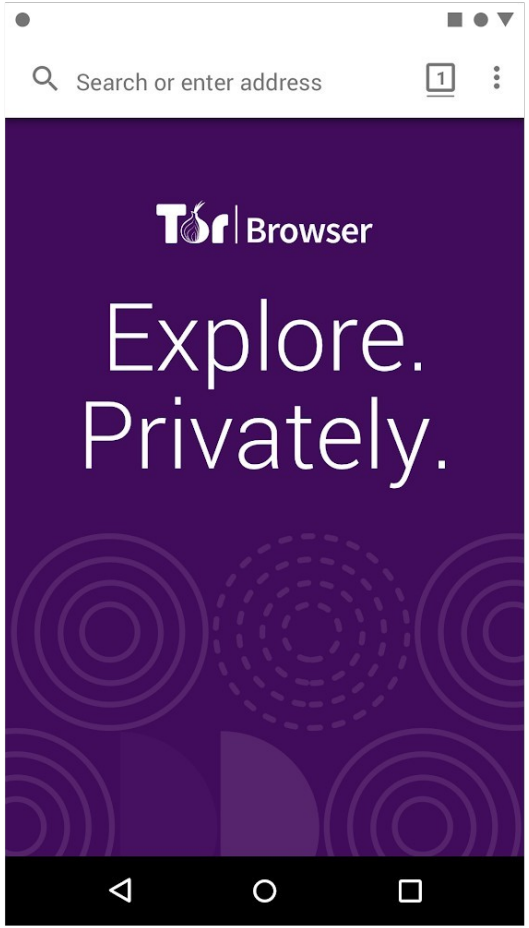
previne compartilhar sua impressão digital

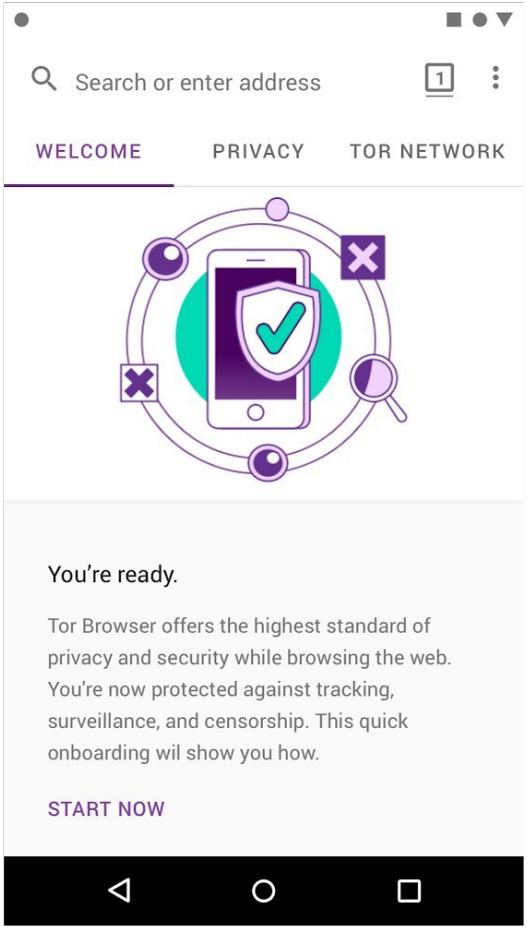
previne trocas de contextos entre abas

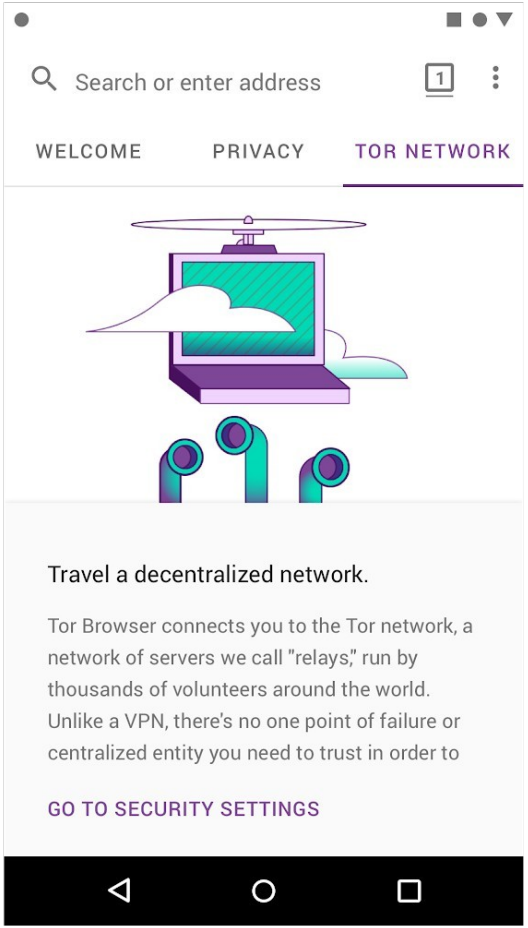
isola *cookies* e *scripts*

escritas mínimas em disco

não salva histórico de navegação

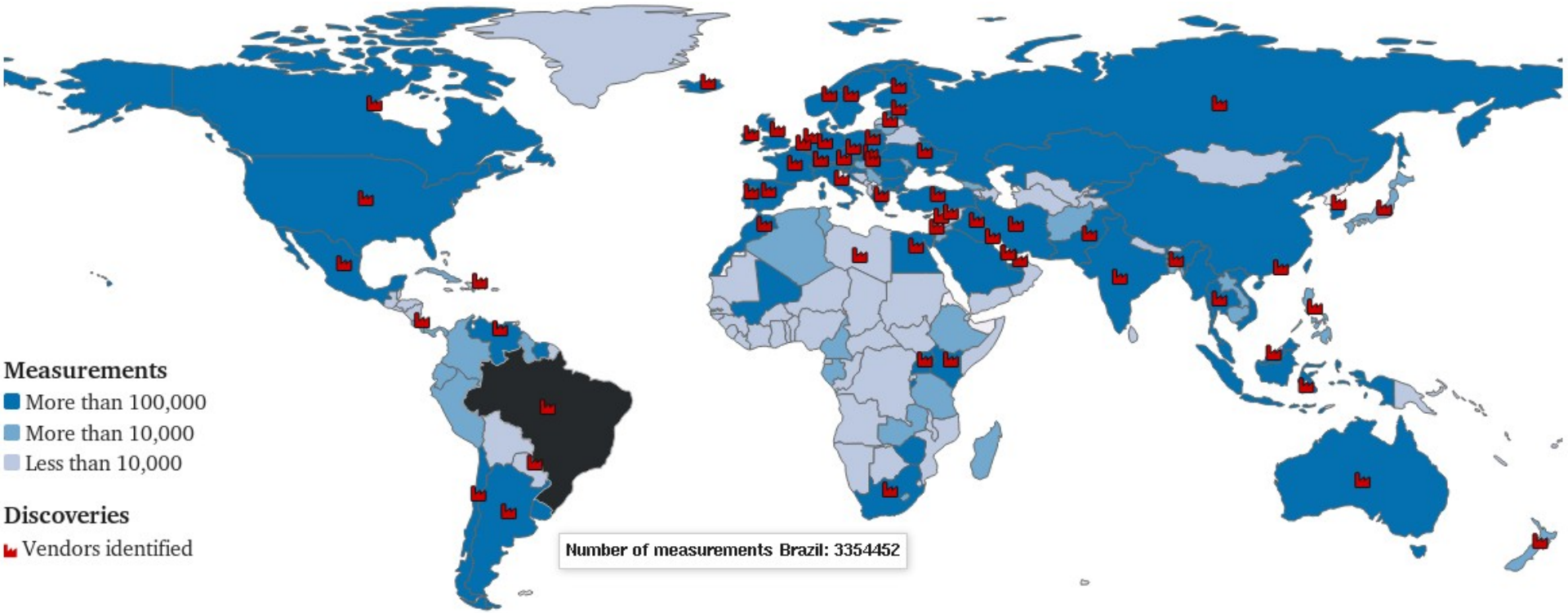

Search or enter address
Tor Browser
Explore.
Privately.


Search or enter address
WELCOME
PRIVACY
TOR NETWORK
You're ready.
Tor Browser offers the highest standard of privacy and security while browsing the web. You're now protected against tracking, surveillance, and censorship. This quick onboarding wil show you how.
START NOW

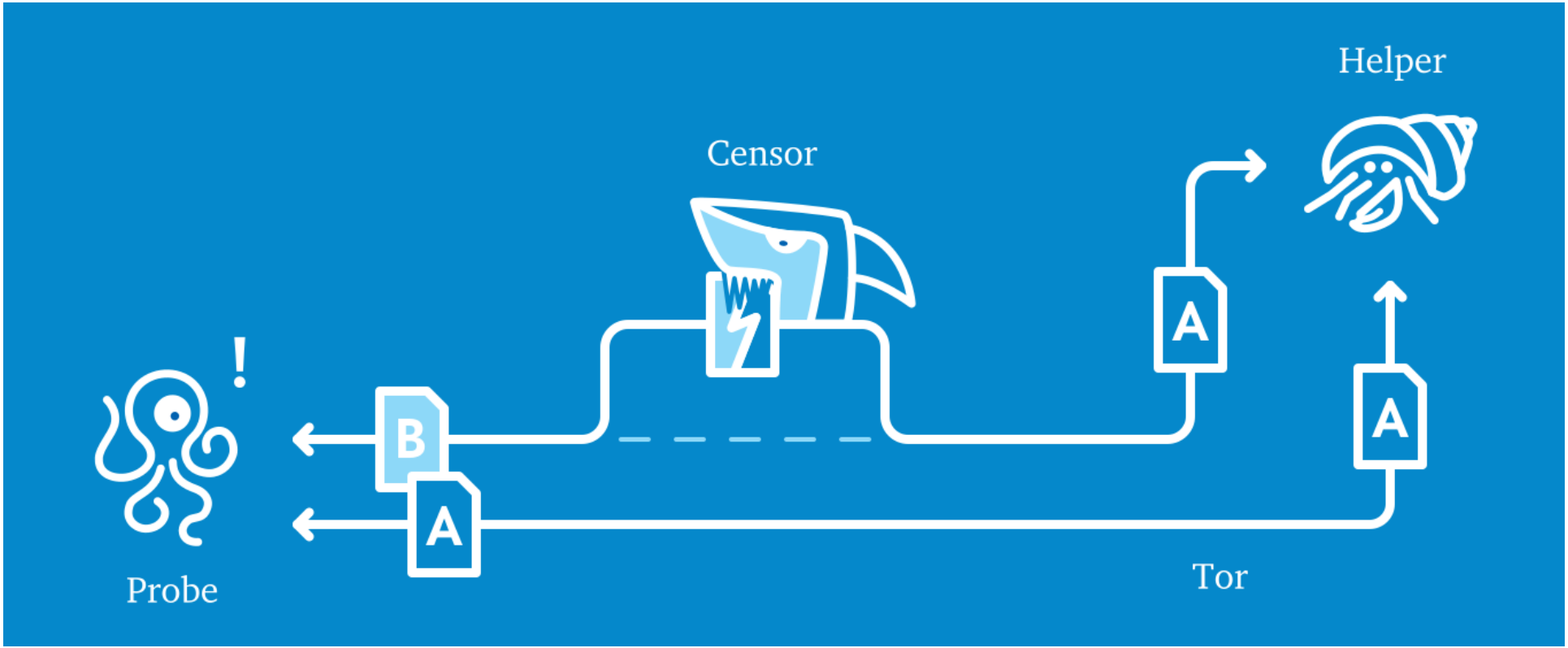

Search or enter address
WELCOME
PRIVACY
TOR NETWORK
Travel a decentralized network.
Tor Browser connects you to the Tor network, a network of servers we call "relays," run by thousands of volunteers around the world. Unlike a VPN, there's no one point of failure or centralized entity you need to trust in order to
GO TO SECURITY SETTINGS

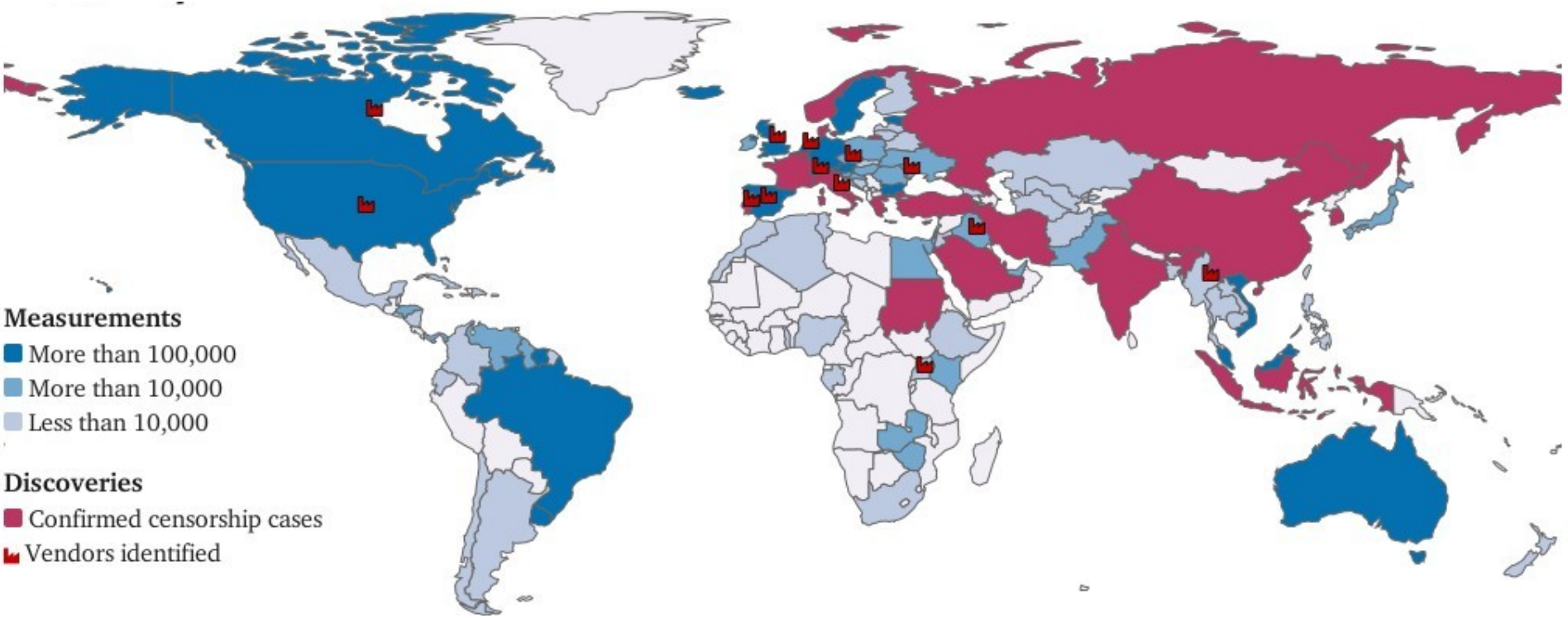
Open Observatory of Network Interference

ooni

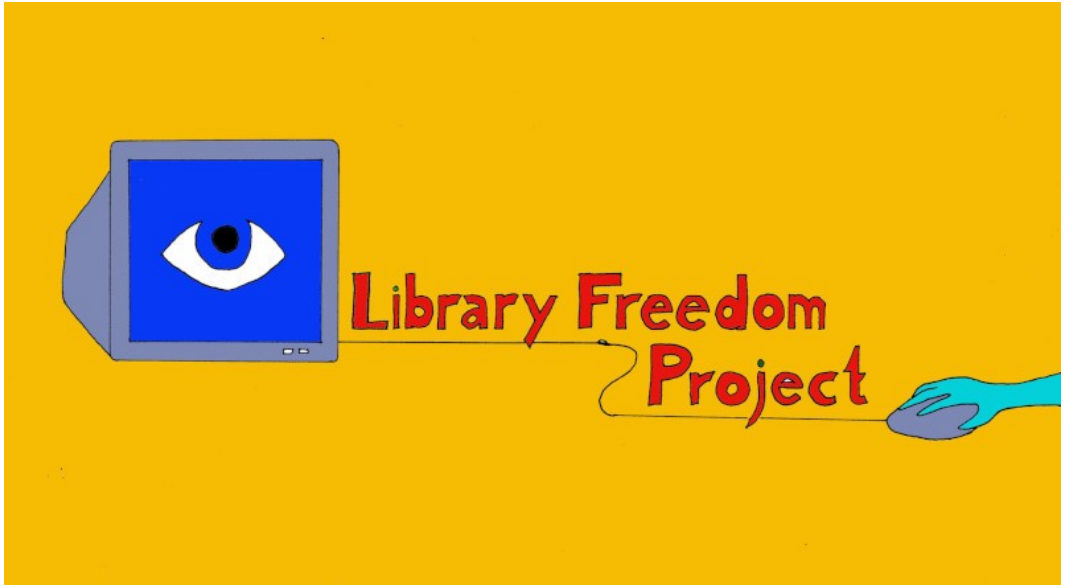


https://explorer.ooni.torproject.org


Helper
Censor
!
A
A
B
A
Probe
Tor



https://explorer.ooni.torproject.org



Edward Snowden ✓
@Snowden

Follow

DHS fought to stop libraries from using privacy technology, but @LibraryFreedom beat them. Librarians are badass.

