

# Anonymity, Usability, and Humans. Pick Two.

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# About Runa

- Studied at the Norwegian University of Science and Technology
- Worked for the Tor Project during Google Summer of Code in 2009
- Developer, security researcher, translation coordinator

# What are we talking about?

- Crash course on anonymous communications
- Quick overview of Tor
- Usability, Security, and Humans

# The Tor Project, Inc.

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

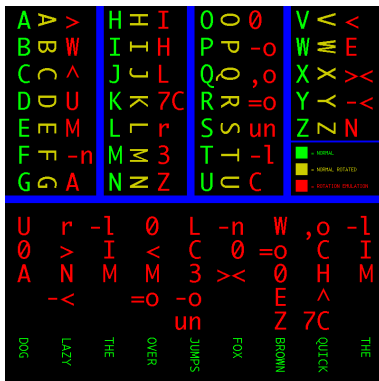


# What is anonymity?



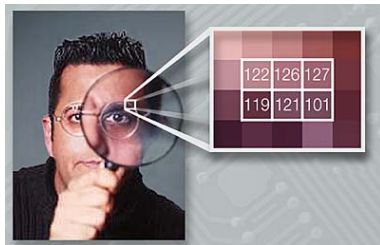
# Anonymity isn't cryptography

- Cryptography protects the contents in transit
- You still know who is talking to whom, how often, and how much data is sent.



# Anonymity isn't steganography

Attacker can tell Alice is talking to someone, how often, and how much data is sent.



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- "I didn't write my name on it!"
- "Isn't the Internet already anonymous?"

..since "weak" isn't anonymity.

- *"You can't prove it was me!"* Proof is a very **strong** word. Statistical analysis allows suspicion to become certainty.

..since "weak" isn't anonymity.

- "*Promise you won't look/remember/tell*" Will other parties have the abilities and incentives to keep these promises?

..since "weak" isn't anonymity.

- *"I didn't write my name on it!"* Not what we're talking about.



..since "weak" isn't anonymity.

- *"Isn't the Internet already anonymous?"* Nope!

# Anonymous communication

- People have to hide in a crowd of other people ("anonymity loves company")
- The goal of the system is to make all users look as similar as possible, to give a bigger crowd
- Hide who is communicating with whom
- Layered encryption and random delays hide correlation between input traffic and output traffic

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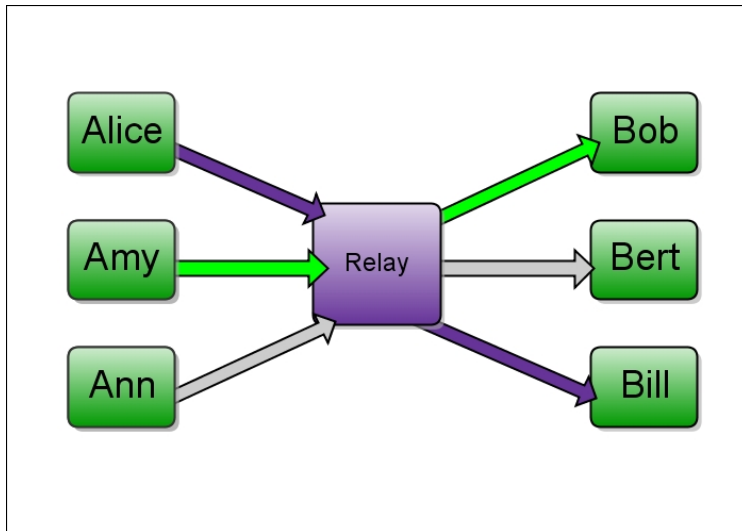
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- Online anonymity software and network
- Open source, freely available (3-clause BSD license)
- Active research environment:  
Rice, UMN, NSF, NRL, Drexel, Waterloo, Cambridge UK, Bamberg  
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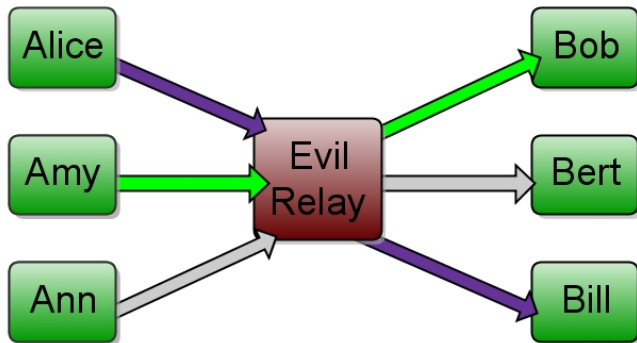
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- Increasingly diverse toolset:  
Tor, Torbutton, Tor Browser Bundle, TAILS Anonymous Operating System, Tor Weather, GetTor, Thandy, Orbot, Tor Check, Arm, Torouter, Tor Cloud and more

