Safety of the Tor network

A look at network diversity, relay operators, and malicious relays

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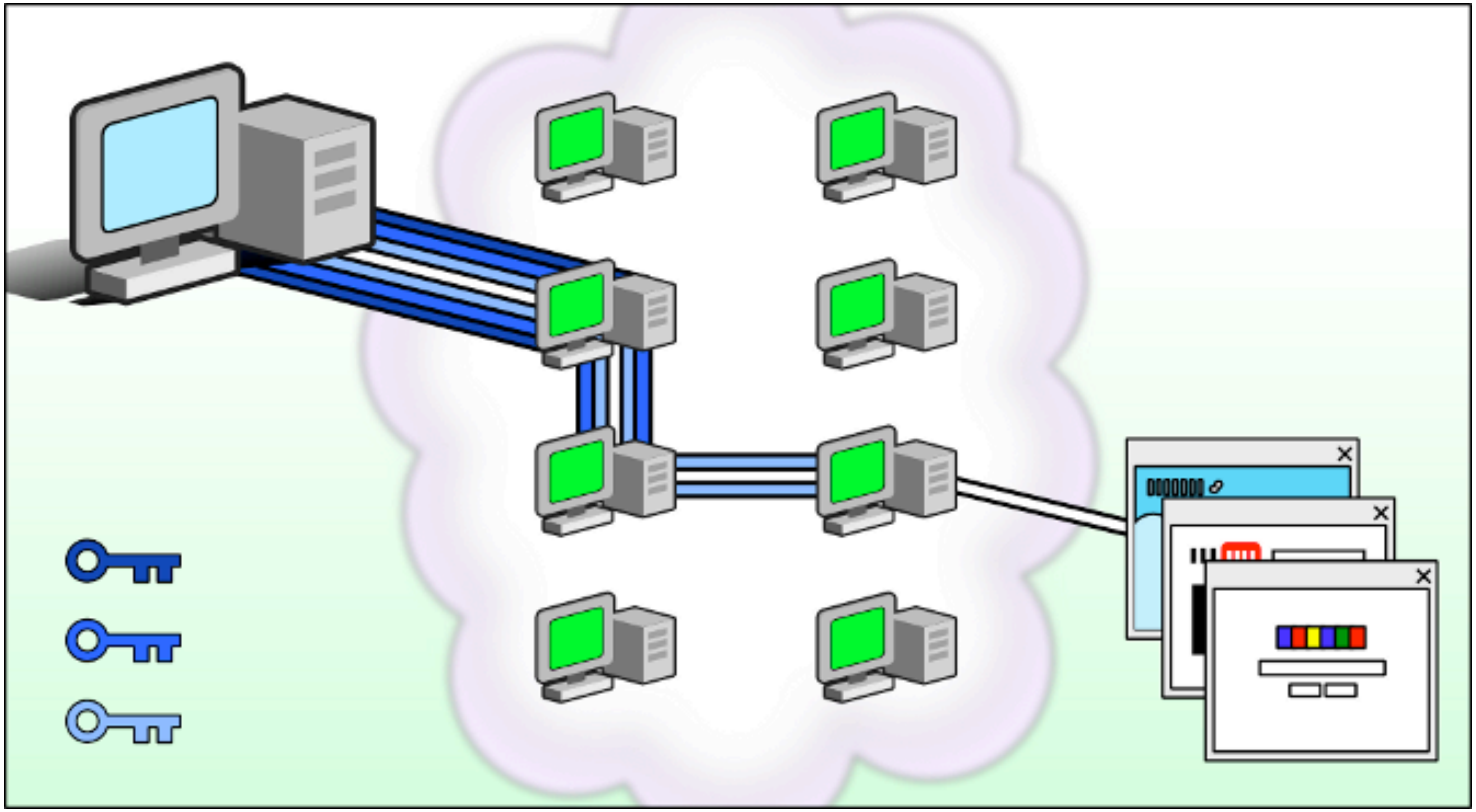
- Developer for the Tor Project
- Worked with/for Tor since GSoC 2009
- Frequent traveler



What this talk is about

- Is the Tor network a CIA honeypot?
- Are all relays malicious?
