Technical multi-stakeholder report on Internet shutdowns: The case of Iran amid autumn 2022 protests

Contributors:
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Trade and Technology Council Follow-Up Event
20th December 2022

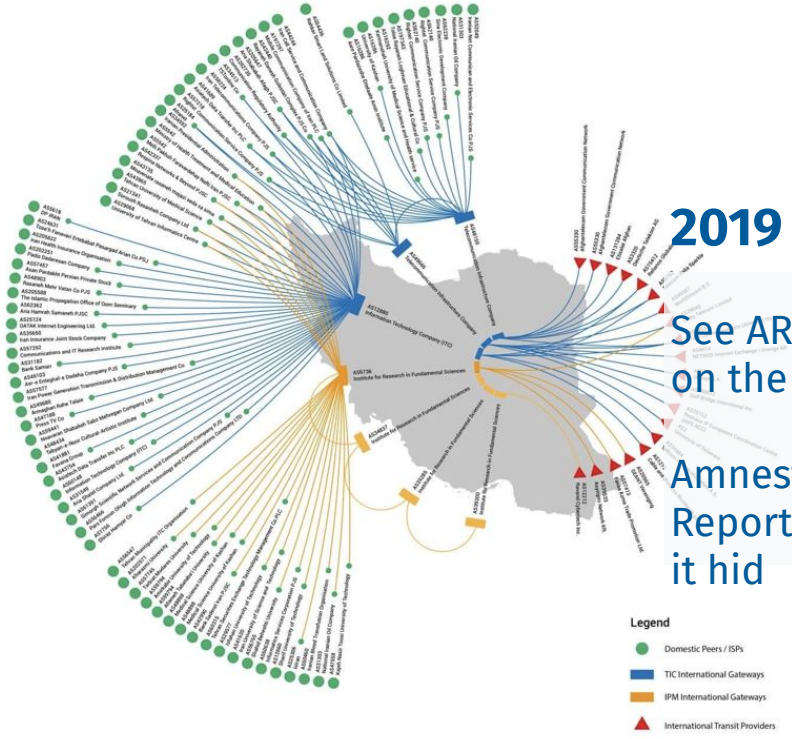
IRANIAN INTERNET INFRASTRUCTURE MAP 2019

Domestic Peers / ISPs
The majority of the connections we see on this map are the "domestic peers" or domestic Internet Servic Providers (ISPs) that are connecting homes, mobile networks, and institutions to domestic and international networks.
This is the first layer of Internet Service Providers (ISPs) that are connected directly to the international gateways. A second layer smaller ISPs connect through these "first layer" which are major providers, illustrated in this map.

TIC International Gateways
The Telecommunication Infrastructure Company (TIC) is the sole provider of IP communication infrastructure to all private and public operators in the Iran. TIC is also the sole party for all international gateways and IP capacity and connectivity services in the country. It sits under the Ministry of Information, Communication and Technology (ICT), which oversees all IP communication infrastructure across the country.

IPM International Gateways
Although not as large as the TIC Gateway, this older international gateway from the Institute for research in fundamental sciences (IPM), is the only other international gateway in Iran and serves the Internet to research and educational institutes.

International Transit Providers
International transit providers are companies providing international connectivity to the Iranian network, via the two gateways mentioned above.



2019 Protest Shutdowns

See ARTICLE19's 2020 Tightening the Net repor on the anatomy of the 2019 shutdowns

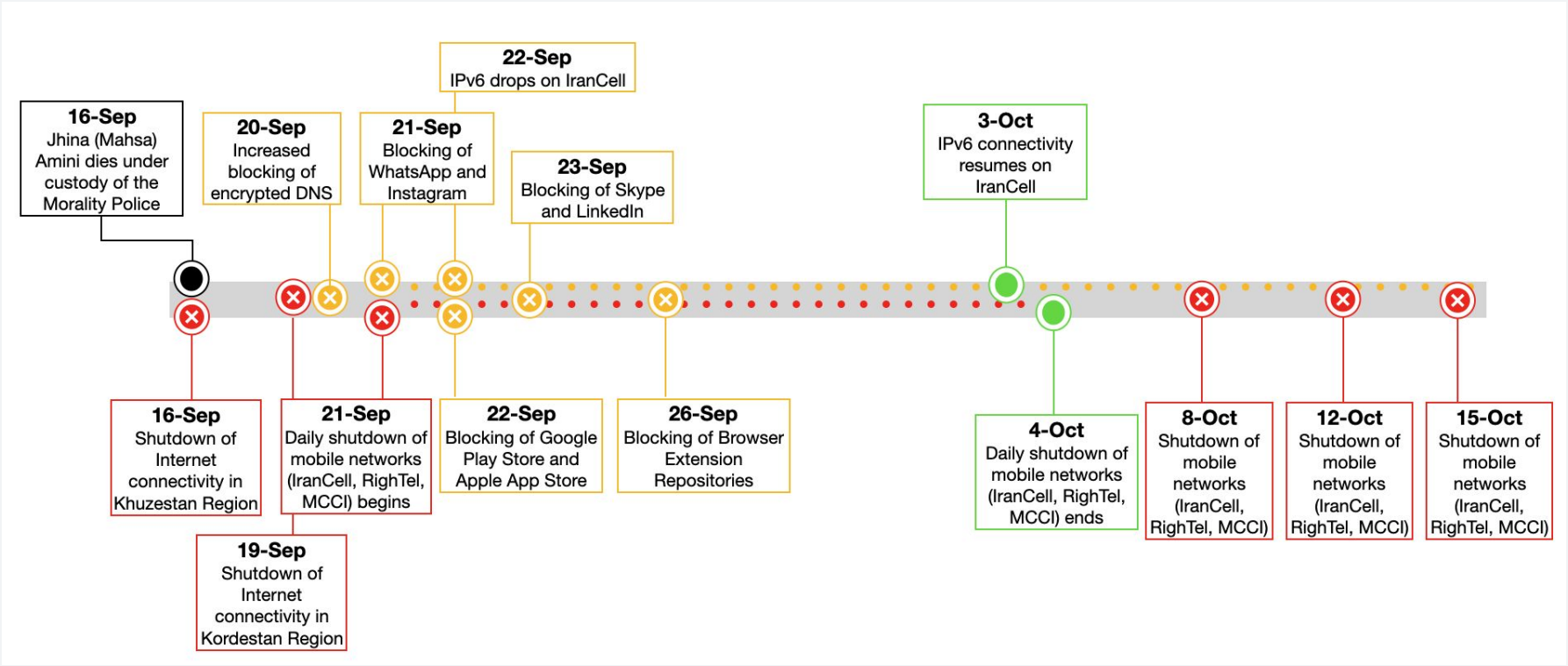
Amnesty International's 2020 Web of Impunity Report on the Shutdowns and the deaths that it hid

