



OONI

Internet Censorship Measurements

University of Cape Town, 16th February 2018

WHY MEASURE INTERNET CENSORSHIP?

- It's harder to notice the blocking of less popular sites and services.
- Internet censorship often differs from network to network within a country.
- Most censorship techniques are quite subtle.
- Cases of over-blocking, collateral damage, and censorship leakages.
- The fact that a site or service is inaccessible doesn't necessarily mean that it's blocked by your ISP.



OONI

**The Open Observatory of
Network Interference**

OONI IS
OPEN METHODOLOGIES
OPEN SOURCE SOFTWARE
OPEN DATA
FOR REPRODUCIBLE
RESEARCH!



WhatsApp Blocked

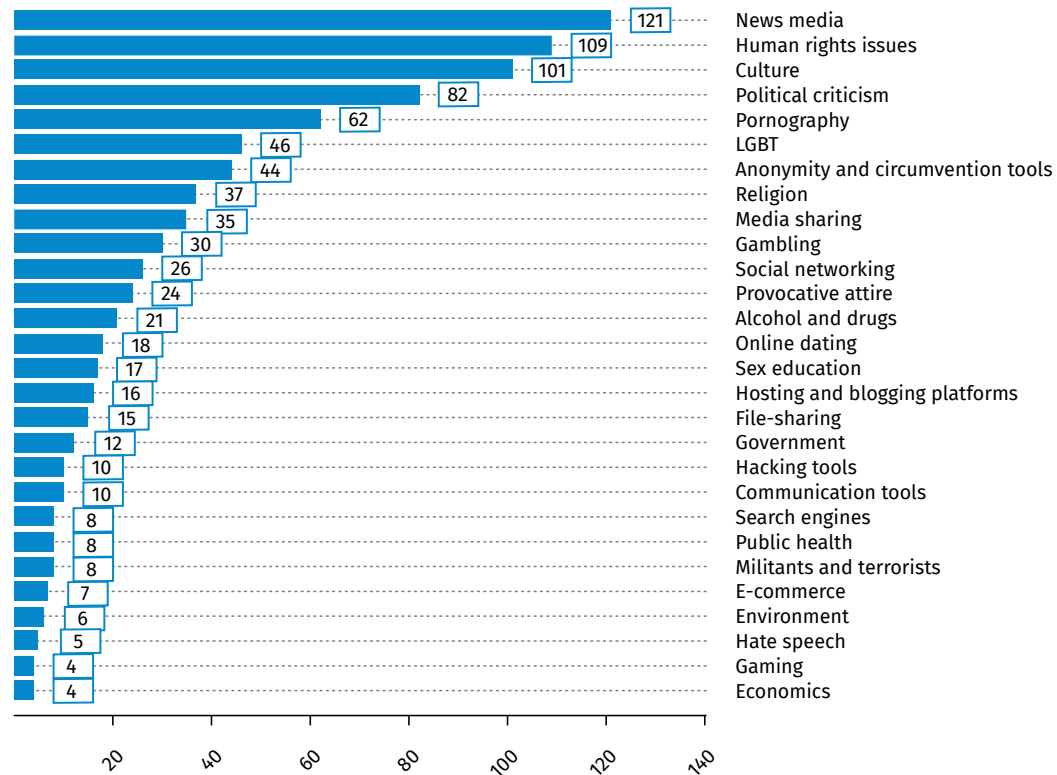
Deep Packet Inspection (DPI) detected

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

Ethiopia's wave of political protests

December 2016

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



Blocked domains in Iran

From 2014 to 2017

September 2017

<https://ooni.torproject.org/post/iran-internet-censorship/>

At least 25 websites related to the Catalonia Independence Referendum were blocked.

The .cat registry was raided and forced to take down many websites.

