Tor, a quick overview

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The Tor Project
https://torproject.org/
What is Tor

• Online anonymity: 1. software, 2. network, 3. protocol
• Open source, freely available
• Community of researchers, developers, users and relay operators
• Funding from US DoD, Electronic Frontier Foundation, Voice of America, Google, NLnet, Human Rights Watch and more
The Tor Project, Inc.

- 501(c)(3) non-profit organization dedicated to the research and development of tools for online anonymity and privacy
Estimated 400,000 daily Tor users
Anonymity serves different interests for different user groups

"It's privacy"

Private citizens
Anonymity serves different interests for different user groups

Private citizens

“It's privacy”

Anonymity?

Businesses

“It's network security”
Anonymity serves different interests for different user groups

- **Governments**: “It's traffic-analysis resistance!”
- **Private citizens**: “It's privacy”
- **Businesses**: “It's network security”
Anonymity serves different interests for different user groups

- Governments: “It's traffic-analysis resistance!”
- Private citizens: “It's privacy”
- Businesses: “It's reachability!”, “It's network security”

Anonymity?
Encryption alone doesn't protect against traffic-analysis
Regular citizens don't want to be watched and tracked
Regular citizens don't want to be watched and tracked

8-year-old Alice

Web services
Regular citizens don't want to be watched and tracked
Regular citizens don't want to be watched and tracked

Employed Alice

Web search
Vårdguiden.se
Netdoktor.se
Regular citizens don't want to be watched and tracked

Consumer Alice

Amazon.com
Cdon.se
Bokus.com
Prisjakt.nu
Pricerunner.se
Business need to keep trade secrets
Business need to keep trade secrets
Law enforcement needs anonymity to get the job done
Law enforcement needs anonymity to get the job done
Law enforcement needs anonymity to get the job done
Law enforcement needs anonymity to get the job done.
Law enforcement needs anonymity to get the job done

Alice with protected identity

Online news
Internet shops
Web forums
Governments need anonymity for their security
Governments need anonymity for their security

Agent Alice

Defence agency
Journalists and their sources need Tor for their personal safety

Alice the source

Bob the journalist
Journalists and their sources need Tor for their personal safety.
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Journalists and their sources need Tor for their personal safety
The simpler systems use only one relay

(For example relax.se, dold.se and ipredator.se)
The simpler systems put all the eggs in the same basket
A single relay is also an attractive target

Trafic and timing analysis will reveal which Alice is talking to which Bob.
So, add multiple relays so that no single one can betray Alice
A corrupt first hop can tell that Alice is talking, but not to whom
A corrupt final hop can tell that somebody is talking to Bob, but not who
The first hop is protected by three layers of encryption, then each hop peels off one layer, *onion routing*. 
Number of relays and bridges (all data)

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