> **Dan Gillmor** ✓ @dangillmor
> Just donated to the excellent Library Freedom Project. Here's why.libraryfreedomproject.org/libraries-tor-... Should have done this sooner.

11:24 AM - 11 Oct 2015

https://libraryfreedomproject.org
https://twitter.com/snowden/status/653275043087151105

Edward Snowden esperando um açaí misto lá na Gorete

– infelizmente, Edward nunca foi na Gorete –

Alison Macrina e Nima Fatemi, durante primeira fase do projeto de implementação de nós de saída em bibliotecas públicas

TorBSD Diversity Project – TDP

https://torbsd.org/oostats

Categoria do Relatório: RELAYS
Data: **20190320**
Fonte: **onionoo.torproject.org/details**

Contagem Geral, por Sistema Operacional

Sist. Operacional	Contagem (unidades)
TOTAL (6540)	6540
Linux	6044 (92.4%)
FreeBSD	316 (4.8%)
OpenBSD	77 (1.2%)
Windows	70 (1.1%)
Darwin	16 (0.2%)
SunOS	5 (0.1%)
NetBSD	5 (0.1%)
ElectroBSD	4 (0.1%)
DragonFly	2 (0.0%)
GNU/kFreeBSD	1 (0.0%)

Categoria do Relatório: RELAYS
Data: **20190320**
Fonte: **onionoo.torproject.org/details**

Largura de Banda, por Sistema Operacional

Sist. Operacional	Banda (bytes)
TOTAL (6540)	46582231070
Linux (6044)	42672726257 (91.6%)
FreeBSD (316)	3314165434 (7.1%)
OpenBSD (77)	312187268 (0.7%)
Windows (70)	132065771 (0.3%)
ElectroBSD (4)	47542563 (0.1%)
Darwin (16)	38342647 (0.1%)
SunOS (5)	32633133 (0.1%)
NetBSD (5)	23141477 (0.0%)
DragonFly (2)	7295922 (0.0%)
GNU/kFreeBSD (1)	2130598 (0.0%)

Categoria do Relatório: BRIDGES
Data: **20190320**
Fonte: **onionoo.torproject.org/details**

Largura de Banda, por Sistema Operacional

Sist. Operacional	Banda (bytes)
TOTAL (939)	762049891
Linux (890)	748170422 (98.2%)
FreeBSD (24)	7195249 (0.9%)
OpenBSD (11)	3422706 (0.4%)
Windows (9)	2321365 (0.3%)
Darwin (3)	810515 (0.1%)
NetBSD (1)	76800 (0.0%)
DragonFly (1)	52834 (0.0%)

Router Name	Bandwidth (KB/s)	Uptime	Hostname	ORPort	DirPort
coruja	110	**9 d**		9001	None
cebolinha	92	**137 d**		**443**	**80**
DNCRJ	77	**46 d**		9001	None
lxoliva	48	11 h		9001	9030
francisco	31	**10 d**		9001	None
satoshitor	25	**91 d**		**443**	**80**
Relay01	17	**81 d**		**443**	9030
ididteditheconfigsr	12	23 h		9001	9030
Unnamed	8	11 h		4433	9933
Baldur	1	**13 d**		9001	None
unknow	1	19 h		9001	None
Amor	0	16 h		**443**	9030
astuterelay	0	5 h		9001	9030
cristina	0	**2 d**		**443**	**80**
lzkill	0	24 h		9001	9030
marihess	0	21 h		9001	9030
OrbotRelay	0	2 h		9001	None
SanToRelay	0	**4 d**		9001	9030
shad0wguyirc	0	19 h		**443**	9030
topcat	0	**17 d**		9001	None
Unnamed	0	5 h		**443**	None
Unnamed	0	**91 d**		9001	None
warpzone	0	21 h		8181	None

▼ Router Name	▼ Bandwidth (KB/s)	▲ Uptime	▼ Hostname	▼ ORPort	▼ DirPort
SPFCFutebol	2976	**177 d 6 h**		9001	9030
tauro	1955	**104 d 9 h**		**443**	**80**
gregory	1269	**259 d 8 h**		593	21462
bearmeettea	1246	3 d 10 h		22407	19747
xtermnginx	1245	**41 d 4 h**		1468	3334
overlay	1207	**275 d 5 h**		8307	635
trueconf	1201	**275 d 12 h**		26378	22316
uhwfa	1199	**117 d 23 h**		10672	4466
Unnamed	1195	**10 d 8 h**		26155	11718
utzer2	1195	**75 d 23 h**		**443**	9030
Unnamed	1194	**31 d 10 h**		16313	862
Unnamed	1186	1 d 3 h		31140	14388
echykd	1157	**33 d 13 h**		7325	16350
ecramrelay1	1115	**9 d 18 h**		9001	None
galpao	1025	4 d 8 h		9001	None
brasilhostil	854	4 d 15 h		9000	9001
torbsd2	815	**11 d 20 h**		3389	None
Unnamed	613	**9 d 22 h**		23138	32276
brasilhostil2	597	4 d 15 h		9100	9101
Relay01	560	**96 d 19 h**		**443**	9030

▼ Router Name	▼ Bandwidth (KB/s)	▲ Uptime	▼ Hostname	▼ ORPort	▼ DirPort
torbsd4	553	**11 d 20 h**		9000	None
torbsd3	518	**11 d 20 h**		7331	None
ecramrelay2	417	**9 d 3 h**		9001	None
Unnamed	389	**6 d 17 h**		9001	9030
torbsd5	386	**11 d 19 h**		21	None
arbitrium	335	**7 d 20 h**		9001	9030
RjPi1	248	3 d 17 h		4430	8000
BR101	233	**8 d 17 h**		9001	9030
Unnamed	231	0 d 8 h		9001	None
nohcego	204	0 d 16 h		2223	None
torbsd	157	**11 d 19 h**		1194	None
torbsd6	151	**11 d 20 h**		22	None
ImOHelping	141	2 d 14 h		9001	9030
lxoliva	131	0 d 3 h		9001	9030
mmacedo	116	1 d 10 h		9001	None
observeble	107	**210 d 9 h**		28042	16256
Unnamed	81	0 d 18 h		9001	None
UbuntuCore196	68	0 d 5 h		37313	None
UbuntuCore196	66	2 d 1 h		46293	None
UbuntuCore197	54	0 d 8 h		35927	None

▼ Router Name	▼ Bandwidth (KB/s)	▲ Uptime	▼ Hostname	▼ ORPort	▼ DirPort
UbuntuCore196	52	0 d 4 h		44301	None

Nickname†	Advertised Bandwidth	Uptime	Country	IPv4	IPv6	Flags	Add. Flags	ORPort	DirPort	Type
tauro (1)	2.36 MiB/s	2d 22h			-			443	80	Relay
citsp64 (1)	1.92 MiB/s	96d 23h			-			443	0	Relay
Netburst (1)	1.64 MiB/s	7d 20h						443	69	Relay
Relay01 (1)	1.51 MiB/s	52d 22h						443	9030	Relay
SPFCFutebol (1)	1.42 MiB/s	1y 24d 23h			-			9001	9030	Relay
cnsp1 (1)	1.42 MiB/s	1d 18h			-			443	0	Relay
anarres (2)	1.41 MiB/s	10d 6h			-			9000	9001	Relay
anarres (2)	1.41 MiB/s	10d 6h			-			9100	9101	Relay
vovis (1)	1.39 MiB/s	2d 17h			-			9001	9030	Relay
BrasilHostil (7)	1.35 MiB/s	1d 23h			-			9300	0	Relay
alqnetwork (1)	1.29 MiB/s	3d 15h			-			443	80	Relay
1964NuncaMais (6)	1.29 MiB/s	11d 6h			-			443	9000	Relay
utzer2 (15)	1.27 MiB/s	243d 2h			-			443	9030	Relay
ImOHpi (1)	1.27 MiB/s	2d 18h			-			9003	9030	Relay
cebolitos (1)	1.24 MiB/s	7d 18h			-			9001	0	Relay
snap269 (1)	1.23 MiB/s	7d 2h			-			44797	0	Relay
Bolsonaro2018 (1)	1.19 MiB/s	5d 3h			-			12345	23456	Relay
ecramrelay1 (1)	1.18 MiB/s	4d 10h			-			9001	0	Relay
snap269 (1)	1.09 MiB/s	1d 10h			-			46593	0	Relay
desnaturado (1)	987.72 KiB/s	17d 19h			-			20044	20045	Relay
sucuri (1)	802 KiB/s	2d 6h			-			9001	9030	Relay
snap269 (1)	772 KiB/s	4h 34m			-			41213	0	Relay
Bael (2)	657.77 KiB/s	205d 2h			-			9001	9030	Relay
Coderi (2)	640.8 KiB/s	124d 6h			-			9001	9030	Relay
Tapioca (1)	594.63 KiB/s	23d 22h			-			443	9030	Relay
Total	**35.97 MiB/s**									

