

The Tor software ecosystem

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Jacob Appelbaum




The Tor Project

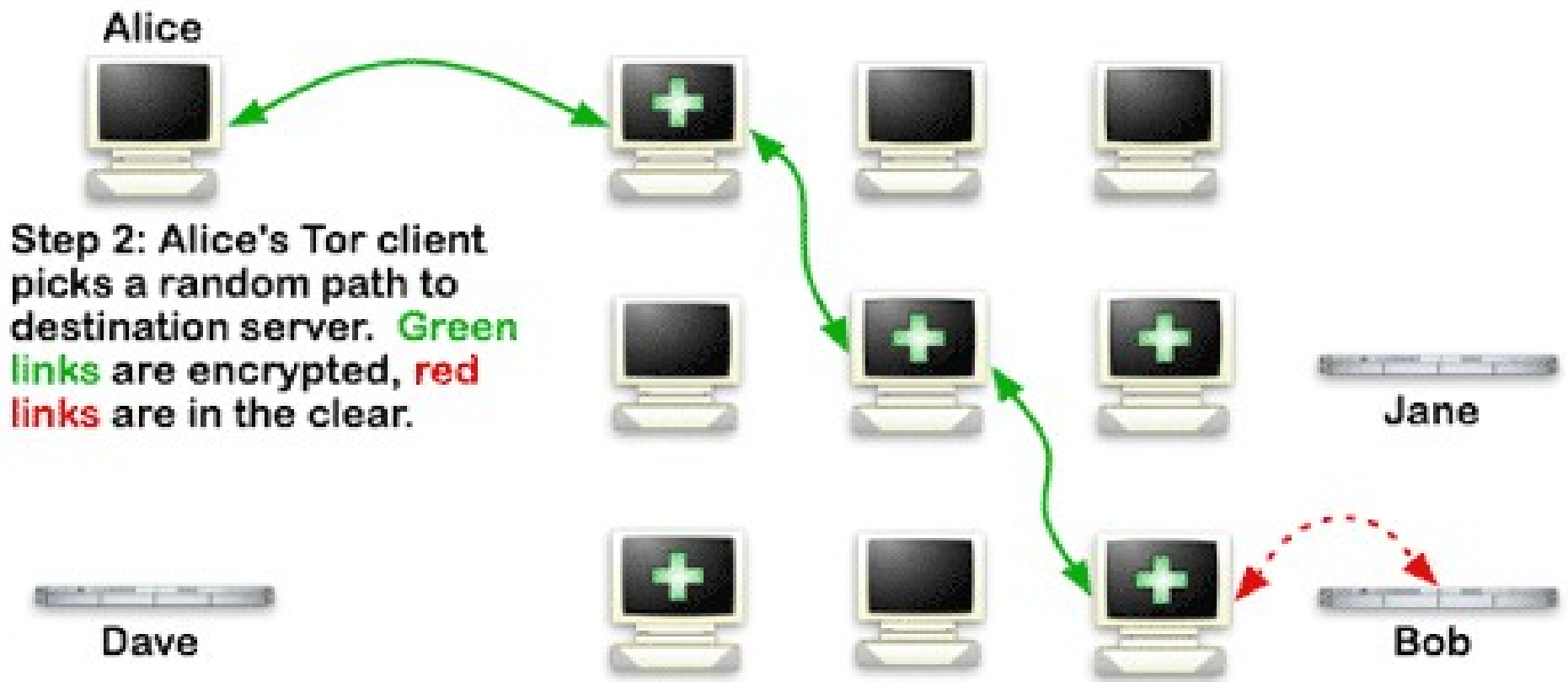
<https://torproject.org/>

Tor: client, relay/bridge, dir (heavy)

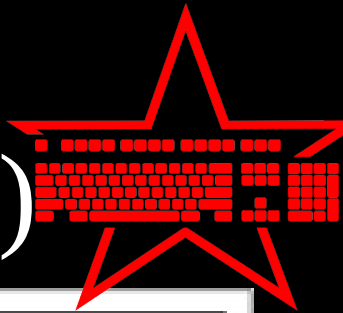
How Tor Works: 2

Legend:

-  Tor node
-  unencrypted link
-  encrypted link

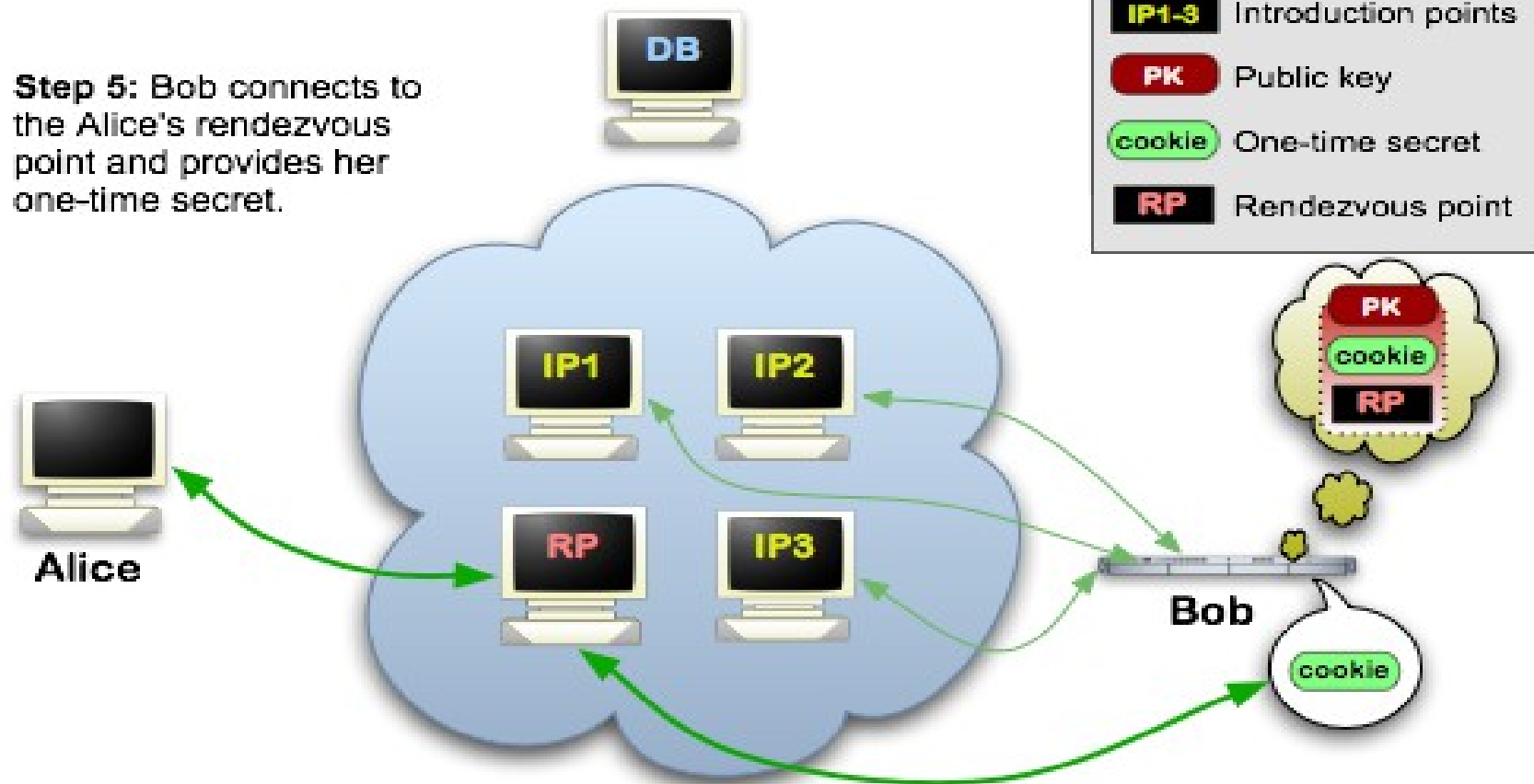


Tor: hidden services (moderate)