Intro: A History of Shutdowns and Information Controls

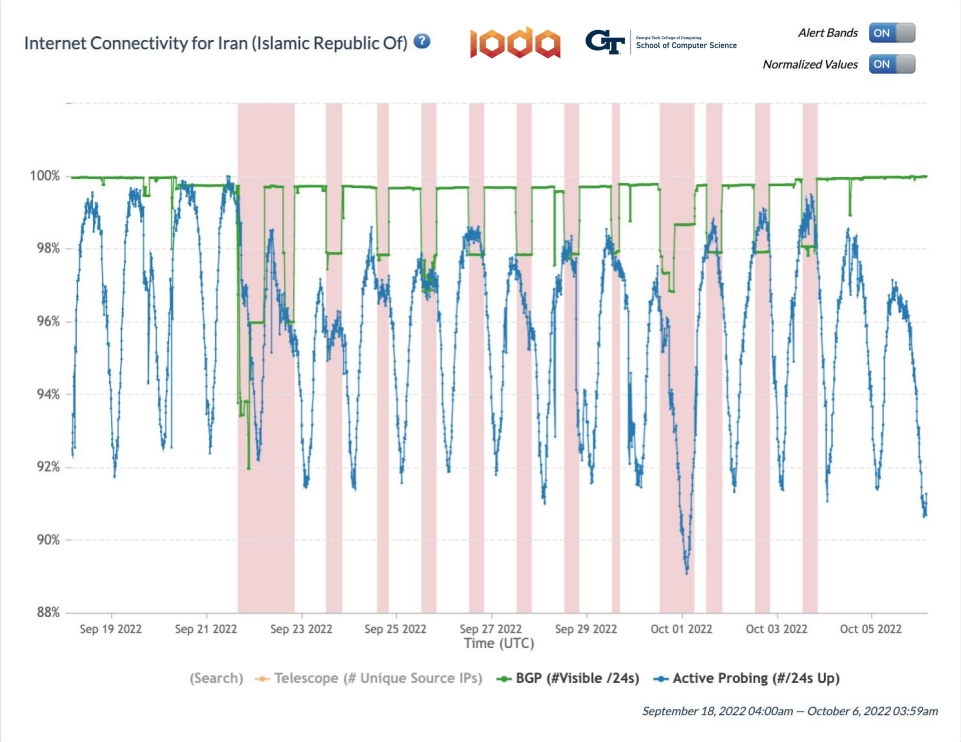
ARTICLE 19

“Possibly, with the aim of implementing the Internet ‘Protection Bill’, and to detect ‘usual and unusual’ traffic, the country’s Internet [flow] is being intensely analysed. ‘Unusual traffic’ is traffic tunnelled through VPNs. The machines used for detecting the type of traffic cannot process this amount of data [simultaneously], and subsequently slow down the traffic, although bandwidth is available in abundance.”
-Anonymous network engineer in Iran, October 2021

Controls and Shutdowns Since 2019



Iran Censorship Timeline of Events: 16 Sep - 16 Oct



Internet Outage Detection and Analysis (IODA) is an open-source project at Georgia Tech that provides measurements of the connectivity of Internet infrastructure at the country, subnational and Internet operator level that is available via a public, online dashboard *(https://ioda.live)*.

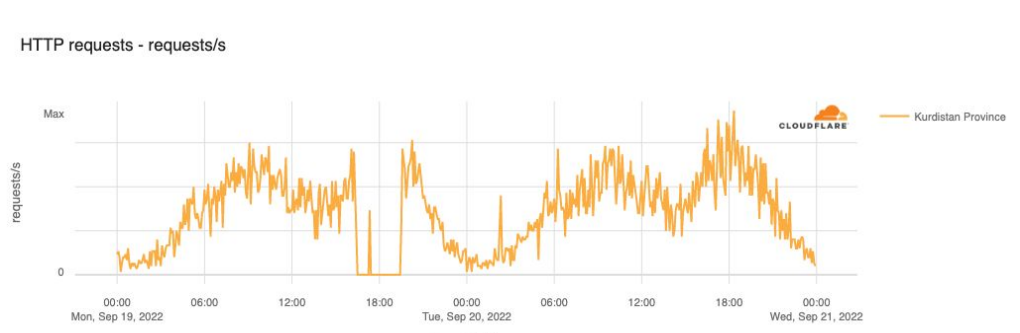
A digital “curfew” blocked all mobile Internet use for 13 consecutive evenings.

Users were cut off from mobile networks daily, then again on Oct. 8th, 12th, & 15th.

Traffic drops were visible on the 3 main cellular providers: Irancell, MCCI, & Rightel.