Showing 1 to 25 of 47 entries

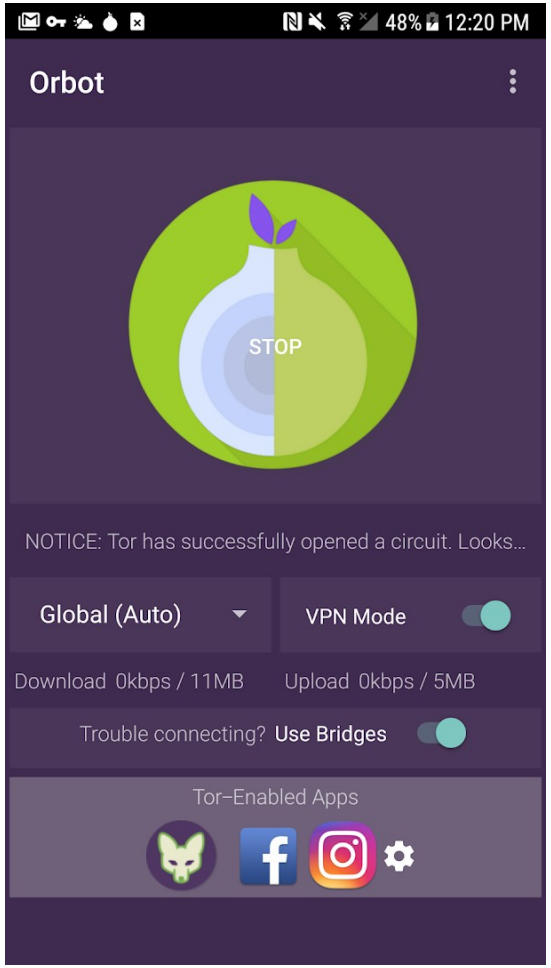

Tails
theamnesicincognitolivesystem

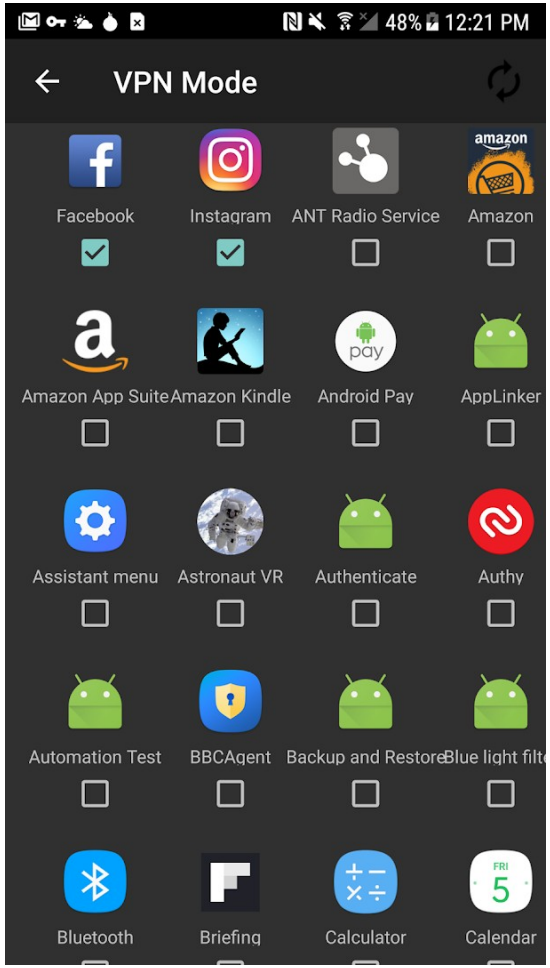

whonix
PRIVACY & ANONYMITY OS

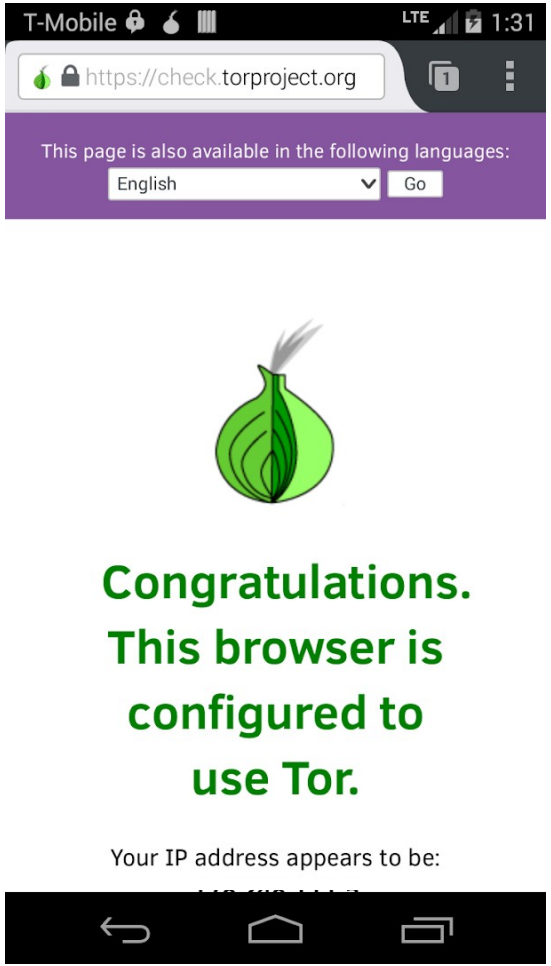
QUBES OS

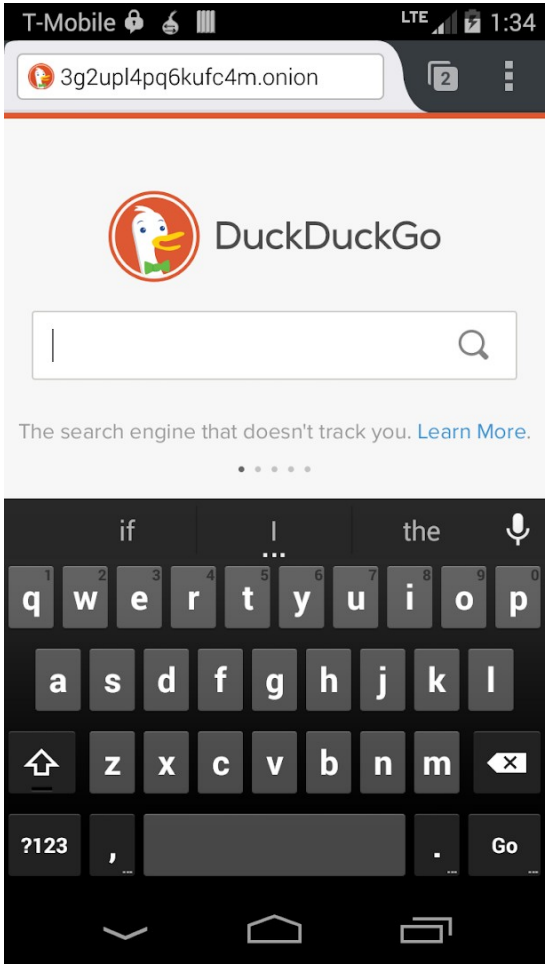
THE GUARDIAN PROJECT

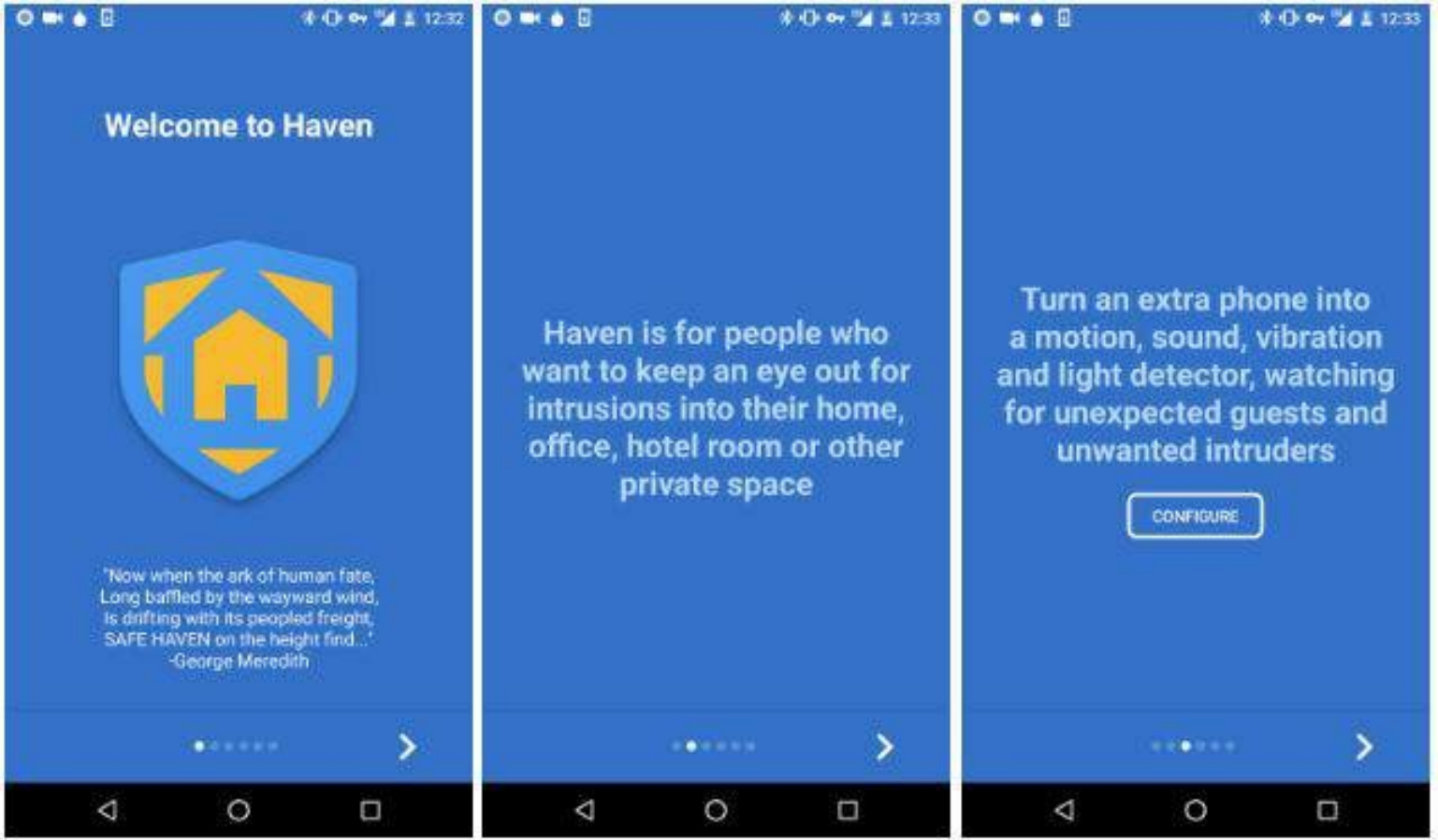
https://guardianproject.info


48% 12:20 PM
Orbot
STOP
NOTICE: Tor has successfully opened a circuit. Looks...
Global (Auto)
VPN Mode
Download 0kbps / 11MB
Upload 0kbps / 5MB
Trouble connecting? Use Bridges
Tor-Enabled Apps


48% 12:21 PM
VPN Mode
Facebook
Instagram
ANT Radio Service
Amazon
Amazon App Suite
Amazon Kindle
Android Pay
AppLinker
Assistant menu
Astronaut VR
Authenticate
Authy
Automation Test
BBCAgent
Backup and Restore
Bluetooth
Briefing
Calculator
Calendar


T-Mobile
LTE 1:31
https://check.torproject.org
This page is also available in the following languages:
English
Go
Congratulations.
This browser is
configured to
use Tor.
Your IP address appears to be:


T-Mobile
LTE 1:34
3g2upl4pq6kufc4m.onion
DuckDuckGo
The search engine that doesn't track you. Learn More.
if
the
Go


12:32
Welcome to Haven
'Now when the ark of human fate,
Long baffled by the wayward wind,
Is drifting with its peopled freight,
SAFE HAVEN on the height find...'
-George Meredith
12:33
Haven is for people who want to keep an eye out for intrusions into their home, office, hotel room or other private space
12:33
Turn an extra phone into a motion, sound, vibration and light detector, watching for unexpected guests and unwanted intruders
CONFIGURE

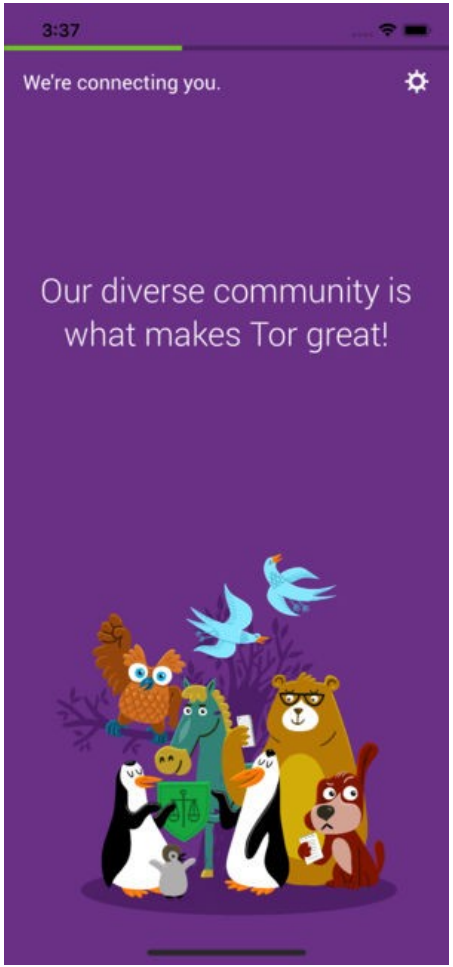
Onion Browser 17+

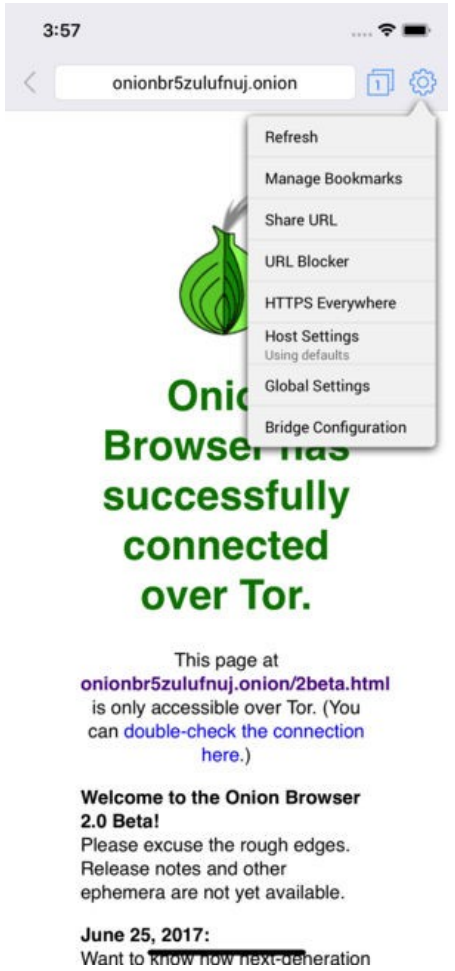
Secure, anonymous web with Tor

Mike Tigas

★★★½☆ 3.7, 328 Ratings

Free · Offers In-App Purchases

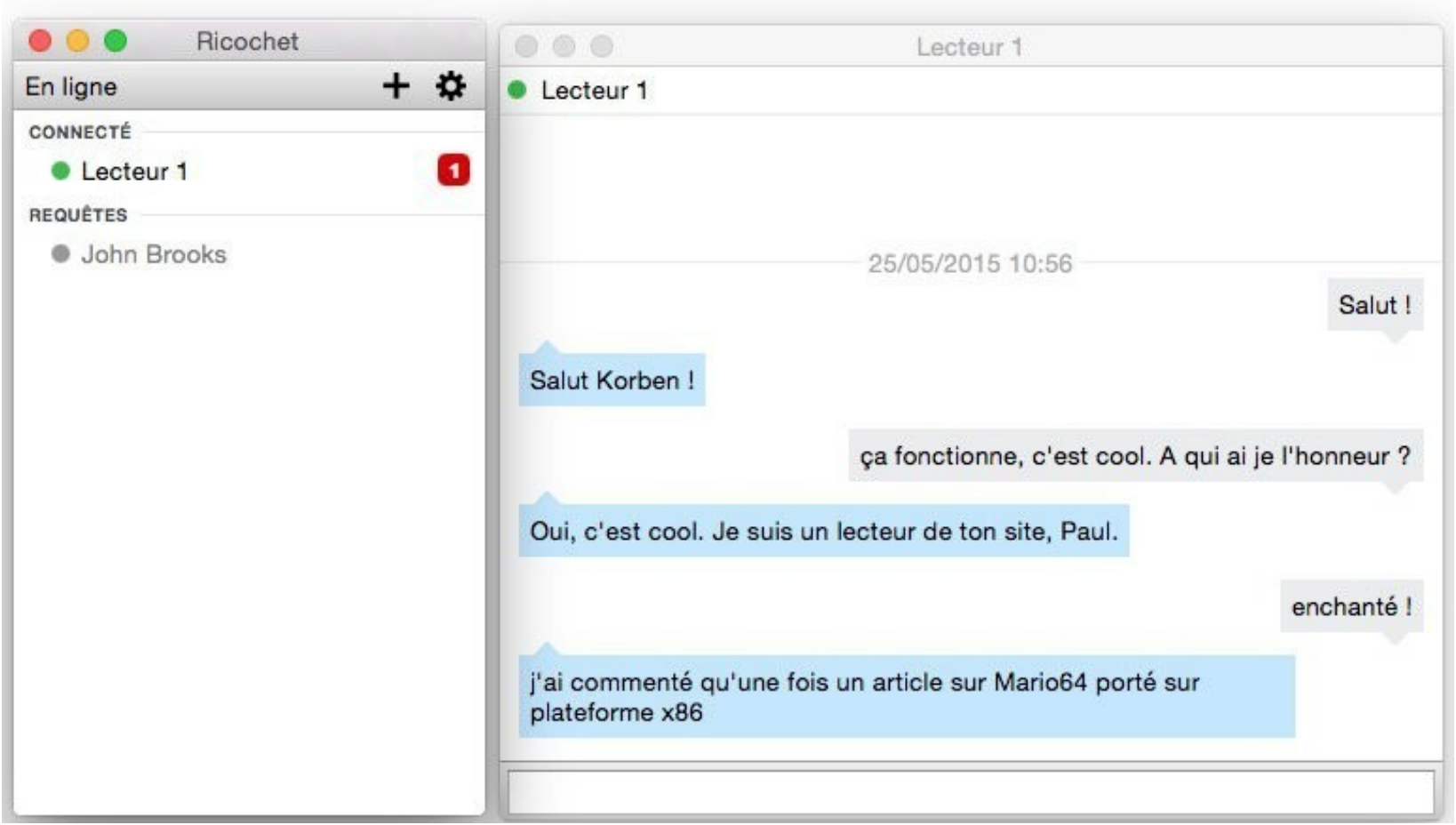




Ricochet I.M.

Mensagens instantâneas anônimas para privacidade real; uma abordagem diferente que não confia em ninguém para proteger sua privacidade.

- *elimina metadados. ninguém sabe quem você é, nem com quem fala ou o que você diz;*
- *presa anônimato. compartilhe o que você quer, sem compartilhar sua identidade e localização;*
- *ausenta escutas. não há servidores para monitorar, censurar ou comprometer;*
- *seguro por padrão. a segurança não é segura até que seja automática e fácil de usar.*


Ricochet
En ligne
CONNECTÉ
Lecteur 1
1
REQUÊTES
John Brooks
Lecteur 1
Lecteur 1
25/05/2015 10:56
Salut !
Salut Korben !
ça fonctionne, c'est cool. A qui ai je l'honneur ?
Oui, c'est cool. Je suis un lecteur de ton site, Paul.
enchanté !
j'ai commenté qu'une fois un article sur Mario64 porté sur plateforme x86

Briar é um aplicativo de mensagens projetado para quaisquer pessoas que precisem se comunicar com outras pessoas ou entidades de uma forma segura, fácil e robusta.

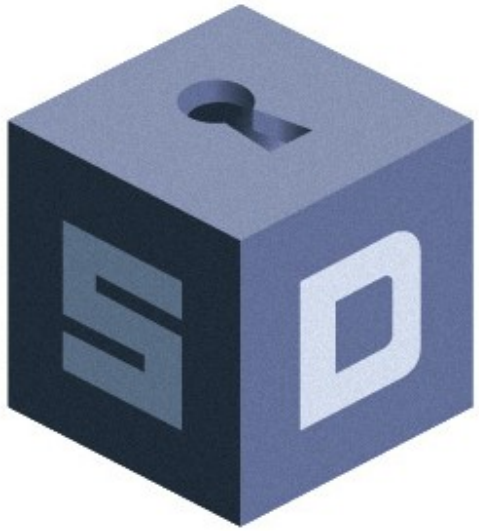
Ao contrário de aplicativos semelhantes, ele não depende de servidores dedicados à entrega das mensagens.

Caso sua conexão com a Internet não esteja funcionando, o aplicativo pode sincronizar via Bluetooth ou Wi-Fi, mantendo as informações fluindo. O tráfego pela Internet também pode ser feito através da rede Tor.


TorBirdy

https://projects.newyorker.com/securedrop/

Antes conhecido como *StrongBox*, o *SecureDrop* mantido pelo *New Yorker* é um serviço oferecido pelo jornal para que você possa compartilhar dicas, informações e arquivos dignos de se tornarem notícia, cuja importância ou sensibilidade exige um grau maior de anonimato e segurança do que é oferecido por meios convencionais.



https://securedrop.org/overview

SECUREDROP

originalmente desenvolvido por Aaron Swartz e James Dolan, sob o nome de DeadDrop