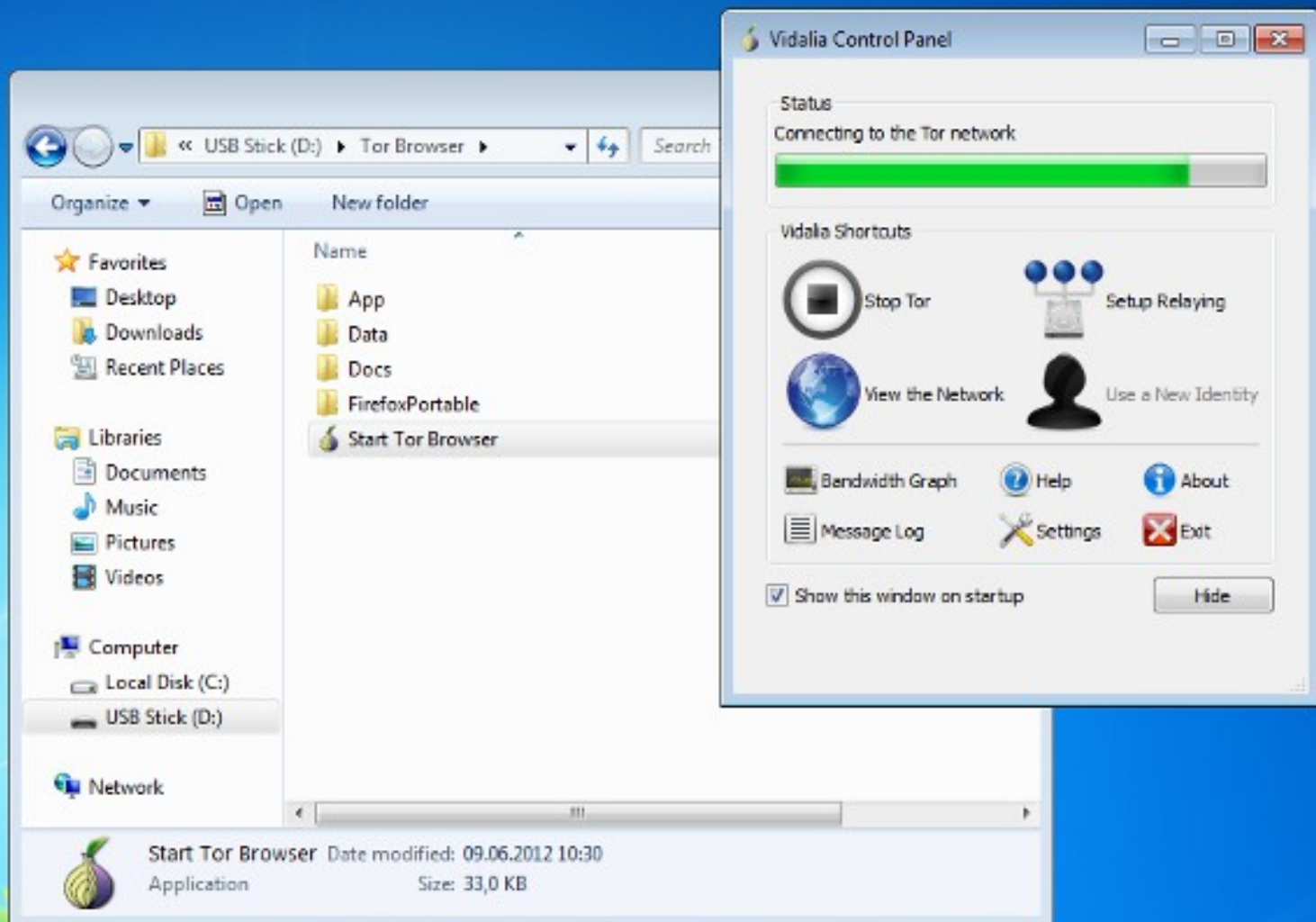
Tor Hidden Services: 5

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

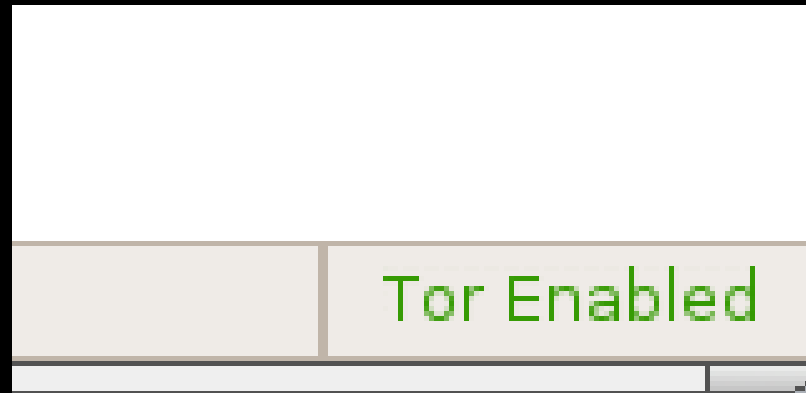


All of these projects are listed at
<https://www.torproject.org/volunteer>

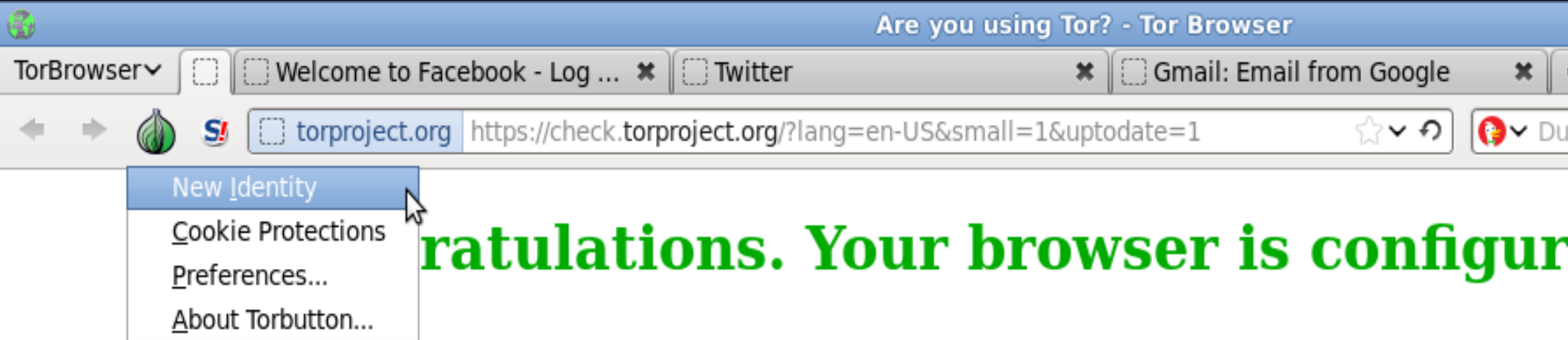
TBB: Tor Browser (heavy)



The old Torbutton



TBB: Torbutton (heavy)



Please refer to the [Tor website](#) for further information about using Tor safely. You are now free to

Your IP address appears to be: **95.170.88.81**

This page is also available in the following languages:

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TBB: Vidalia (light)



Arm (light)

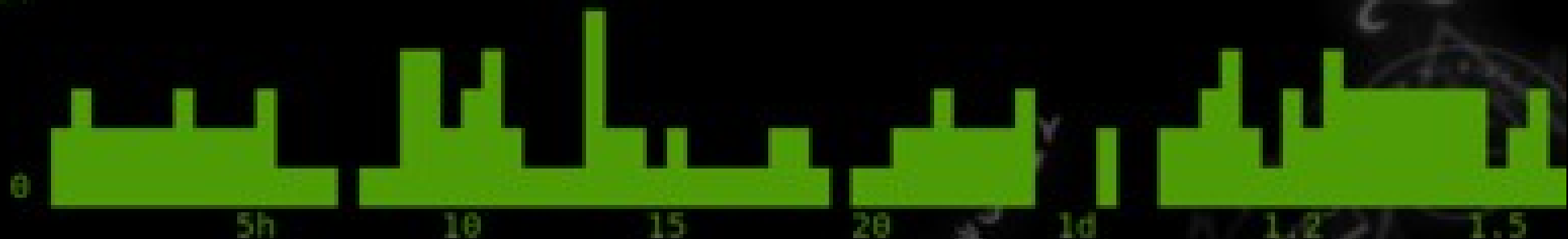
```
arm - odin (Linux 2.6.28-18-generic)      Tor 0.2.1.19 (unknown)
caerSidi - 76.104.132.98:9001, Control Port (password): 9051
flags: Fast, HSDir, Named, Running, Stable, Valid
```

```
page 1 / 3 - q: quit, p: pause, h: page help
```

```
Bandwidth (cap: 40 KB, burst: 100 KB):
```

```
Downloaded (586 bytes/sec - avg: 13.2 KB/sec, total: 11.8 GB):
```

```
34
```



```
Accounting (awake)
```

```
16 GB / 30 GB
```

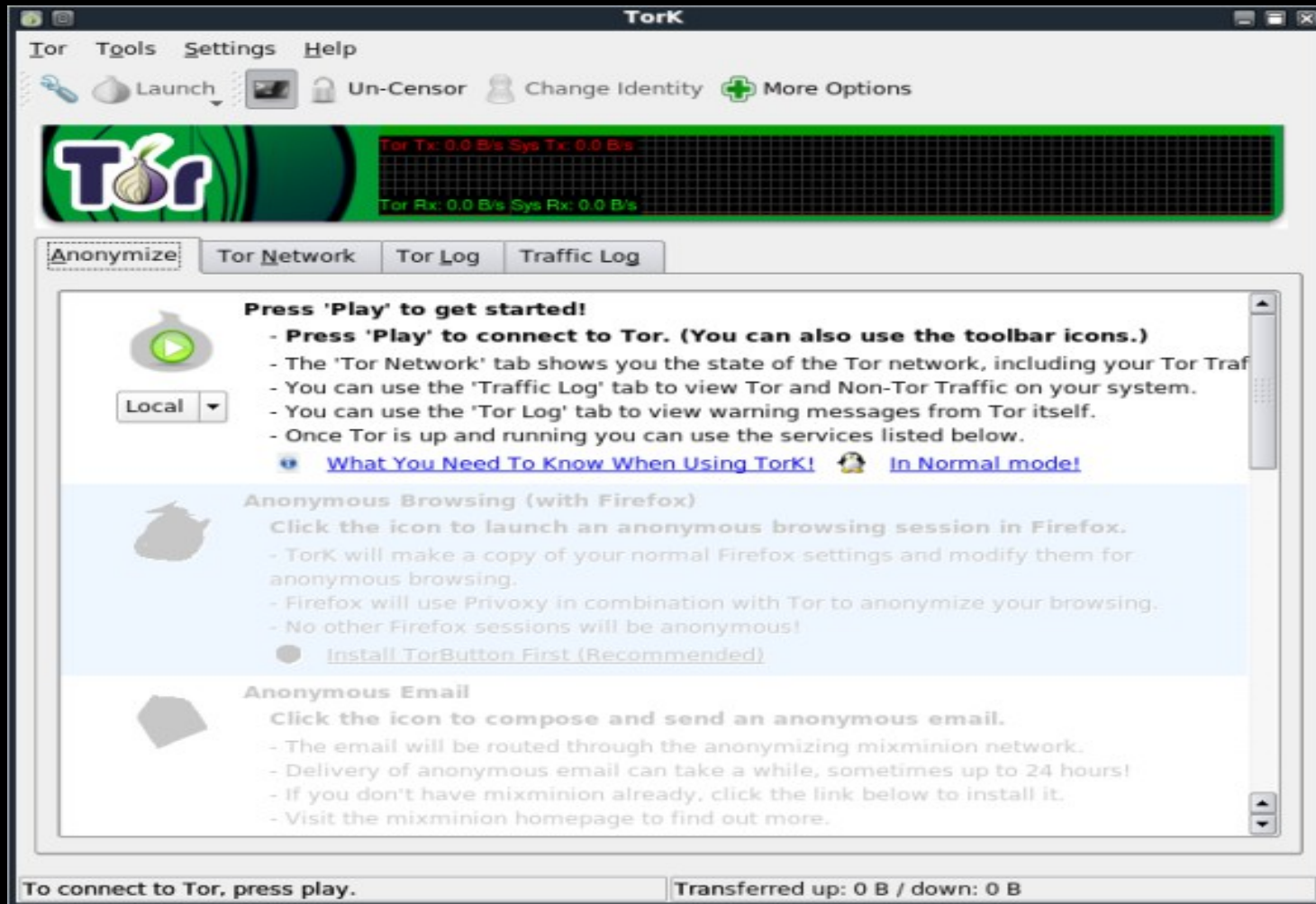
```
Time to reset: 150:10:02
```

```
16 GB / 30 GB
```

```
Events (INFO, BW):
```

```
18:49:57 [INFO] router_pick_published address(): Could not determine our add
18:49:57 [INFO] resolve_my_address(): Address 'odin' resolves to private IP
public IP addresses.
18:49:57 [INFO] resolve_my_address(): Interface IP address '192.168.1.20' 1
```

TorK (dead)



Tor Controller libs (heavy)

- stem
- pytorctl
- jtorctl
- txtorcon

```
meejah@pretend:~/src/txtorcon-github$ make
trial --reporter=text txtorcon.test
.....
.....
.....
-----
Ran 229 tests in 1.140s

PASSED (successes=229)
meejah@pretend:~/src/txtorcon-github$ python examples/launch_tor_endpoint.py
10%: Finishing handshake with directory server
15%: Establishing an encrypted directory connection
20%: Asking for networkstatus consensus
25%: Loading networkstatus consensus
40%: Loading authority key certs
45%: Asking for relay descriptors
80%: Connecting to the Tor network
85%: Finishing handshake with first hop
90%: Establishing a Tor circuit
100%: Done
I have set up a hidden service, advertised at:
http://567zt26xqpvmduc5.onion:80
locally listening on IPv4Address(TCP, '0.0.0.0', 31855)
□
```



TBB: HTTPS Everywhere (heavy)

Encrypt the Web



with **HTTPS Everywhere**

TBB: Noscript (external)

Mozilla Firefox Multiple Vulnerabilities

SA39240

2010-03-31

2010-04-05

1,251 view

[0 comments](#)

[Highly critical](#)

Security Bypass

System access


From remote

About NoScript...

Options...