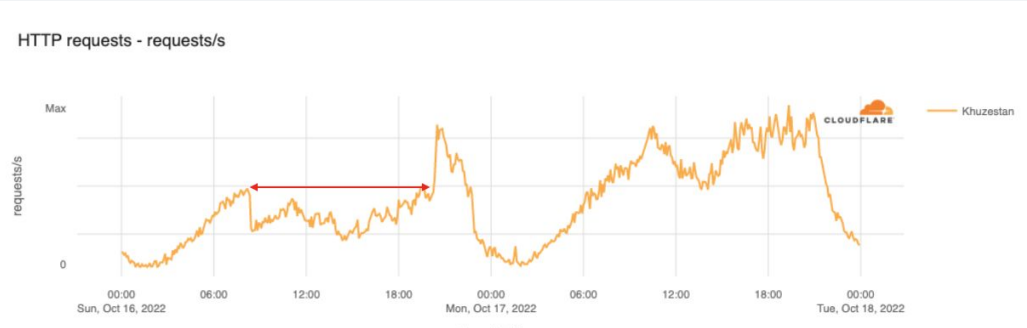
Kordestan

19th Sept. 20:40 –
19th Sept. 20:50 local time

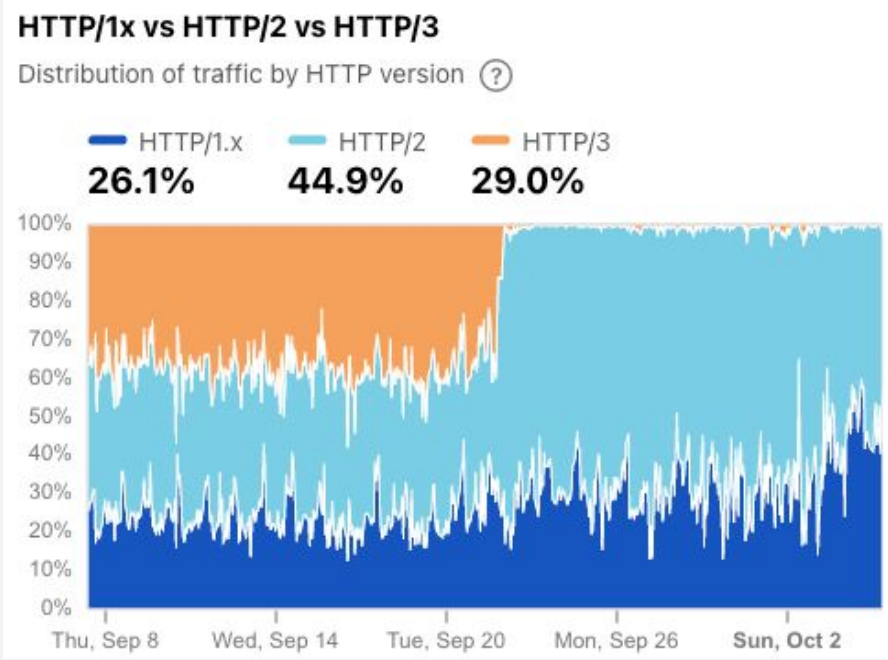


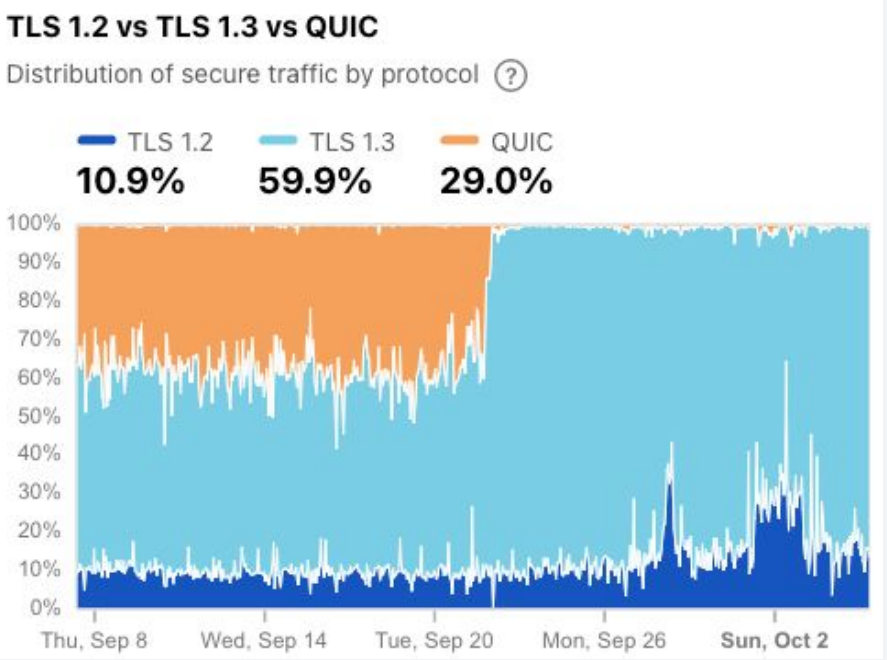
Khuzestan

16th Oct. 8:00 –
16th Oct. 21:30 local time

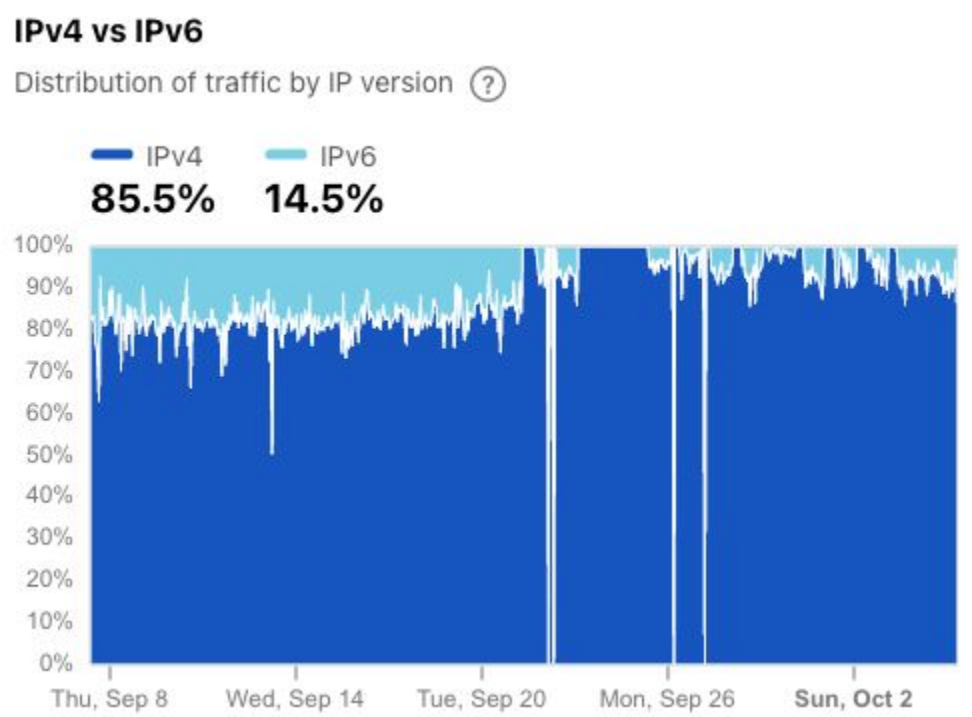


Regional outages limited communication and documentation of local protests.