Spain

October 2017

<https://ooni.torproject.org/post/internet-censorship-catalonia-independence-referendum/>

OONI SOFTWARE ECOSYSTEM



OONI

Probe



OONI

Run



OONI

Explorer



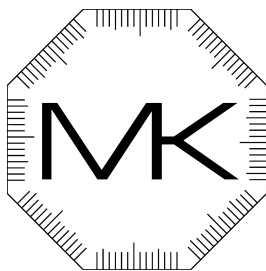
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Proteus



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Sync



Measurement Kit



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API



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Pipeline

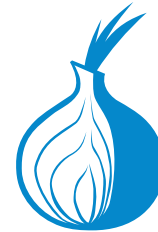
OONI Software tests



Web Censorship



Instant Messaging Apps



Censorship Circumvention



Middleboxes



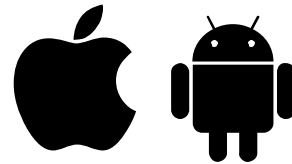
Speed & Performance



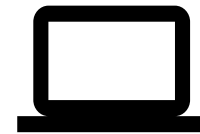
OONI

Probe

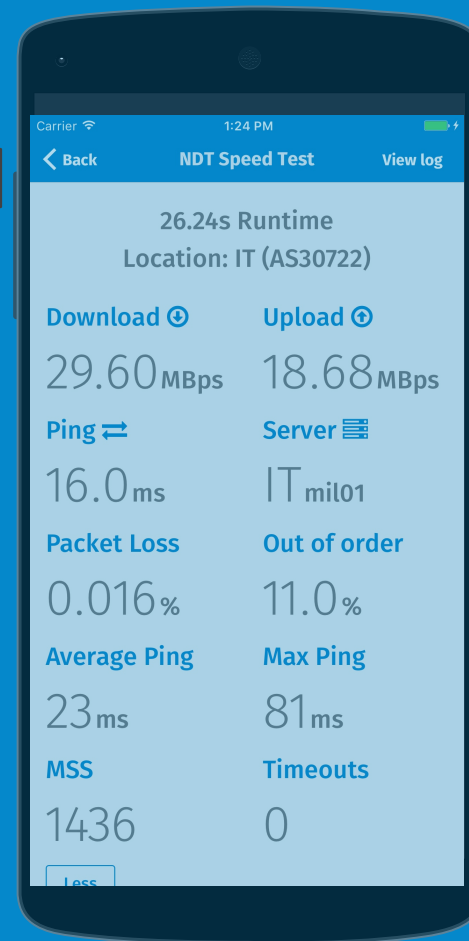
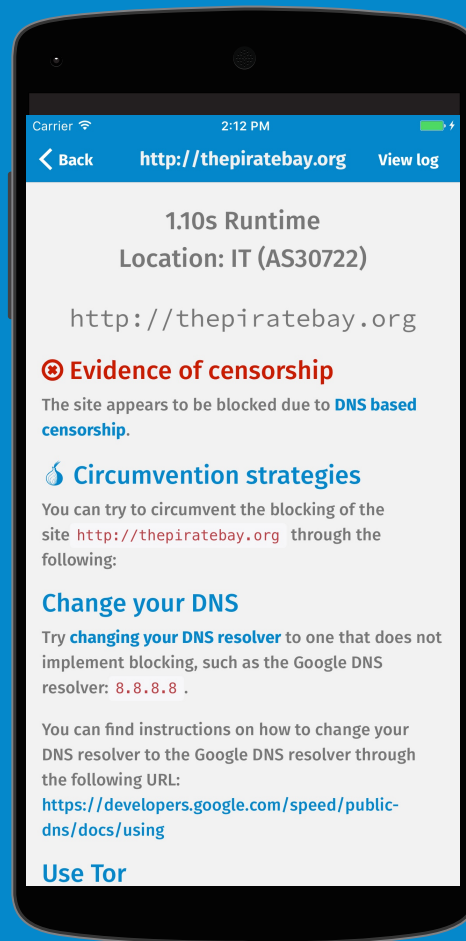
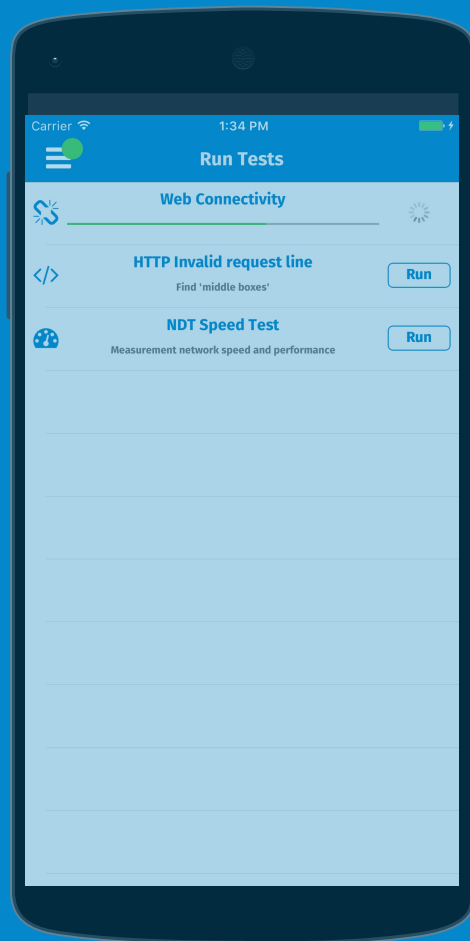
MEASUREMENT APP FOR