 Allow Scripts Globally (dangerous)

 Allow all this page

 *Temporarily allow all this page*

 Untrusted 

 **Allow secunia.com**

 *Temporarily allow secunia.com*



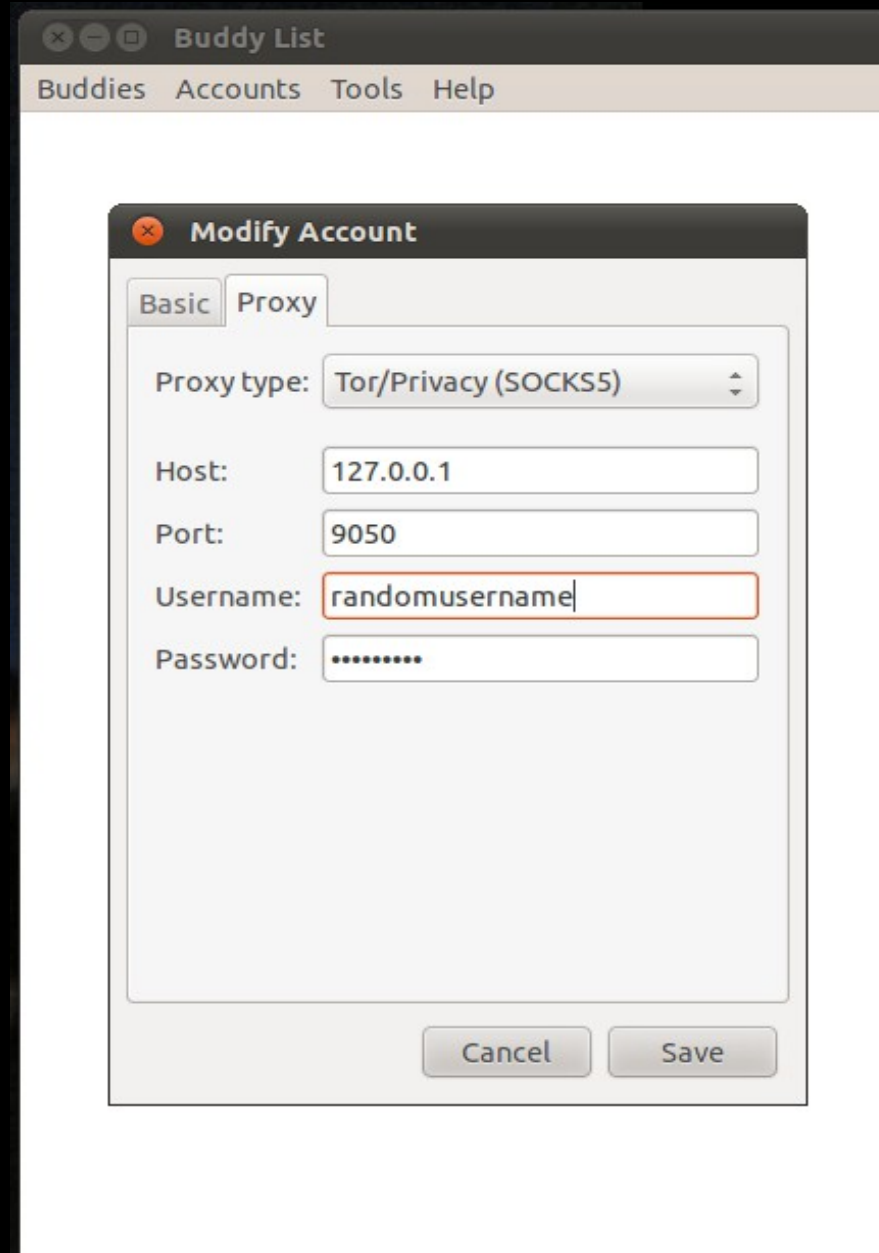
TBB: Thandy (light)



updateframework.com

Torsocks (light)

Pidgin (community)



HTTP Proxies (deprecated?)

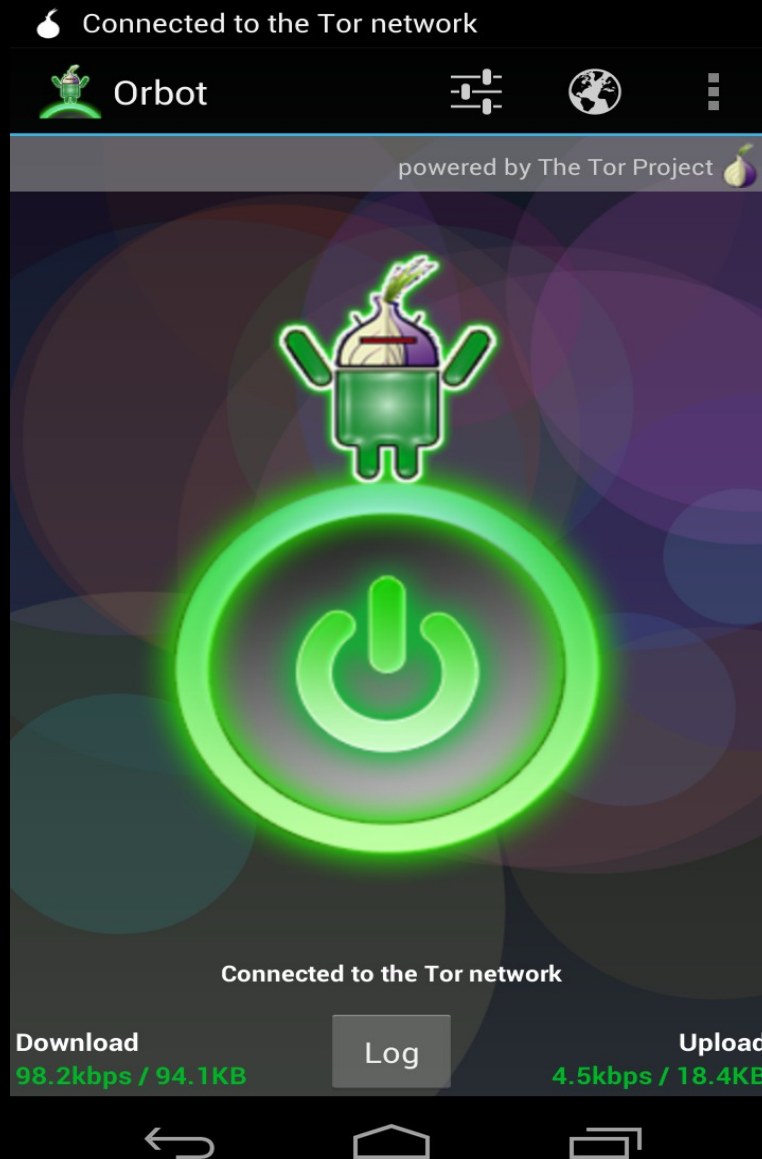
- Privoxy
- Polipo
- Shim

Torbirdy (moderate)



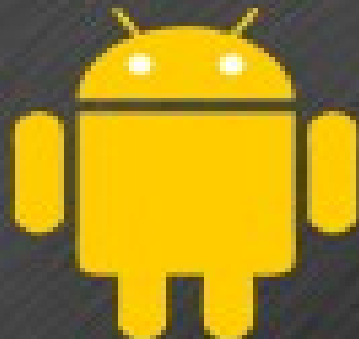
ttdnsd (light)

Orbot (heavy)



Gibberbot (moderate)

gibberbot



Pond (light)

The screenshot shows the Pond (light) application interface. On the left is a sidebar with a list of contacts and folders. The main area displays a 'CREATE CONTACT' form with two steps: '1. Set a name' and '2. Give them a handshake message'. The first step has a text input field containing 'alice' and a 'Create' button. The second step includes a paragraph of instructions and a pre-formatted POND key exchange message.

Inbox

- agl
Dec 15 18:13
- agl
Dec 15 22:32
- agl
Dec 21 22:34

Outbox

Compose

- agl
Dec 21 09:34
- agl
Dec 22 00:58

Contacts

Add

- elijah
pending
- xmux
- marsh
pending
- agl
- folkert
pending
- morgan
- cda
pending
- nadia
pending
- zooko
pending

CREATE CONTACT

1. Set a name

Your name for this contact:

Create

2. Give them a handshake message

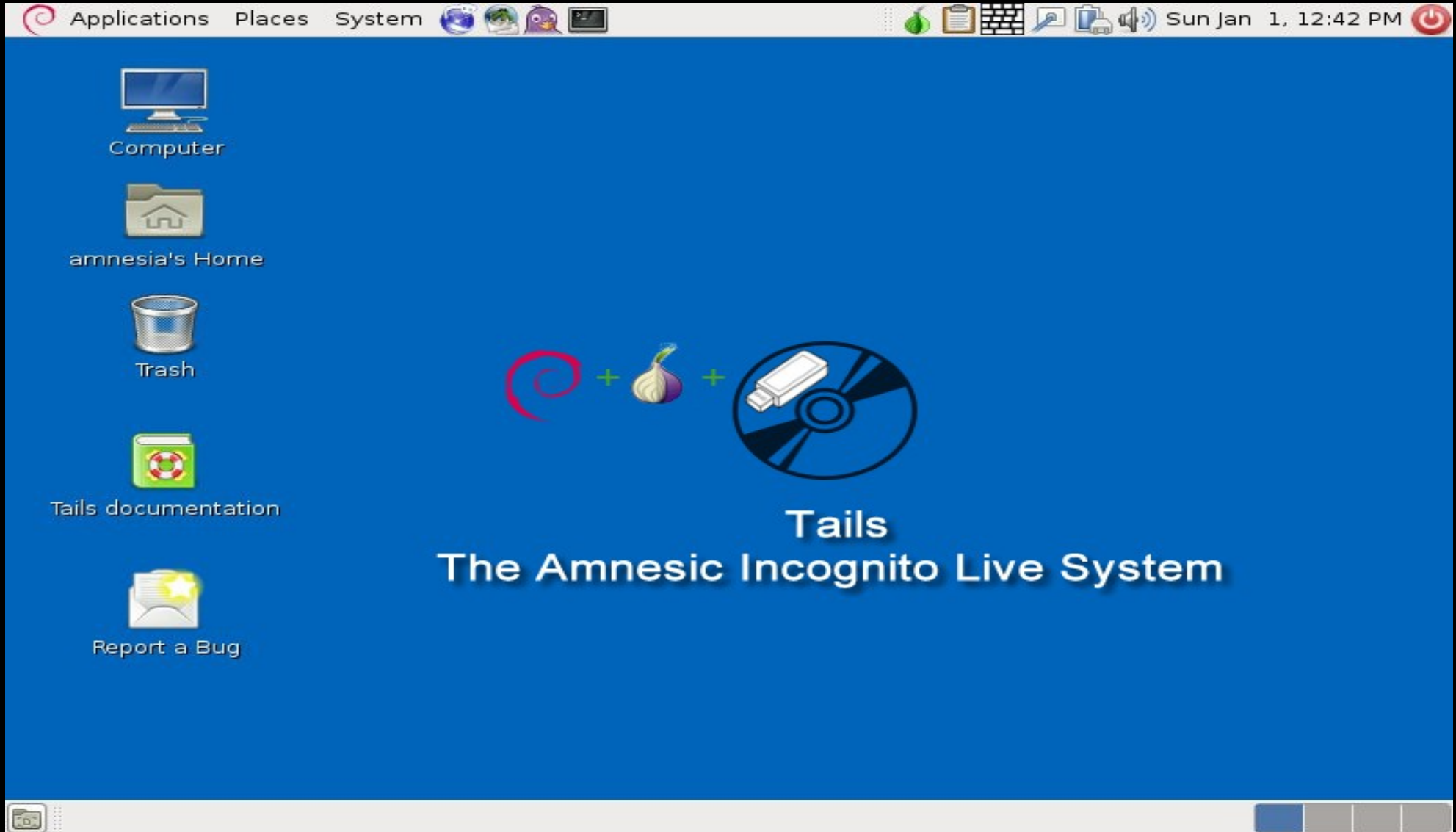
A handshake is for a single person. Don't give it to anyone else and ensure that it came from the person you intended! For example, you could send it in a PGP signed and encrypted email, or exchange it over an OTR chat.

```
-----BEGIN POND KEY EXCHANGE-----  
CqsGC1A+90RjvJtouz6kb226FWI1f/iPW+BqWeAhBMjtv6fgYhIggYftnJPDzvqN  
shAqdAcfAy411LvFIfIxPQ9o4ycSeCcaWHBvbmRzZXJ2ZXI6Ly9JQ11VSFNBWUdJ  
WFRLWUtYU0FISUJXRUFURQ1RFRjI2V1VXRVBPVkM3NjRXWUVMQ0pNVVBBQgp1NjQ0  
emFwamU1ZHZnazMub25pb24iIECpx0EDZH1wUo1bvfQPgXJ5ZIQot+xPgiKLpKGk  
031wKoAERNiTDFFrDM0IqTIXsj9eiBXNVGeQk9dfz/YqV+v2FUg1LI4DheRjtHNa  
sN21h4K710qj6x0GosS9MUaqJwwIOFTryps7IpfKV74pHHZ4gK0mx/HV7ZRJg0E4  
069onemVMYeCC++bykg887DLio/W31gwEyfb/ljJChDixLcbjecMJV7uVMD7sI93  
ivJc68GBsB0FAY6YMZYyYJ/JkoibPS0jvf+hV0EuTZ4AY17pk1Pt3vAoBMGSmgKn  
-----
```