ICIJ The International Consortium of Investigative Journalists

GREENPEACE

Nova Zelândia

The New York Times

npr

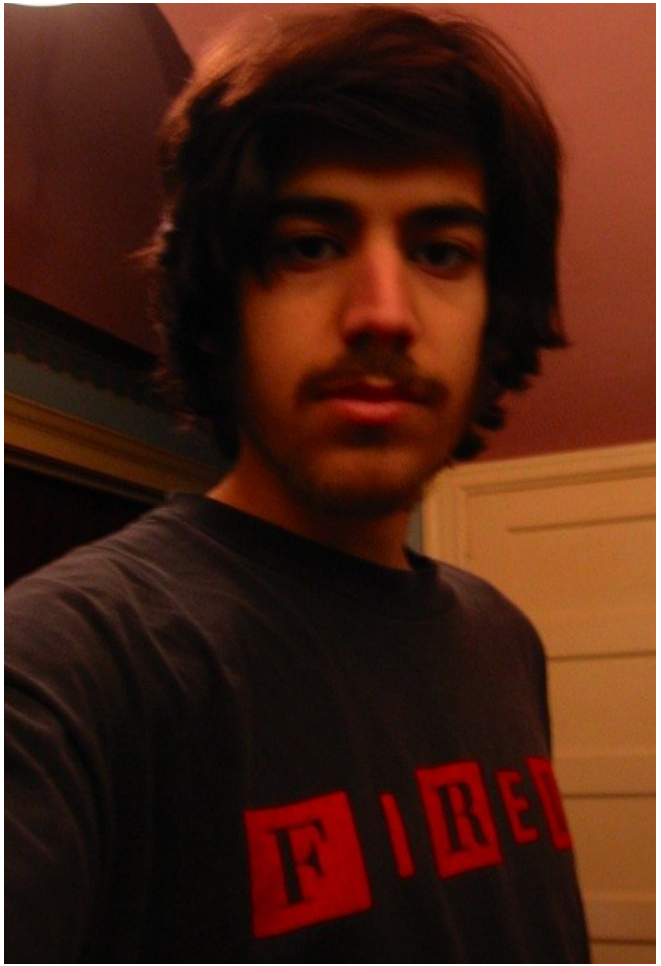
heise online

https://securedrop.org/directory

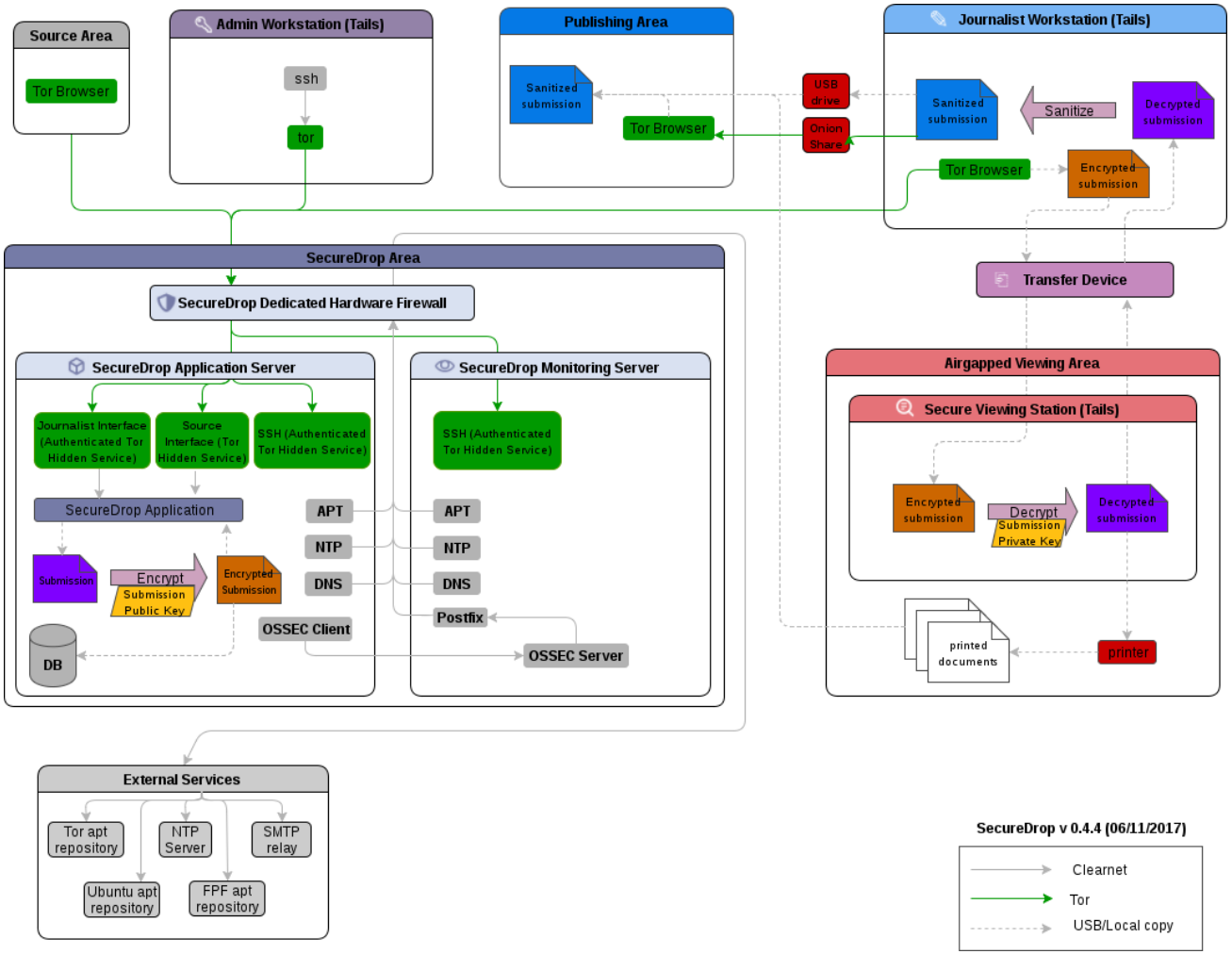
português

HUFFPOST

The Intercept_



James Dolan e Aaron Swartz


Source Area
Tor Browser
Admin Workstation (Tails)
ssh
tor
Publishing Area
Sanitized submission
Tor Browser
USB drive
Onion Share
Journalist Workstation (Tails)
Sanitized submission
Sanitize
Decrypted submission
Tor Browser
Encrypted submission
SecureDrop Area
SecureDrop Dedicated Hardware Firewall
SecureDrop Application Server
Journalist Interface (Authenticated Tor Hidden Service)
Source Interface (Tor Hidden Service)
SSH (Authenticated Tor Hidden Service)
SecureDrop Application
Submission
Encrypt Submission Public Key
Encrypted Submission
DB
APT
NTP
DNS
OSSEC Client
SecureDrop Monitoring Server
SSH (Authenticated Tor Hidden Service)
APT
NTP
DNS
Postfix
OSSEC Server
Transfer Device
Airgapped Viewing Area
Secure Viewing Station (Tails)
Encrypted submission
Decrypt Submission Private Key
Decrypted submission
printed documents
printer
External Services
Tor apt repository
NTP Server
SMTP relay
Ubuntu apt repository
FPF apt repository
SecureDrop v 0.4.4 (06/11/2017)
Clearnet
Tor
USB/Local copy

HERMES
CENTER FOR TRANSPARENCY AND DIGITAL HUMAN RIGHTS

"GlobaLeaks (...) won't have any central point of failure"

Forbes

"Their project aims to make a suite of software (...) to (...) maintain a whistle-blowing platform"

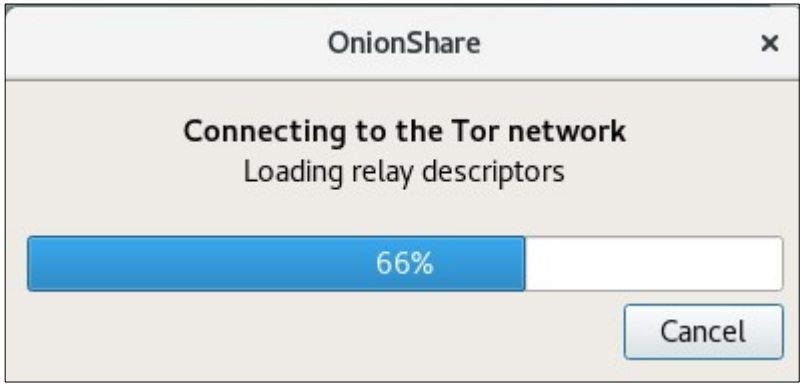
RadioFreeEurope RadioLiberty

"Tor2web is a positive step for those who want to publish anonymously without sacrificing the exposure"

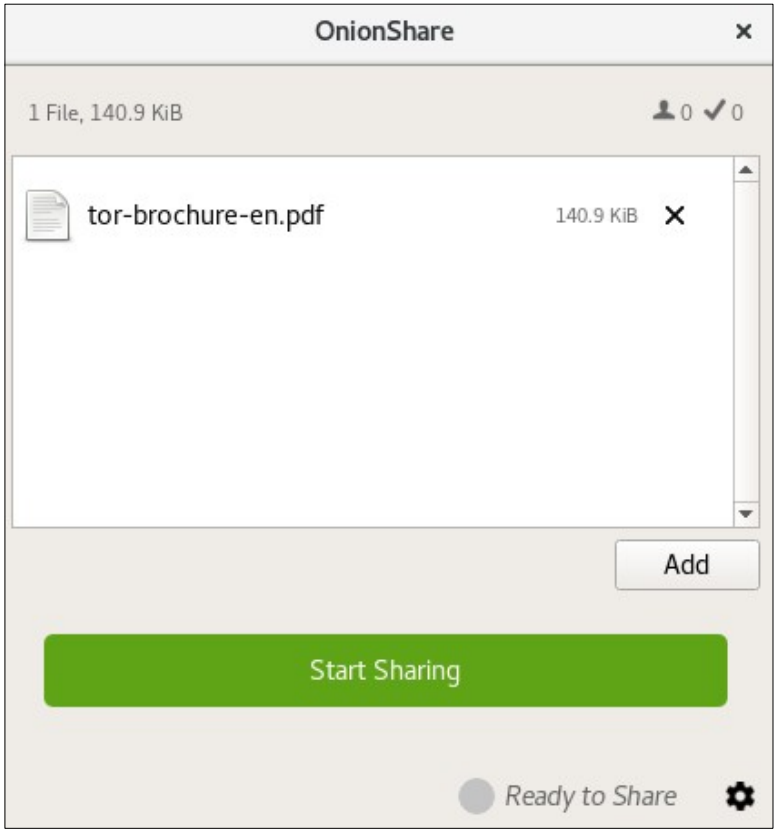
ars technica

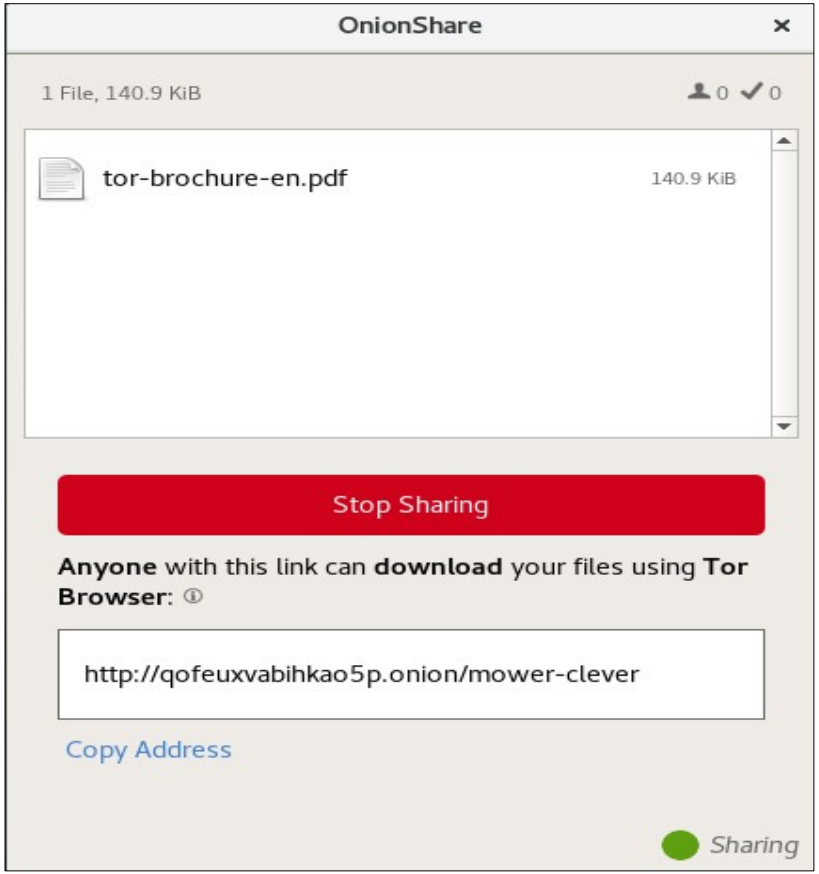
OnionShare

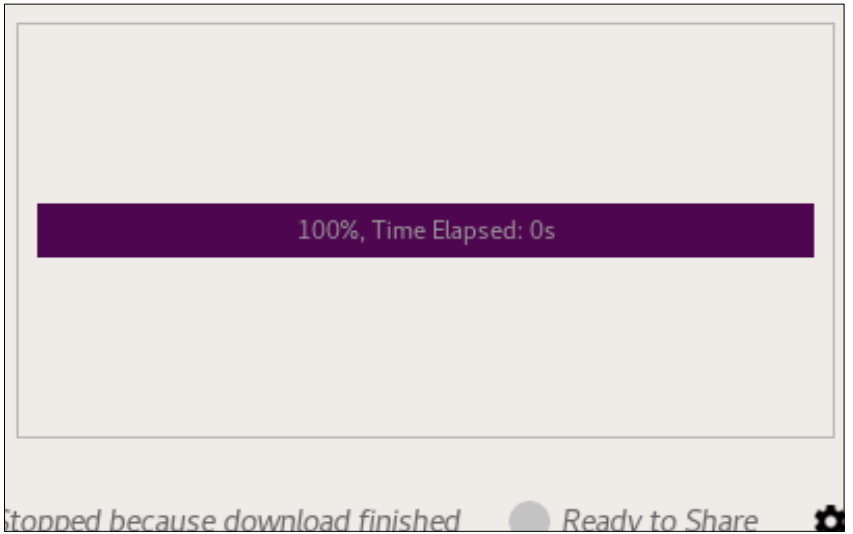
https://onionshare.org


OnionShare
Connecting to the Tor network
Loading relay descriptors
66%
Cancel

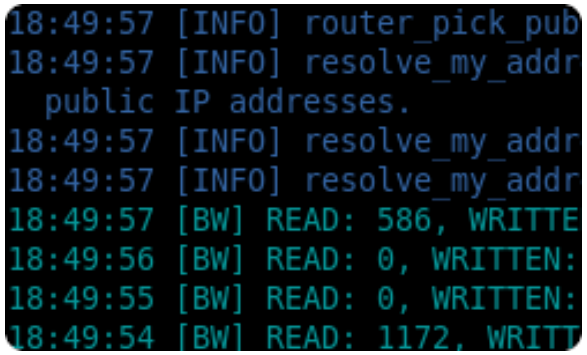

OnionShare
Drag and drop files and folders
to start sharing
Add
Ready to Share

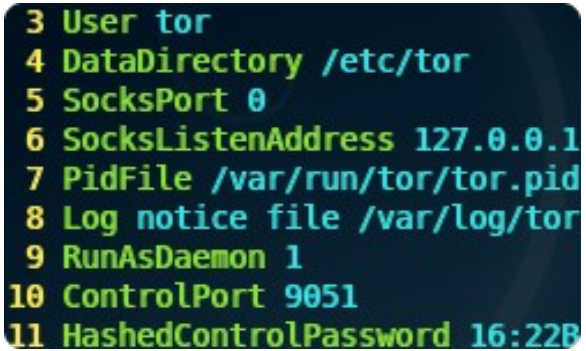

OnionShare
1 File, 140.9 KiB
0 0
tor-brochure-en.pdf
140.9 KiB
Add
Start Sharing
Ready to Share

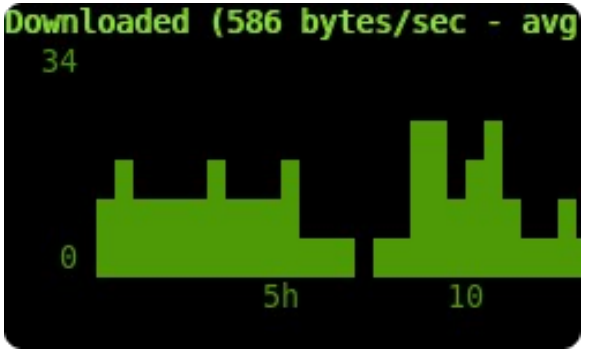

OnionShare
1 File, 140.9 KiB
0 0
tor-brochure-en.pdf
140.9 KiB
Stop Sharing
Anyone with this link can download your files using Tor Browser:
http://qofeuxvabihkao5p.onion/mower-clever
Copy Address
Sharing

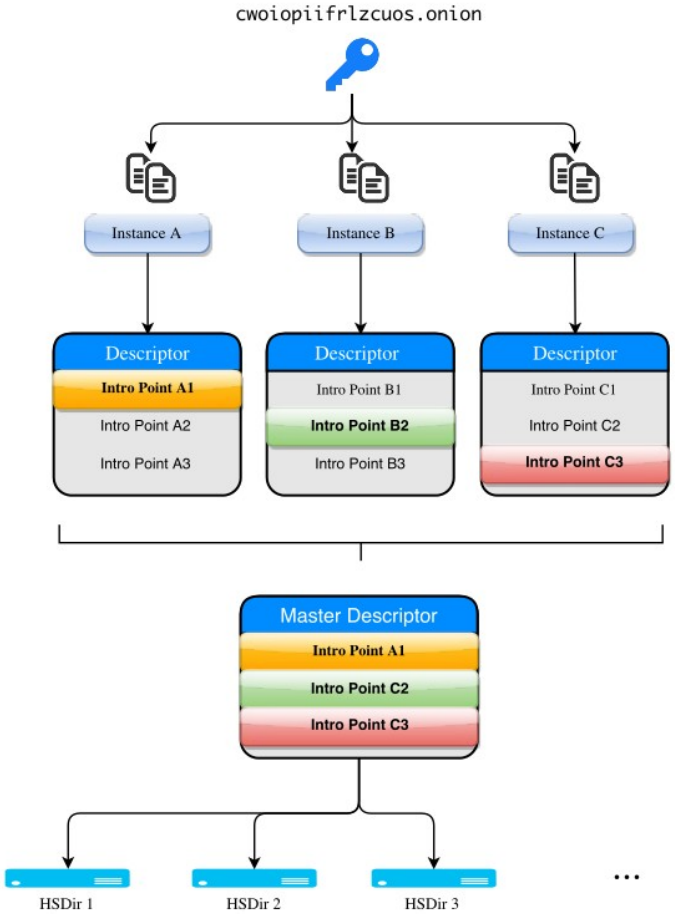

100%, Time Elapsed: 0s
Stopped because download finished
Ready to Share

nyx


18:49:57 [INFO] router_pick_pub
18:49:57 [INFO] resolve_my_addr
public IP addresses.
18:49:57 [INFO] resolve_my_addr
18:49:57 [INFO] resolve_my_addr
18:49:57 [BW] READ: 586, WRITTE
18:49:56 [BW] READ: 0, WRITTEN:
18:49:55 [BW] READ: 0, WRITTEN:
18:49:54 [BW] READ: 1172, WRITT


3 User tor
4 DataDirectory /etc/tor
5 SocksPort 0
6 SocksListenAddress 127.0.0.1
7 PidFile /var/run/tor/tor.pid
8 Log notice file /var/log/tor
9 RunAsDaemon 1
10 ControlPort 9051
11 HashedControlPassword 16:22B


Downloaded (586 bytes/sec - avg
34
0
5h
10


cwoiopiifrlzcuos.onion
Instance A
Instance B
Instance C
Descriptor
Intro Point A1
Intro Point A2
Intro Point A3
Descriptor
Intro Point B1
Intro Point B2
Intro Point B3
Descriptor
Intro Point C1
Intro Point C2
Intro Point C3
Master Descriptor
Intro Point A1
Intro Point C2
Intro Point C3
HSDir 1
HSDir 2
HSDir 3
...

