Tor Ecosystem: A Developer's Guide to Contributing to the Tor Project

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The Tor Project
https://torproject.org/
Full presentation given during 29c3
https://media.torproject.org/video/
How Tor Works: 2

Step 2: Alice’s Tor client picks a random path to destination server. Green links are encrypted, red links are in the clear.
Tor: Hidden Services

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

- Vidalia (2006 – 2013)
- Tor Browser (2007 - Present)
- Arm (2009 - Present)
- TorK (2006 - 2010)
Vidalia

Status

Connected to the Tor network!

Vidalia Shortcuts

Stop Tor
View the Network
Bandwidth Graph
Message Log
Show this window on startup

Setup Relaying
Use a New Identity
Help
Settings
Exit

Tor Network Map

Connection
Status
redpineapple
mastermindone
TorLuxi1g
Open
bach, cebollain3, cortix
Open
redpineapple/jardel, humanisticsheur
Open
humanisticsheur1
Open
redpineapple, reconder, Unnamed
Open

Refresh
Zoom In
Zoom Out
Zoom To Fit
Help
Close
Congratulations. Your browser is configured to use Tor.

Please refer to the Tor website for further information about using Tor safely. You are now free to visit any website without fear of being watched by your Internet Service Provider (ISP) or the government.

Your IP address appears to be: 95.170.88.81

This page is also available in the following languages:

Arabiya (Arabiya) Burmese česky dansk Deutsch Elliniká (Ellinika) English español Estonian فارسی (Farsi) suomi français Italiano română Русский (Russkij) Thai Türkçe українська (ukrajins'ka) Vietnamese
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
18:49:57 [INFO] resolve_my_address(): Address 'odin' resolves to private
public IP addresses.
TorK

Press 'Play' to get started!
- Press 'Play' to connect to Tor. (You can also use the toolbar icons.)
- The 'Tor Network' tab shows you the state of the Tor network, including your Tor Traffic.
- You can use the 'Traffic Log' tab to view Tor and Non-Tor Traffic on your system.
- You can use the 'Tor Log' tab to view warning messages from Tor itself.
- Once Tor is up and running you can use the services listed below.

What You Need To Know When Using TorK! in Normal mode!

Anonymous Browsing (with Firefox)
- Click the icon to launch an anonymous browsing session in Firefox.
- TorK will make a copy of your normal Firefox settings and modify them for anonymous browsing.
- Firefox will use Privoxy in combination with Tor to anonymize your browsing.
- No other Firefox sessions will be anonymous!
- Install TorButton 1st (Recommended)

Anonymous Email
- Click the icon to compose and send an anonymous email.
- The email will be routed through the anonymizing mixmixin network.
- Delivery of anonymous email can take a while, sometimes up to 24 hours!
- If you don't have mixmixin already, click the link below to install it.
- Visit the mixmixin homepage to find out more.
Controller Libraries

- Stem (October 2011 - Present)
- Txtorcon (February 2012 - Present)
- TorCtl (July 2008 - November 2011)
- JTorCtl (June 2005 - May 2009)
Welcome to Stem!

Stem is a python controller library for Tor. Like its predecessor, TorCtl, it uses Tor’s control protocol to help developers program against the Tor process, enabling them to build things similar to Vidalia and arm.

Subsections
- Development Wiki
- Contact
- Index
- Module Index
- Search Page
- Automated Testing
- Contents
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://567zt26xqpvmdwcs.onion:80
locally listening on IPv4Address(TCP, '0.0.0.0', 31855)
Ecosystems

- Guardian Project
- Tails
- OONI Probe
The Guardian Project
(https://guardianproject.info/)
Tails (https://tails.boum.org/)
OONI Probe
(https://ooni.torproject.org/)

```
(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
Performing GET request to http://google.com/
Performing GET request to http://facebook.com/ via Tor
Performing GET request to http://youtube.com/
Performing GET request to http://yahoo.com/
Performing GET request to http://baidu.com/
```

16
Network Visualization

- Atlas (2012 - Present)
- Globe (2013 - Present)
- Compass (2012 – 2013)
- Metrics (2010 - Present)
- TorStatus (2011)
- Onionoo (2011 - Present)
Atlas (https://atlas.torproject.org/)

Details for: moria1
General  Overall information on the Tor relay

Configuration
Nickname
moría1
OR Addresses
128.31.0.34:9101
Contact
1024D/28988BF5 arma mit edu
Dir Address
128.31.0.34:9131
Advertised Bandwidth
512 KB/s
Exit Policy Summary
reject
1-65535

Exit Policy
reject "*

Properties
Fingerprint
9695DFC35FFE8B561329B9F1AB04C46397020CE31
Flags
Authority 🌐 Fast 🌐 HSDir 🌐 Named 🌐 Running ⌛ Stable
V2Dir 🌐 Valid
Country
🇺🇸 United States
AS Number
AS3
AS Name
Massachusetts Institute of Technology
Last Restarted
2013-10-02 01:03:02
Family Members