3. Enter the handshake message from them

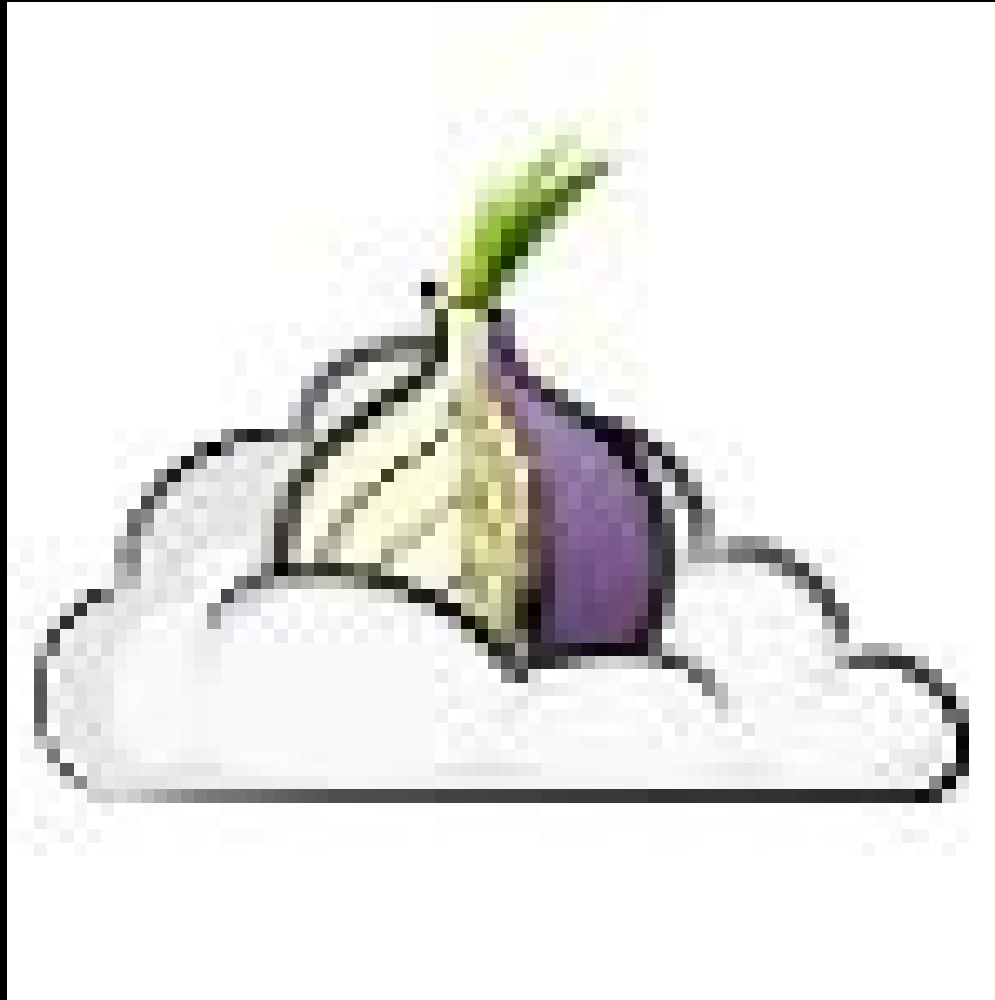
You won't be able to exchange messages with them until they complete the handshake.

Tails (heavy)



TLSDate (moderate)

Tor cloud bridge images (moderate)



Tor-ramdisk (community)

NOTE: Only ftp supported at present

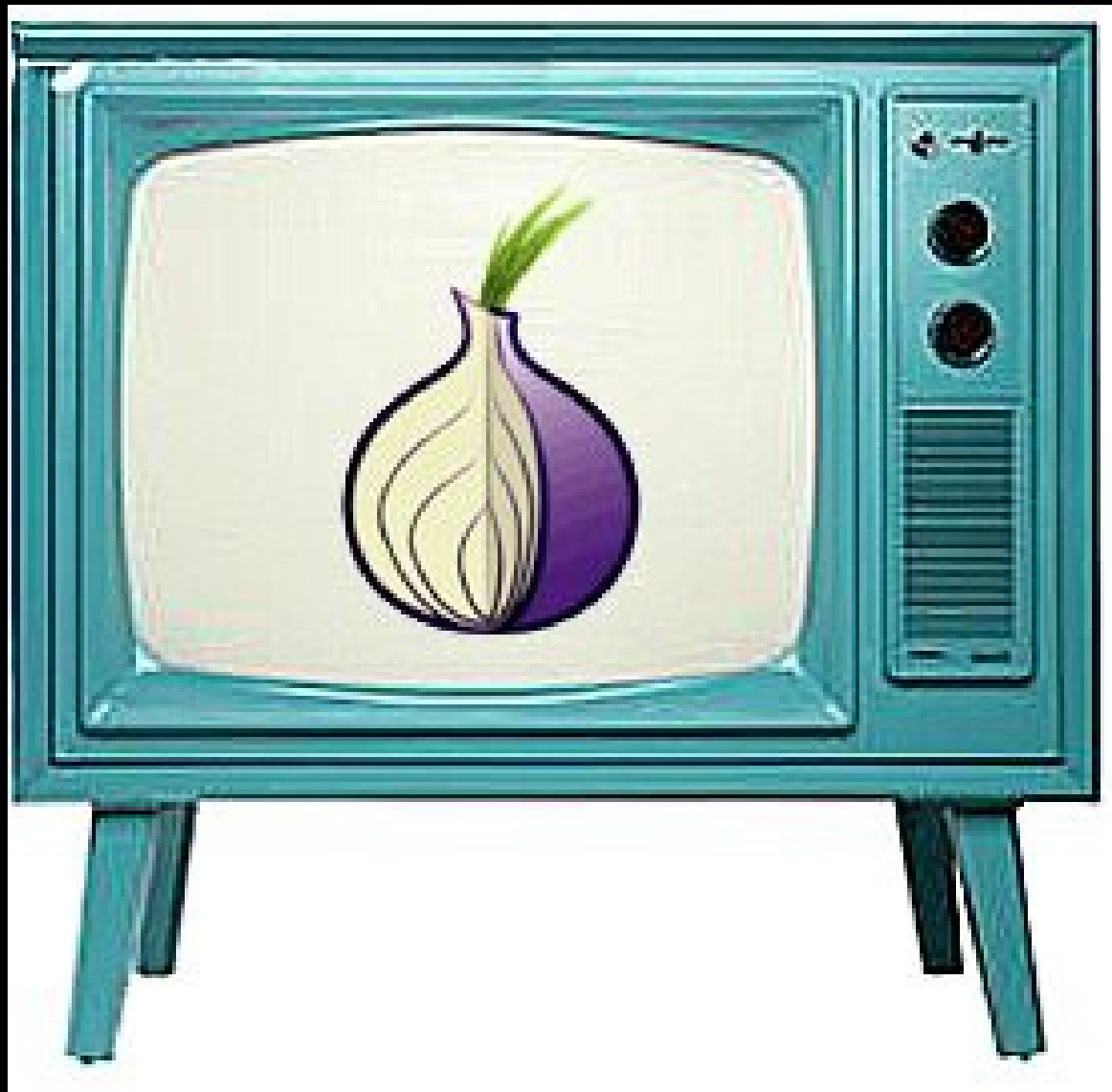
Enter IMPORT or GENERATE (all upper case): GENERATE
A new secret key will be generated when tor is started ...

<Tor is configured (but not started yet)>

Hit enter to continue:

- * Enter "netstart" to (re)configure the network
 - * Enter "netstatus" to see the network status
 - * Enter "nettest" to test network connectivity
 - * Enter "listening" to see sockets listeing on the network
 - * Enter "established" to see sockets established on the network
 - * Enter "torconf" to (re)import/generate the secret_id_key/torrc
 - * Enter "torstart" to (re)start tor.
 - * Enter "torreload" to reload torrc.
 - * Enter "torstop" stop the tor server.
 - * Enter "torexport" to export the secret_id_key/torrc and NOT halt the system.
 - * Enter "processes" to see all the running processes
 - * Enter "resources" to see ram usage
 - * Enter "shutdown" to export the secret_id_key/torrc AND halt the system.
- * torstart_

TorTV (community)



Torouter (light)

Libs we depend on / help maintain

- Libevent
- OpenSSL
- tor-fw-helper (libnatpmp, miniupnp)

compass.torproject.org (light)

Tor **Compass** beta [Home](#) [Trac Ticket #6498](#)

Compass

Filter

Inactive include relays in selection that aren't currently running

Guards select only relays suitable for guard position

Exits select only relays suitable for exit position

Family Select family by fingerprint or nickname

AS Number select only relays from AS number

Country Code select only relays from country with code

Exits All relays

Fast exit relays (95+ Mbit/s, 5000+ KB/s, 80/443/554/1755, 2 relays per /24)

Almost fast exit relays (80+ Mbit/s, 2000+ KB/s, 80/443, not in set of fast exits)

Fast exits relays any network (95+ Mbit/s, 5000+ KB/s, 80/443/554/1755)

Group

Country group relays by country

AS group relays by AS

Display

Number of results display only the top results (-1 for all)

compass.torproject.org (light)

#	Consensus Weights	Advertised Bandwidth	Guard Probability	Middle Probability	Exit Probability	Nickname	Fingerprint	Exit	Guard	Country	Autonomous System
1	3.2680%	1.0554%	1.6295%	1.6295%	6.5450%	TorLand1	4E377F91	Exit	Guard	??	AS13213 UK-2 Ltd Autonomous System
2	2.9021%	0.9346%	1.4470%	1.4471%	5.8122%	chaoscomputerclub20	CFA48FC3	Exit	Guard	de	AS39138 rrbone UG
3	2.4947%	0.8704%	1.2439%	1.2439%	4.9961%	chaoscomputerclub19	A59E1E7C	Exit	Guard	de	AS39138 rrbone UG
4	1.6714%	1.1596%	0.0000%	3.8116%	1.2026%	manning1	073F2793	Exit	-	us	AS29761 OC3 Networks & Web Solutions, LLC
5	1.4552%	0.9069%	0.7256%	0.7256%	2.9144%	TorLand2	332895D0	Exit	Guard	??	AS13213 UK-2 Ltd Autonomous System
6	1.3638%	1.1625%	0.0000%	3.1100%	0.9812%	dorrisdeebrown	C1E2CF4B	Exit	-	us	AS8100 IPTelligent LLC
7	1.1891%	0.3974%	0.5929%	0.5929%	2.3815%	chaoscomputerclub4	659DF653	Exit	Guard	de	AS20773 Host Europe GmbH
8	1.1143%	0.3121%	0.0000%	2.5411%	0.8017%	Unnamed	2624AE04	Exit	-	se	AS47155 ViaEuropa Sweden
9	1.0478%	0.4420%	0.5224%	0.5224%	2.0984%	kramse	3C5DF71E	Exit	Guard	dk	AS197564 Solido Networks ApS
10	1.0228%	0.5791%	0.5100%	0.5100%	2.0484%	assk	8543536F	Exit	Guard	se	AS51815 Teknikbyran i Sverige AB
11	0.9480%	0.3556%	0.0000%	2.1618%	0.6821%	Unnamed	AE5A97FA	Exit	-	se	AS47155 ViaEuropa

compass.torproject.org (light)