- ferramentas extras
  - DNS
    - unbound;
    - BIND
    - doh-proxy (facebook);
    - dnscrypt-proxy;
  - GPG/PGP
    - keybase;
    - enigmail; k-9;
  - containers, e virtualização
    - docker; jails (FreeBSD);
    - KVM, Xen, VirtualBox, QEMU, bhyve (FreeBSD), vmm (OpenBSD).
  - BIOS e sistemas operacionais “*libres*”
    - coreboot;
    - libreboot;
    - trisquel;
    - pureos (purism);
    - librecmc;

- ferramentas extras
  - análise ou remoção de metadados
    - metagoofil;
    - mat;
  - detectores de intrusão
    - suricata;
    - snort;
    - zeek (bro);
  - gerenciadores de senhas
    - keepassx;
    - bitwarden
  - autenticação de múltiplos fatores
    - OTP
      - andotp;
      - linotp;
    - privacyidea;
    - yubikey;

- ferramentas extras
  - miscelânia
    - nextcloud; owncloud; send (mozilla); up1 (riseup);
    - luks; veracrypt; geli (freebsd); bioctl (openbsd);
    - nautilus wipe, shred; dd; bcwipe;
    - ossec; clamav;
    - pf; ipfw, netfilter (iptables); npf; ufw;
    - wireshark (tshark); tcpdump;
    - socat; netcat (nc); redsocks; torsocks; proxychains;
    - privoxy; polipo; squid; haproxy;
    - ntpd; openntpd; ntpdate; htpdate;

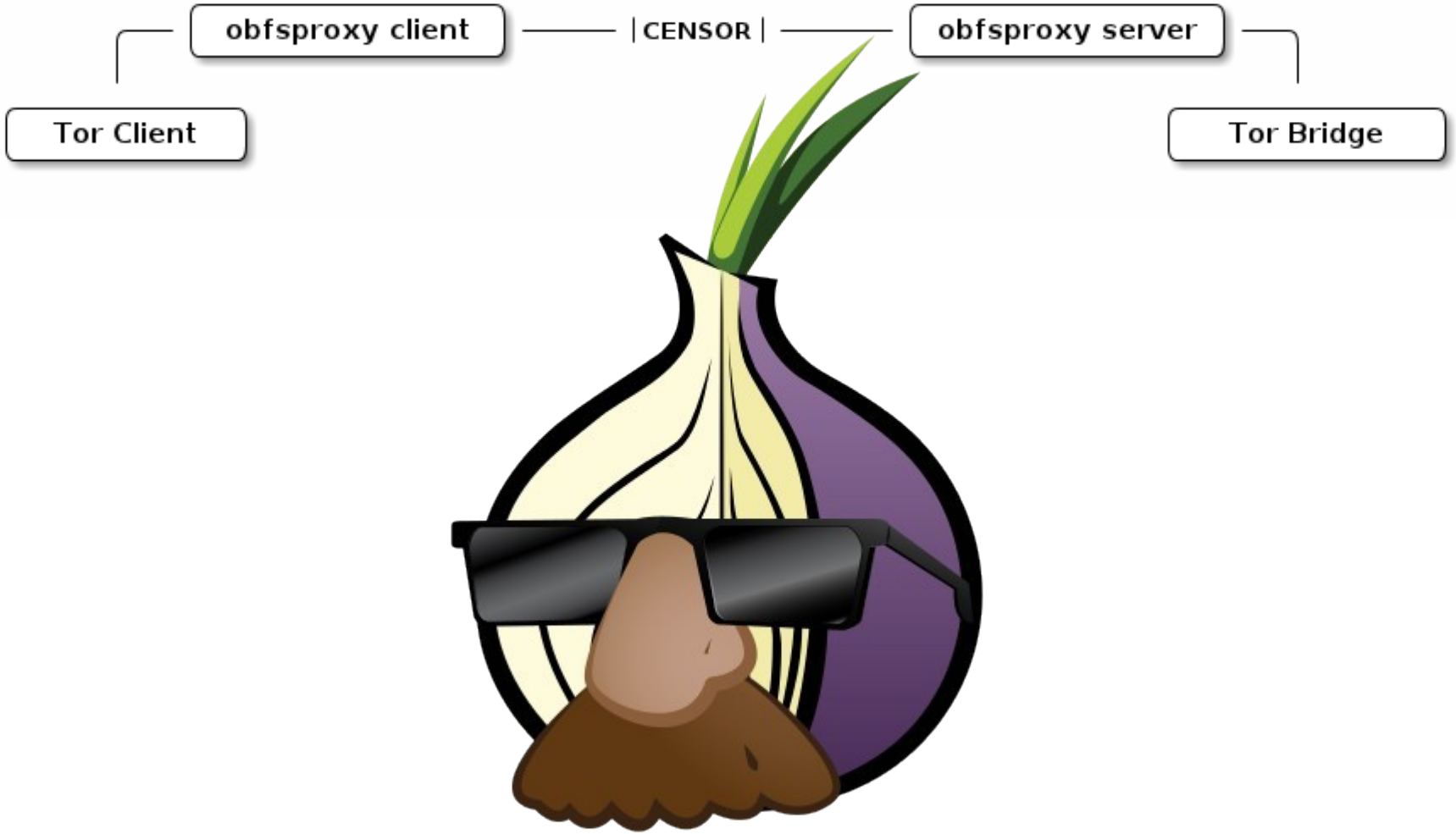
informações adicionais sobre a rede

- ingresso de nós na rede
  - primeira fase (3 dias), medição passiva de banda;
  - segunda fase (5 dias), medição ativa de banda;
  - terceira fase (60 dias), indicação de consenso;
  - quarta fase (demais dias), promoção estável.

- obtenha o navegador com uma ajudinha extra
  - Get Tor
    - https://gettor.torproject.org;
    - https://twitter.com/get_tor *(atenção para o uso do sublinhado)*

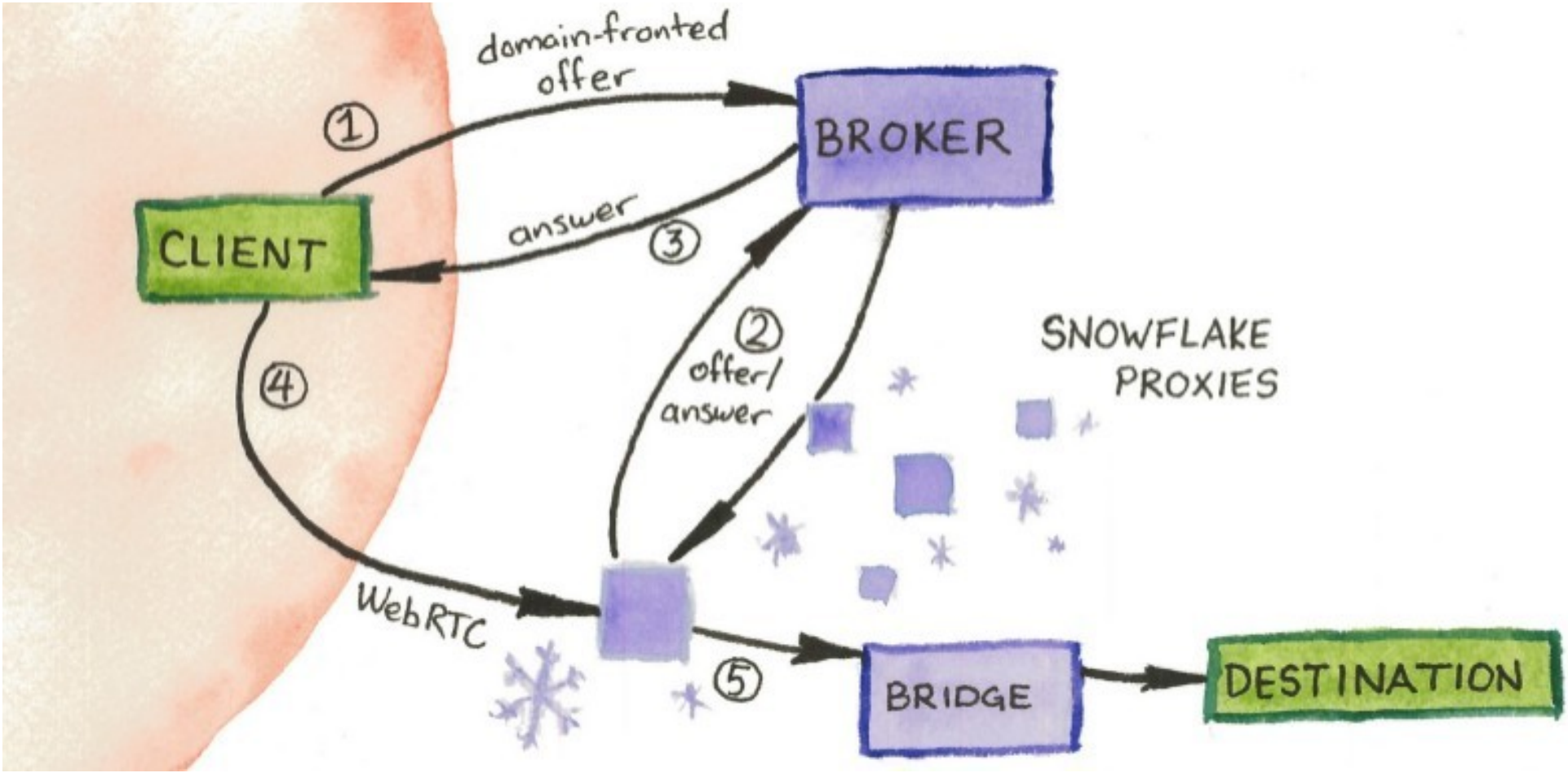
- pontes (nós de entrada camaradas)
  - semelhante a um nó guarda;
  - lista com endereços não é publicada;
    - https://bridges.torproject.org;
    - bridges@torproject.org – Gmail, Riseup, Yahoo!;
    - compartilhada (disponível quando solicitada manualmente);
    - privada (disponível apenas para vc, ou contatos próximos);
  - embutidas no navegador;
    - auxilio dos obfuscadores de tráfego.

obfuscadores de tráfego


obfsproxy client
CENSOR
obfsproxy server
Tor Client
Tor Bridge

- obfuscadores de tráfego
  - **fte**, imita tráfego HTTP comum;
  - **obfs**
    - ***obfs3***, gera tráfego randomizado;
    - ***obfs4***, aprimoração do anterior que funciona na China;
  - **meek**
    - meek-amazon;
    - meek-azure (funciona na China).

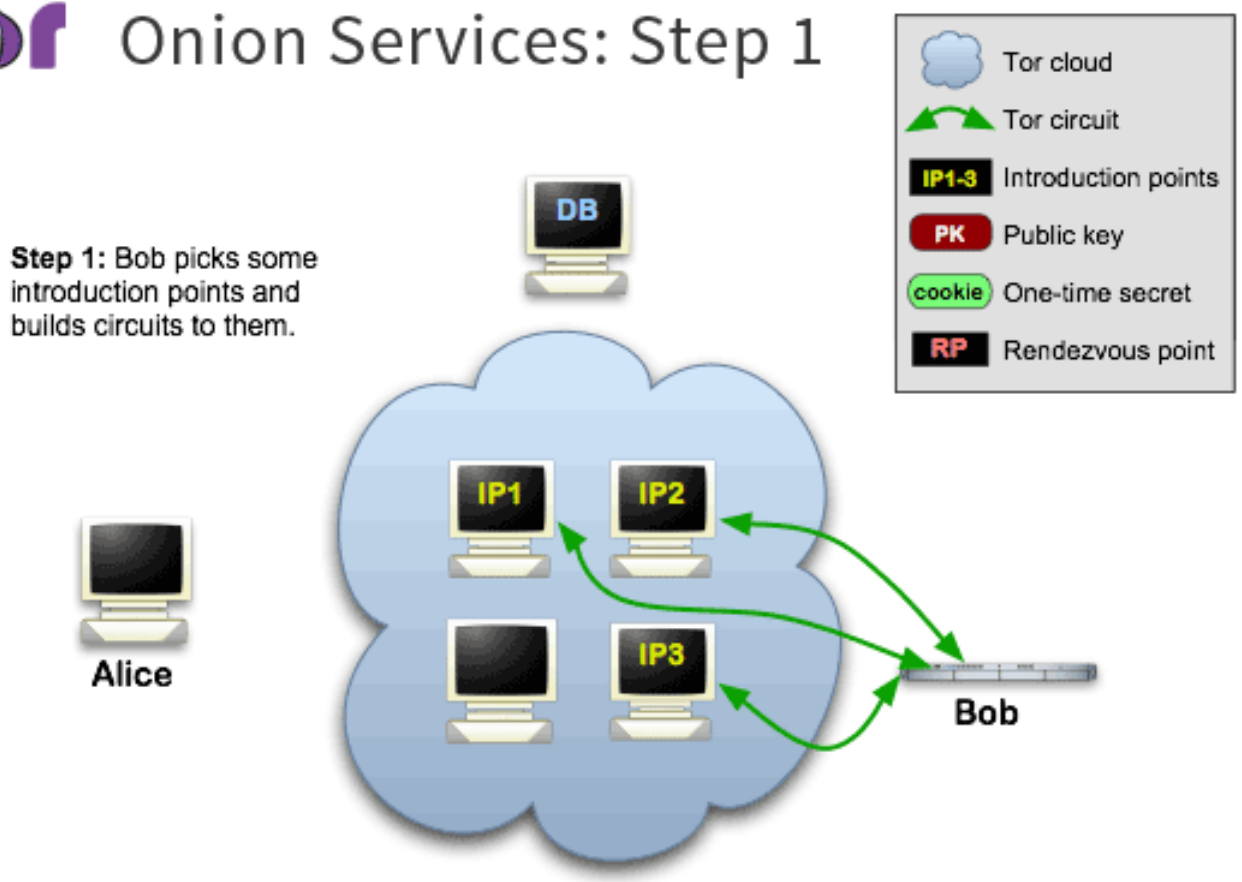
- flashproxy (Stanford) | Web Socket
- stegotorus (SRI/CMU) | HTTP
- SkypeMorph (Waterloo) | Skype Videocall
- uProxy (Google) | WebRTC
- ScrambleSuit (Karlstad) | obfs-based
- Telex (Michigan/Waterloo) | Traffic Divert


domain-fronted
offer
1
BROKER
CLIENT
answer
3
2
offer/
answer
SNOWFLAKE
PROXIES
4
WebRTC
5
BRIDGE
DESTINATION

serviços acebolados

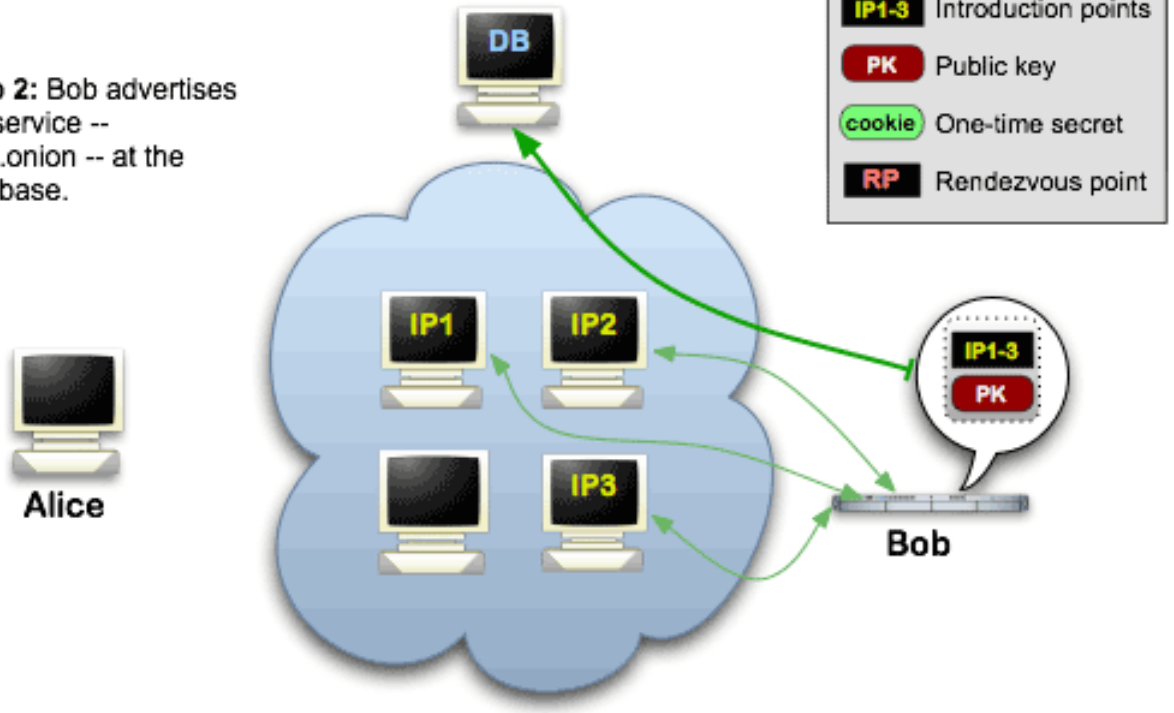
- ***.onion**
  - */torspec/address-spec.txt;*
  - */torspec/rend-spec-v2.txt;*
  - */torspec/rend-spec-v3.txt.*
- encriptação fim-a-fim;
- auto-autenticados (dispensa autoridade certificadora);
- drible sob tradução de endereços de rede (NAT punching);
- não necessita sair para a Internet;
  - menor contato com mundo exterior;
- modo privado/restrito (steath mode);
- HTTP*, SSH/SFTP, SMTP/IMAP, ...