- Looked at all consensus files created between late 2007 and mid 2013

```
r OnionSoup CNImeTd8nvcBGTwfGZ2bCz8a7jw 6i1X8TC+YxGITibB352JRwVHEu8 2012-09-17 22:00:03 87.195.253.3 9001 9030
s Exit Fast Guard HSDir Named Running V2Dir Valid
v Tor 0.2.3.20-rc
w Bandwidth=5800
p accept 80,110,143,443,993,995
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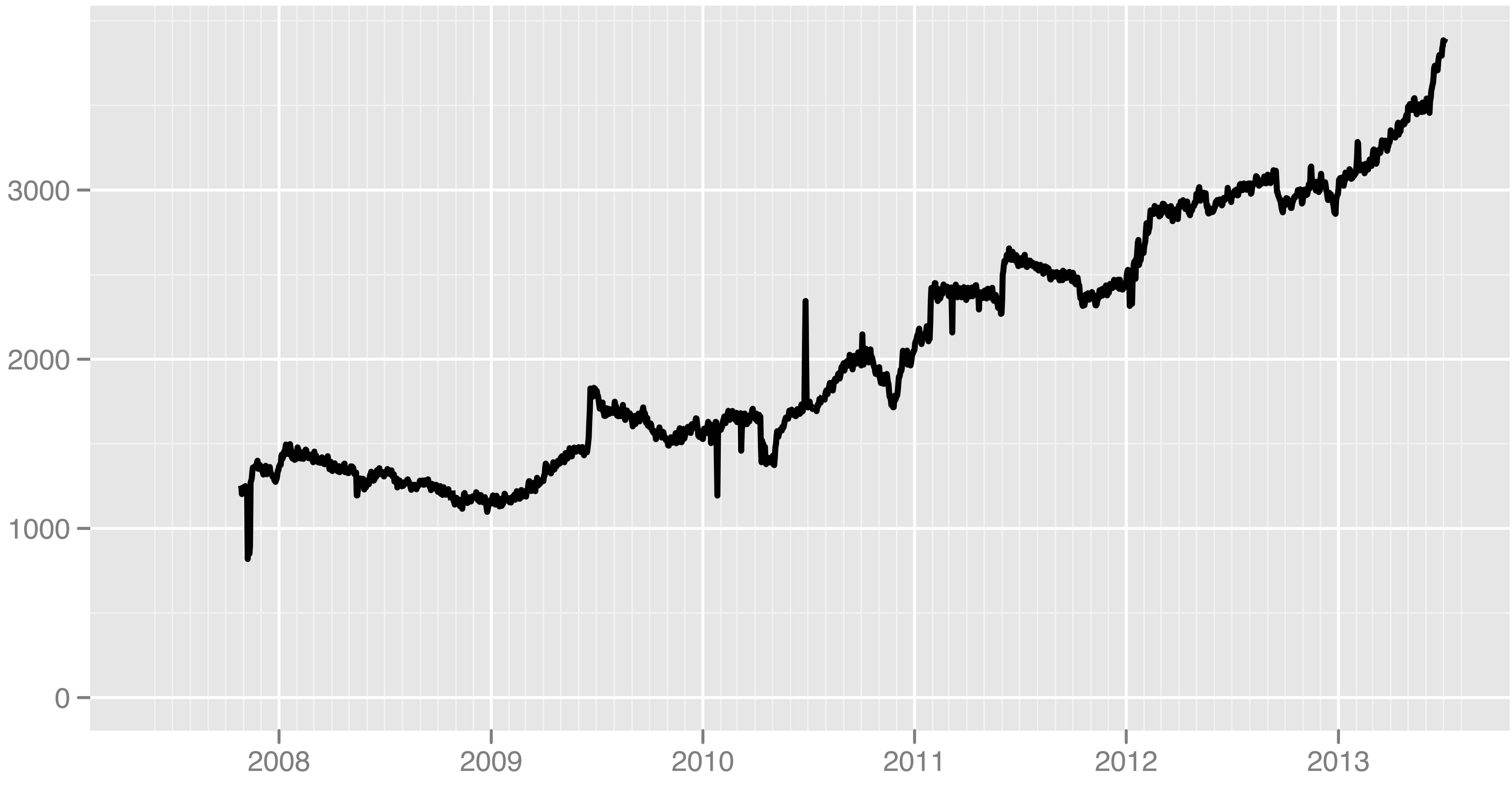
Number of relays in all countries



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

High-level statistics

- 95,314 unique nicknames
- 1,595,879 unique IP address
- 230,595 unique fingerprints
- 195 different countries

Top countries

- The US
- Germany
- France
- Russia
- Netherlands
- United Kingdom

Top nicknames

- Popular nicknames: *Unnamed*, *default*, *ididnteditheconfig*, *ididedititheconfig*, *MgeniUser*, *anonymous*
- *anonymous* (Germany, Sweden, US, Ukraine) versus *Anonymous* (US, Germany, Ukraine, Japan)
- A lot of Orbot relays in the Middle East

What is average?