Android
iOS



macOS
Linux



OONI Probe Dashboard

ooniprobe 2.2.1-dev | **running**  | Location: IS (AS47172)

Test Tor



Test the Web



Test Instant Messaging Apps



Test for Middle Boxes



Last 4 tests

 telegram

Dec 23, 2017 3:14 AM

AS47172

IS



 facebook_messenger

Dec 23, 2017 3:14 AM

AS47172

IS



 whatsapp

Dec 23, 2017 3:10 AM

AS47172

IS



 tcp_connect

Dec 23, 2017 3:05 AM

AS47172

IS



[View your measurements](#)

OPEN DATA



OONI | Pipeline

Provides **evidence** of censorship events



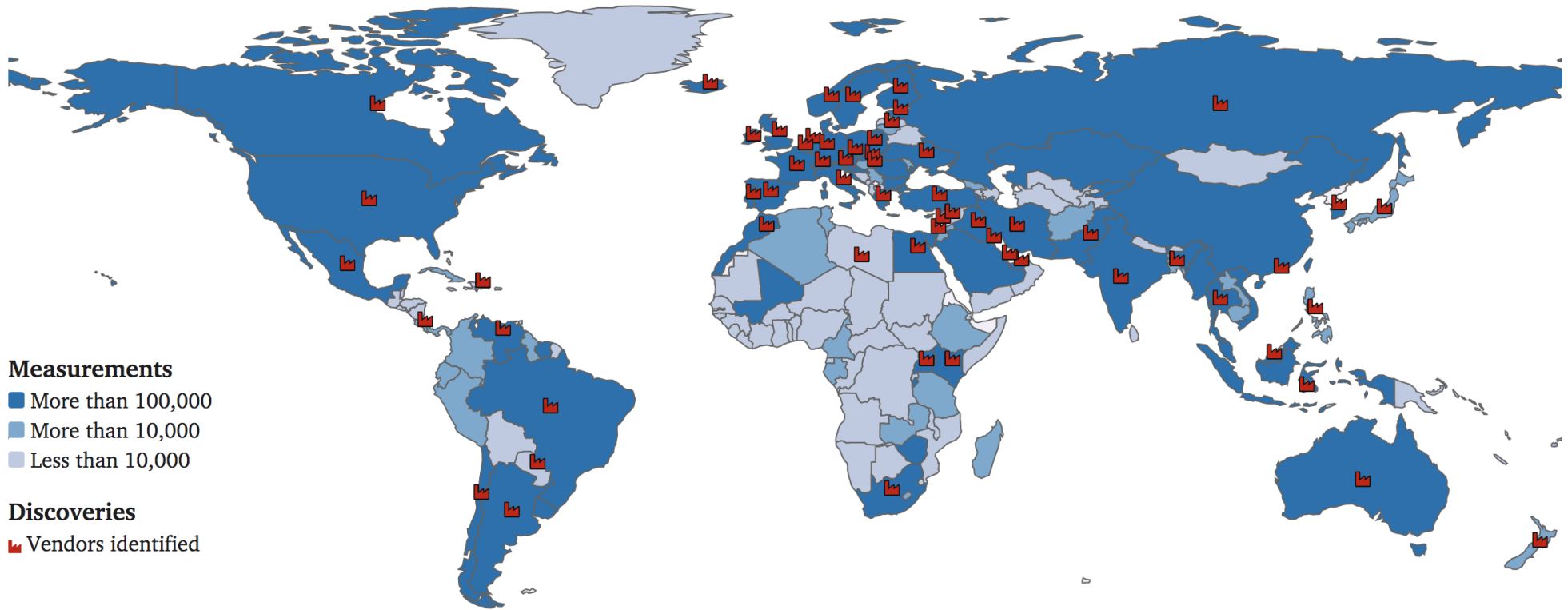
OONI | API

Allows researchers to conduct **independent studies** & to explore other research questions



OONI | Explorer

Allows the public to **verify** our findings



Country List

Browse countries to find the one you want to investigate measurements for

Filter Country

<https://explorer.ooni.io>



Afghanistan

24,756

measurements



Albania

8,450

measurements



Algeria

36,756

measurements



Andorra

142



Angola

1,848



Antigua And Barbuda

47



[Files](#) [API docs](#) [Statistics](#)

Welcome to the OONI API

Dynamically updated every day, the OONI API enables researchers and data scientists to analyze all data collected from OONI Probes around the world.

Download and search [OONI Probe](#) network measurements.

Join the OONI data analyst community and help uncover internet censorship worldwide!

[READ THE API DOCS](#)

