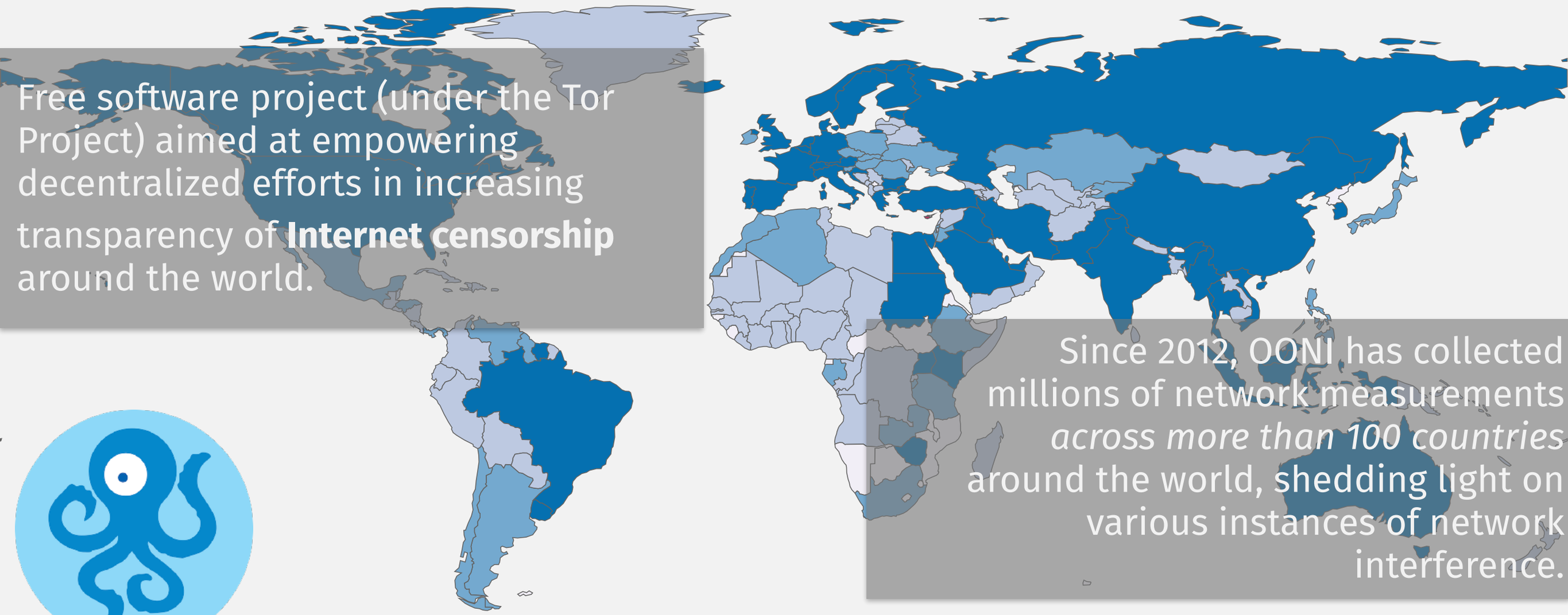
Uncovering Internet Censorship

International Journalism Festival, 6th April 2017

Arturo Filastò & Maria Xynou



Free software project (under the Tor Project) aimed at empowering decentralized efforts in increasing transparency of **Internet censorship** around the world.

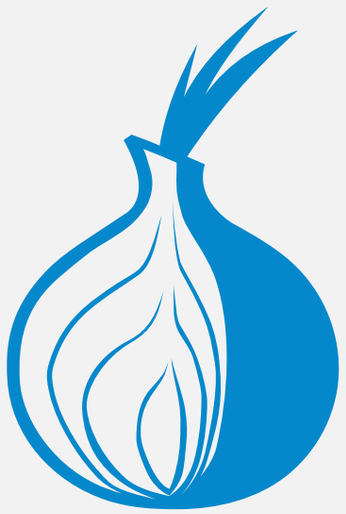
Since 2012, OONI has collected millions of network measurements *across more than 100 countries* around the world, shedding light on various instances of network interference.