# What makes Tor different, part 1

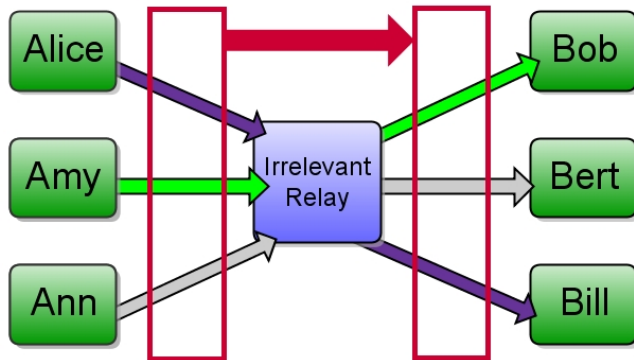


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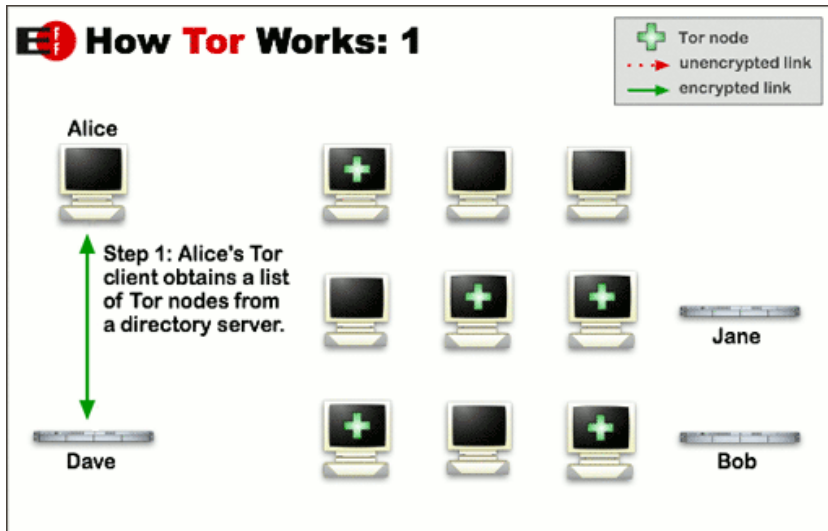




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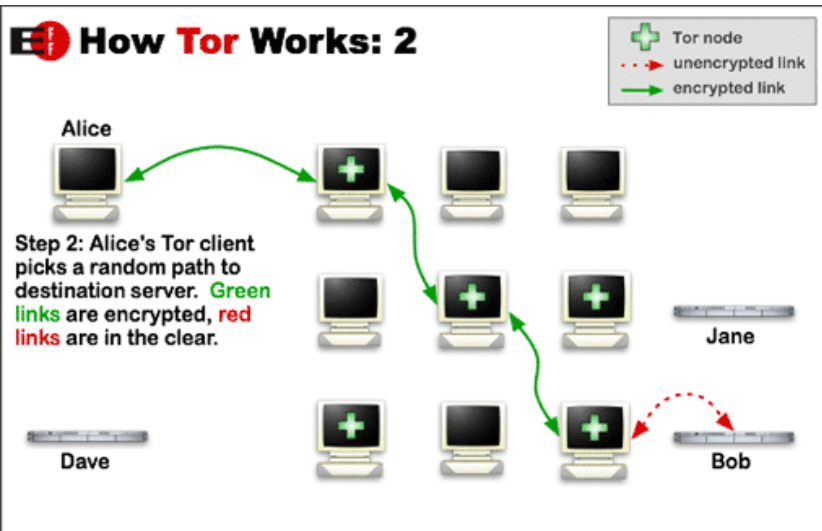