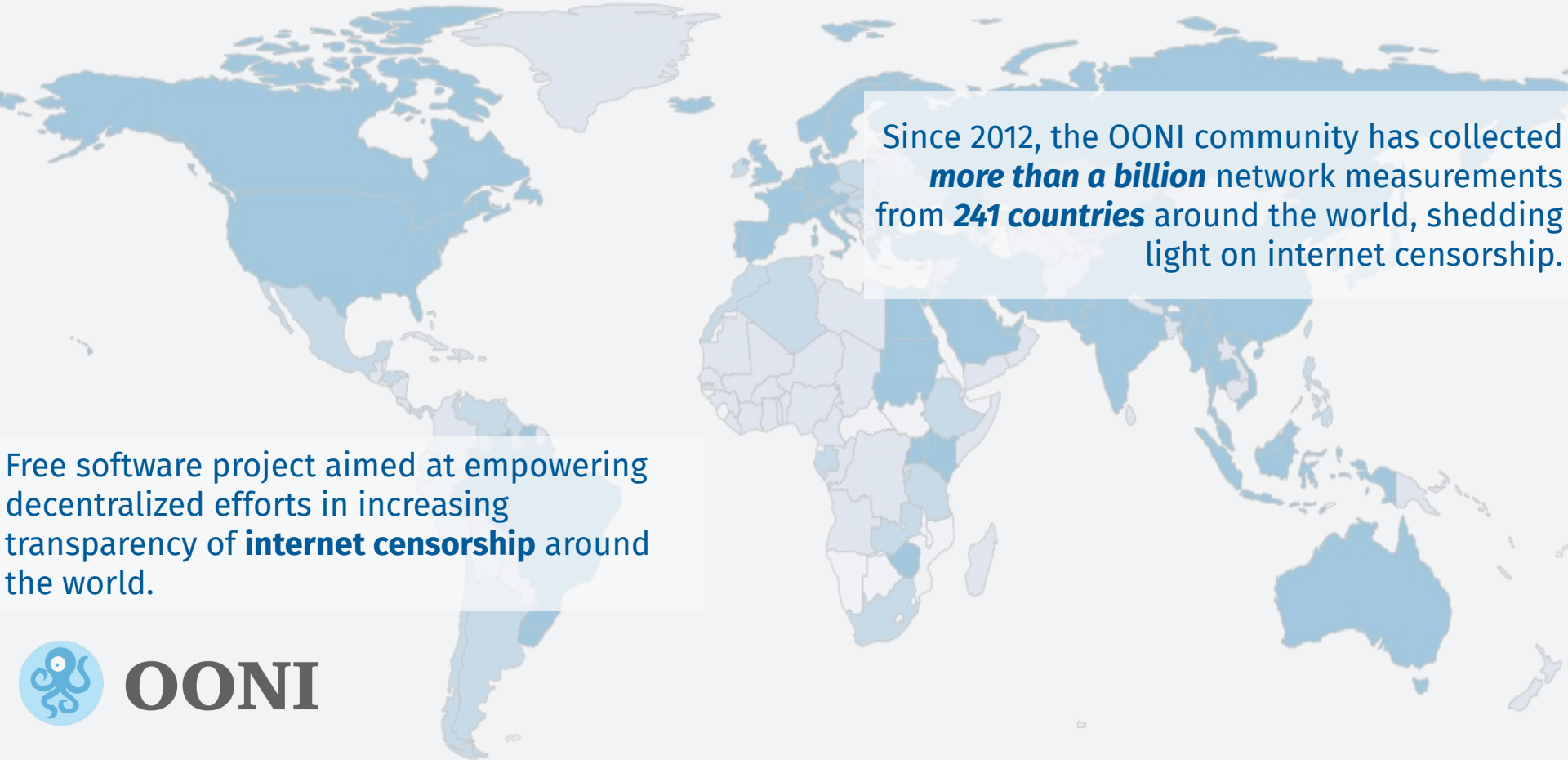




Content filtering tools were probably aided by brute-force blocking of newer protocols.



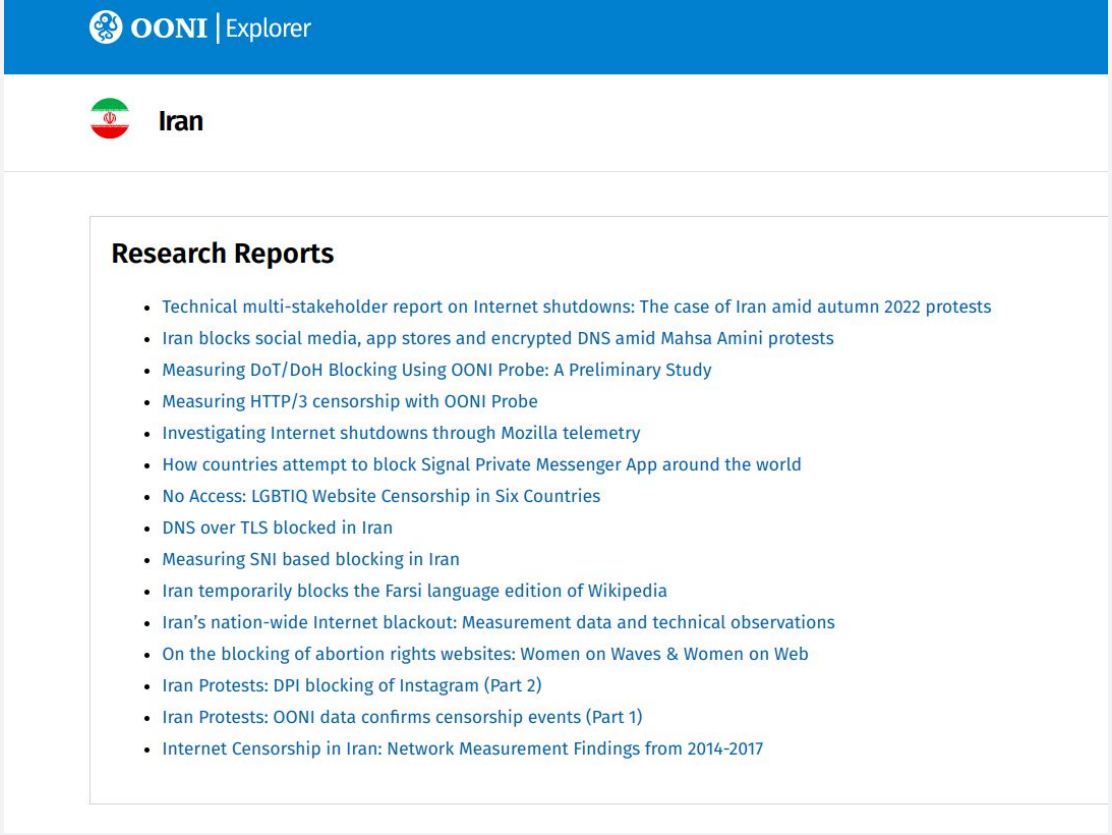
The latest Internet Protocol version was blocked on Irancell, with unclear impact.