Onion Services: Step 1

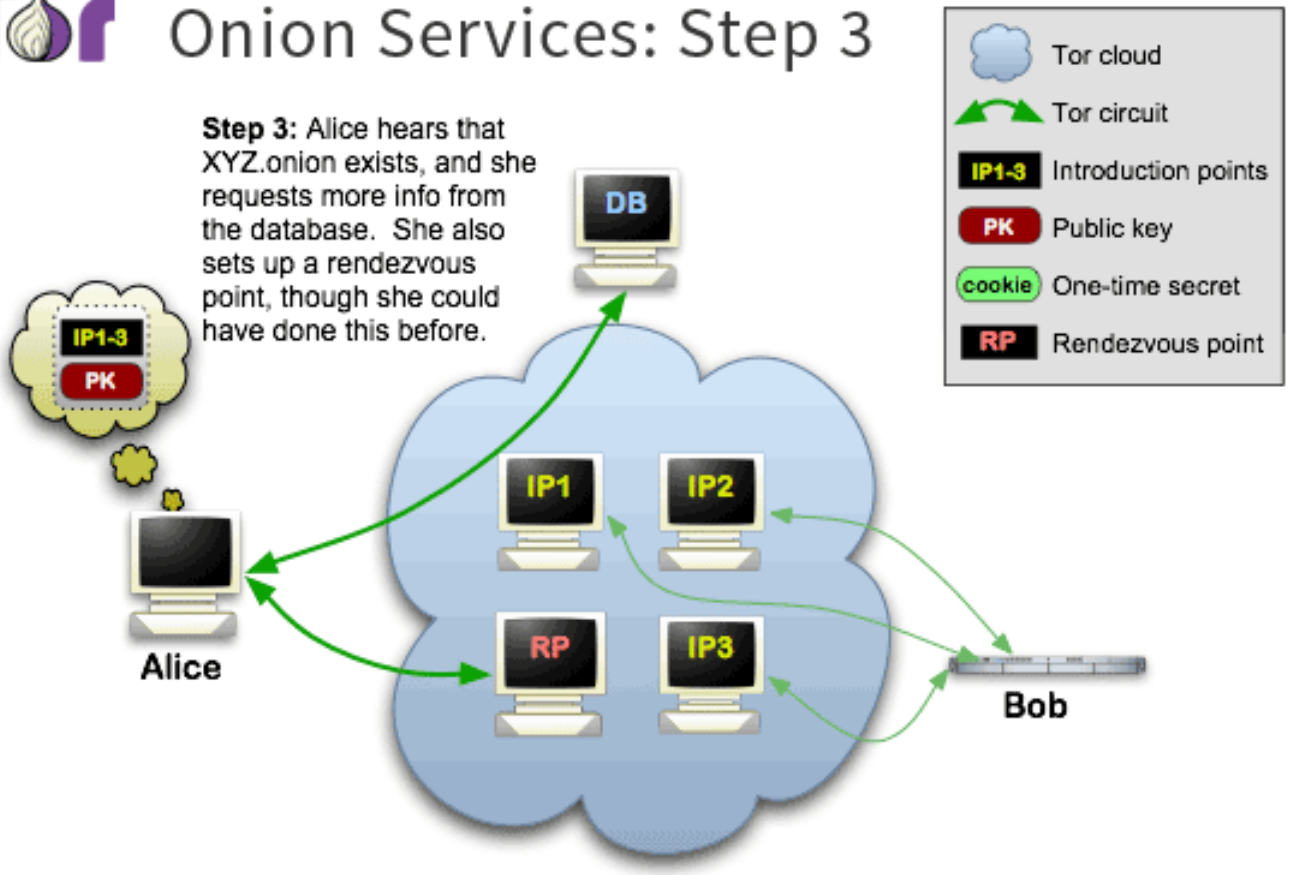


Onion Services: Step 2

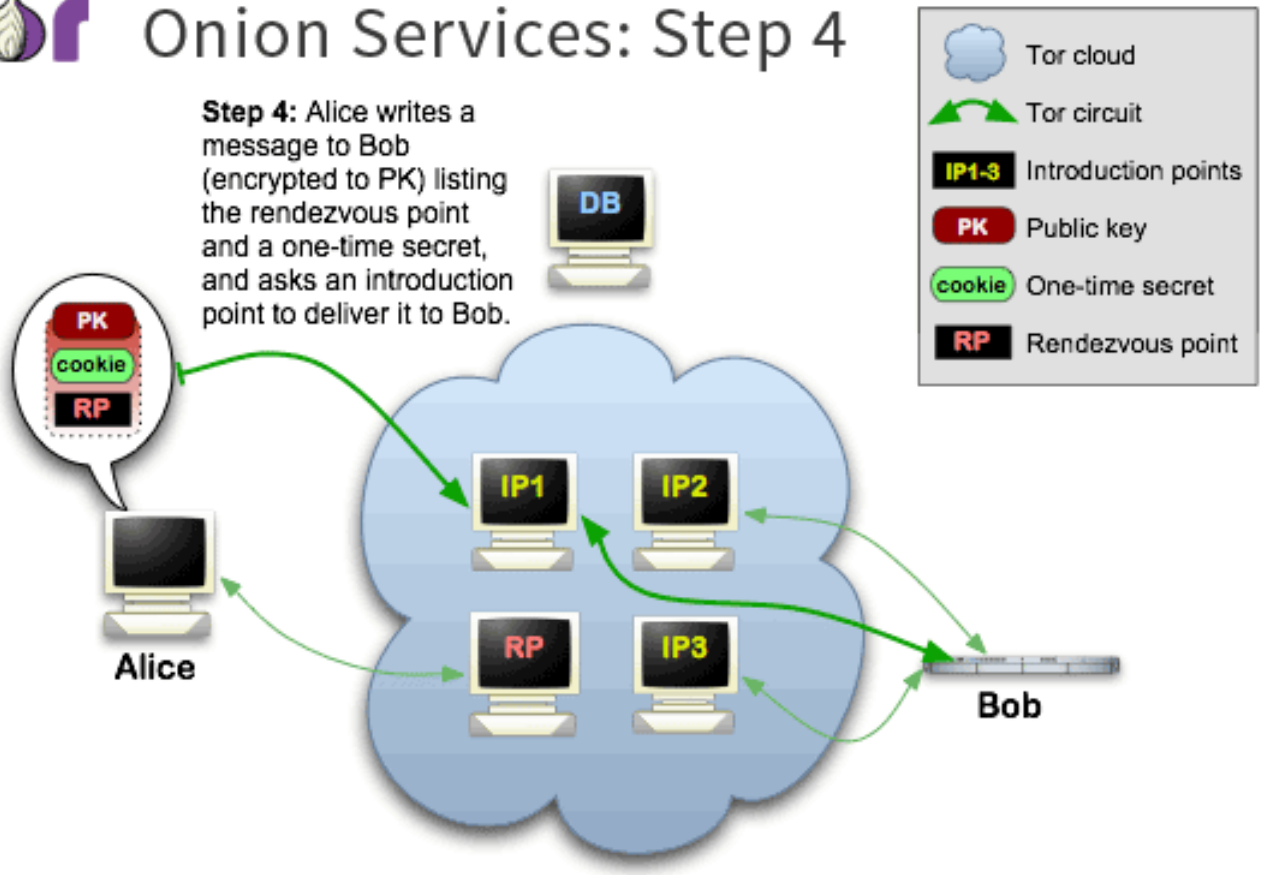
Step 2: Bob advertises his service -- XYZ.onion -- at the database.



