Tor Research and Development

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TorProject.org

The Tor Project, Inc.

501(c)(3) non-profit organization dedicated to the research and development of technologies for online anonymity and privacy

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- active research environment:
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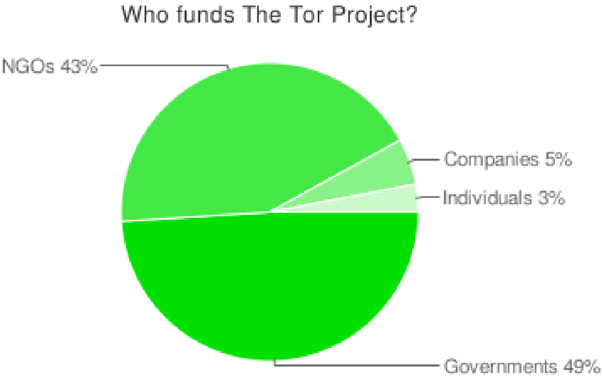
- increasingly diverse toolset:
  Tor, Torbutton, Tor Browser Bundle, TorVM, Incognito LiveCD, Tor Weather, Tor auto-responder, Secure Updater, Orbot, TorFox, Torora, Portable Tor, Tor Check, Arm, Nymble, Tor Control, Tor Wall

estimated 300,000 daily users

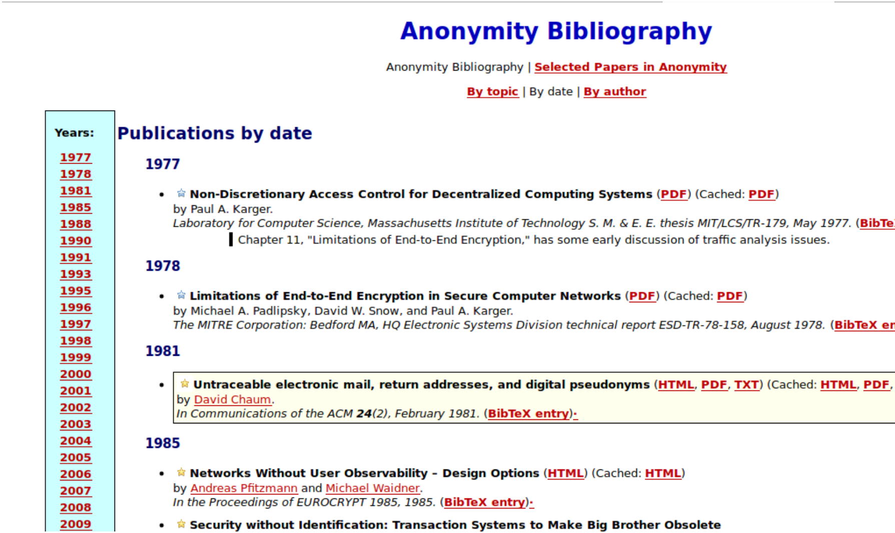
Who funds Tor?



Who uses Tor?

- Normal people
- Law Enforcement
- Human Rights Activists
- Business Execs
- Militaries
- Abuse Victims

http://freehaven.net/anonbib/



Anonymity Bibliography

Anonymity Bibliography | **Selected Papers in Anonymity**

By topic | By date | **By author**

Years:

1977
1978
1981
1985
1988
1990
1991
1993
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009

Publications by date

1977

- ☆ **Non-Discretionary Access Control for Decentralized Computing Systems** (**PDF**) (Cached: **PDF**)
  by Paul A. Karger.
  Laboratory for Computer Science, Massachusetts Institute of Technology S. M. & E. E. thesis MIT/LCS/TR-179, May 1977. (**BibTe**

  Chapter 11, "Limitations of End-to-End Encryption," has some early discussion of traffic analysis issues.

1978

- ☆ **Limitations of End-to-End Encryption in Secure Computer Networks** (**PDF**) (Cached: **PDF**)
  by Michael A. Padlipsky, David W. Snow, and Paul A. Karger.
  The MITRE Corporation: Bedford MA, HQ Electronic Systems Division technical report ESD-TR-78-158, August 1978. (**BibTeX er**

1981

- ☆ **Untraceable electronic mail, return addresses, and digital pseudonyms** (**HTML**, **PDF**, **TXT**) (Cached: **HTML**, **PDF**,
  by David Chaum.
  In Communications of the ACM ***24****(2), February 1981.* (**BibTeX entry**)·

1985

- ☆ **Networks Without User Observability – Design Options** (**HTML**) (Cached: **HTML**)
  by Andreas Pfitzmann and Michael Waidner.
  In the Proceedings of EUROCRYPT 1985, 1985. (**BibTeX entry**)·
- ☆ **Security without Identification: Transaction Systems to Make Big Brother Obsolete**

Performance

- Circuit Latency
- Relay capacity estimation
- bandwidth authorities
- cell sizing

Metrics

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- Metrics portal: `https://www.torproject.org/projects/metrics`

Bridge Distribution Strategies

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- Bootstrapping problem.

Censorship Resistance

- Theoretical blocking strategies from the censors?

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- Blocking resistant strategies

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- `http://www.decloak.net/` is a fine test

Mobile Operating Systems

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- iphone, maemo, symbian, etc
- Tor on Windows CE, `http://www.gsmk.de` as an example.

Anonymity Online Research

or attacks galore

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- Parititioning/DHT/Shared Consensus Attacks

Next steps

Visit `https://www.torproject.org/volunteer#Research` for more information, links, and ideas.

Credits & Thanks

- who uses tor? `http://www.flickr.com/photos/mattw/2336507468/siz`, Matt Westervelt, CC-BY-SA.
- danger!, `http://flickr.com/photos/hmvh/58185411/sizes/o/`, hmvh, CC-BY-SA.
- 300k, `http://www.flickr.com/photos/lukaskracic/334850378/sizes/l/`, Luka Skracic, used with permission.