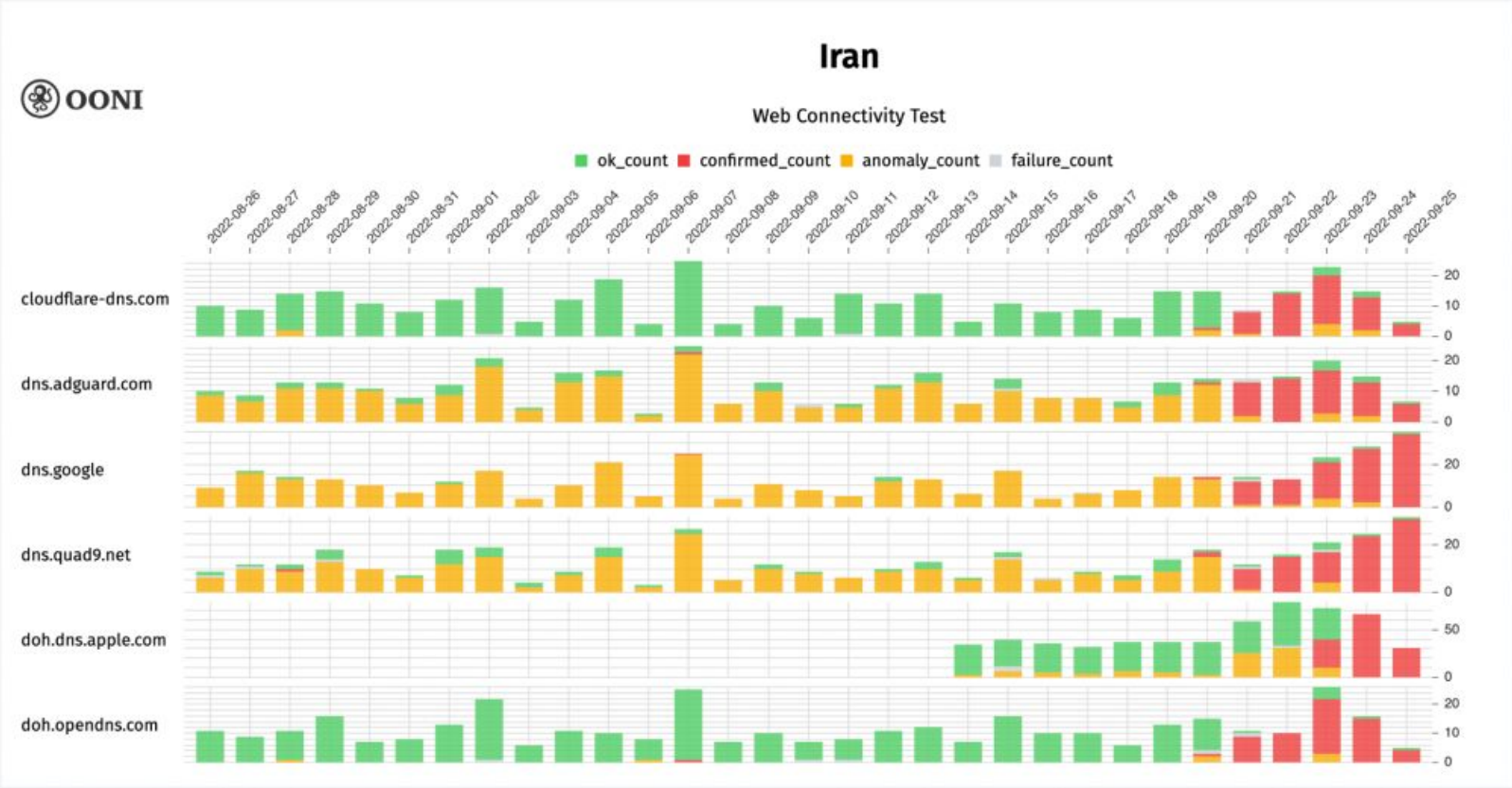
Since 2012, the OONI community has collected ***more than a billion*** network measurements from ***241 countries*** around the world, shedding light on internet censorship.

Free software project aimed at empowering decentralized efforts in increasing transparency of **internet censorship** around the world.

