

Introduction to Tor

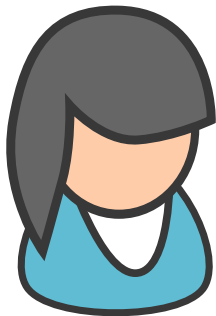
and

The Tor Software Ecosystem

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sukhbir@torproject.org

August 9, 2017

Anonymity on the Internet



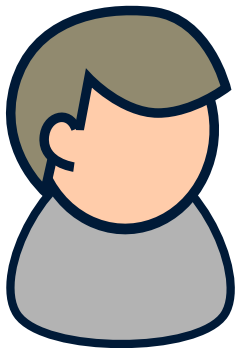
Anonymity on the Internet



Anonymity on the Internet



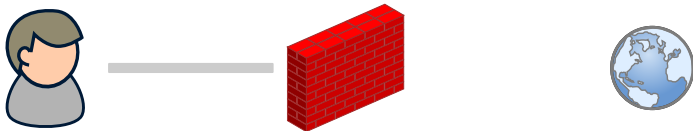
Anonymity on the Internet



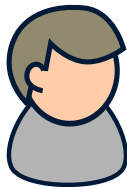
Anonymity on the Internet



Anonymity on the Internet



Anonymity on the Internet



Anonymity on the Internet

"On the Internet, Nobody Knows..."



"On the Internet, nobody knows you're a dog."

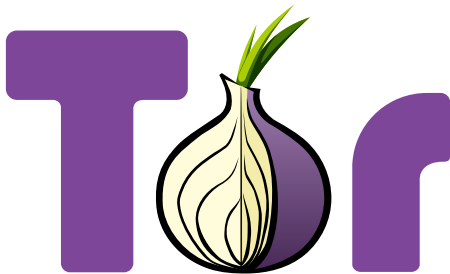
†

† Image from The New Yorker cartoon by Peter Steiner, 1993

On the Internet, *They* Know...