https://ooni.torproject.org

OONI: Open Observatory of Network Interference

Blocking of websites

Blocking of instant messaging apps



Blocking of censorship circumvention tools

Detection of middle boxes

Measurement of network speed & performance

OONI Software Tests

Recent cases

WhatsApp blocked in Brazil

May 2016

https://ooni.torproject.org/post/brazil-whatsapp-block/

Social media blocked in Uganda

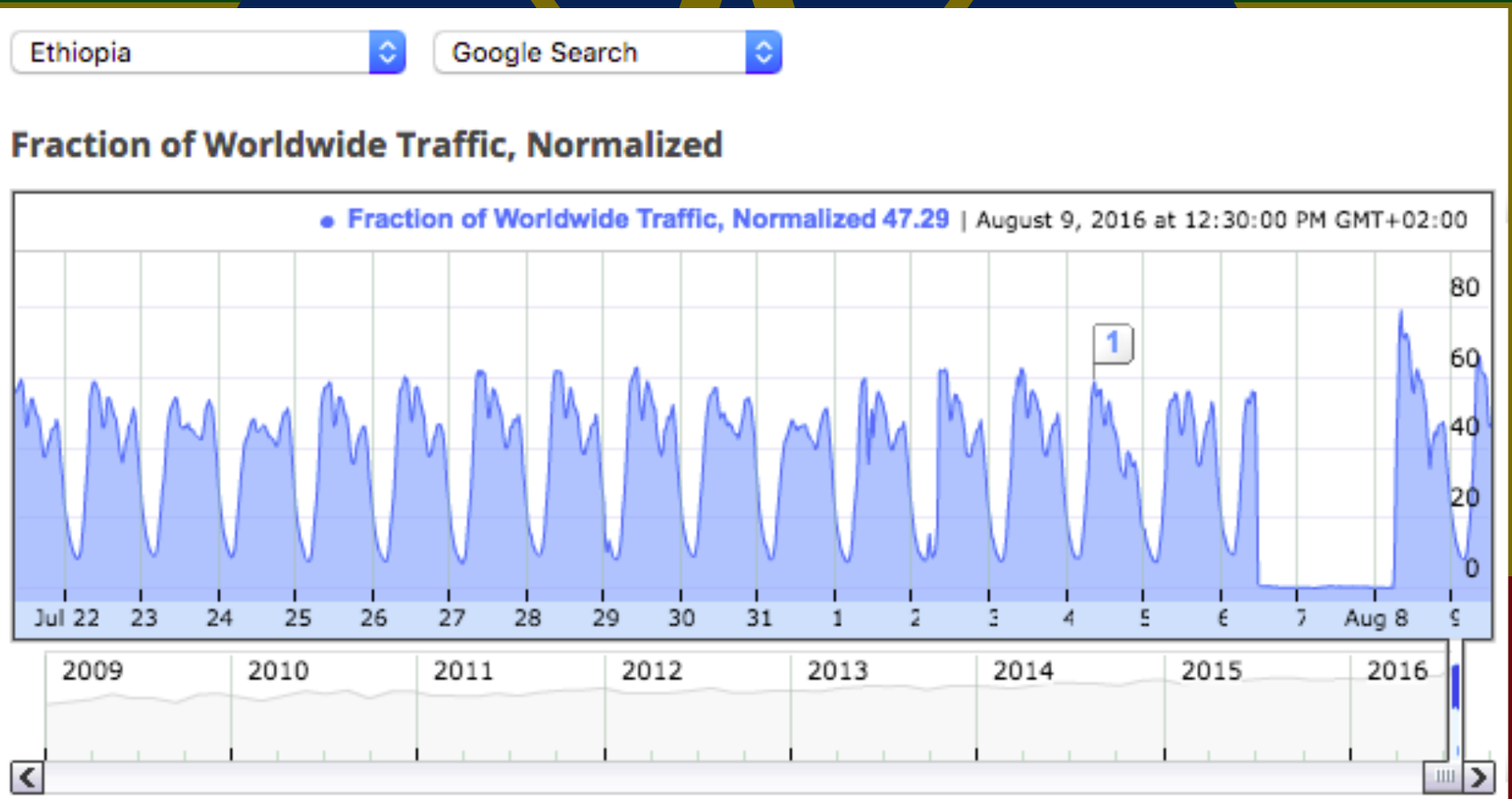
May 2016

Site	Smile Telecom	Orange
http://facebook.com	Blocked	Blocked
https://facebook.com	Blocked	Not blocked
http://twitter.com	Blocked	Blocked
https://twitter.com	Blocked	Not blocked
http://whatsapp.com	Blocked	Not blocked
http://viber.com	Blocked	Not blocked