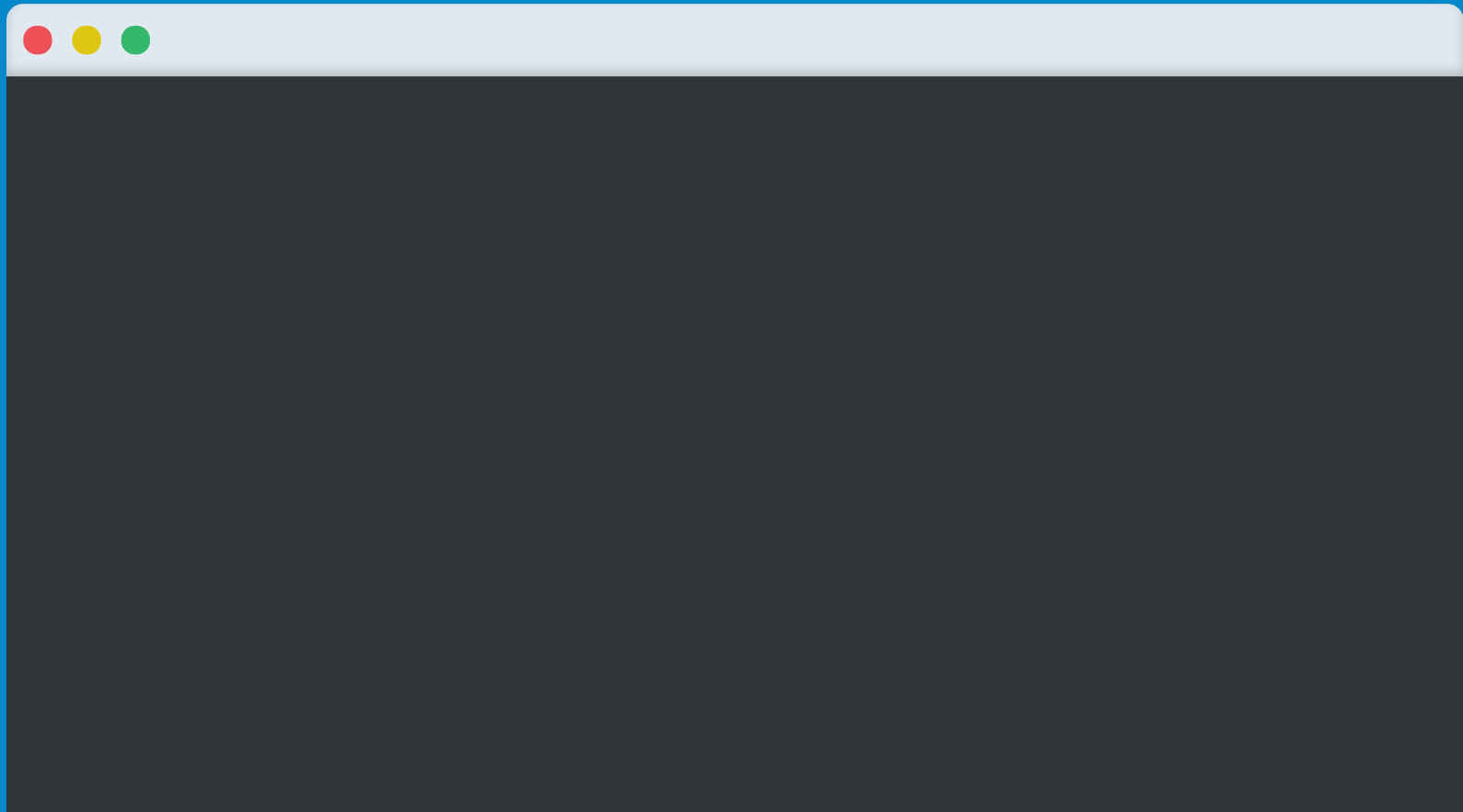
Latest Measurements

ASN	Country code	Test Start Time	Test Name	
AS9121	TR	2018-01-04 21:32:10	ndt	Download
AS15895	UA	2017-12-30 05:49:02	ndt	Download
AS15895	UA	2017-12-30 01:46:11	ndt	Download
AS5438	TN	2017-12-29 11:14:18	ndt	Download
AS197207	IR	2017-12-28 16:35:15	ndt	Download
AS4818	MY	2017-12-28 01:59:24	ndt	Download