Tor: The Onion Router



Tor: The Onion Router

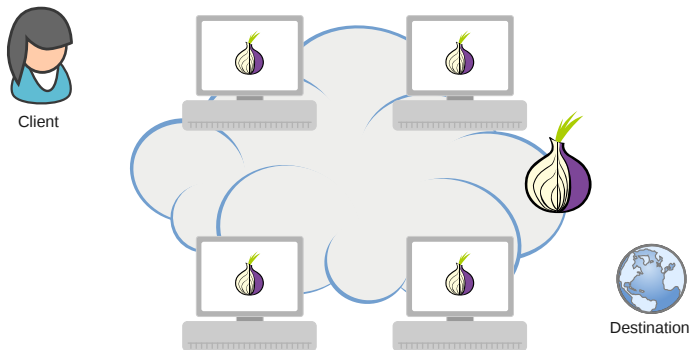


Client

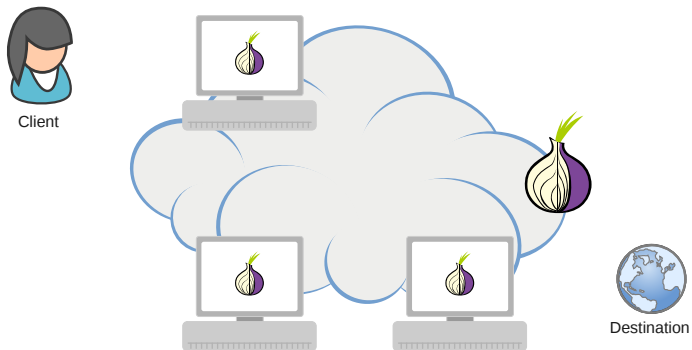


Destination

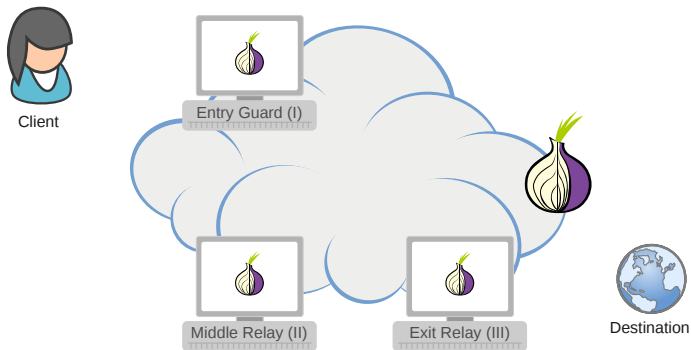
Tor: The Onion Router



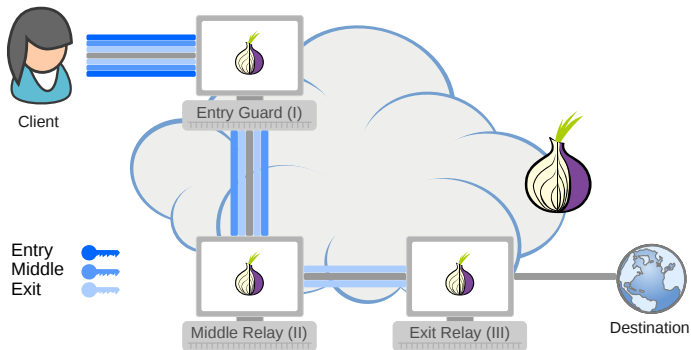
Tor: The Onion Router



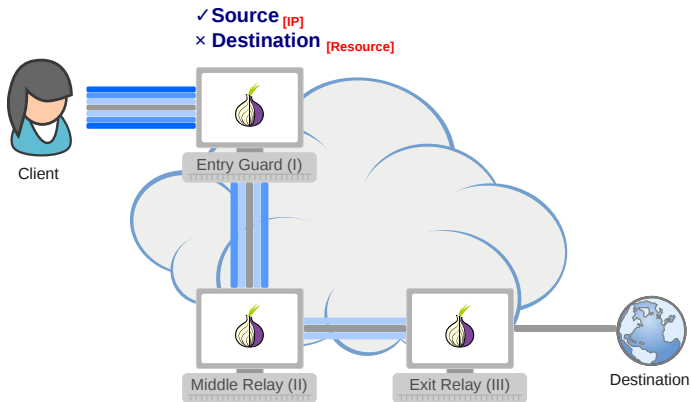
Tor: The Onion Router



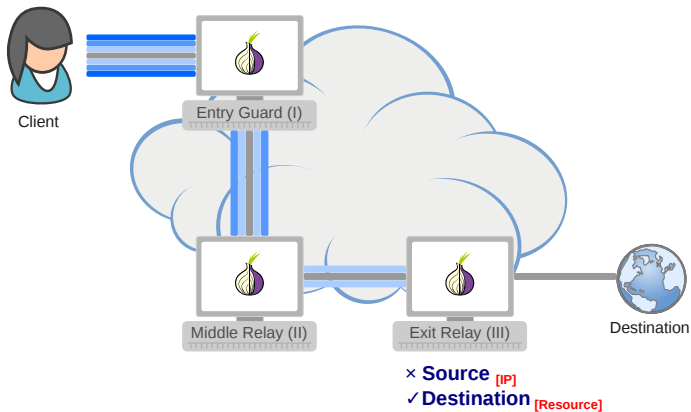
Tor: The Onion Router



Tor: The Onion Router



Tor: The Onion Router



Tor: The Onion Router

- ▶ Low-latency anonymity

*<https://metrics.torproject.org>

Tor: The Onion Router

- ▶ Low-latency anonymity
- ▶ Distributed design

* <https://metrics.torproject.org>

Tor: The Onion Router

- ▶ Low-latency anonymity
- ▶ Distributed design
- ▶ 2,000,000 users and 6000 relays
 - ▶ 100 Gbit/sec available bandwidth

* <https://metrics.torproject.org>

Who Uses Tor?

Who Uses Tor?

- ▶ Journalists

Who Uses Tor?

- ▶ Journalists
- ▶ Activists

Who Uses Tor?

- ▶ Journalists
- ▶ Activists
- ▶ You...

Tor vs. VPN

†	VPN	Tor	Tor Browser
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† Modified under CC BY-SA 4.0. Original work by Tim Sammut from <https://teamsammut.com/blog/2015/08/tor-vs-vpn-and-proxies-slides.html>

Tor vs. VPN

†	VPN	Tor	Tor Browser
Censorship Evasion	++	+++	+++

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Tor vs. VPN

†	VPN	Tor	Tor Browser
Censorship Evasion	++	+++	+++
Appear Elsewhere	++	+	+

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Tor vs. VPN

†	VPN	Tor	Tor Browser
Censorship Evasion	++	+++	+++
Appear Elsewhere	++	+	+
Anonymity	+	++	+++

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Tor vs. VPN

†	VPN	Tor	Tor Browser
Censorship Evasion	++	+++	+++
Appear Elsewhere	++	+	+
Anonymity	+	++	+++
Privacy	—	+	+++