# What makes Tor different, part 2

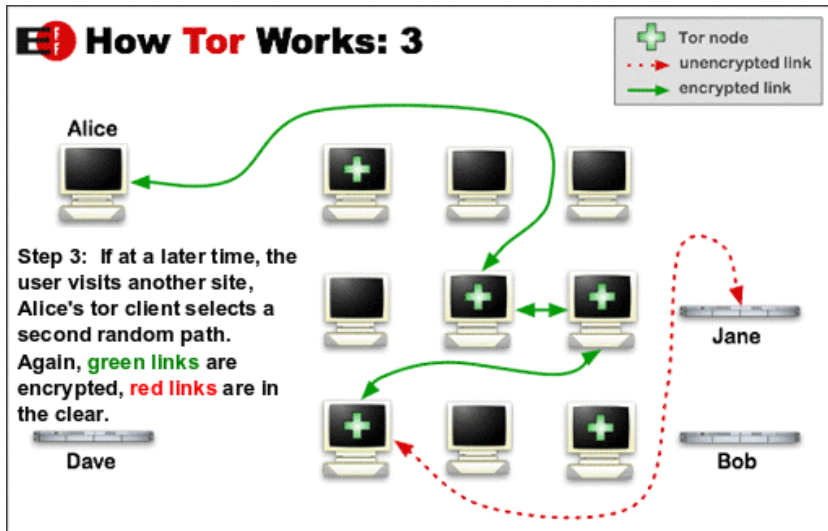


# What makes Tor different, part 2

## How Tor Works: 2



# What makes Tor different, part 2



# Bridges versus relays

- A step forward in the blocking resistance race
- Bridge relays (or "bridges" for short) are Tor relays that aren't listed in the main Tor directory
- To use a bridge, you will need to locate one first (can be done using [bridges.torproject.org](http://bridges.torproject.org), email, social media etc)
- A bridge will act as the first hop in the circuit

# Hidden services

- Tor makes it possible for users to hide their locations while offering various kinds of services, such a website or an im server
- Using Tor "rendezvous points," other Tor users can connect to these hidden services, each without knowing the other's network identity
- A hidden service will have an address that ends in .onion, e.g.  
<http://duskgytldkxiuqc6.onion/>

# Who uses Tor?



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

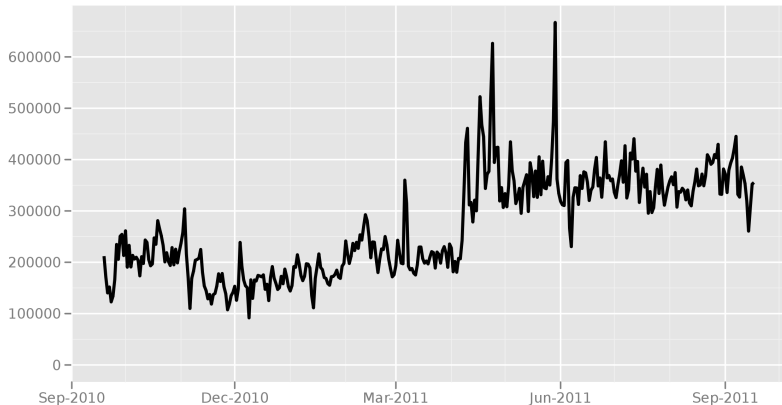
estimated 300k to 800k daily users





# How many people use Tor daily?

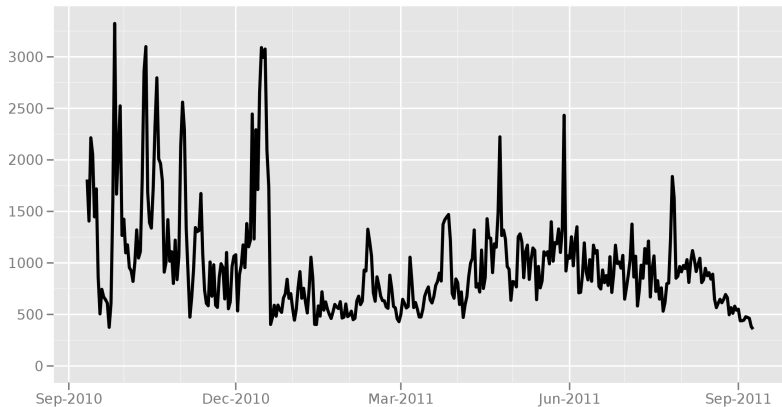
Directly connecting users from all countries



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

# Tor users in China

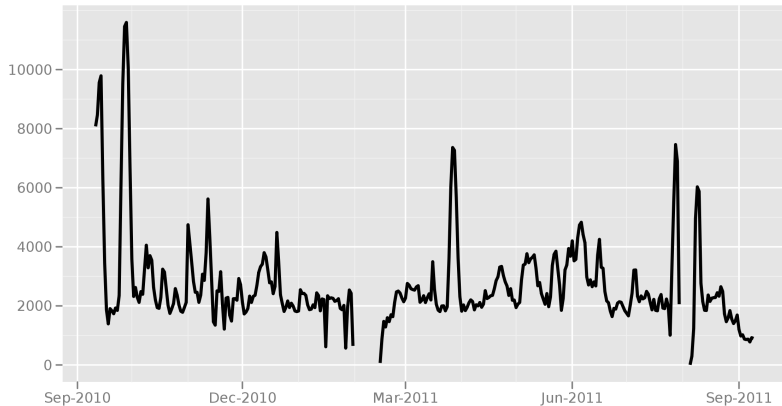
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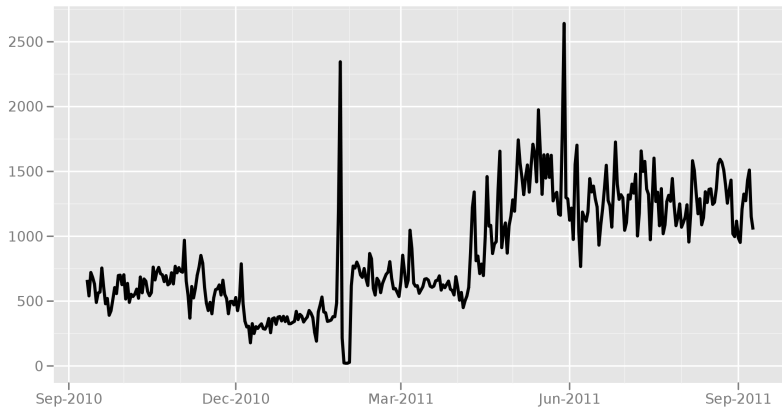
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# Tor users in Egypt