https://ooni.torproject.org/post/uganda-social-media-blocked/

Internet shutdown in Ethiopia

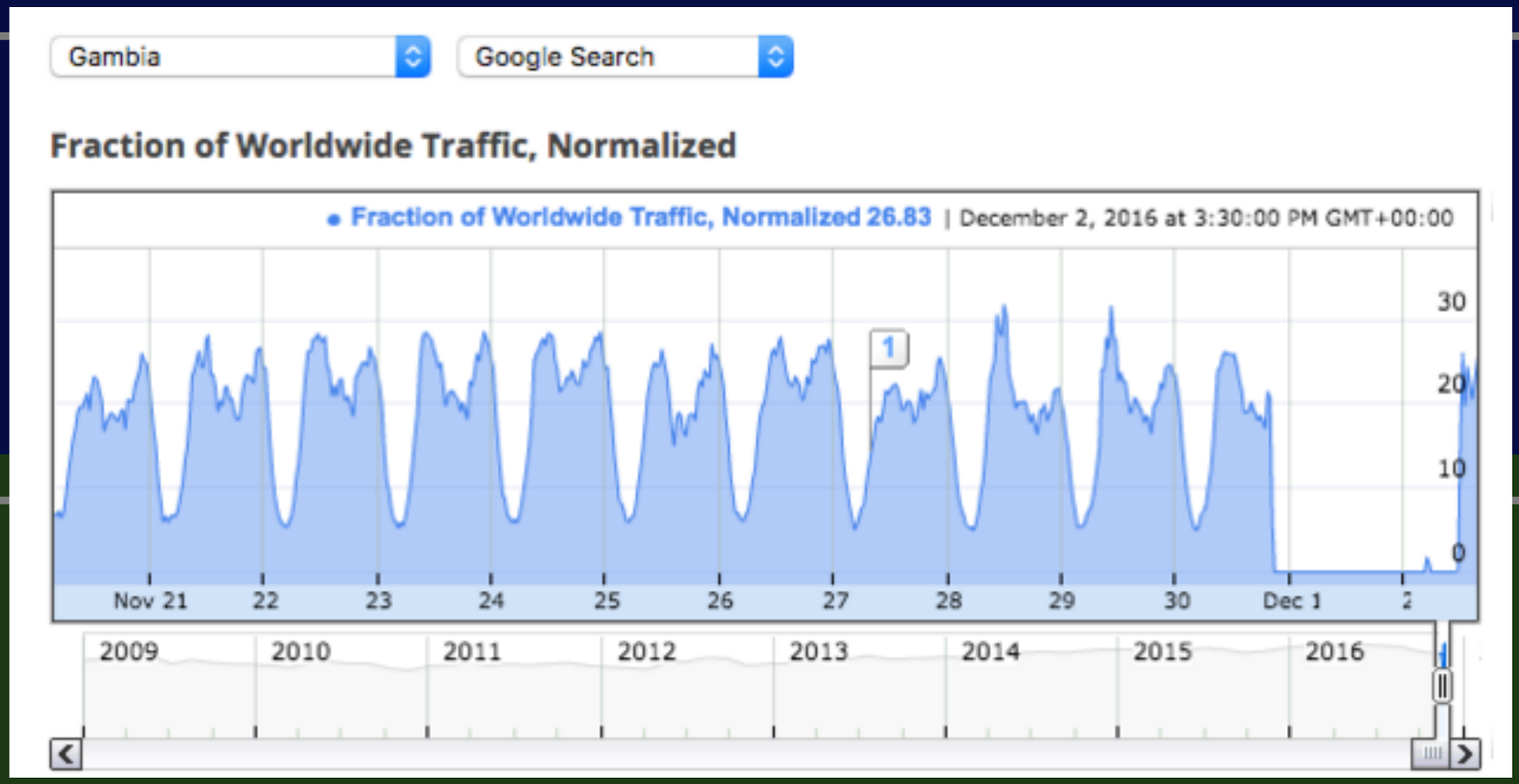
August 2016



https://ooni.torproject.org/post/ethiopia-internet-shutdown-amidst-recent-protests/

Internet shutdown in the Gambia

December 2016



https://ooni.torproject.org/post/gambia-internet-shutdown/

Internet censorship events in Ethiopia

December 2016

WhatsApp found to be blocked

Deep Packet Inspection (DPI) detected

Media outlets, LGBTI sites, human rights websites, political opposition sites & circumvention tool sites found to be blocked

https://ooni.torproject.org/post/ethiopia-report/

Internet censorship in Malaysia

December 2016

39 websites found to be blocked through the DNS injection of block pages

News outlets, blogs, and medium.com blocked for covering the 1MDB scandal

https://ooni.torproject.org/post/malaysia-report/

Internet censorship in Thailand

March 2017

Blocked sites include:

News outlets (nypost.com & dailymail.co.uk**)**
wikileaks.org
Circumvention tool sites (e.g. hotspotshield.com**)**

https://ooni.torproject.org/post/thailand-internet-censorship/

Internet censorship in Myanmar

March 2017

The sites of the U.S embassy in Myanmar and of the Organization of American States (OAS) presented strong signs of TCP/IP and HTTP blocking.

Blue Coat software was detected by ooniprobe in 2012. No signs of this software appeared to currently be present in the 6 networks where tests were recently run.

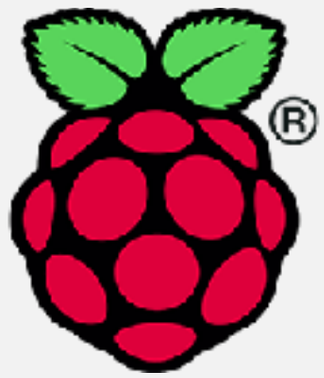
https://ooni.torproject.org/post/myanmar-report/