#	Consensus Weights	Advertised Bandwidth	Guard Probability	Middle Probability	Exit Probability	Nickname	Fingerprint	Exit	Guard	Country	Autonomous System
11	16.9410%	9.3179%	7.3388%	12.4071%	31.0763%	*	(93 relays)	(93)	(50)	de	(36)
11	16.4037%	15.9140%	4.2991%	22.0444%	22.8665%	*	(196 relays)	(196)	(58)	us	(94)
11	6.9328%	3.5566%	2.4072%	7.2074%	11.1835%	*	(18 relays)	(18)	(6)	??	(10)
11	5.9957%	3.9851%	1.4297%	8.5637%	7.9934%	*	(35 relays)	(35)	(17)	se	(14)
11	4.3453%	3.6399%	1.1942%	5.6417%	6.1998%	*	(62 relays)	(62)	(18)	nl	(21)
11	2.0473%	1.6717%	0.4237%	3.1546%	2.5635%	*	(69 relays)	(69)	(13)	fr	(15)
11	1.5967%	1.0994%	0.7739%	0.8758%	3.1405%	*	(23 relays)	(23)	(11)	ca	(13)
11	1.5656%	3.3506%	0.7397%	0.9267%	3.0302%	*	(15 relays)	(15)	(10)	ro	(5)
11	1.3084%	0.7519%	0.6420%	0.6896%	2.5936%	*	(14 relays)	(14)	(6)	dk	(8)
11	0.7217%	1.2861%	0.1452%	1.1270%	0.8928%	*	(134 relays)	(134)	(13)	ru	(49)
11	0.7048%	0.6389%	0.3347%	0.4111%	1.3686%	*	(12 relays)	(12)	(5)	ch	(5)
11	0.6985%	0.3215%	0.3387%	0.3826%	1.3742%	*	(28 relays)	(28)	(5)	gb	(16)
11	0.6395%	0.7764%	0.2571%	0.5397%	1.1218%	*	(26 relays)	(26)	(6)	ua	(17)
11	0.6238%	0.6516%	0.1891%	0.7468%	0.9354%	*	(21 relays)	(21)	(2)	lu	(2)
11	0.4634%	0.4638%	0.2308%	0.2320%	0.9274%	*	(14 relays)	(14)	(12)	cz	(8)
11	0.4285%	0.2444%	0.2136%	0.2141%	0.8580%	*	(3 relays)	(3)	(2)	gr	(2)
11	0.3941%	0.2973%	0.1961%	0.1979%	0.7883%	*	(2 relays)	(2)	(1)	a2	(2)
11	0.3166%	0.5118%	0.0431%	0.5680%	0.3388%	*	(8 relays)	(8)	(1)	eu	(5)
11	0.2070%	0.2899%	0.1022%	0.1070%	0.4119%	*	(10 relays)	(10)	(3)	pl	(7)
11	0.0730%	0.1709%	0.0010%	0.1630%	0.0551%	*	(9 relays)	(9)	(1)	at	(5)
11	0.0510%	0.1195%	0.0000%	0.1162%	0.0367%	*	(4 relays)	(4)	(0)	lv	(4)
11	0.0235%	0.0295%	0.0117%	0.0117%	0.0471%	*	(1 relays)	(1)	(1)	md	(1)

compass.torproject.org (light)

#	Consensus Weights	Advertised Bandwidth	Guard Probability	Middle Probability	Exit Probability	Nickname	Fingerprint	Exit	Guard	Country	Autonomous System
14	9.4299%	3.5801%	4.7018%	4.7020%	18.8854%	*	(4 relays)	(4)	(4)	de	AS39138 rrbone UG
15	6.4778%	2.9081%	2.3550%	6.3564%	10.7218%	*	(3 relays)	(3)	(2)	??	AS13213 UK-2 Ltd Autonomous System
17	5.0251%	4.8345%	0.8015%	8.5954%	5.6782%	*	(7 relays)	(7)	(4)	us	AS29761 OC3 Networks & Web Solutions, LLC
14	3.6971%	1.8147%	1.8434%	1.8435%	7.4043%	*	(6 relays)	(6)	(6)	de	AS20773 Host Europe GmbH
14	3.5358%	2.7354%	1.1278%	4.0330%	5.4464%	*	(5 relays)	(5)	(3)	nl	AS43350 NForce Entertainment BV
13	2.9845%	3.5895%	0.0000%	6.8059%	2.1473%	*	(3 relays)	(3)	(0)	us	AS8100 IPTelligent LLC
13	2.8958%	1.7706%	0.7035%	4.0899%	3.8940%	*	(33 relays)	(33)	(11)	fr	AS16276 OVH Systems
14	2.8739%	2.1561%	1.4329%	1.4330%	5.7556%	*	(8 relays)	(8)	(8)	us	AS22219 Applied Operations, LLC
13	2.6111%	1.0402%	0.0000%	5.9544%	1.8786%	*	(3 relays)	(3)	(0)	se	AS47155 ViaEuropa Sweden
15	1.8436%	1.1358%	0.9192%	0.9193%	3.6922%	*	(2 relays)	(2)	(2)	se	AS51815 Teknikbyran i Sverige AB
13	1.6806%	3.5000%	0.7199%	1.2600%	3.0618%	*	(13 relays)	(13)	(8)	ro	AS39743 Voxility SRL
14	1.0478%	0.4420%	0.5224%	0.5224%	2.0984%	*	(1 relays)	(1)	(1)	dk	AS197564 Solido Networks ApS

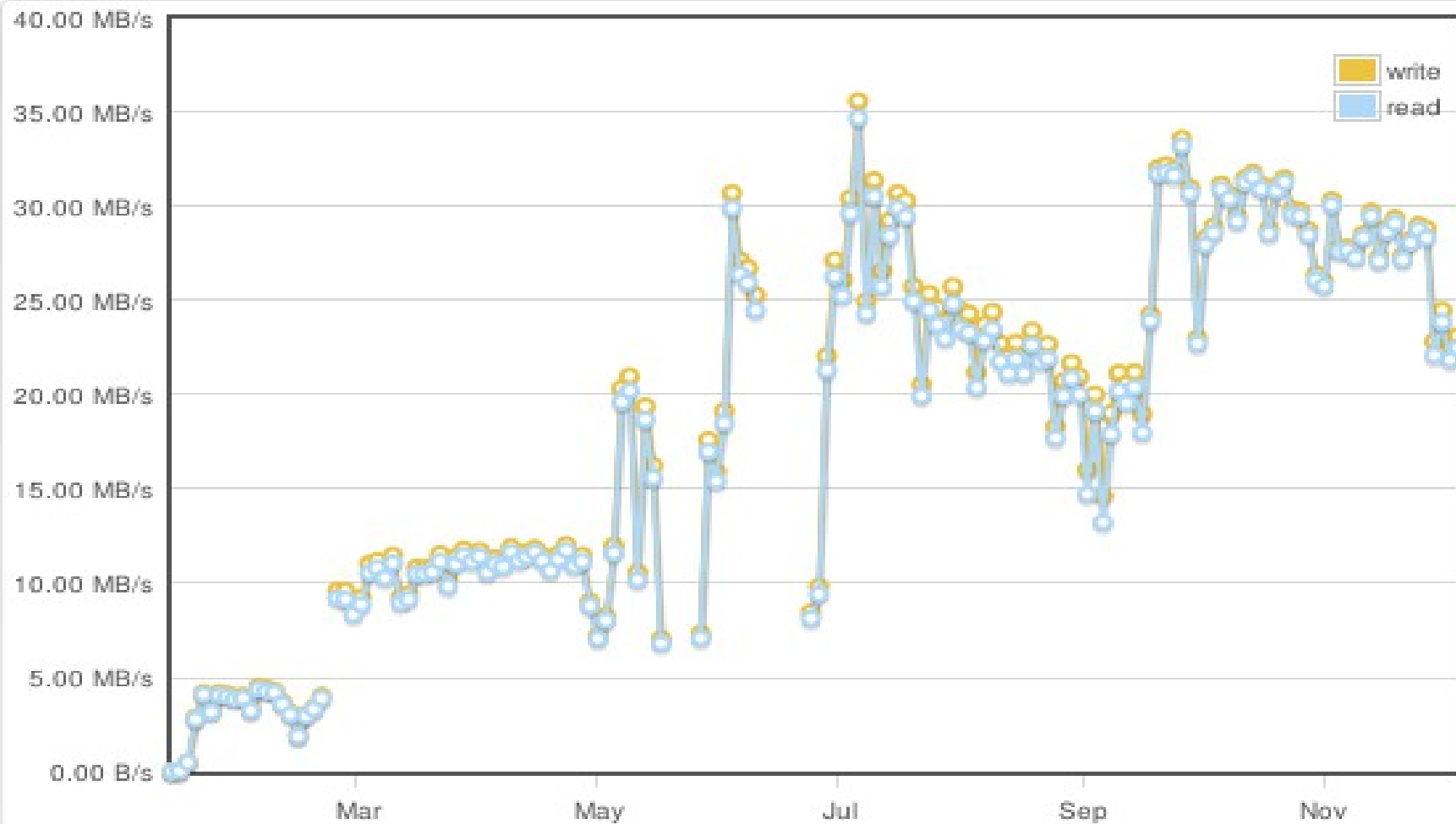
atlas.torproject.org (light)



Tor Status ^{beta}

[Home](#)

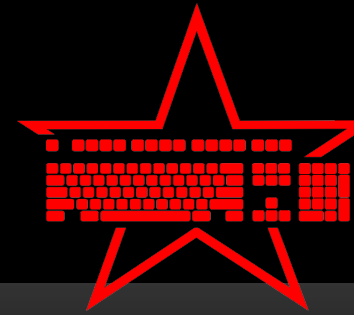
[About](#)



1 Year graph

[Save Graph](#)

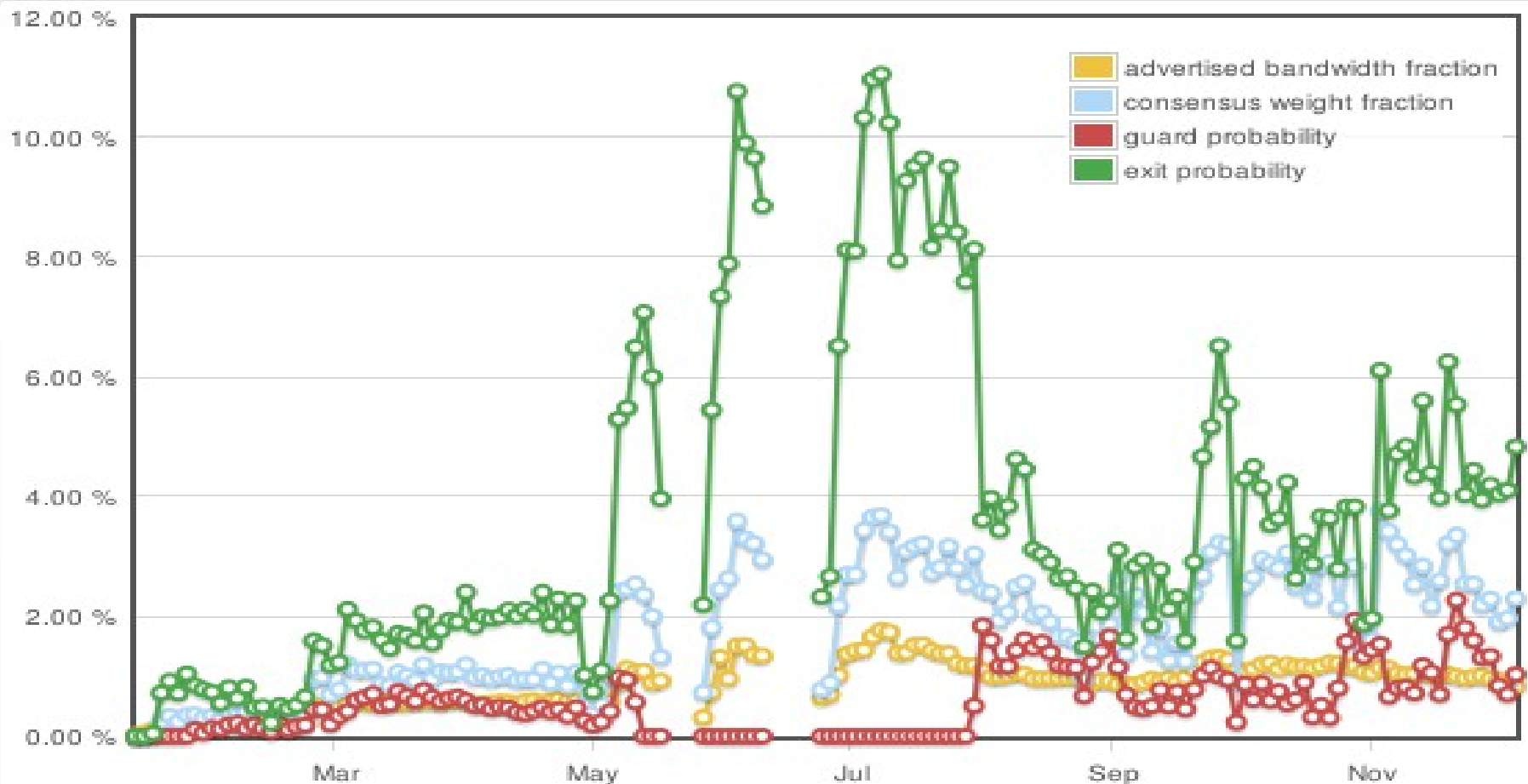
atlas.torproject.org (light)