Descriptor Published
Platform
Tor 0.2.5.1-alpha on Linux
Consensus Weight
20

Current Status
Uptime
38 days 6 hours 1 minutes and 56 seconds
Running
true
Globe (http://globe.rndm.de/)

nickname  perceus  uptime  28 days 9 hours  running  true

Fingerprint

DEC3330B3E4F220E792BD2113D86F2C0C90159B9

Flags (as of in 7 hours)

- Fast
- Stable
- Guard
- Unnamed
- Running
- Valid

OR Addresses

178.63.80.36:443

Contact
torrelay<at>alkbio<dot>de
Compass
(https://compass.torproject.org/)
Metrics
(https://metrics.torproject.org/)

Total relay bandwidth

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

- Shadow
- ExperimenTor
- Chutney
- Puppetor
... and many more...

- Obfsproxy (2011 – Present)
- FlashProxy (2011 - Present)
- Torbirdy (2012 - Present)
- Tor Cloud (2011 - 2013)
- Tor-ramdisk (2010 - Present)
- Tor2Web (2011 - Present)
- HTTPS Everywhere (2010 - Present)
- TorFlow (BWAuths, SoaT)
- TorDNSEL / TorBEL
- TorCheck, GetTor, BridgeDB...
Obfsproxy

Tor Client

| CENSOR |

obfsproxy client

obfsproxy server

Tor Bridge
Flashproxy

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

Light blue means a client is currently being served.

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).

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

---

1. Client registers its address using secure rendezvous
2. Proxy polls
3. Facilitator responds with address
4. Proxy connects to client
5. Proxy connects to relay
Torbirdy
Tor Cloud

Tor bridges in the Amazon cloud

The Tor Cloud project gives you a user-friendly way of deploying bridges to help users access an uncensored Internet. By setting up a bridge, you donate bandwidth to the Tor network and help improve the safety and speed at which users can access the Internet. Learn more about Tor and bridges ».

This project runs on the Amazon EC2 cloud computing platform, which powers Amazon.com and other major websites. Amazon EC2 allows users to launch their own virtual machines and computing resources with flexible and cost-effective terms. Learn more about Amazon EC2 ».

Setting up a Tor bridge on Amazon EC2 is simple and will only take you a couple of minutes. The images have been configured with automatic package updates and port forwarding, so you do not have to worry about Tor not working or the server not getting security updates. Get started with Tor Cloud »
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" to 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_
Tor2Web
HTTPS Everywhere

Encrypt the Web

with HTTPS Everywhere
Non-Development Tasks

- Run a Relay!
- Translation
- Outreach
- Research
All of these projects are listed at https://www.torproject.org/volunteer

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Language</th>
<th>Activity</th>
<th>Contributors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tor</td>
<td>Core</td>
<td>C</td>
<td>Heavy</td>
<td>nickm, athena, arma</td>
</tr>
<tr>
<td>*JTor</td>
<td>Core</td>
<td>Java</td>
<td>Moderate</td>
<td>bleidl</td>
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<tr>
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<td>Bundle</td>
<td>C, Scripting</td>
<td>Moderate</td>
<td>mikeperry, Erinn</td>
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<tr>
<td>Torbutton</td>
<td>Browser Add-on</td>
<td>Javascript</td>
<td>Moderate</td>
<td>mikeperry</td>
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<td>Browser Add-on</td>
<td>Javascript</td>
<td>Heavy</td>
<td>pde, mikeperry</td>
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<td>Vidalia</td>
<td>User Interface</td>
<td>C++, Qt</td>
<td>None</td>
<td>chiiph</td>
</tr>
<tr>
<td>Arm</td>
<td>User Interface</td>
<td>Python, Curses</td>
<td>Light</td>
<td>atagar</td>
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<tr>
<td>Orbot</td>
<td>User Interface</td>
<td>Java</td>
<td>Light</td>
<td>n8fr8</td>
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<td>Tails</td>
<td>OS image</td>
<td>Sys Admin</td>
<td>Heavy</td>
<td>#tails</td>
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<td>OS image</td>
<td>Sys Admin</td>
<td>None</td>
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<td>OS image</td>
<td>Sys Admin</td>
<td>None</td>
<td>ioerror</td>
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<td>Usability</td>
<td>C</td>
<td>Light</td>
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<td>Browser Add-on</td>
<td>JavaScript</td>
<td>Heavy</td>
<td>Sukhbir (sukhe)</td>
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<td>Client Add-on</td>
<td>Python</td>
<td>Moderate</td>
<td>asn</td>
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<tr>
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<td>Client Add-on</td>
<td>Python</td>
<td>Heavy</td>
<td>def, mallia, jst</td>
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