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Tor vs. VPN

†	VPN	Tor	Tor Browser
Censorship Evasion	++	+++	+++
Appear Elsewhere	++	+	+
Anonymity	+	++	+++
Privacy	—	+	+++
Speed	++	— —	— —

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Tor vs. VPN

†	VPN	Tor	Tor Browser
Censorship Evasion	++	+++	+++
Appear Elsewhere	++	+	+
Anonymity	+	++	+++
Privacy	—	+	+++
Speed	++	— —	— —
Cost	— —	+++	+++

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little-t-tor

- ▶ Core of the Tor software ecosystem

little-t-tor

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- ▶ Runs as a daemon and sets up a local SOCKS5 proxy[†]

[†]localhost:9050

little-t-tor

- ▶ Core of the Tor software ecosystem
- ▶ Runs as a daemon and sets up a local SOCKS5 proxy[†]
- ▶ Platform support: Linux, macOS, Windows, BSD variants

[†]localhost:9050

Tor Browser

Tor Browser (Bundle)

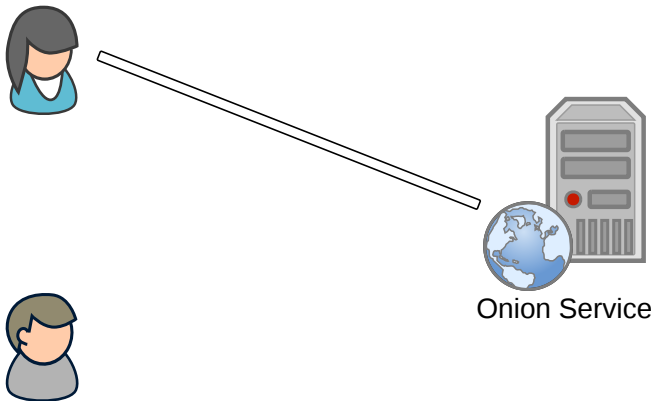
<https://www.torproject.org/torbrowser>

Onion Services

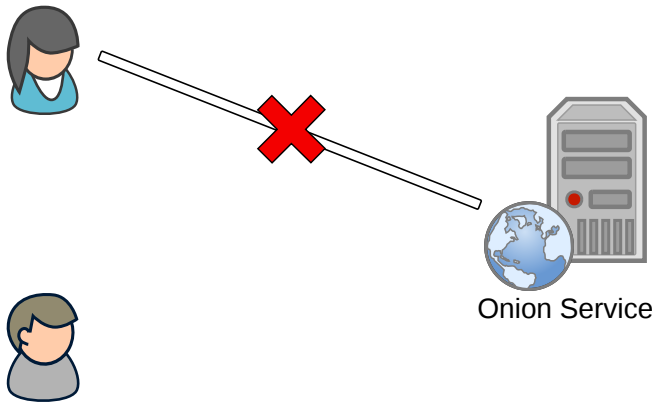


Onion Service

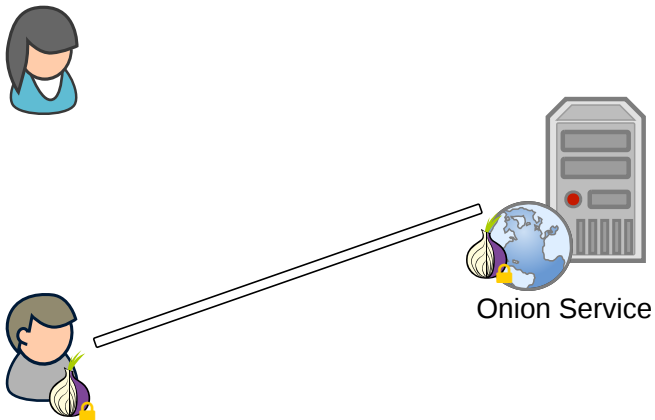
Onion Services



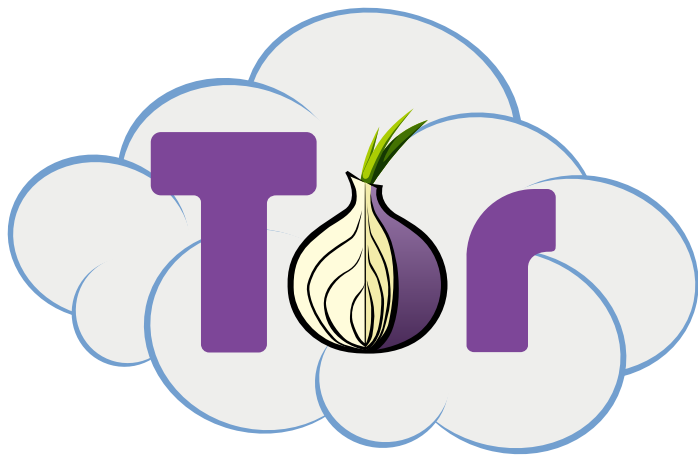
Onion Services



Onion Services



Tor Software Ecosystem



Tor is not just Tor Browser!