MINING OONI DATA

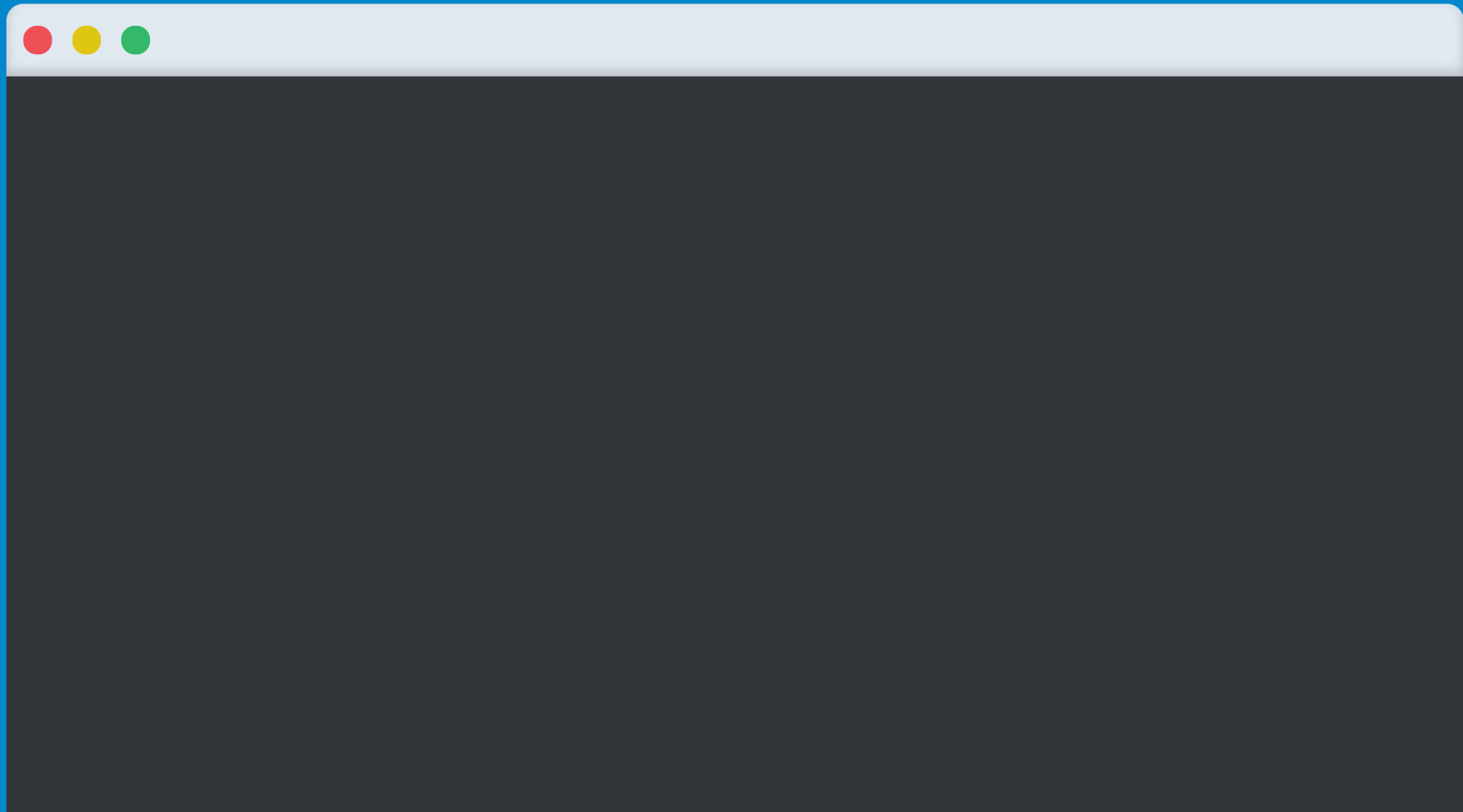
<https://ooni.torproject.org/post/mining-ooni-data/>

OONI-SYNC



<https://github.com/thetorproject/ooni-sync>

AWS S3



<https://aws.amazon.com/cli/>

**READ THE
SOURCE
LUKE**



Essential tools

```
11. import requests
12. try:
13.     from urllib.parse import urlparse
14.     from urllib.request import urlopen
15. except ImportError:
16.     from urllib import urlopen
17.     from urlparse import urlparse
18.
19. # Date parsing
20. from dateutil.parser import parse as parse_date
21.
22. # For dealing with ASN data (optional)
23. import pyasn
24. import radix
25.
26. # Numpy and pandas
27. import pandas as pd
28. import numpy as np
29.
30. # Dask
31. import dask.bag as db
32. import dask.dataframe as dd
33. from dask.delayed import delayed
34. import dask.multiprocessing
35. from dask.diagnostics import ProgressBar
36.
37. # censys (optional)
38. import censys.ipv4 as censsysipv4
39.
40. MEASUREMENT_DIR = 'data/'
41.
42. import re
43. BLOCKPAGES = [
44.     {
45.         'match': [
```

LEARN MORE

- <https://ooni.torproject.org/>
- <https://api.ooni.io/>
- <https://explorer.ooni.io/>

Contacts

- <https://slack.openobservatory.org/>
- contact@openobservatory.org