Linux or macOS

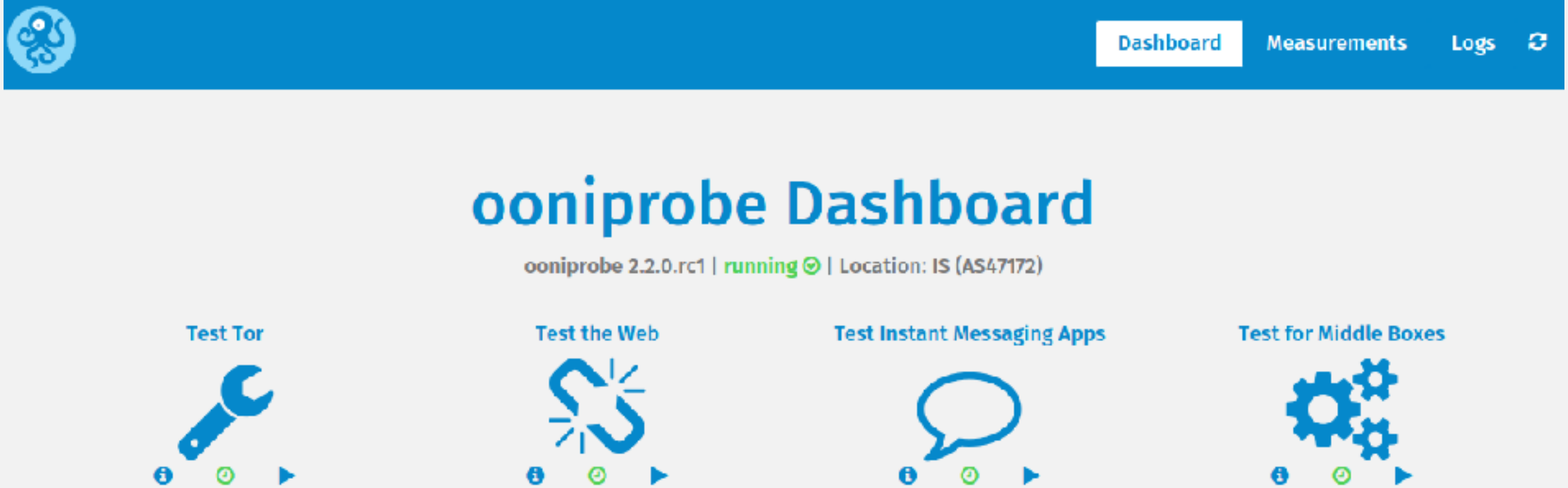
Android

iOS

RaspberryPi

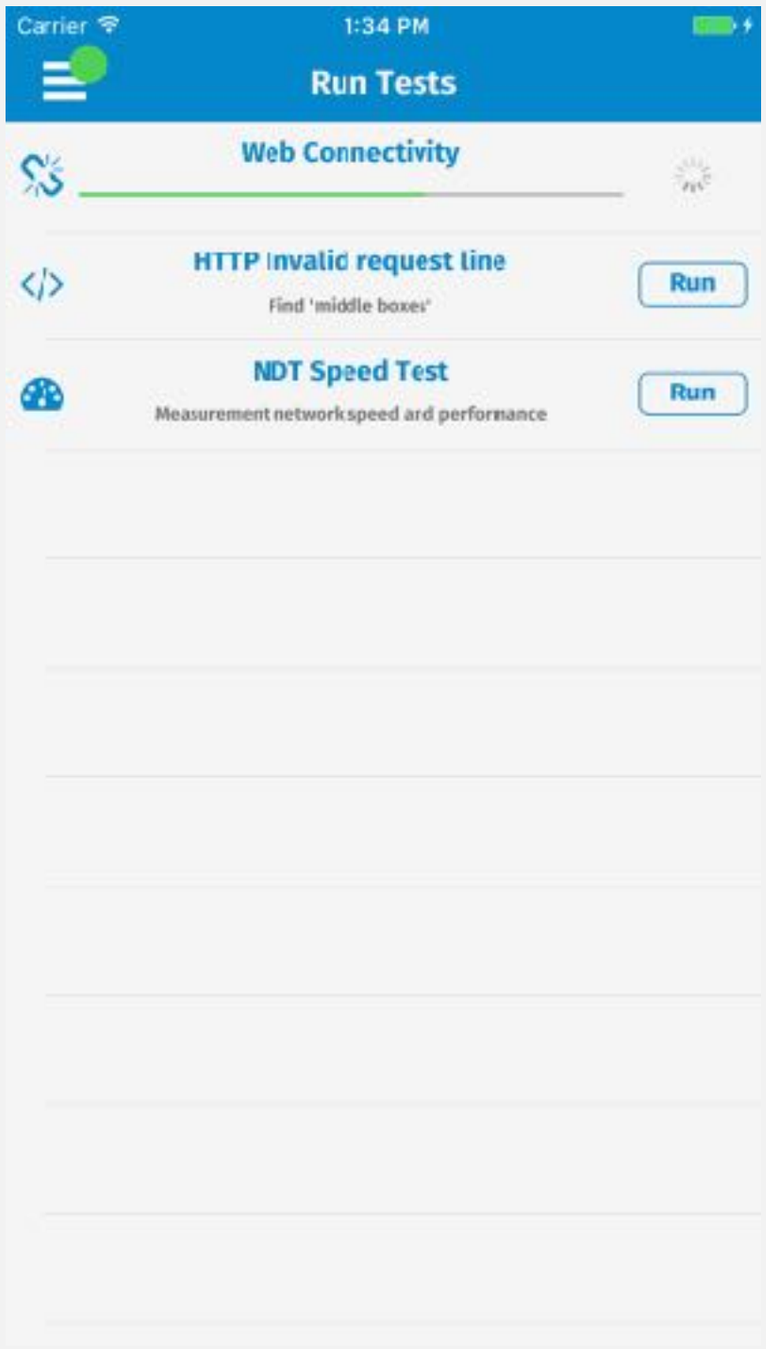


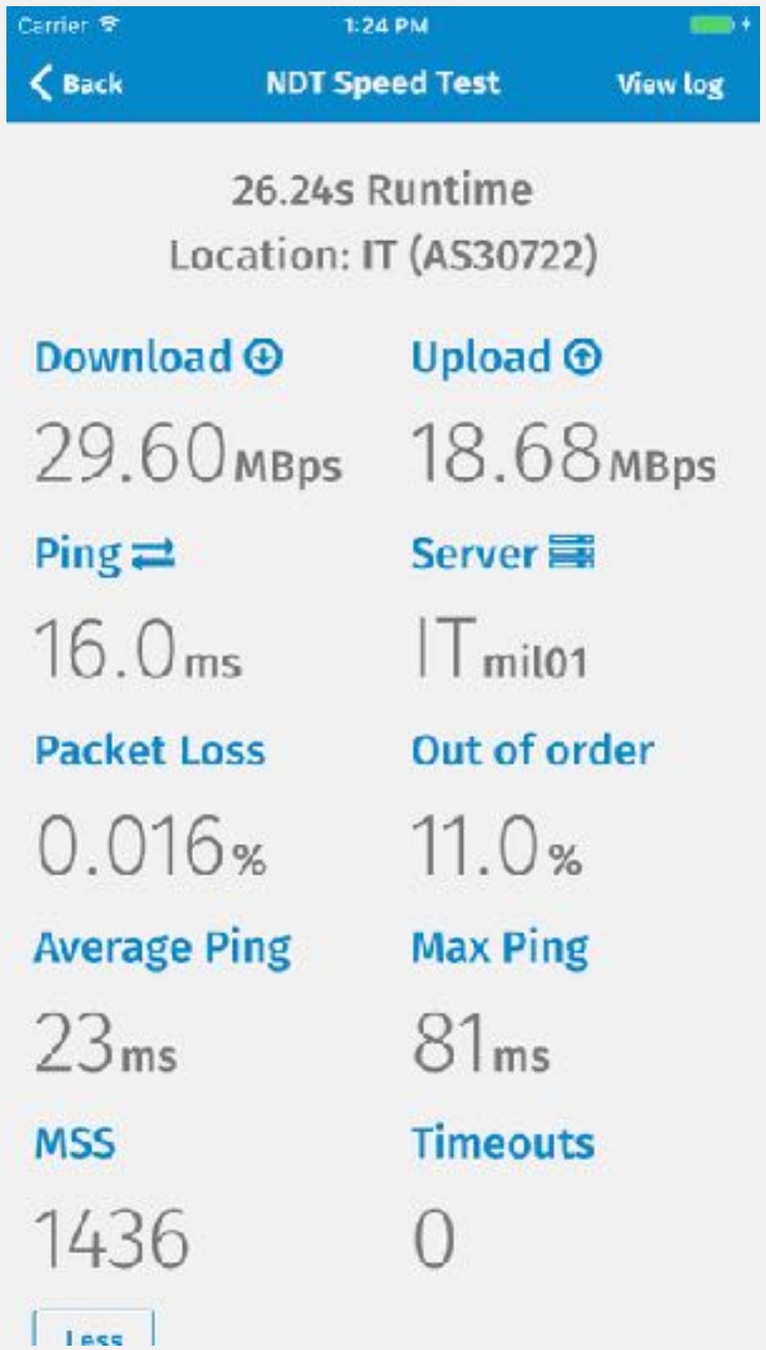
Running ooniprobe



ooniprobe web user interface

ooniprobe on RaspberryPi





ooniprobe mobile app

- Anyone monitoring your internet activity (e.g. ISP) will know that you are running ooniprobe.

- Types of URLs tested include provocative or objectionable sites (e.g. pornography).

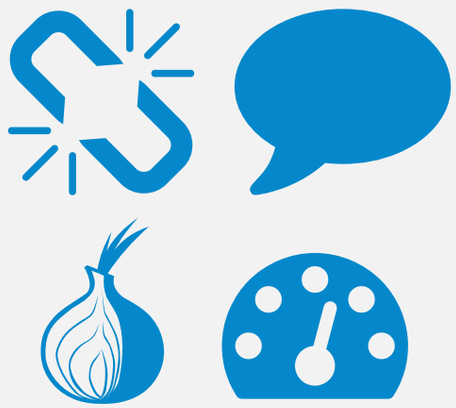