- Uptime
- Lifetime
- Bandwidth
- Utilization

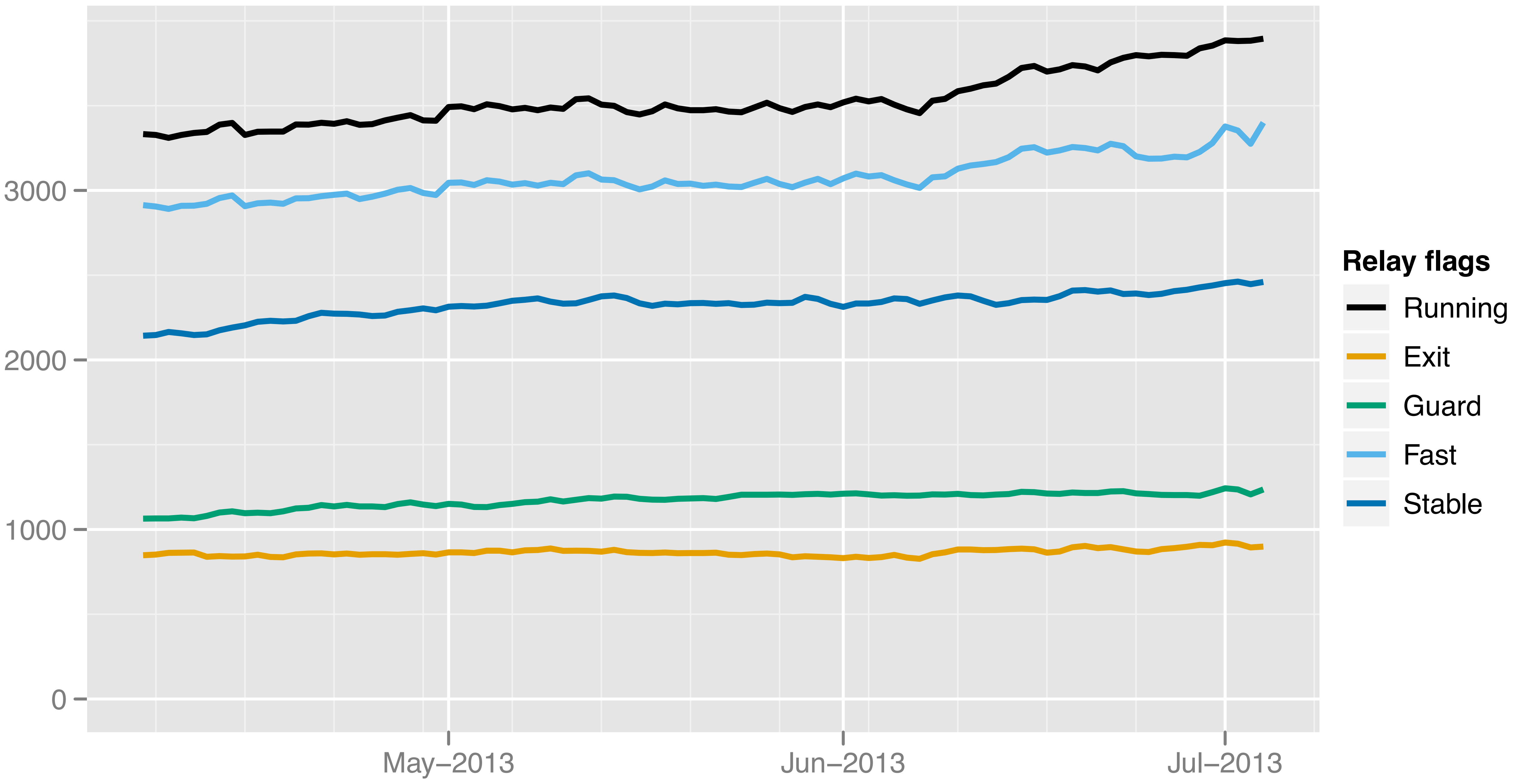
So it’s all good?