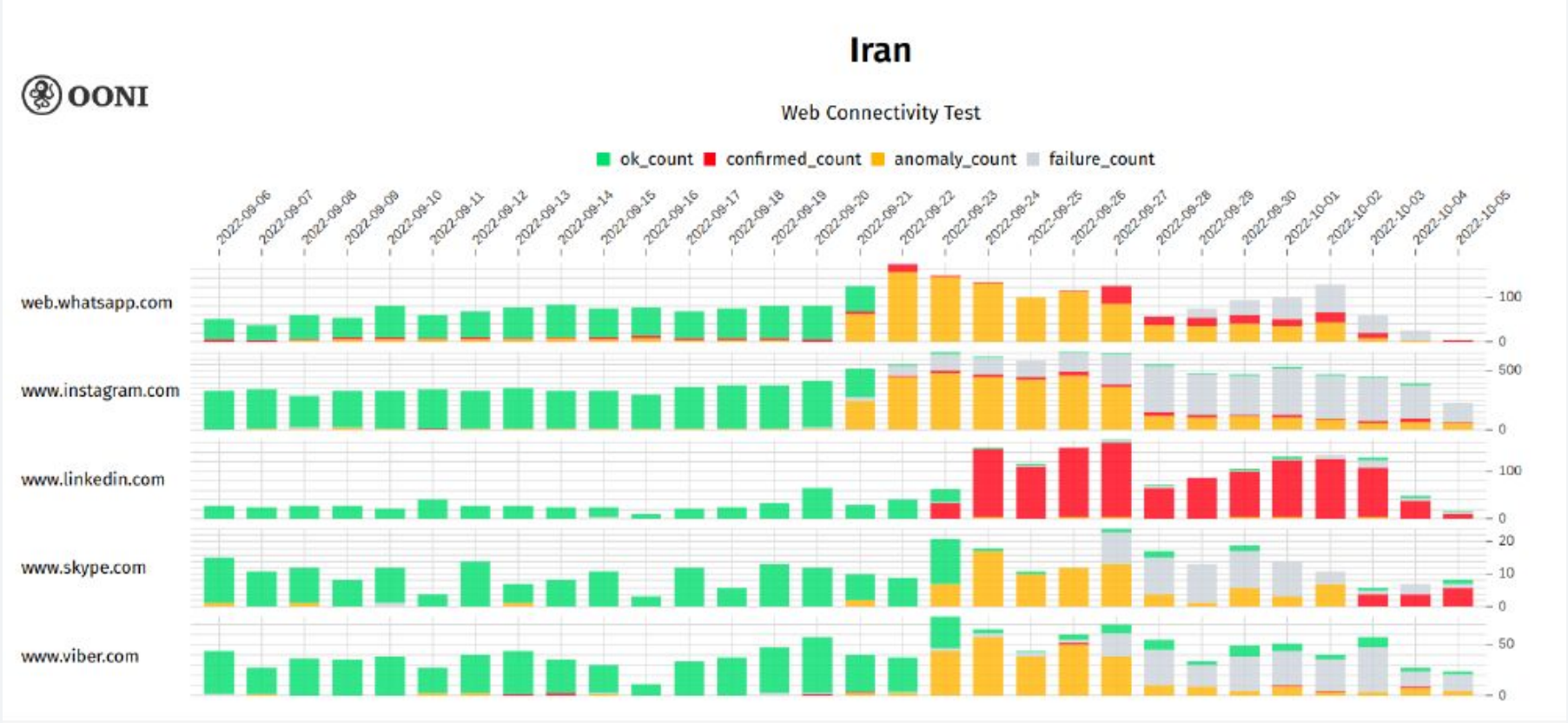
OONI



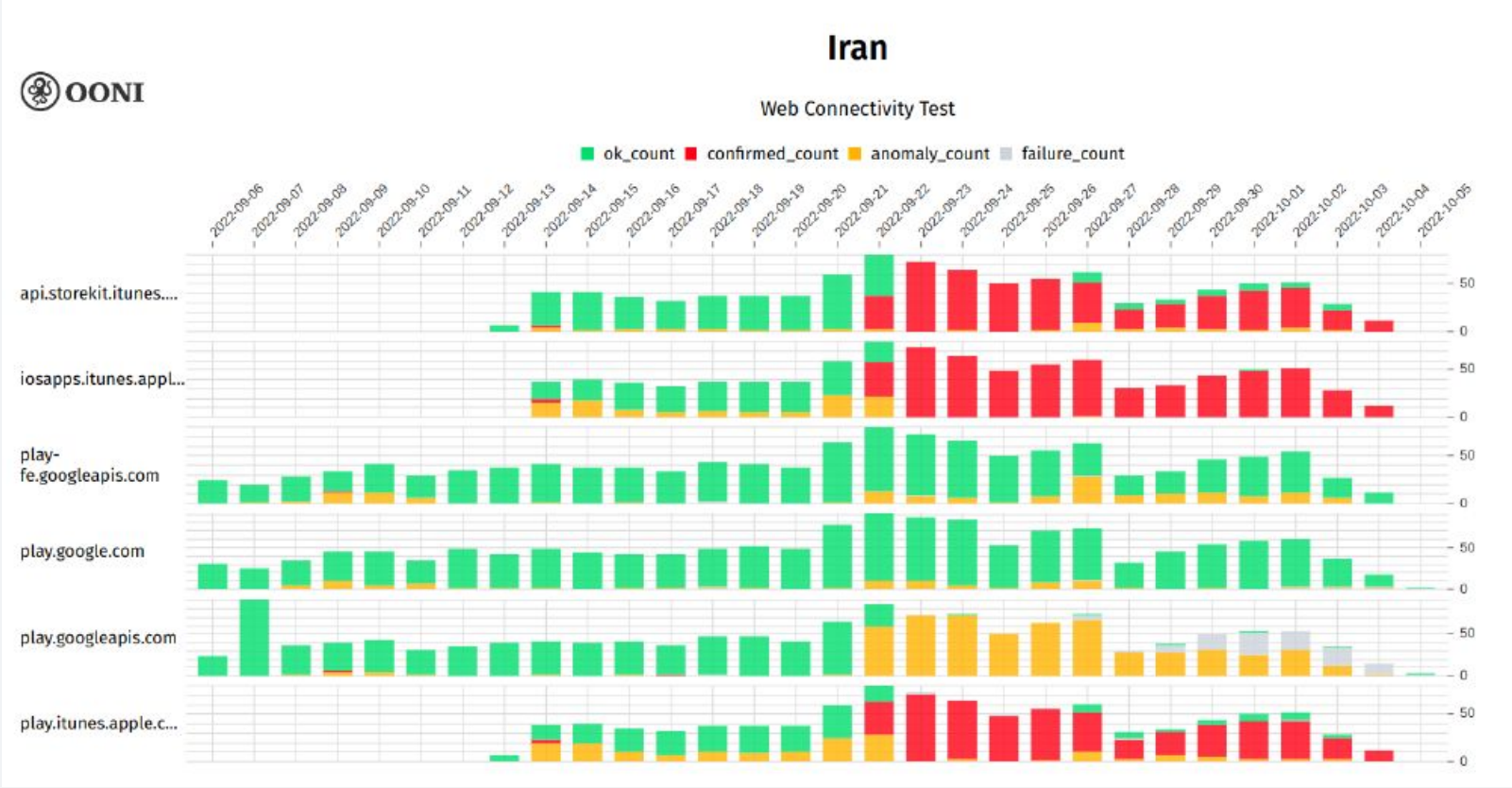
Iran: Long-term, pervasive levels of Internet censorship