Tor Status ^{beta}

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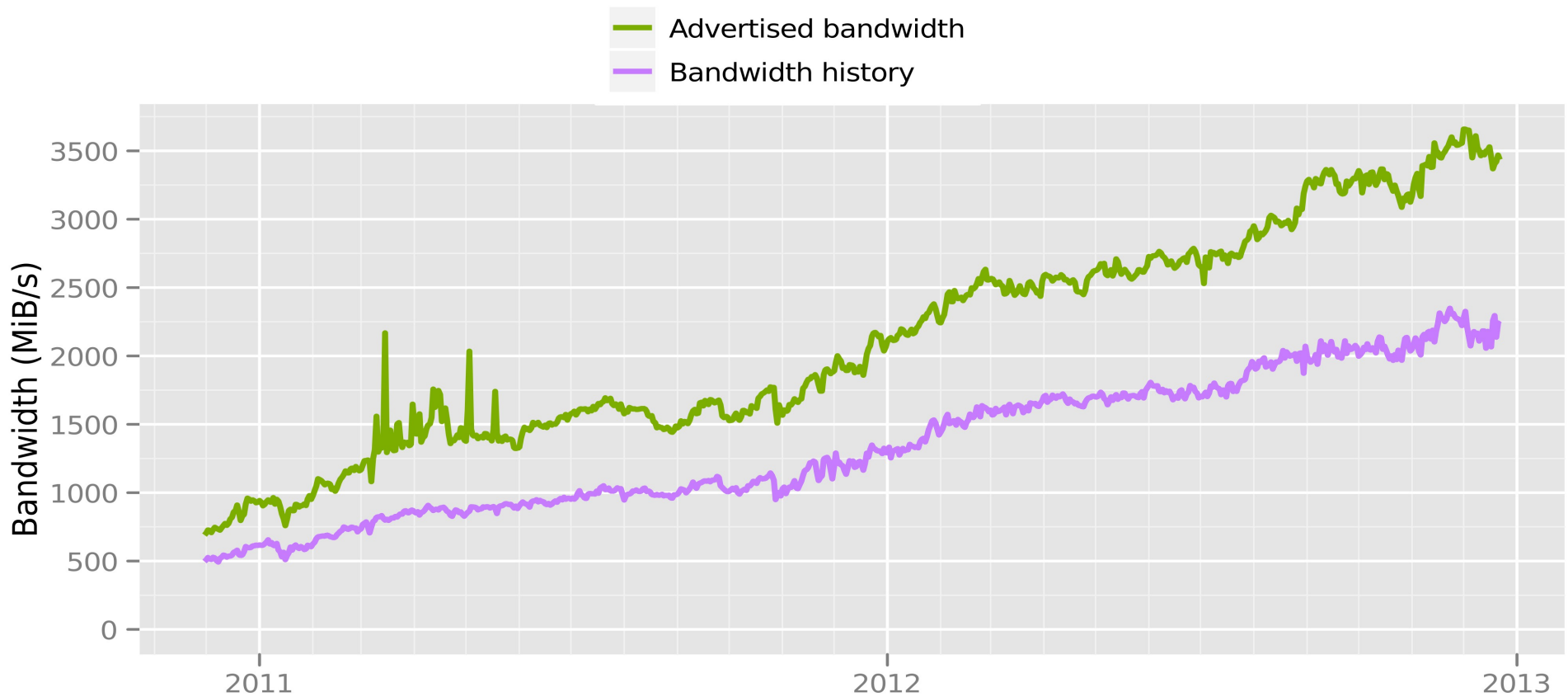


1 Year graph

[Save Graph](#)

metrics.torproject.org (heavy)

Total relay bandwidth



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

Relay search (light)

Tor Metrics Portal: Relay Search

Search for a relay in the relay descriptor archive by typing (part of) a **nickname**, **\$-prefixed fingerprint**, or **IP address** and optional **(yyyy-mm)** or up to three **days (yyyy-mm-dd)** in the following search field and clicking Search. The search will stop after 30 hits or provide a month or a day, after parsing the last 30 days of relay lists.

Searching for relays with nickname **chaoscomputerclub** ...

valid-after [2012-12-26 12:00:00](#)

r chaoscomputerclub10 EaAjn8ZmhwX2iEKBExi2acY2+G4 [Eyaik1MdQ4PdrHshhhYihnrV2sQ](#) 2012-12-26 11:54:07 62.113.219.3 443 80
s Exit Fast Guard HSDir Named Running Stable V2Dir Valid

v Tor 0.2.4.6-alpha

w Bandwidth=1537

p accept 22,43,53,79-81,88,443,465,554,563,587,706,873,993,995,1194,1533,1755,2947,3386,3690,4321,5031,5222-5223,8008,8080,8443,9

r chaoscomputerclub29 PlaTxLD82LQhU4aUlEIRZ0Qqn+A [Nip1X+Eh4BbqDL+K6ojxqnJhiBw](#) 2012-12-26 11:01:55 77.244.254.229 443 80

s Exit Fast Guard HSDir Named Running Stable V2Dir Valid

v Tor 0.2.4.6-alpha

w Bandwidth=5930

p accept 22,43,53,79-81,88,443,465,554,563,587,706,873,993,995,1194,1533,1755,2947,3386,3690,4321,5031,5222-5223,8008,8080,8443,9

r chaoscomputerclub27 YxgewWRnfzWnyXJRf2JoI6npH5Q [daoixQVMRKT7whwyWdHhArBRABu](#) 2012-12-26 10:50:38 77.244.254.227 443 80

s Exit Fast Guard HSDir Named Running Stable V2Dir Valid

v Tor 0.2.4.6-alpha

w Bandwidth=4525

p accept 22,43,53,79-81,88,443,465,554,563,587,706,873,993,995,1194,1533,1755,2947,3386,3690,4321,5031,5222-5223,8008,8080,8443,9

r chaoscomputerclub4 ZZ32U31gX+qzt35Y51NC1wTwp5k [vW0vwrQS9BuXjY/8QcecJ4D6JVA](#) 2012-12-25 18:42:24 80.237.226.74 443 80

s Exit Fast Guard HSDir Named Running Stable V2Dir Valid

v Tor 0.2.4.6-alpha

w Bandwidth=10000

p accept 22,43,53,79-81,88,443,465,554,563,587,706,873,993,995,1194,1533,1755,2947,3386,3690,4321,5031,5222-5223,8008,8080,8443,9

r chaoscomputerclub11 cee0m5YdXiXxow/M0V6Bqjs2y5M [KwFGgp+wloy7wVb0upWtoQEtt10](#) 2012-12-26 11:55:03 62.113.219.4 443 80

s Exit Fast Guard HSDir Named Running Stable V2Dir Valid

ExoneraTor (light)

Was there a Tor relay running on this IP address?

IP address in question: (Ex.: 86.59.21.38 or 2001:858:2:2:aabb:0:563b:1526)

Date or timestamp, in UTC: (Ex.: 2010-01-01 or 2010-01-01 12:00)

Looking up IP address 128.31.0.34 in the relay lists published between 2011-01-01 09:00 and 2011-01-01 12:00 UTC as well as in the relevant exit relay lists. Clients could have selected any of these relays to build circuits. You may follow the links to relay lists and relay descriptors to grep for the line printed below and confirm that results are correct.

valid-after [2011-01-01 09:00:00](#)
r moria1 lpXfw1/+uGEym58asExGOXAqzjE [9inGIK0Qqr0Hl11US8iolNse3PA](#) 2010-12-31 15:39:29 **128.31.0.34** 9101 9131

valid-after [2011-01-01 10:00:00](#)
r moria1 lpXfw1/+uGEym58asExGOXAqzjE [fo/t0mGfpia3/L7pEqbNQpkj7HY](#) 2011-01-01 09:39:40 **128.31.0.34** 9101 9131

valid-after [2011-01-01 11:00:00](#)
r moria1 lpXfw1/+uGEym58asExGOXAqzjE [fo/t0mGfpia3/L7pEqbNQpkj7HY](#) 2011-01-01 09:39:40 **128.31.0.34** 9101 9131

valid-after [2011-01-01 12:00:00](#)
r moria1 lpXfw1/+uGEym58asExGOXAqzjE [fo/t0mGfpia3/L7pEqbNQpkj7HY](#) 2011-01-01 09:39:40 **128.31.0.34** 9101 9131

Result is POSITIVE with high certainty!

We found one or more relays on IP address 128.31.0.34 in the most recent relay list preceding 2011-01-01 12:00 that clients were likely to know.

Was this relay configured to permit exiting to a given target?

Target address: (Ex.: 4.3.2.1)

Target port: (Ex.: 80)

Consensus health (light)

Fingerprint	Nickname	Farav.	danne.	dizum	gabel.	maatu.	moria1	tor26	turtl.	urras	consensus
0013D223	sumkledi	Exit Fast	Exit Fast	Exit Fast	Exit Fast Named	Exit Fast	Exit Fast	Exit Fast Named	Exit Fast	Exit Fast	Exit Fast Named Running Valid
003C9A57	Unnamed	Running Valid	Running Valid	Running Valid	Running Valid	Running Valid	Running Valid	Running Valid	Running Valid	Running Valid	Running Valid
006C3FA7	TC	Exit Fast Running Valid	Exit Fast	Exit Fast	Exit Fast	Exit Fast	Exit Fast	Exit Fast	Exit Fast	Exit Fast	Exit Fast Running Valid
0080B637	Unnamed	V2Dir Valid	V2Dir Valid	V2Dir Valid	V2Dir Valid	V2Dir Valid	V2Dir Valid	V2Dir Valid	V2Dir Valid	V2Dir Valid	V2Dir Valid
008295E2	TorRelay01	Fast Running Stable	Fast Running Stable	Fast Running Stable	Fast Running Stable Unnamed	Fast Running Stable	Fast Running Stable	Fast Running Stable Unnamed	Fast Running Stable	Fast Running Stable	Fast Running Stable Unnamed Valid
009AE464	pornosteffi	Running Valid	Running Valid	Running Valid	Running Valid Named	Running Valid	Running Valid	Running Valid Named	Running Valid	Running Valid	Running Valid Named
00C2C2A1	ph3x	Fast Guard HSDir	Fast Guard HSDir	Fast Guard HSDir	Fast Guard HSDir Named	Fast Guard HSDir	Fast Guard HSDir	Fast Guard HSDir Named	Fast Guard HSDir	Fast Guard HSDir	Fast Guard HSDir Named Running Stable V2Dir Valid