- OONI's “HTTP invalid request line” test could be viewed as a form of “hacking”.

- The use of ooniprobe might potentially be viewed as illegal or anti-government activity.

  https://ooni.torproject.org/about/risks/

Risks: ooniprobe is a tool for investigations!

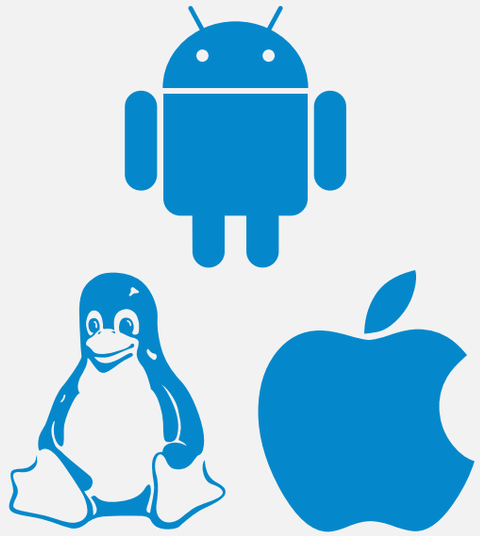
Contribute to test lists



Types of test to run

Privacy settings

How you upload data



Platform for running ooniprobe

Choices you can make

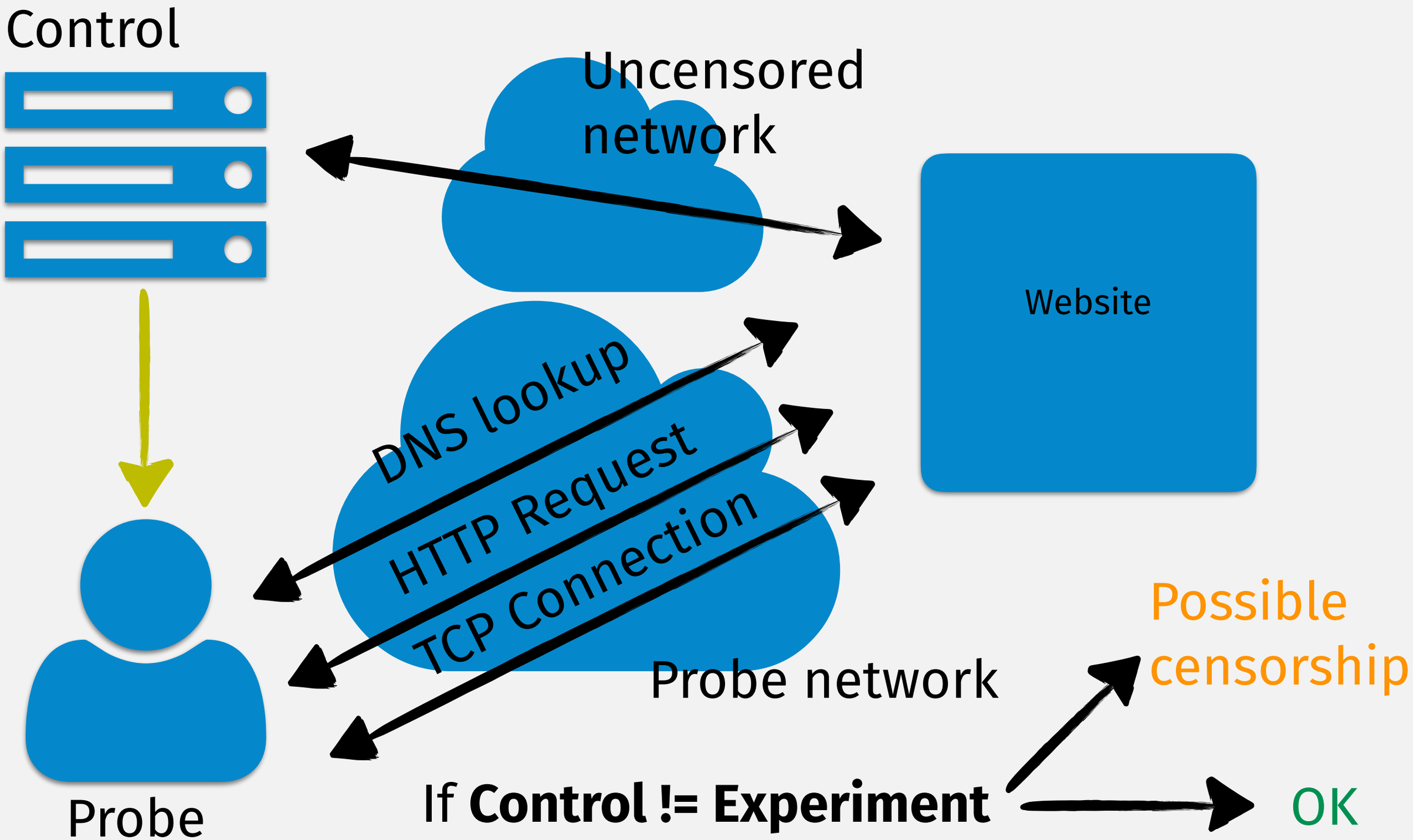
- **Global list**: Internationally relevant websites