HTTPS Everywhere



Browser Extension for Enabling HTTPS

<https://www.eff.org/https-everywhere>

Orbot and Orfox



Tor and Tor Browser on Android

<https://guardianproject.info/>

Tails



Secure Operating System

<https://tails.boum.org/>

torsocks

\$. torsocks on

Wrapper to Torify Applications

<https://gitweb.torproject.org/torsocks.git>



Anonymous P2P Instant Messaging Client

<https://ricochet.im/>

Tor Messenger



Chat Client with native Tor and OTR Support

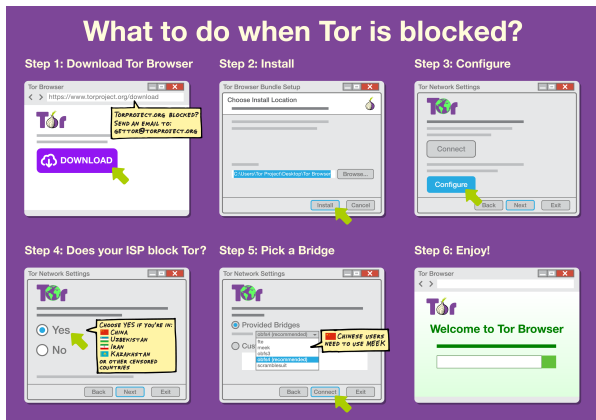
<https://trac.torproject.org/projects/tor/wiki/doc/TorMessenger>



Thunderbird Extension for Secure Email Communication

<https://trac.torproject.org/projects/tor/wiki/torbirdy>

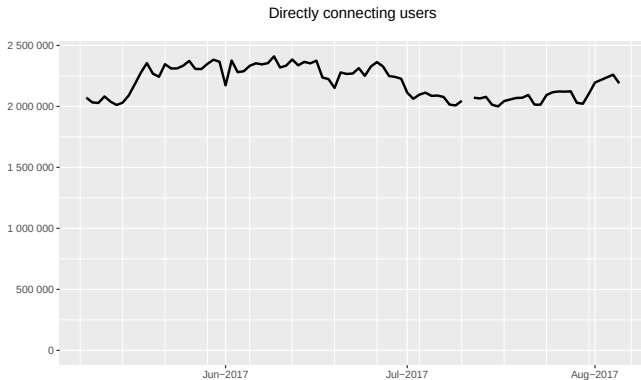
Pluggable Transports



Obfuscate Tor Traffic

<https://www.torproject.org/docs/pluggable-transport.html.en>

Metrics



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

Tor Network Metrics

<https://metrics.torproject.org/>

Stem



Python Controller

<https://stem.torproject.org/>



Tor CLI Monitor

<https://nyx.torproject.org/>



Twisted-based Python Asynchronous Controller

<https://github.com/meejah/txtorcon>



Open Observatory of Network Interference

<https://ooni.torproject.org/>

Check



Congratulations. This browser is configured to use Tor.

Your IP address appears to be: **207.244.70.35**

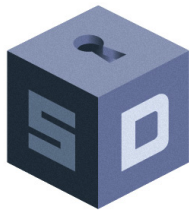
Please refer to the [Tor website](#) for further information about using Tor safely. You are now free to browse the Internet anonymously. For more information about this exit relay, see: [Atlas](#).

[Donate to Support Tor](#)

[Tor Q&A Site](#) | [Volunteer](#) | [Run a Relay](#) | [Stay Anonymous](#)

Test Your Network Settings

`https://check.torproject.org/`



SECUREDROP

Open-source Whistleblower Submission System

<https://securedrop.org/>

torproject.org blocked?

gettor@torproject.org

Provides Alternative Access to Tor Project Software

<https://gettor.torproject.org/>

Thank You

Come hack with us!

<https://www.torproject.org/getinvolved/>

sukhbir@torproject.org

E4AC D397 5427 A5BA 8450 A1BE B01C 8B00 6DA7 7FAA