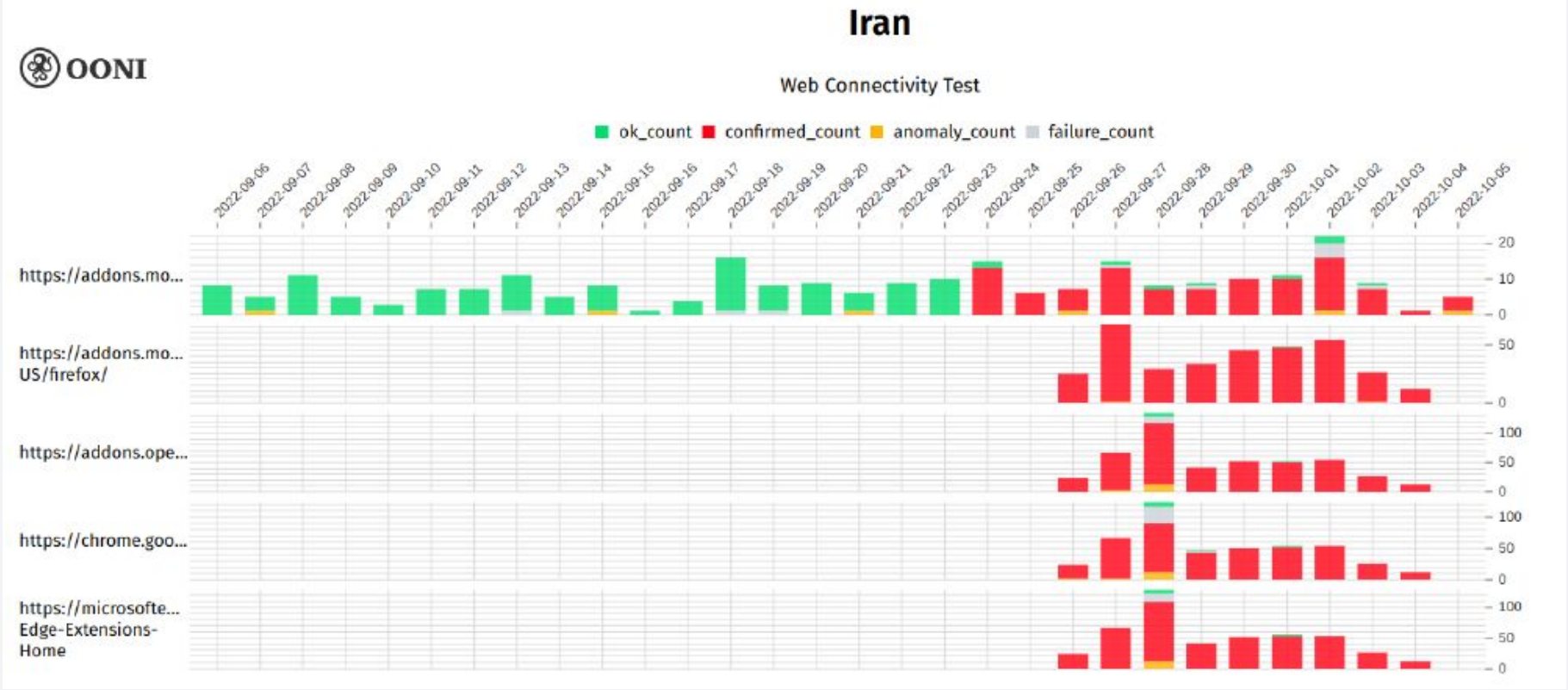
More encrypted DNS services, which aid censorship circumvention, were blocked.