- China
- Russia
- Eastern European botnet

Network diversity

- Different relays owned by different people in different data centers in different parts of the world

Number of relays with relay flags assigned



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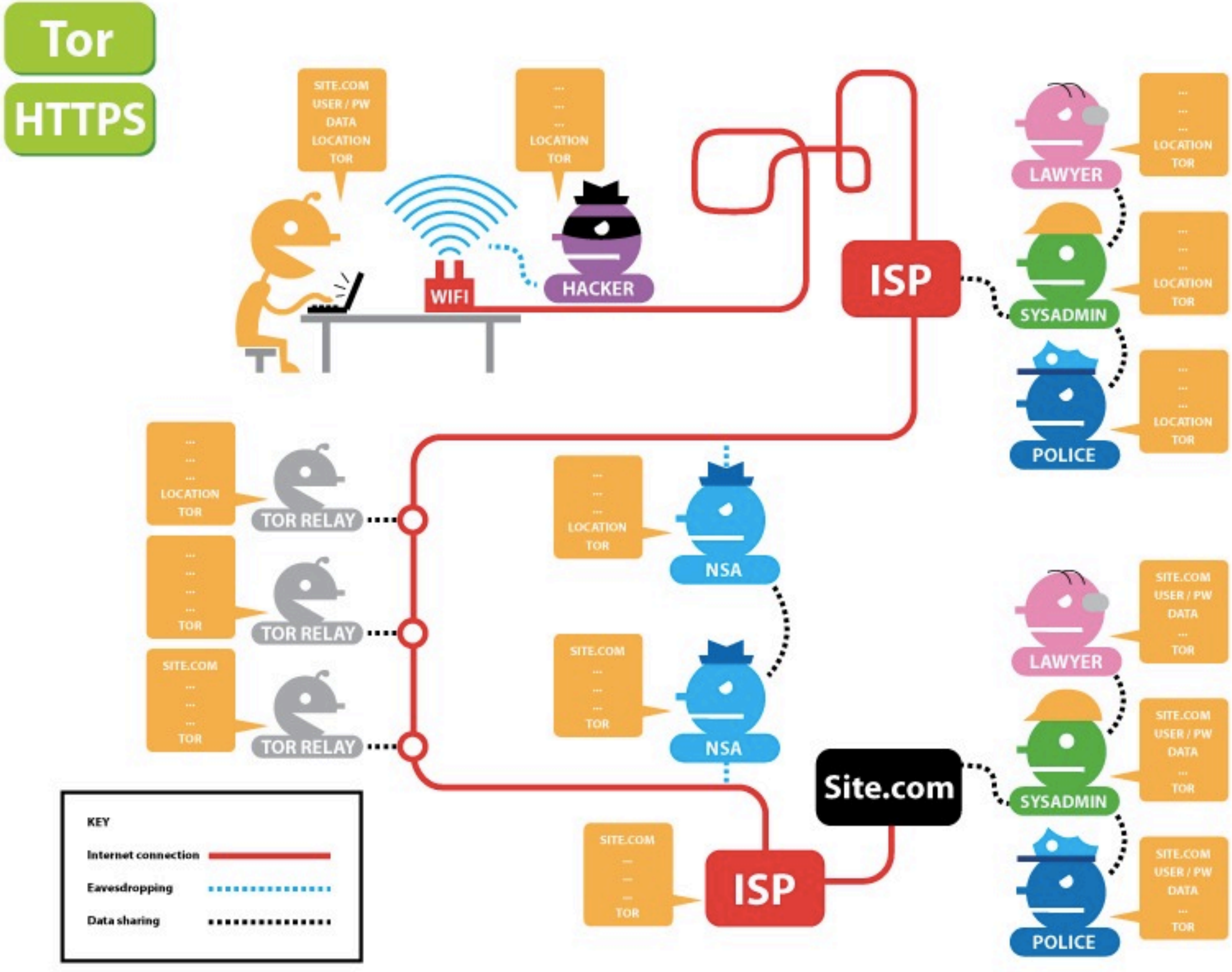

From https://www.eff.org/pages/tor-and-https

Malicious relays

- SSL MITM
- sslstrip
- Plaintext only exit policy
- Anti-virus filter blocking sites
- Dropping TLS connections for multiple sites

Snakes on a Tor (SoaT)

- Scans the Tor network for misbehaving and misconfigured exit relays
- Several tests, including HTML, javascript, arbitrary HTTP, SSL, DNS scans
- A number of relays banned since 2010, but SoaT is currently not maintained

How to ban a relay

- *BadExit* flag set by directory authorities
- 36,356 unique IP addresses, tied to 264 unique nicknames, with the *BadExit* flag

Where do we go from here?