- **Country-specific lists**: Websites that are relevant to a specific country

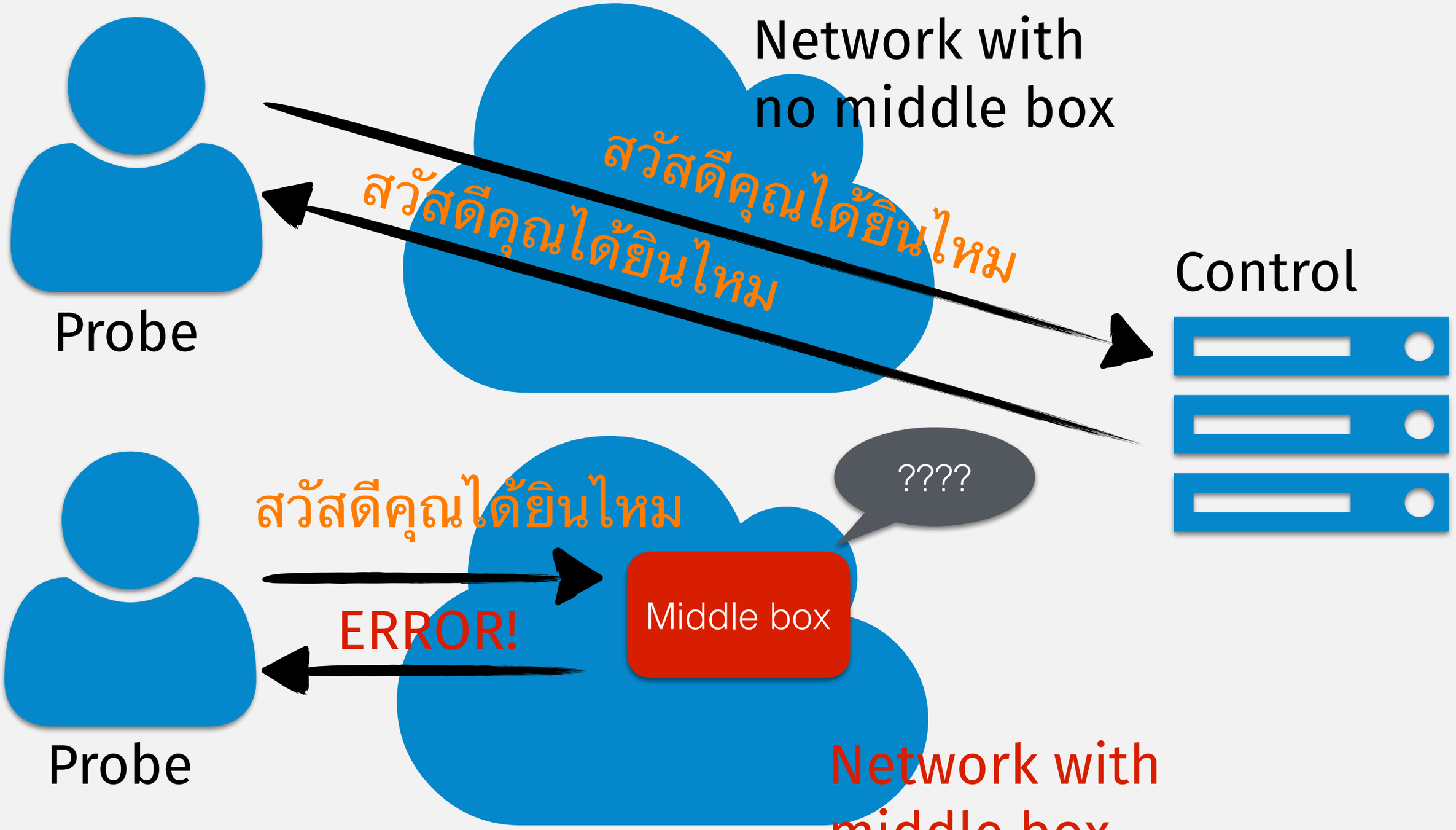
- How to contribute to test lists: https://ooni.torproject.org/get-involved/contribute-test-lists/