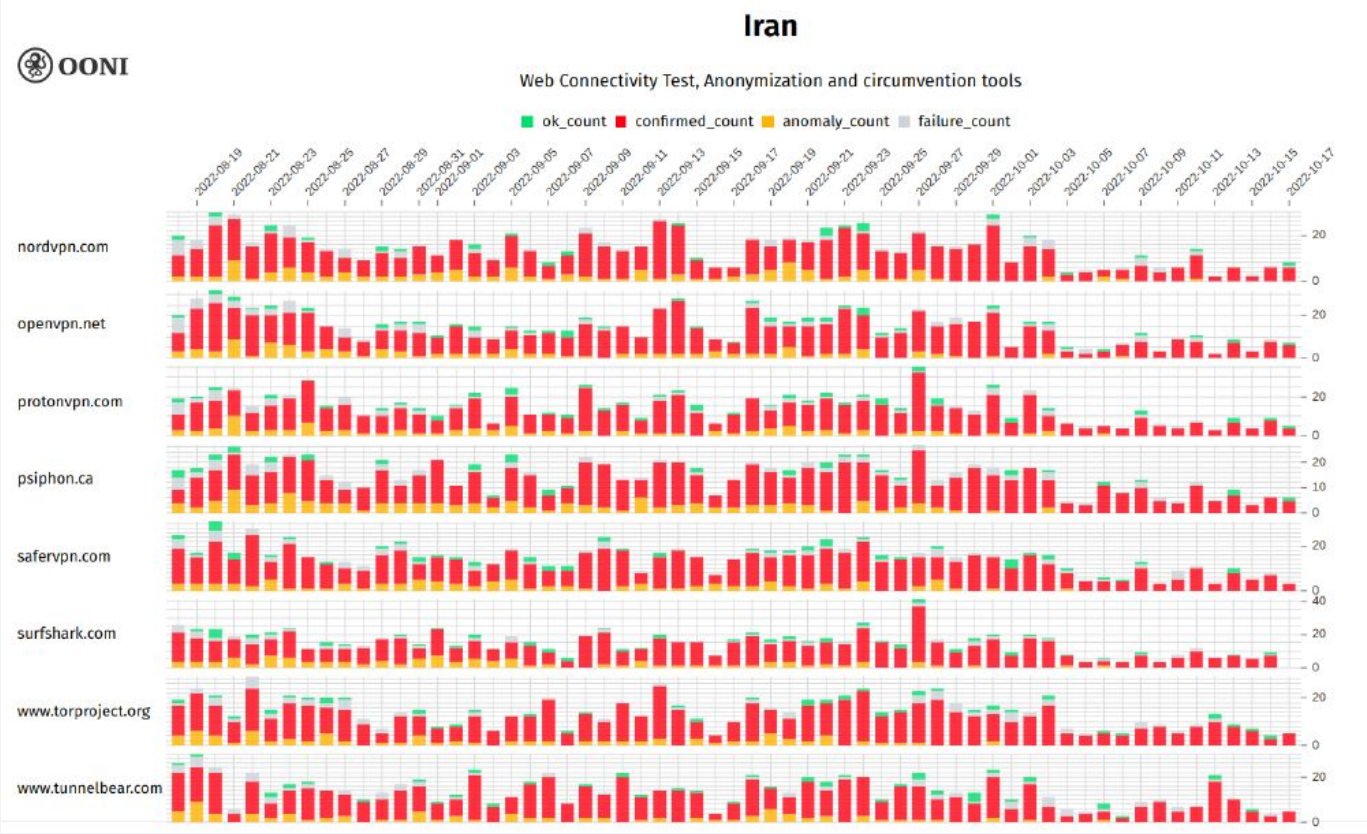
Several messaging and social media platforms were newly blocked.



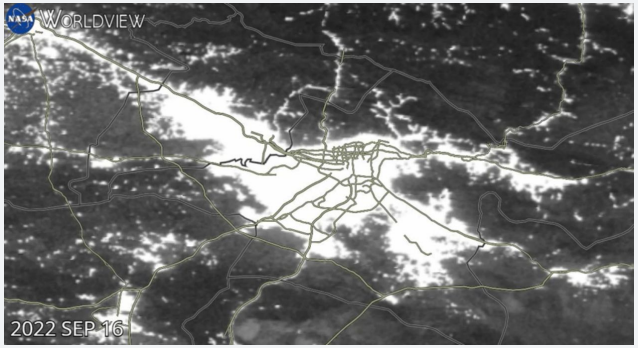
Also blocked were app stores, where users could install circumvention tools, ...

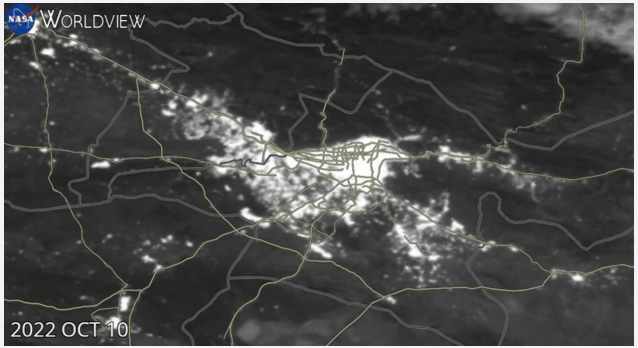


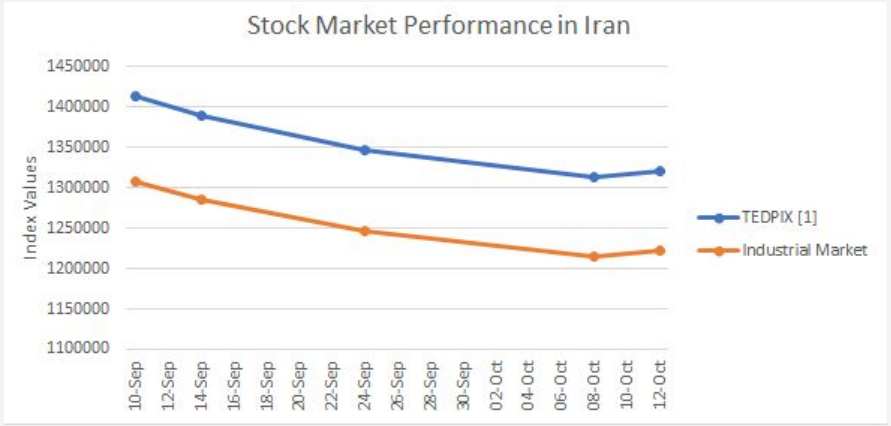
...and browser extension repositories, which sometimes offer similar tools.



Numerous additional circumvention tools remain blocked in Iran.







Nighttime lighting and stock markets showed possible economic impacts.

Next steps

We have set up the tool; collaboration is needed for future incidents

- This exercise proved viability of **collaboration across different groups,** and set up the tools needed for further collaboration.
- The Internet Society is available as a neutral focal point for future collaborations.
- Detection of events and assembly of parties can follow similar steps to this exercise.

In short, these shutdowns exhibited:

- greater scale of impact;
- greater attention to targeting censorship; and
- increased attempts at preventing censorship circumvention.

Questions?


OONI



CLOUDFLARE


Backup slides

OONI

Next steps

We have set up the tool, collaboration is needed for other incidents

- This exercise proved that collaboration across different groups and parties and set up the tool needed for further collaboration.
- The Internet Society is available as a neutral focal point for future collaborations to develop new reports to support decision-making and highlighting incidents that deter Internet development and use across the globe.
- Detection of events and assembly of parties can follow similar steps to this exercise with defined contact points across groups and parties.

Nightly Cellular Network Provider Outages: Irancell, MCCI, Rightel