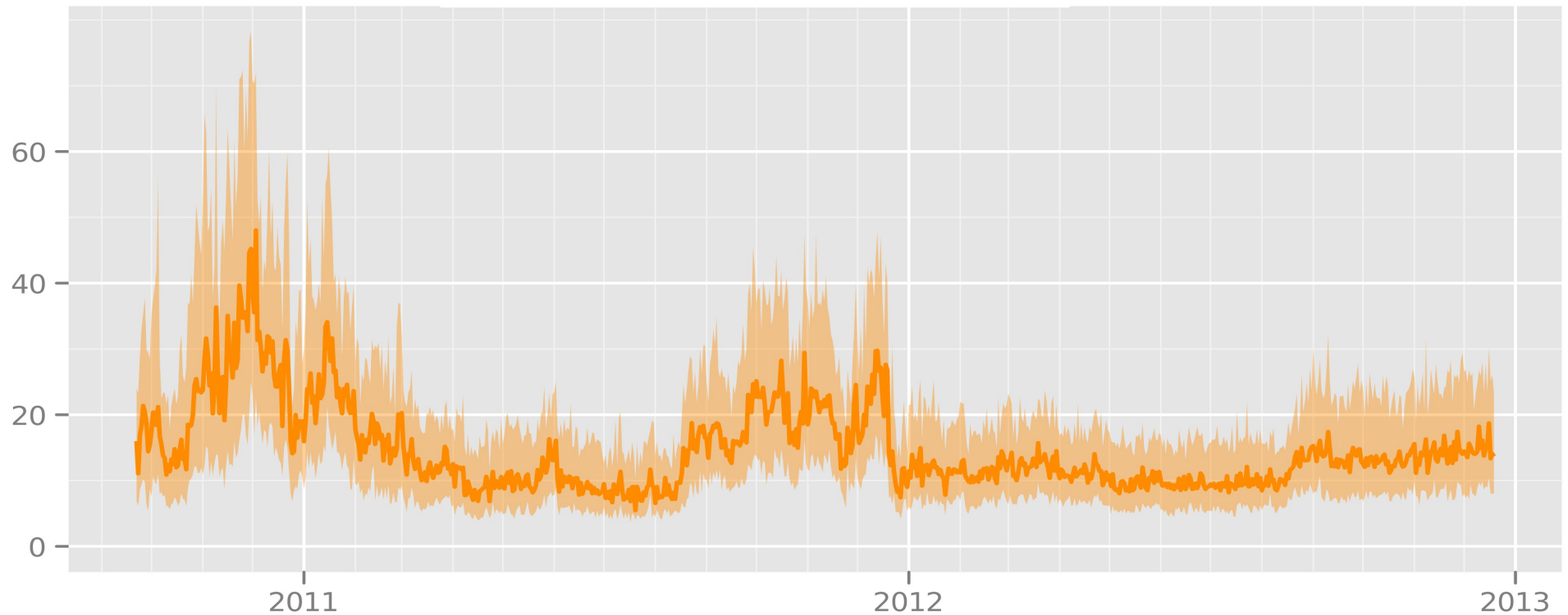
Torperf (light)



Time in seconds to complete 1 MiB request

Measured times on all sources per day

- Median
- 1st to 3rd quartile



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

weather.torproject.org (light)

Tor Weather - Sign Up!

Enter Email:

Re-enter Email:

Node Fingerprint: ([search for a router](#))

Hint: Often your node fingerprint can be found on unix-like machines in the file: `/var/lib/tor/fingerprint`

Note that this service is not for [Bridge](#) relays.

Email me when the node is down

How long before we send a notification?

Default value is 0

hours



Enter a value between one hour and six months

- Email me when the router's Tor version is out of date
- Email me when the router has low bandwidth capacity
- Email me when the router has earned me a [Tor t-shirt](#)

[\(More Info\)](#)

Please note that while we won't ever intentionally publish them, the address/node pairs sent to this server are not protected against SMTP eavesdropping, hacking, or lawyers.

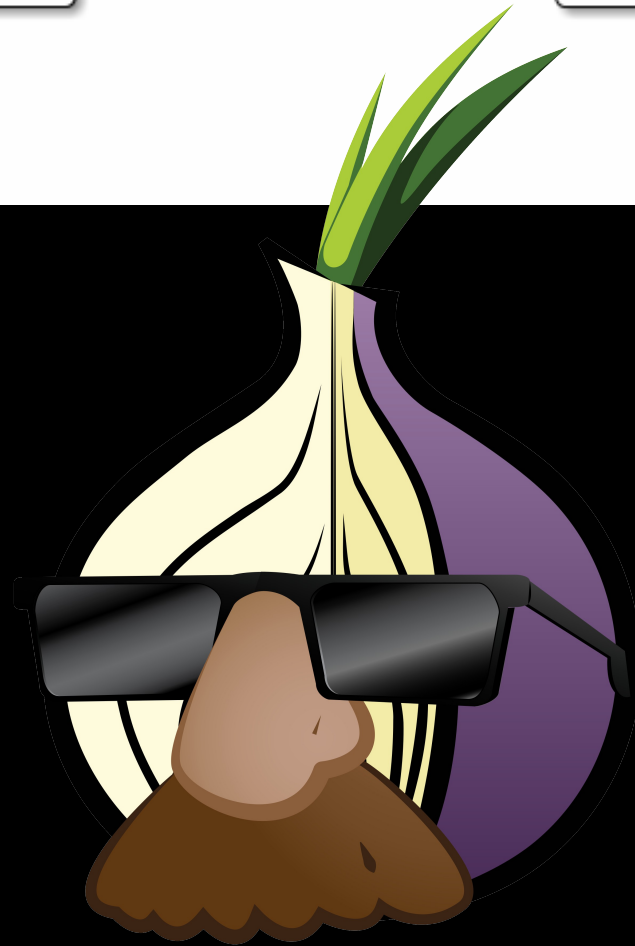
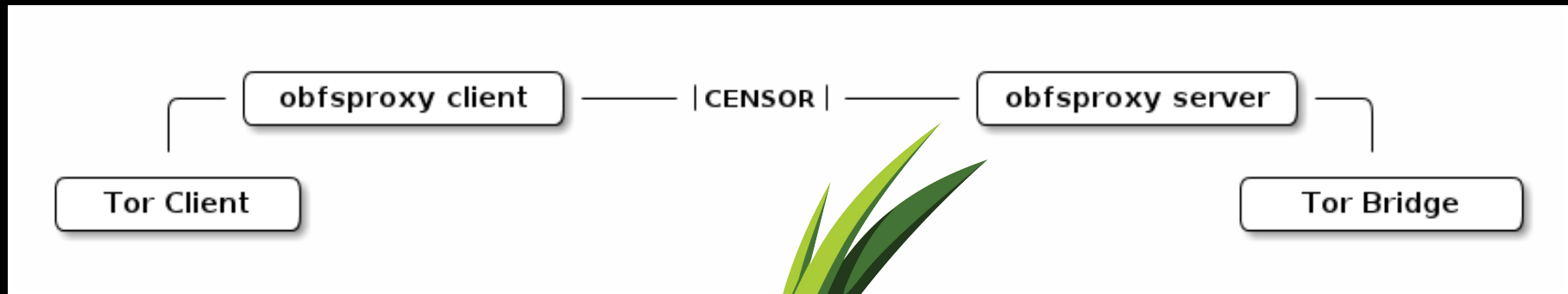
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Backend database support for metrics (moderate)

- Onionoo
- PyOnionoo

(py)obfsproxy (moderate)



Flashproxy (moderate)

INTERNET FREEDOM

Dark blue means the proxy is running but no client is being served.

INTERNET FREEDOM

Light blue means a client is currently being served.

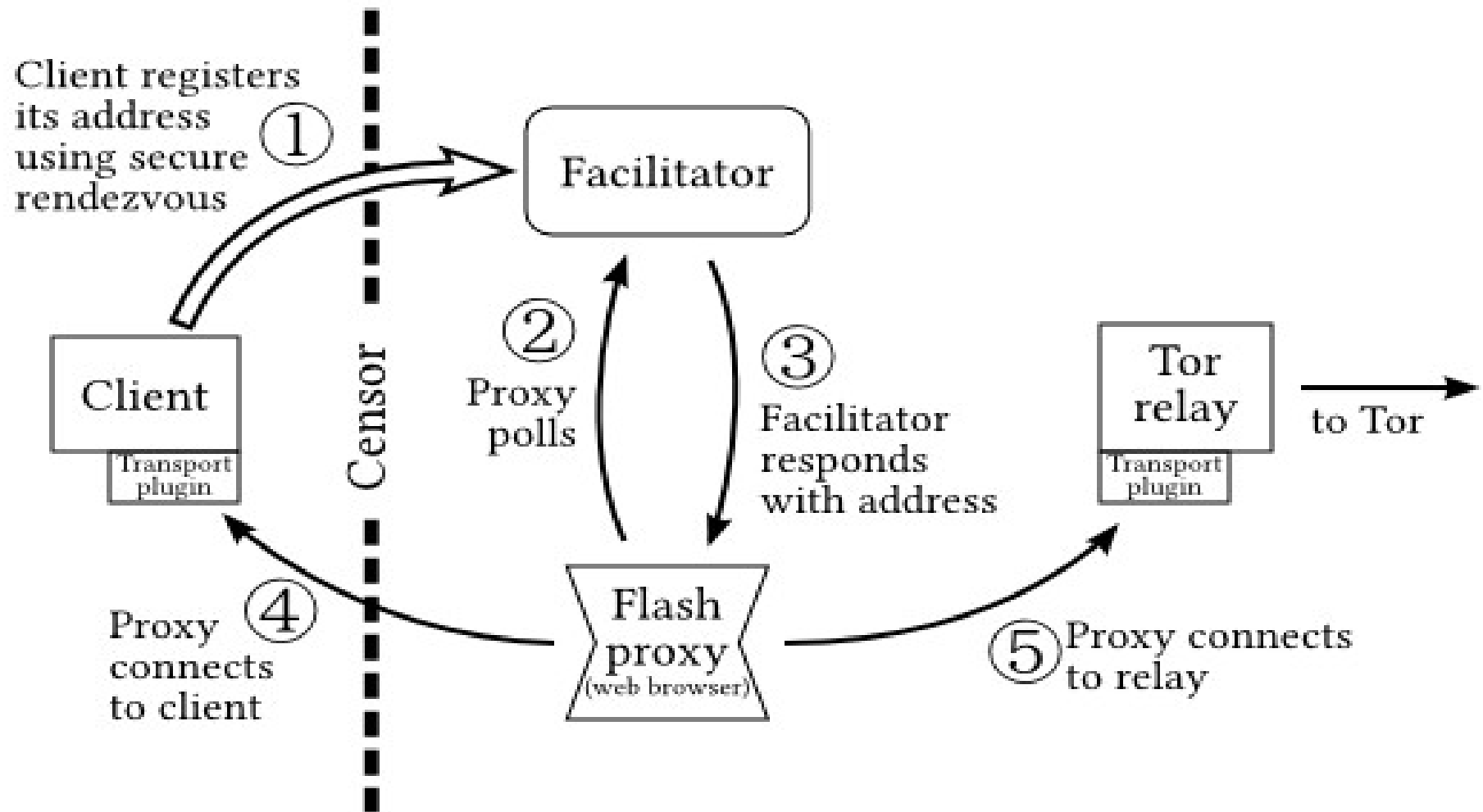
INTERNET FREEDOM

Gray means that the badge has disabled itself. This can be because it has detected it is running on a mobile device, or the browser doesn't support WebSocket (this happens on Internet Explorer 9).

INTERNET FREEDOM

Black means that there was an internal error and the proxy is no longer running.

Flashproxy (moderate)



Other pluggable transports

- Stegotorus
- Skypemorph

GetTor (low)

BridgeDB (light)

Bridge relays (or "bridges" for short) are Tor relays that aren't listed in the main directory. Since there is no complete public list of them, even if your ISP is filtering connections to all the known Tor relays, they probably won't be able to block all the bridges.