- Citizen Lab github repo: https://github.com/citizenlab/test-lists

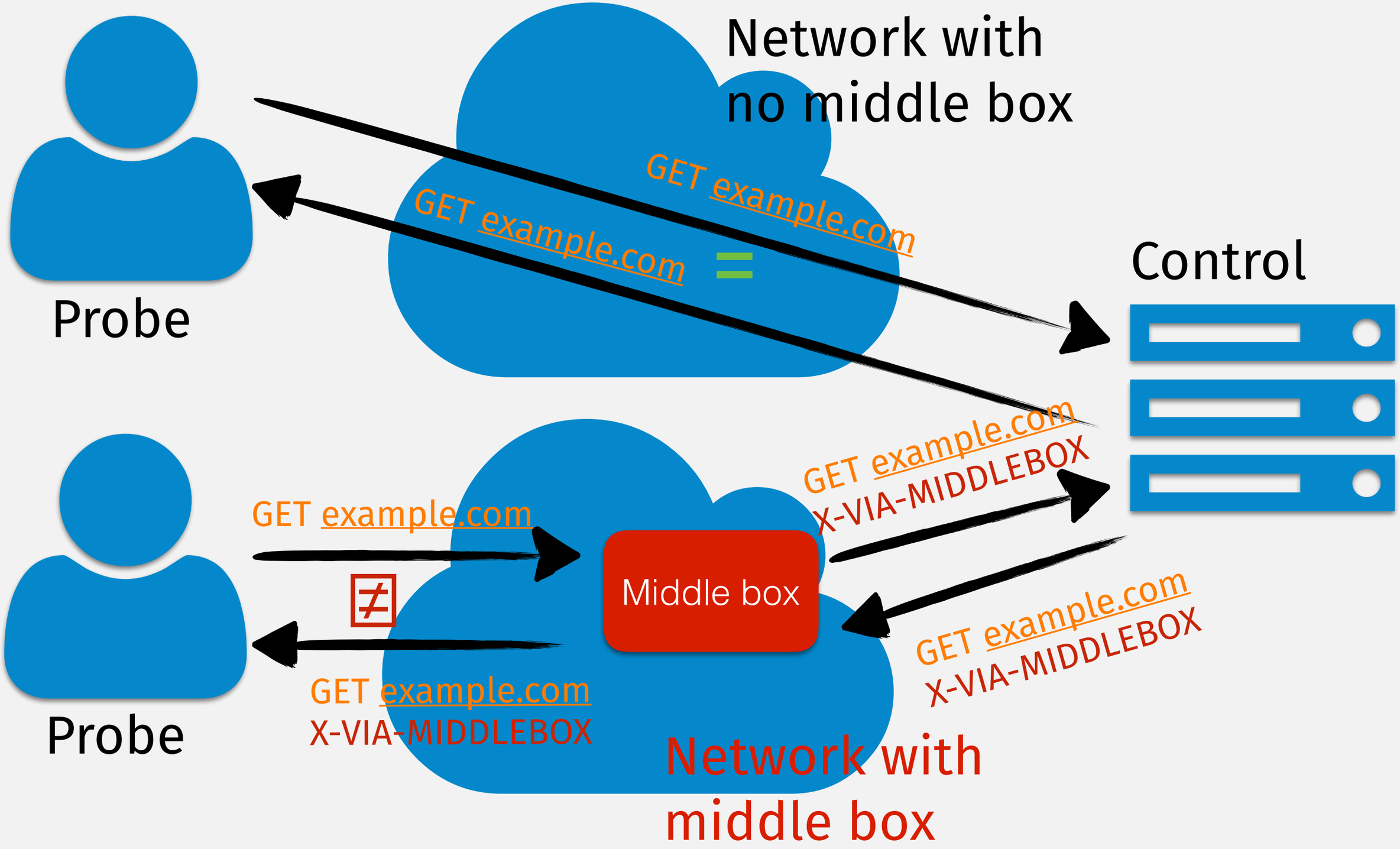
Test lists: Determining which sites to test for censorship



Web Connectivity



HTTP Invalid Request Line



HTTP header field manipulation

- OONI has detected the presence of filtering technology across various countries around the world.

- However, not all proxy technologies are used for censorship and/or surveillance. Often, proxy technologies are, for example, used for caching purposes.

Middle boxes: Good or Bad?

- Country code (e.g. BR for Brazil)
- Autonomous System Number (ASN)
- Date & time of measurements
- Network measurement data (depending on the type of test)
- Note: IP addresses & other potentially identifying information might unintentionally be collected.
- OONI Data Policy: https://ooni.torproject.org/about/data-policy/

Data ooniprobe collects

- Tor hidden services (recommended!)
- HTTPS collectors
- Cloud-fronting

Uploading data to OONI servers

- **Evidence** of censorship events
- **Transparency** of global internet controls
- Allows researchers to conduct **independent studies** & to explore other research questions
- Allows the public to **verify** OONI's findings