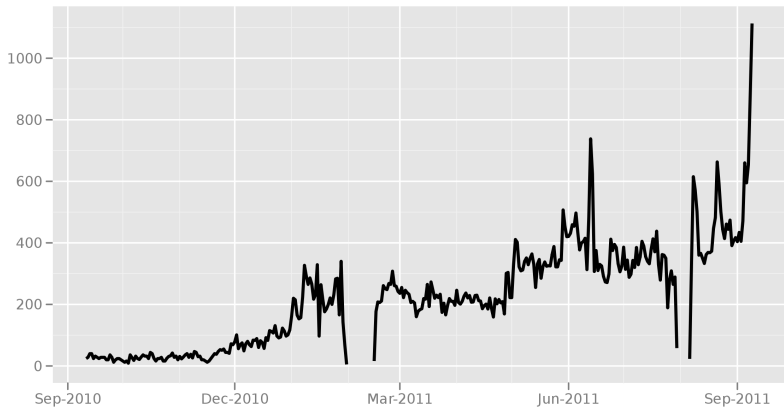
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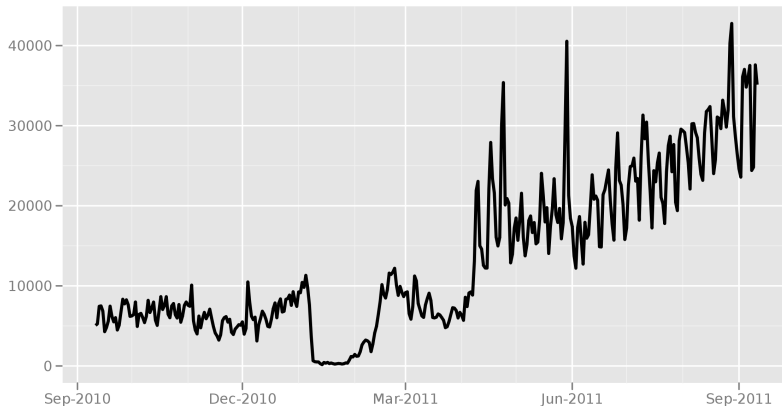
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# Tor users in Iran

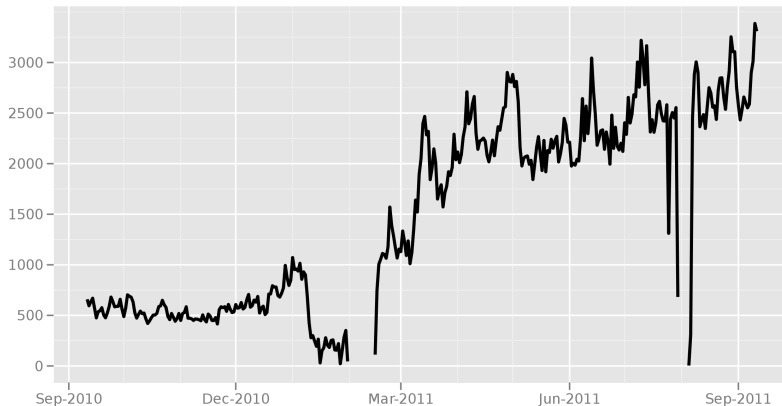
Directly connecting users from the Islamic Republic of Iran



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

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# Anonymity, Usability, and Humans

- Allow the user to fully configure Tor rather than manually searching for and opening text files.
- Let users learn about the current state of their Tor connection, and configure or find out whether any of their applications are using it.
- Make alerts and error conditions visible to the user.
- Run on Windows, Linux, and OS X, on a normal consumer-level machine.



# Time for a demo

## Demonstration of Tor Browser Bundle

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- Cultural differences and their expectations of software, usability, anonymity, privacy, and what tor provides.
- Software leaks data all over the place. Stopping these leaks leads to unexpected user experiences.
- Five years since we last dabbled in Usability.

# Next steps and how you can help

- Test software.
- Provide feedback and suggest improvements.
- Help with development.
- Visit <https://www.torproject.org/> for more information, links, and ideas.



# Copyright

- who uses tor?  
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