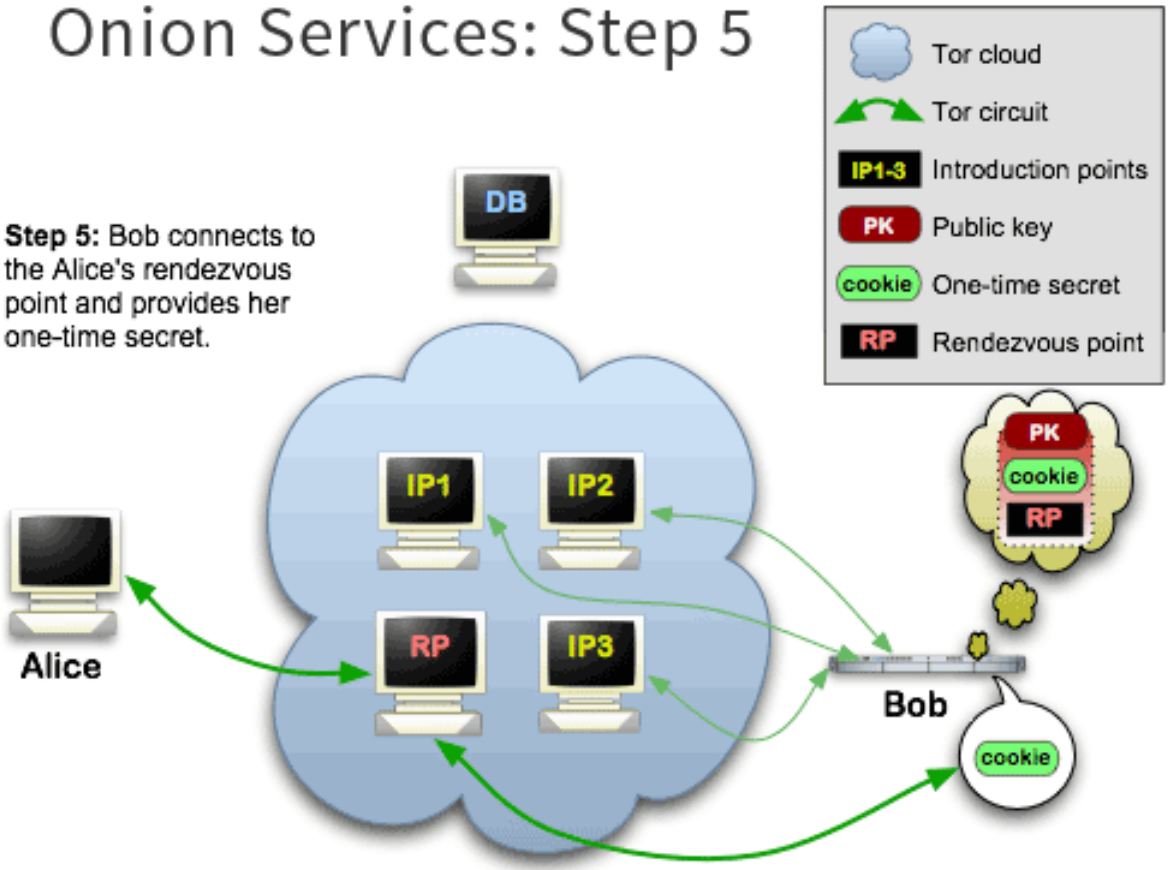
Onion Services: Step 3



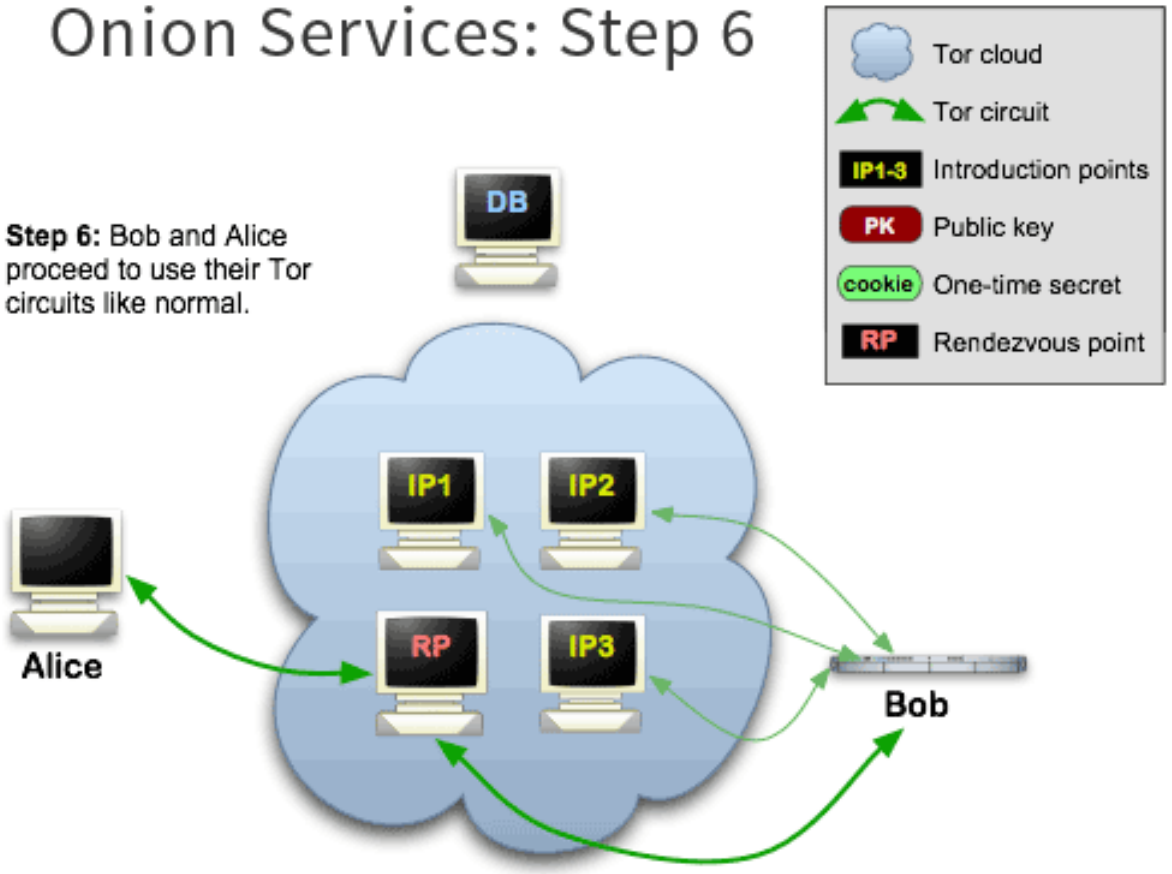
Onion Services: Step 4



Onion Services: Step 5



Onion Services: Step 6



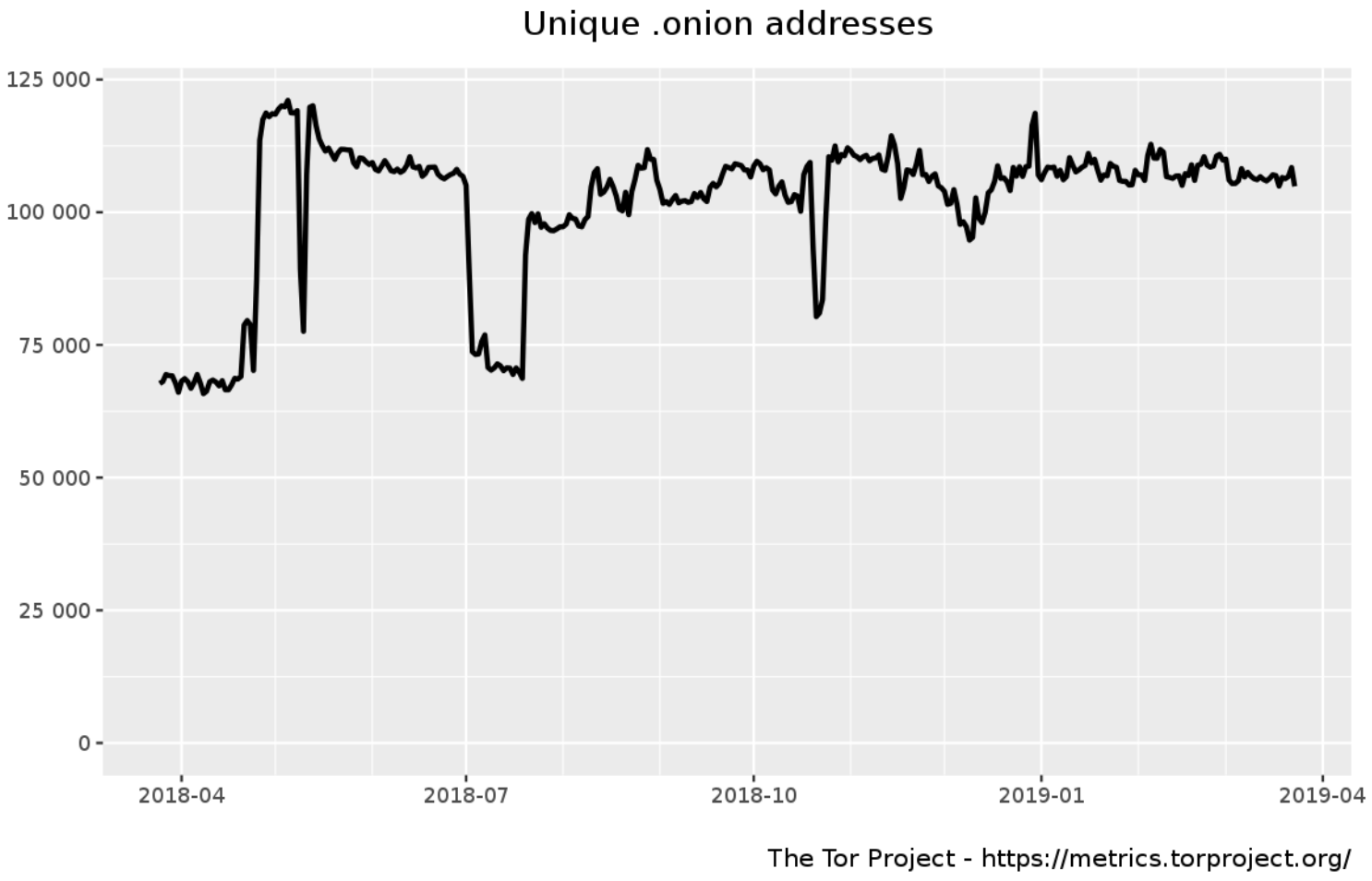
gráficos e números interessantes

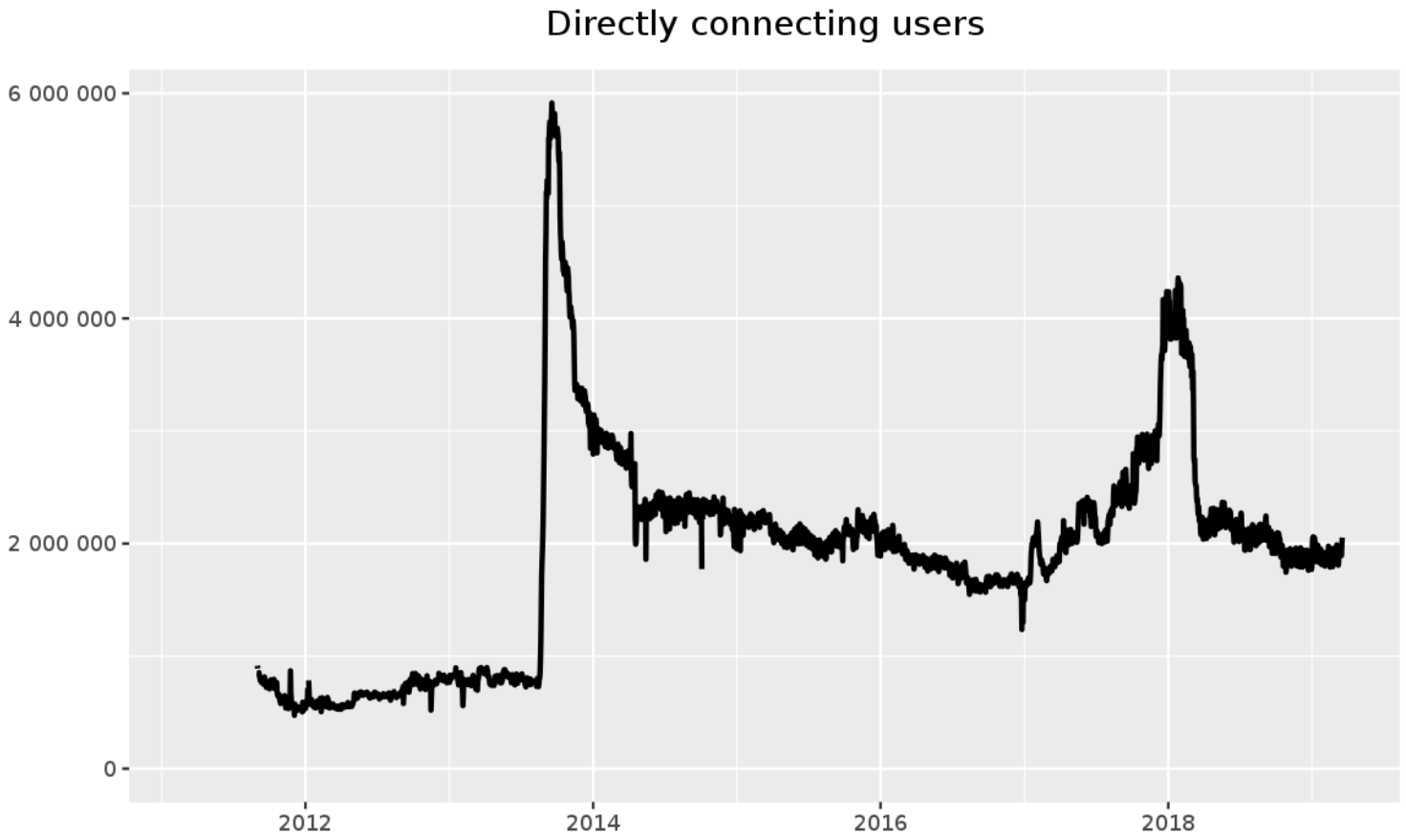
1 Million People use Facebook over Tor

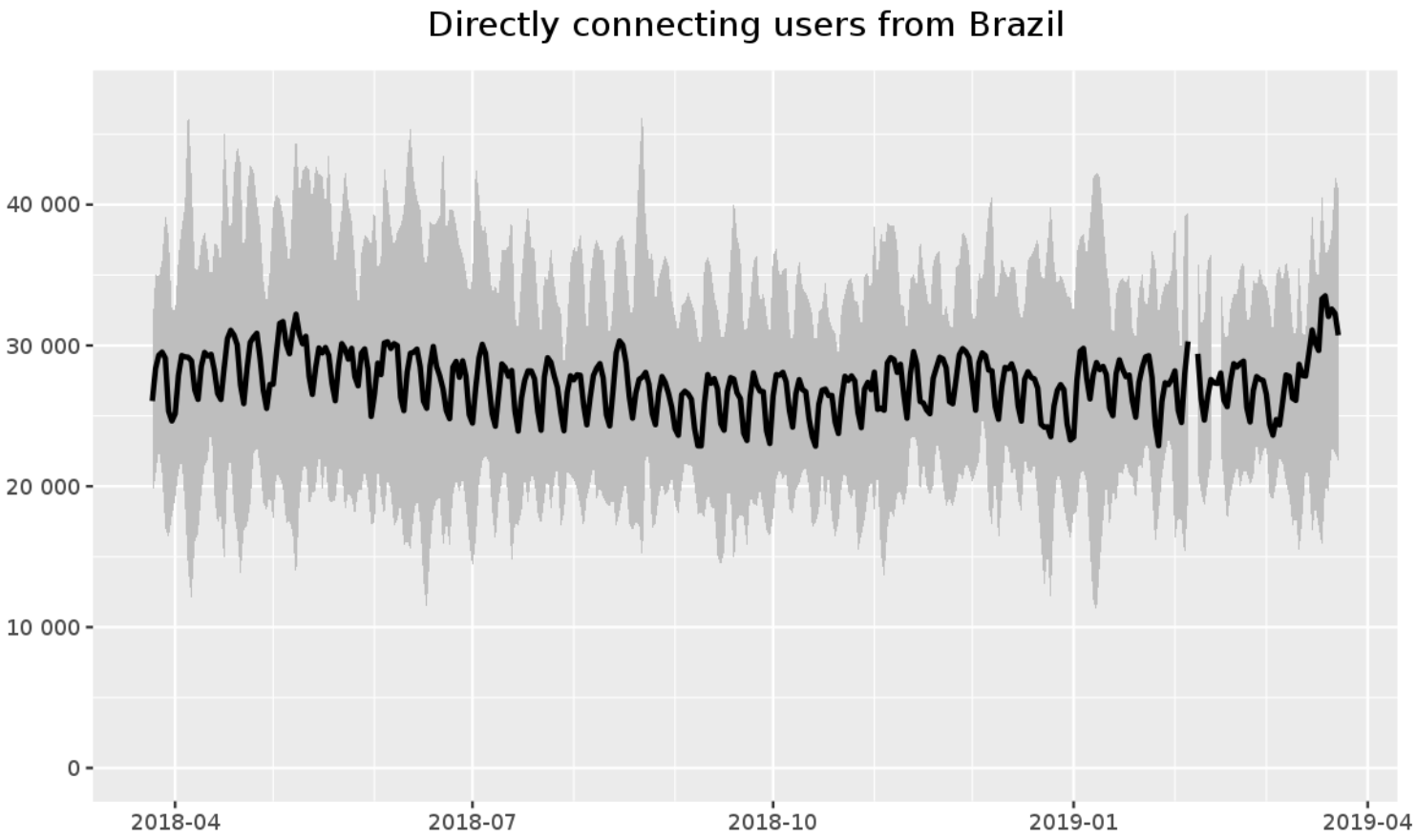
FACEBOOK OVER TOR · FRIDAY, APRIL 22, 2016

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.

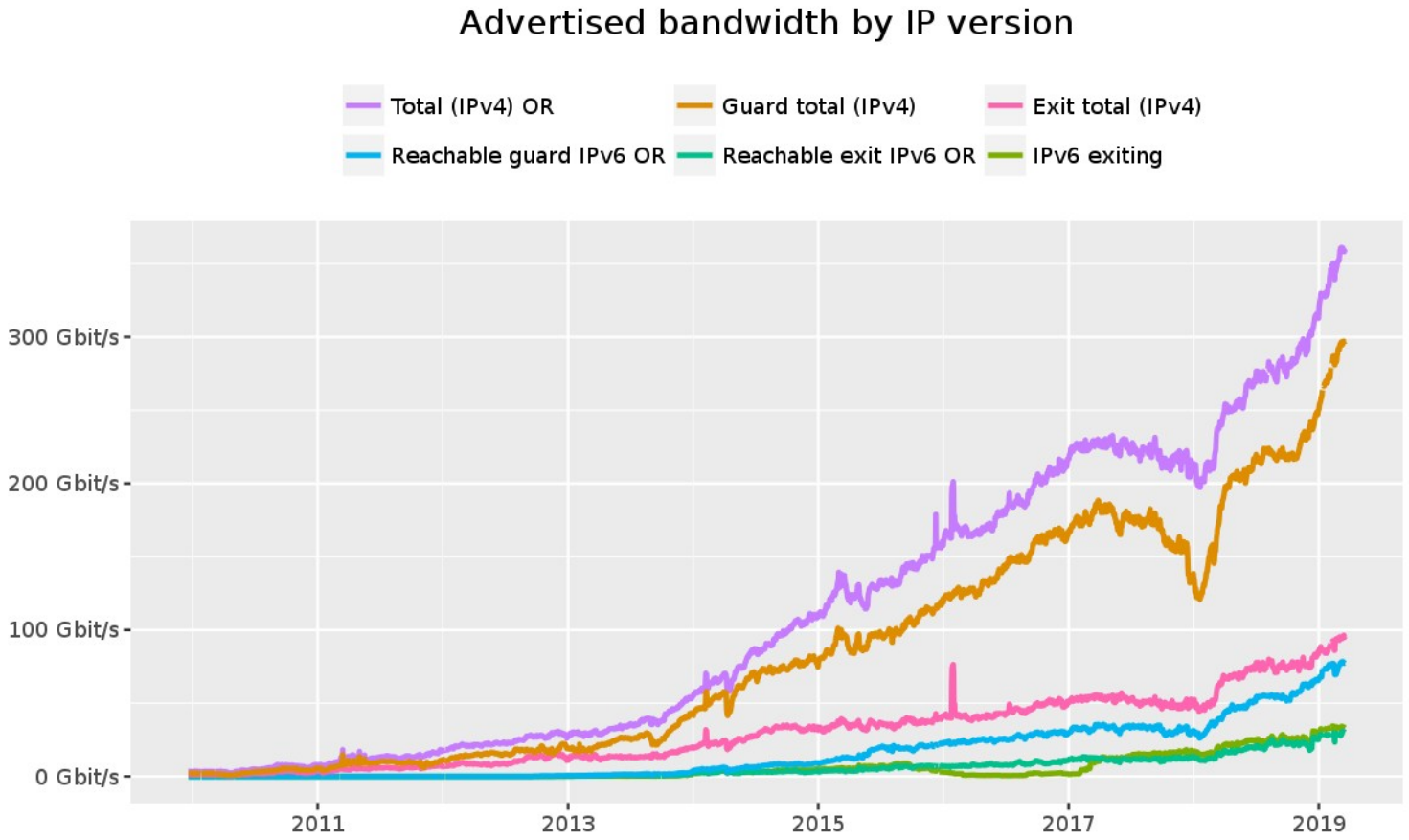
https://www.facebook.com/notes/facebook-over-tor/1-million-people-use-facebook-over-tor/865624066877648

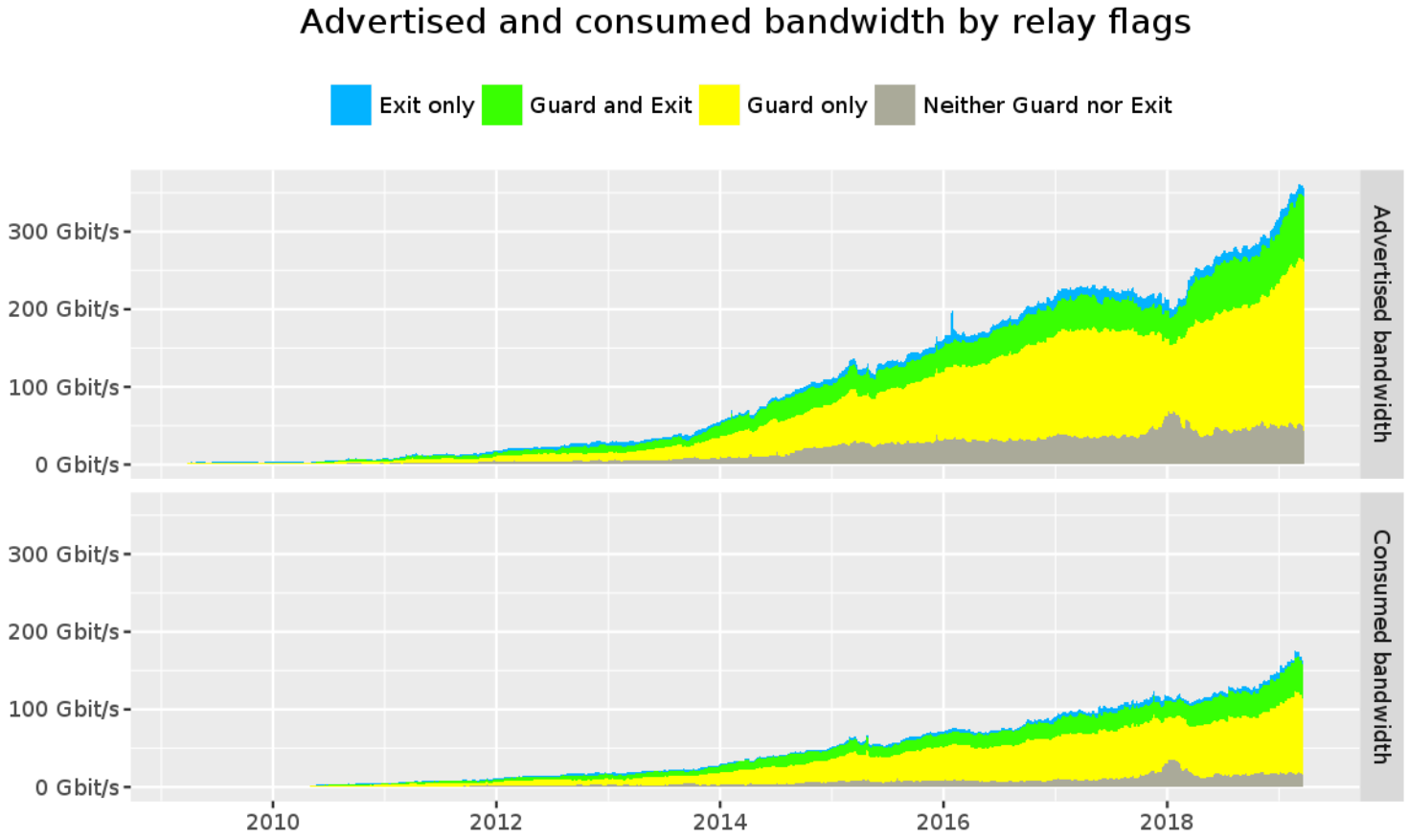

Unique .onion addresses
125 000
100 000
75 000
50 000
25 000
0
2018-04
2018-07
2018-10
2019-01
2019-04
The Tor Project - https://metrics.torproject.org/


Directly connecting users
6 000 000
4 000 000
2 000 000
0
2012
2014
2016
2018
The Tor Project - https://metrics.torproject.org/