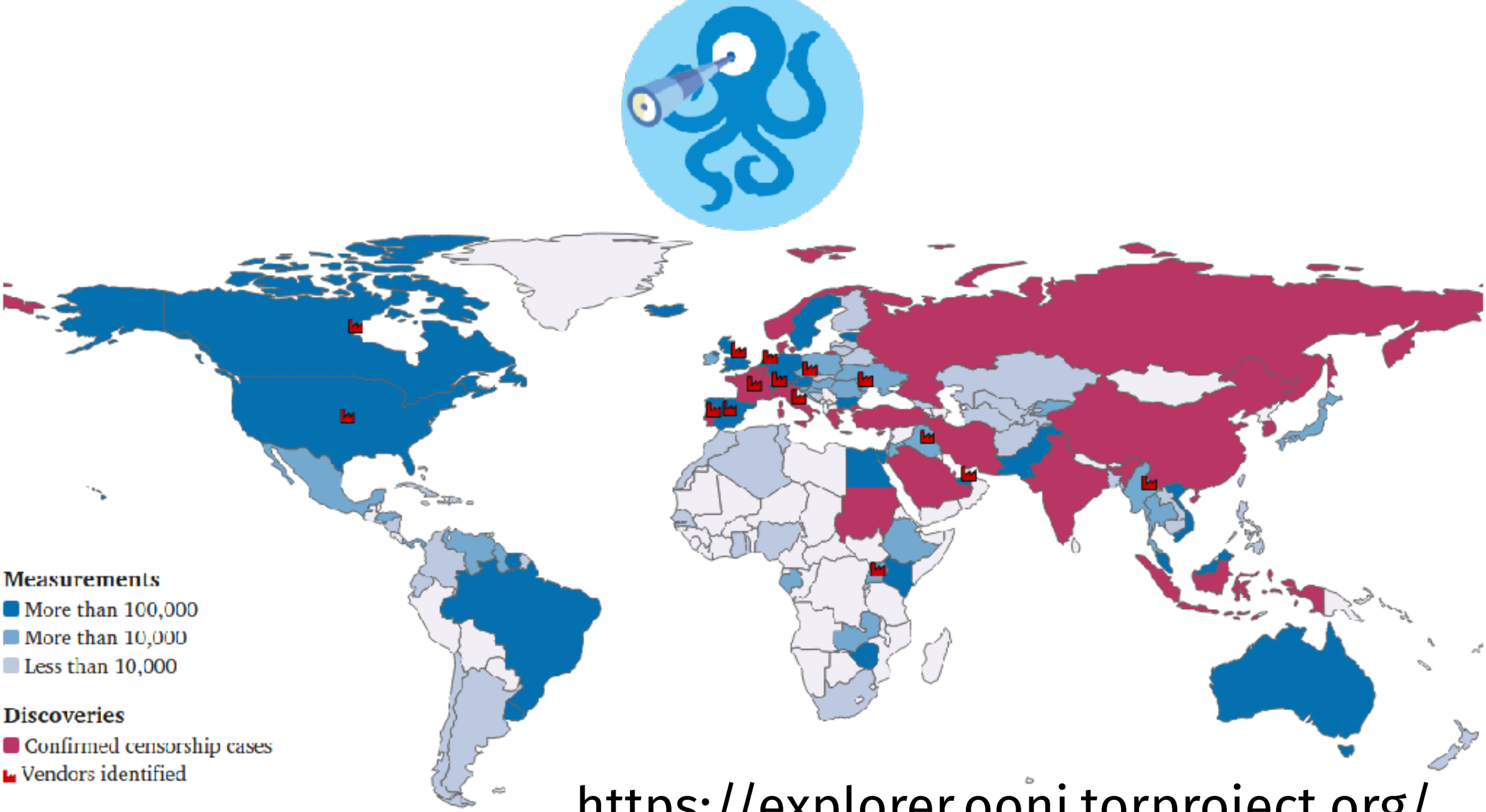
Open Data

- **Legality:** Can the blocking of specific types of sites and services be legally justified?

- **Circumvention tool strategies:** When and where should censorship circumvention tools be promoted the most?

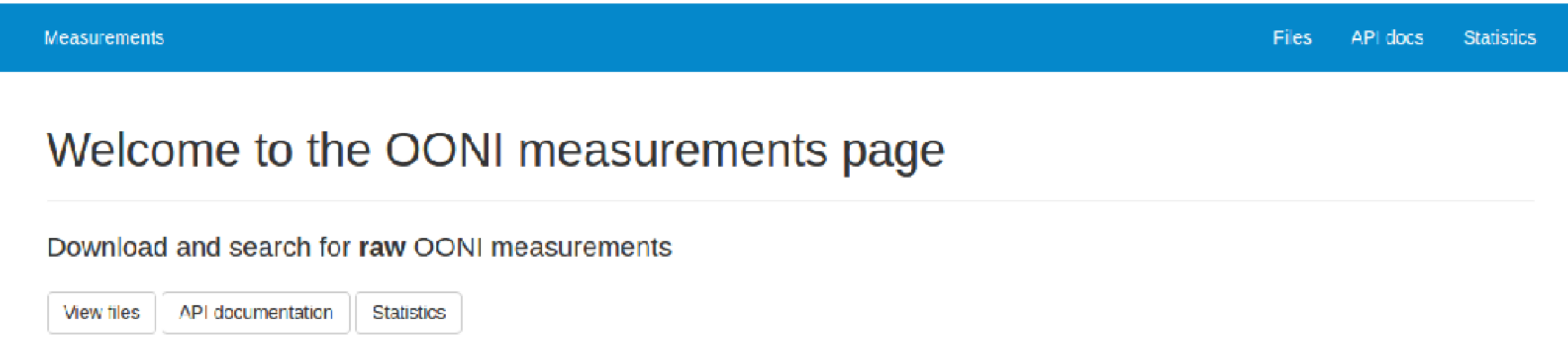
- **Story-telling & Advocacy:** Where are censorship events occurring and what is their impact on human rights?

Open Data



https://explorer.ooni.torproject.org/

OONI Explorer



https://measurements.ooni.torproject.org/

Measurement API

- “Normal” and “anomalous” measurements.
- “Anomalous” measurements MIGHT contain evidence of censorship, but not necessarily (i.e. false positives).
- We only confirm a case of censorship when we have detected a **block page**.

Interpreting the data

- OONI Partnership Program
- Monthly community meetings on https://slack.openobservatory.org
- Run ooniprobe
- Contribute to test lists
- Analyze the data
- Tell stories
- Host an OONI workshop, spread the word! :)

Get involved!

- **OONI:** https://ooni.torproject.org/
- **OONI Explorer:** https://explorer.ooni.torproject.org/
- **Download raw measurements:** https://measurements.ooni.torproject.org/
- **Software:** https://github.com/TheTorProject/ooni-probe
- **Contact the OONI team:**
  contact@openobservatory.org
  Twitter: @OpenObservatory
  IRC: #ooni (irc.oftc.net) - https://slack.openobservatory.org/

Resources & contacts