To receive your bridge relays, please prove you are human

ciansco the

Type the two words

I am human

Another way to find public bridge addresses is to send mail to bridges@torproject.org with the line "get bridges" by itself in the body of the mail. However, so we can make it harder for an attacker to learn lots of bridge addresses, you must send this request from an email address at one of the following domains:

- gmail.com
- yahoo.com

[Looking for IPv6 bridges?](#)

[Looking for obfsproxy bridges?](#)

Specify transport by name:

Submit Query

Brdgrd (community)



0000																
0010																
0020																
0030																
0040					16	03	01	00	e2	01	00	00	de	03	01	50
0050	d6	ec	65	e5	ff	6a	dd	bb	c8	bc	1f	a5	72	fb	f4	3e
0060	c9	0f	f6	e2	da	7e	1d	ac	56	33	ef	ff	72	94	48	00
0070	00	48	c0	0a	c0	14	00	88	00	87	00	39	00	38	c0	0f
0080	c0	05	00	84	00	35	c0	07	c0	09	c0	11	c0	13	00	45
0090	00	44	00	33	00	32	c0	0c	c0	0e	c0	02	c0	04	00	96
00a0	00	41	00	04	00	05	00	2f	c0	08	c0	12	00	16	00	13
00b0	c0	0d	c0	03	fe	ff	00	0a	00	ff	01	00	00	6d	00	00
00c0	00	24	00	22	00	00	1f	77	77	77	2e	75	34	63	6f	73
00d0	63	6e	79	6a	77	7a	35	34	61	67	6a	6f	6e	66	6a	36
00e0	78	33	2e	63	6f	6d	00	0b	00	04	03	00	01	02	00	0a
00f0	00	34	00	32	00	0e	00	0d	00	19	00	0b	00	0c	00	18
0100	00	09	00	0a	00	16	00	17	00	08	00	06	00	07	00	14
0110	00	15	00	04	00	05	00	12	00	13	00	01	00	02	00	03
0120	00	0f	00	10	00	11	00	0f	00	01	01					

OONI

```
(ooni)~/c/n/ooni-probe >>> ./bin/ooniprobe nettests/blocking/http_requests.py -f inputs  
/ooni-inputs/processed/alexa-top-1k.txt  
| Log opened.  
| Starting Tor...  
| Successfully bootstrapped Tor  
| We will include some geo data in the report  
| Your AS number is: AS36692  
| Reporting to file report_http_requests_2012-12-27T134858Z.yamloo  
| Performing GET request to http://google.com/  
| Performing GET request to http://google.com/ via Tor  
| Performing GET request to http://facebook.com/  
| Performing GET request to http://facebook.com/ via Tor  
| Performing GET request to http://youtube.com/  
| Performing GET request to http://youtube.com/ via Tor  
| Performing GET request to http://yahoo.com/  
| Performing GET request to http://yahoo.com/ via Tor  
| Performing GET request to http://baidu.com/  
| Performing GET request to http://baidu.com/ via Tor  
| Performing GET request to http://wikipedia.org/  
| Performing GET request to http://wikipedia.org/ via Tor  
| Performing GET request to http://live.com/  
| Performing GET request to http://live.com/ via Tor  
| Performing GET request to http://twitter.com/  
| Performing GET request to http://twitter.com/ via Tor  
| Performing GET request to http://qq.com/  
| Performing GET request to http://qq.com/ via Tor  
| Performing GET request to http://amazon.com/  
| Performing GET request to http://amazon.com/ via Tor
```

Shallot, Scallion (community)

```
$ mono scallion/bin/Debug/scallion.exe -d 0 prefix
Cooking up some delicious scallions...
LoopIteration:15 HashCount:251.66MH Speed:89.2MH/s Runtime:00:00:02 Predicted:00:00:12
Ding!! Delicious scallions for you!!
```

```
Exponent: 37074435
```

```
Address/Hash: prefix2bp71fuuvp
```

```
-----BEGIN RSA PRIVATE KEY-----
```

```
MIICXQIBAAKBgQDVNx1MDVXQ6EjRLubgMUKhVeVYigEPZ4BLUhzNRp4MEMgVQHLP
GRlMc2yK29Q8fuvC1o2zJS8IF6RbXyB9Sdyuzh43st2CZeTMEwbkz6NNAJz+8UHH
1I35CWx5p4w1sw2eZx+wM7s6Ll4762pV21qolxqHoIef0sIso0AHixYPrQIEAjW2
AwKBgAEqghqEMZ2cedXc+AIKmZebbzJyWvfp9W9HRHXn6c7U0mYFNHXnAjr8KR6r
2w2IGS4LxKi360XRr70gIUw9mr9ti0lMjppkqwu7HSB0ldzCitNkVLRiV+TZQFXc
g6xxZZxX2giZoBThCq8g85/V+AyLRZK9ZdC+GkBP0YPgy8/rAkeA/j8vGpo/OkZq
3ucytAZYb+1HomUiSbh+oxMwxT84xQeSqIg/BsvWixPhu0Y+7HNzdZVN458H8UXC
zSWNmmmnyQJBANave5NDwnw5w/dARWMJsAYRc7GA/wx86o/+qmw/8Q6GBkFdUqcM
2Vw0HzDIq7q1UwYBznlRCI1Wgyd5+0wDZ80CQQDaewQ811o3/8StlKLvpify+fkQ
81j0GdoUJgYCz3nDEp6sCPvg3aSI7b195odY4L3d0pQ4SnPj0zGJMFdqcwFLAkBj
```

Tor2Web (medium)



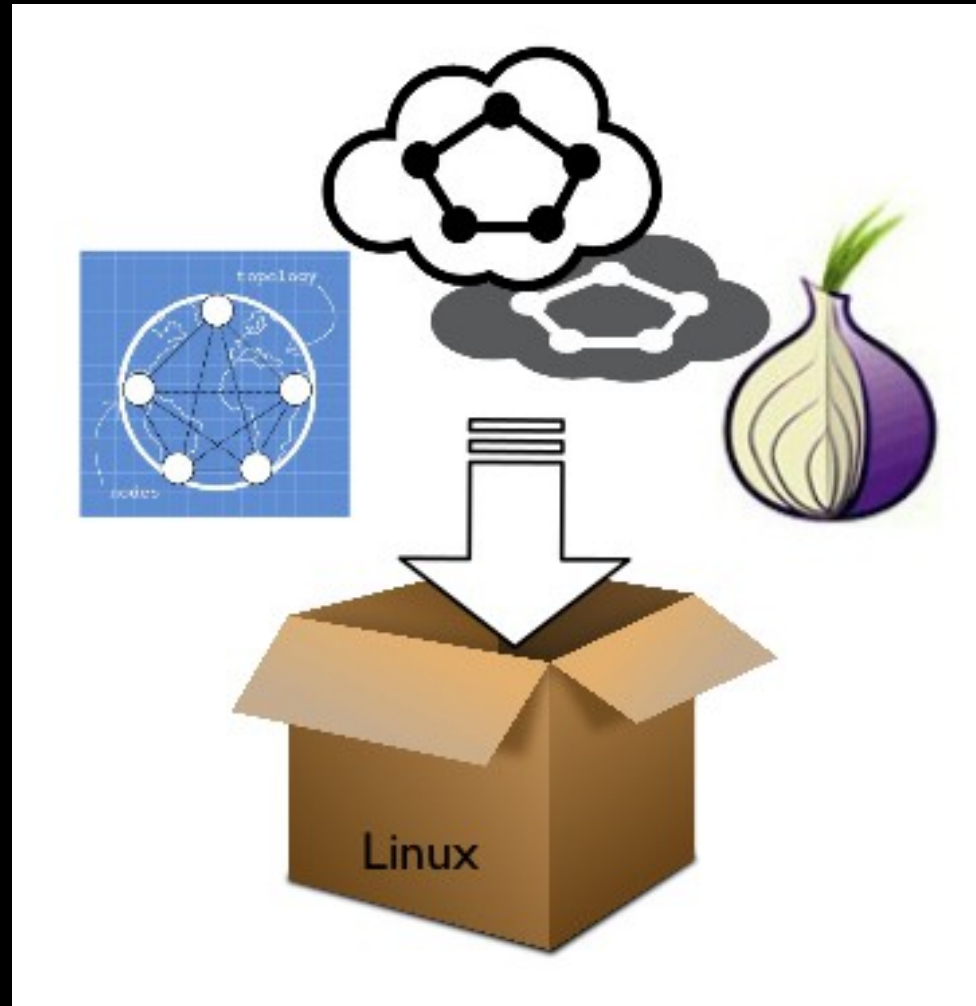
Network testing scripts



- TorFlow
 - Exit testing
 - Bandwidth testing
- TorDNSExitlist
- TorBEL
- TorCheck
 - Bulkexitlist

Tor network simulators

- **Shadow**
- **ExperimenTor**
- **Chutney**
- **Puppetor**



Tor specs (moderate)

- The **specifications** aim to give developers enough information to build a compatible version of Tor:
 - Main Tor specification
 - Tor version 3 directory server specification (and older version 2 directory specification)
 - Tor control protocol specification
 - Tor rendezvous specification
 - Tor path selection specification
 - Special hostnames in Tor
 - Tor's SOCKS support and extensions
 - How Tor version numbers work
 - In-progress drafts of new specifications and proposed changes

Apps that (confusingly!) aren't from Tor

- Tormail
- TorChat
- Advanced Tor
- Misc snakeoil

Nymble, Wikipedia support

freehaven.net/anonbib/ (light)

2012

- ☆ **Congestion-aware Path Selection for Tor** ([PDF](#)) (Cached: [PDF](#))
by Tao Wang, Kevin Bauer, Clara Forero, and [Ian Goldberg](#).
In the Proceedings of Financial Cryptography and Data Security (FC'12), February 2012. ([BibTeX entry](#)) :
- ☆ **BLACR: TTP-Free Blacklistable Anonymous Credentials with Reputation** ([PDF](#)) (Cached: [PDF](#))
by Man Ho Au, Apu Kapadia, and Willy Susilo.
In the Proceedings of the 19th Annual Network and Distributed System Security Symposium (NDSS), February 2012. ([BibTeX entry](#)) :
- ☆ **Shadow: Running Tor in a Box for Accurate and Efficient Experimentation** ([PDF](#)) (Cached: [PDF](#))
by Rob Jansen and [Nicholas Hopper](#).
In the Proceedings of the Network and Distributed System Security Symposium - NDSS'12, February 2012. ([BibTeX entry](#)) :
- ☆ **Peek-a-Boo, I Still See You: Why Efficient Traffic Analysis Countermeasures Fail** ([PDF](#)) (Cached: [PDF](#))
by Kevin P. Dyer, Scott E. Coull, Thomas Ristenpart, and Thomas Shrimpton.
In the Proceedings of the 2012 IEEE Symposium on Security and Privacy, May 2012. ([BibTeX entry](#)) :
- **LASTor: A Low-Latency AS-Aware Tor Client** ([PDF](#)) (Cached: [PDF](#))
by Masoud Akhondji, Curtis Yu, and Harsha V. Madhyastha.
In the Proceedings of the 2012 IEEE Symposium on Security and Privacy, May 2012. ([BibTeX entry](#)) :
- **LAP: Lightweight Anonymity and Privacy** ([PDF](#)) (Cached: [PDF](#))
by Hsu-Chun Hsiao, Tiffany Hyun-Jin Kim, Adrian Perrig, Akira Yamada, Sam Nelson, Marco Gruteser, and Wei Ming.
In the Proceedings of the 2012 IEEE Symposium on Security and Privacy, May 2012. ([BibTeX entry](#)) :
- **How (not) to build a transport layer for anonymity overlays** ([PDF](#)) (Cached: [PDF](#))

All of these projects are listed at
<https://www.torproject.org/volunteer>