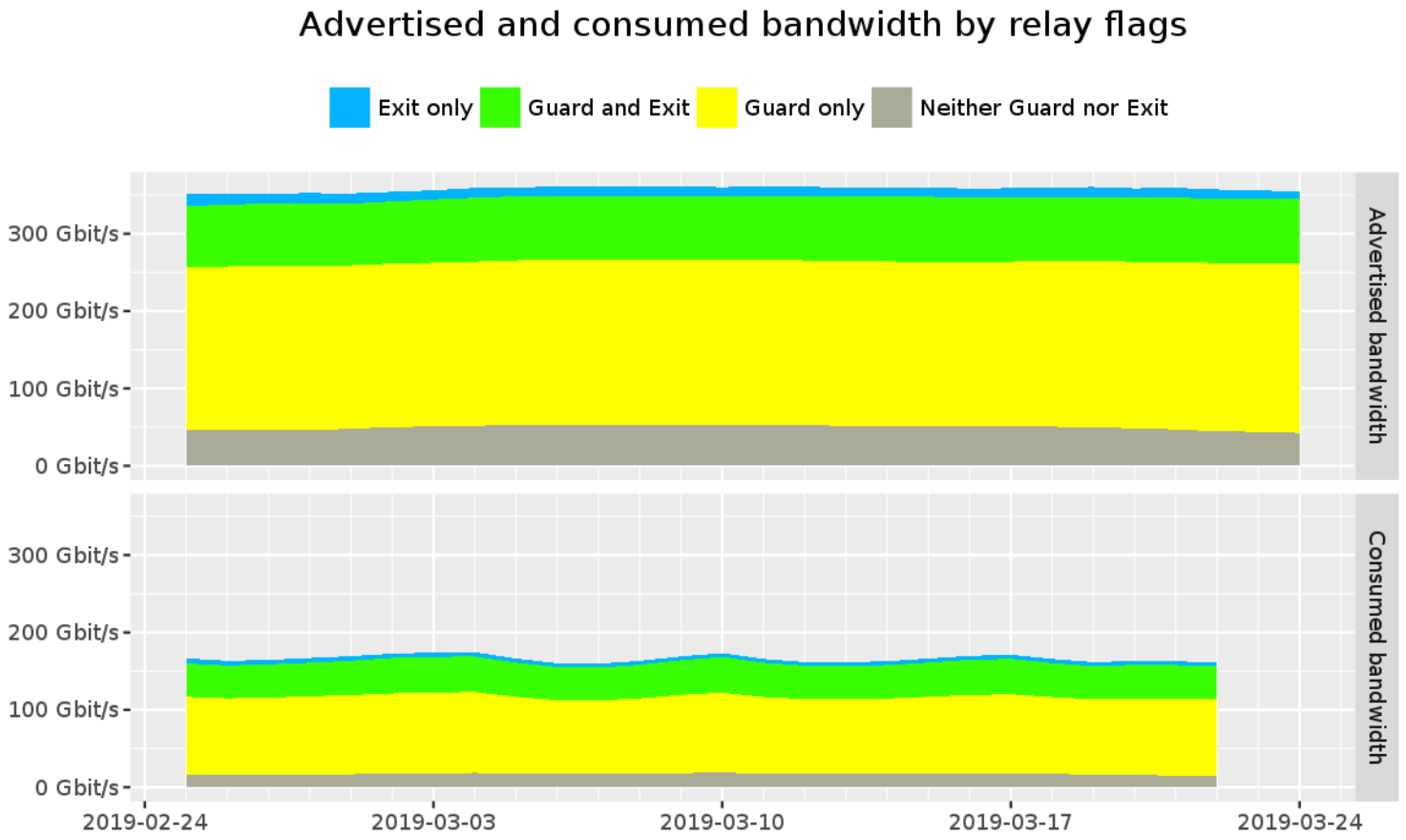


The Tor Project - https://metrics.torproject.org/

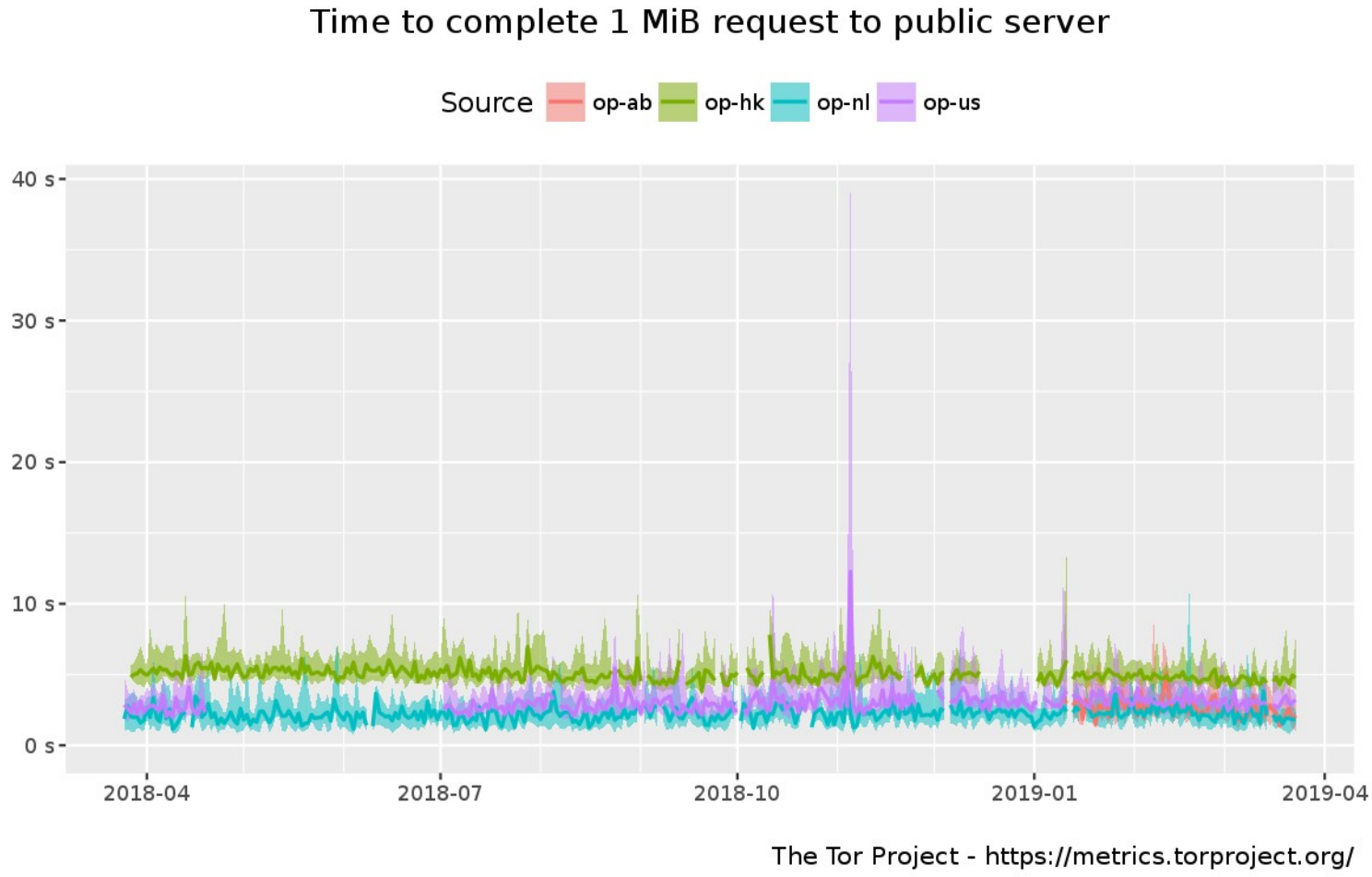

Advertised bandwidth by IP version
Total (IPv4) OR
Guard total (IPv4)
Exit total (IPv4)
Reachable guard IPv6 OR
Reachable exit IPv6 OR
IPv6 exiting
300 Gbit/s
200 Gbit/s
100 Gbit/s
0 Gbit/s
2011
2013
2015
2017
2019
The Tor Project - https://metrics.torproject.org/

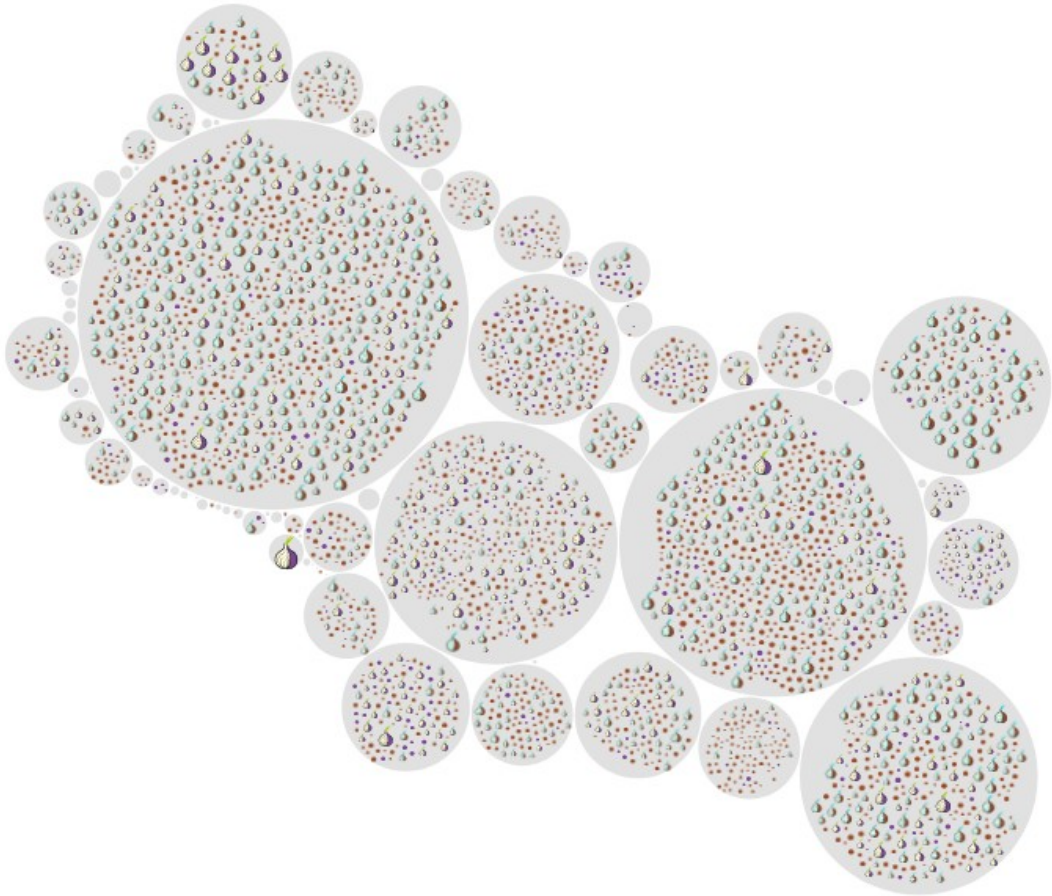


The Tor Project - https://metrics.torproject.org/

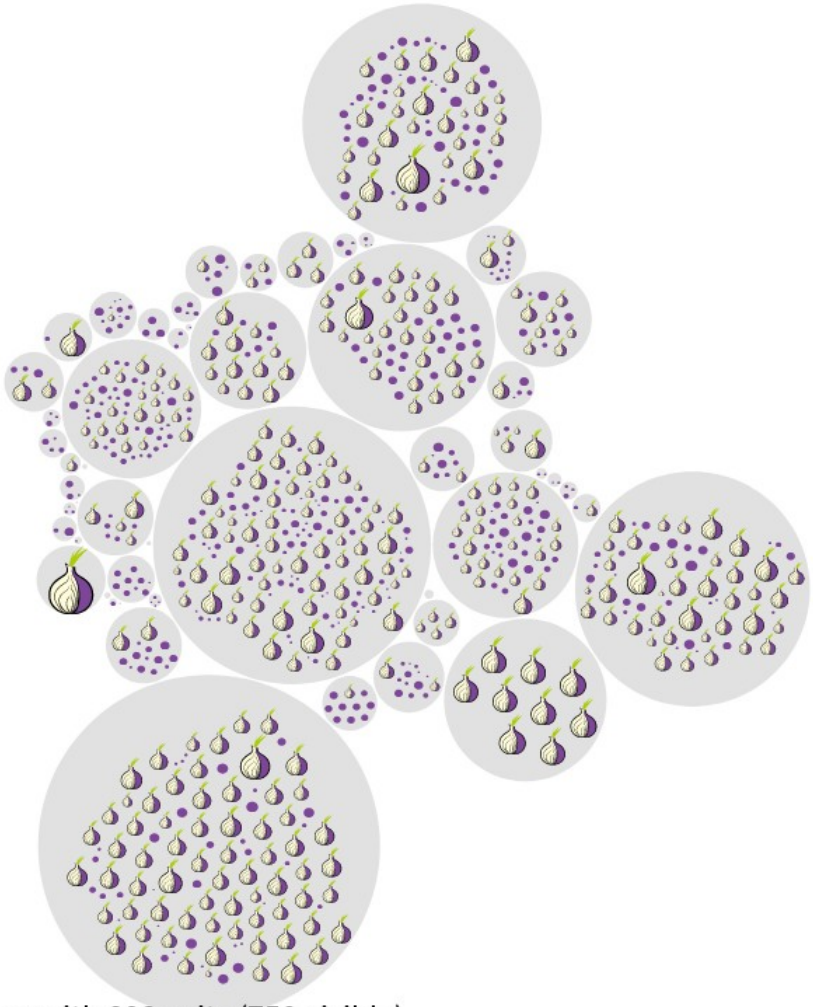


The Tor Project - https://metrics.torproject.org/


Time to complete 1 MiB request to public server
Source
op-ab
op-hk
op-nl
op-us
40 s
30 s
20 s
10 s
0 s
2018-04
2018-07
2018-10
2019-01
2019-04
The Tor Project - https://metrics.torproject.org/



85 countries with 6608 relays (3215 visible)
2019-03-20 19:00:00



55 countries with 893 exits (750 visible)
2019-03-20 19:00:00


Caracas
Venezuela
Panamá
Guyana
Suriname
Colombia
Ecuador
Perú
Brasil
Bolivia
Paraguay
Asunción
São Paulo
Santiago
Argentina
Buenos Aires

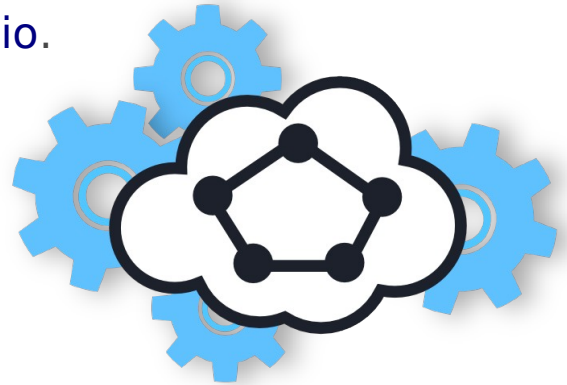
colaboração, suporte e pesquisa

- sítio web oficial (em português)
  - https://www.torproject.org/pt-BR;
- canais de comunicação
  - https://blog.torproject.org;
  - https://twitter.com/torproject;
- métricas, status e históricos
  - https://metrics.torproject.org;
  - https://metrics.torproject.org/exonerator.html;
  - https://torstatus.rueckgr.at;
  - https://torstatus.blutmagie.de;
  - https://onionite.now.sh;
  - https://github.com/kargig/tormap;

- IRC (OFTC.net)
  - #tor, #tor-dev, #tor-relays, #tor-onions, **#tor-south**
  - #ooni, #ooni-dev
- listas de discussão
  - https://lists.torproject.org;
  - https://www.nycbug.org/index?action=lists.
- documentação (wiki)
  - https://trac.torproject.org/projects/tor;
  - https://trac.torproject.org/projects/tor/wiki/org/teams/CommunityTeam/Projects/GlobalSouth;
  - https://wiki.torbsd.org;
  - https://trac.torproject.org/projects/tor/wiki/TorRelayGuide-ptbr.

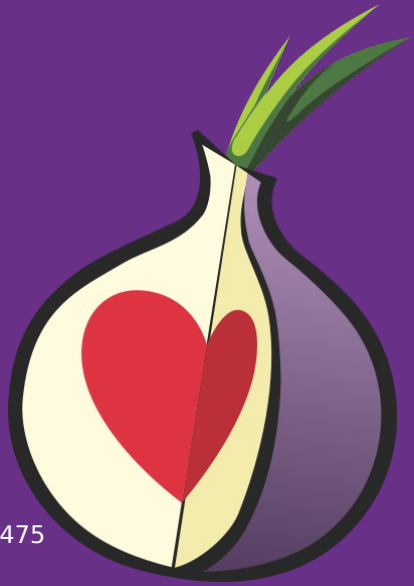
- entidades colaboradoras
  - derechosdigitales.org;
  - torservers.net
    - icetor.is;
    - digitale-gesellschaft.ch;
    - enn.lu;
    - awp.is;
  - noisebridge.net;
  - emeraldonion.org;
  - nos-oignons.net;
  - dfri.se.

- códigos fonte
  - https://gitweb.torproject.org;
  - https://github.com/ooni;
- pesquisa
  - https://research.torproject.org;
- simulação e testes
  - https://trac.torproject.org/projects/tor/wiki/doc/TorChutneyGuide;
  - https://shadow.github.io.



Tor
Baião com Cebola

CriptoBaião – Fortaleza, Brasil – 30 de Março de 2019



Vinícius Zavam
egypcio@torproject.org
13AC CF3E D4E3 B36F 626F D3AE 415C 6534 13B4 3475