

Network Topology Facilitates Internet Traffic Control in Autocracies

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Internet Control in Autocracies

- Typical approaches:
 - censorship
 - disinformation
 - surveillance
- All focus on digital *content*



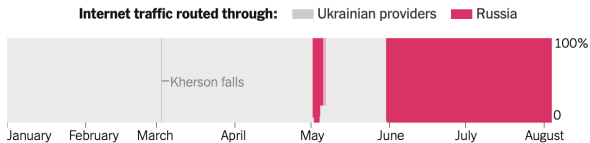
<https://www.foreignpolicy.com>

How Russia Took Over Ukraine's Internet in Occupied Territories

By [Adam Satariano](#) and
Graphics by [Scott Reinhard](#)
Aug. 9, 2022

Internet traffic in Kherson is being diverted through Russia

Internet routing data for a service provider in Kherson shows traffic beginning to flow through Russian networks in May before fully transitioning by early June.



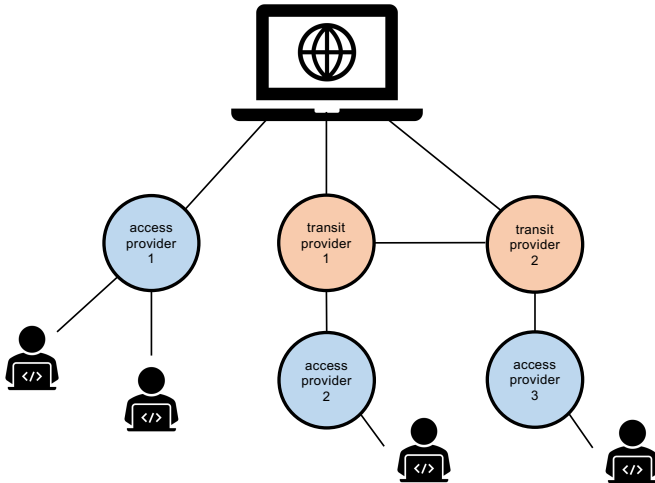
Source: Kentik

<https://www.nytimes.com/interactive/2022/08/09/technology/ukraine-internet-russia-censorship.html>

Our Focus: Infrastructure Control

- Internet control is most effective when there is control over the infrastructure
- Our questions:
 - What is the influence of state-owned providers on Internet traffic control, and how does this differ between democracies and autocracies?

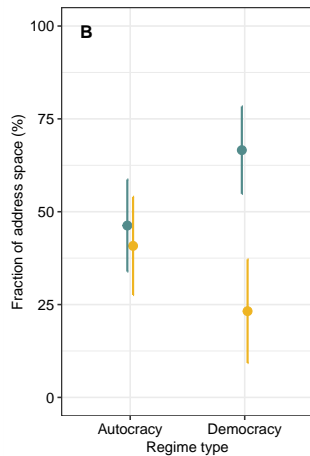
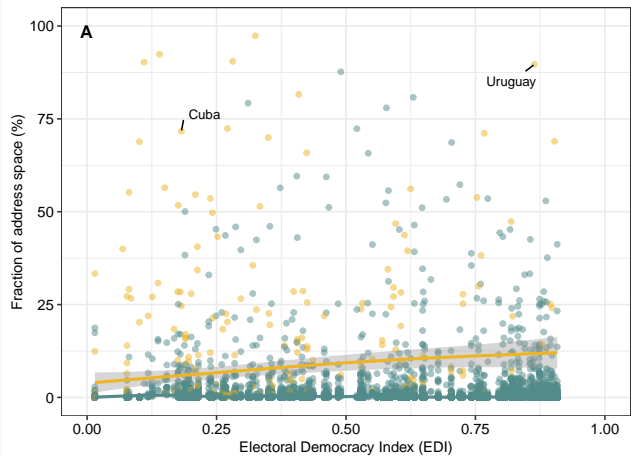
The Domestic Internet Topology



Data and Research Design

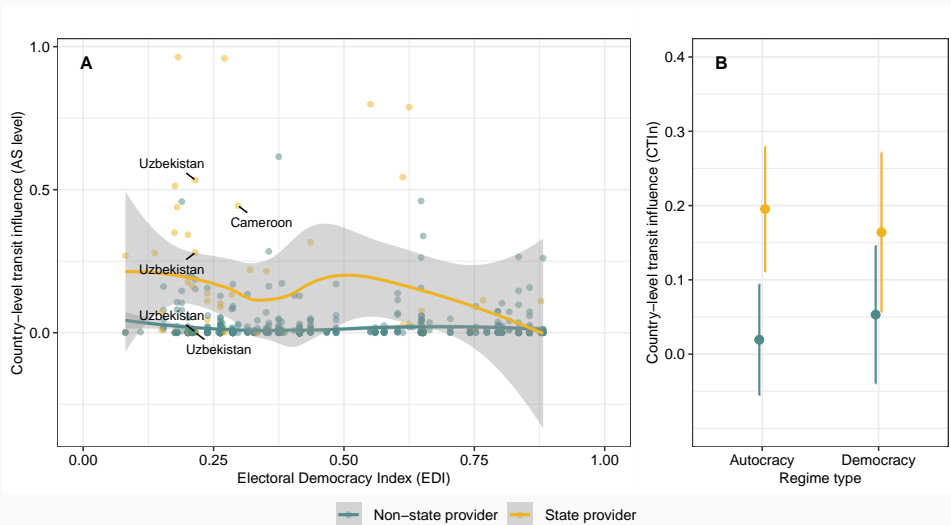
- Cross-sectional analysis (country-level)
 - Access: >120 countries
 - Transit: 75 countries, covering approximately 1 billion users (or 26% of the world)
- Regime type (autocracy vs. democracy)
 - Electoral Democracy Index (EDI), V-Dem project
 - binary indicator (democracy if > 0.5)
- Outcomes:
 - Access: share of address space assigned to a provider (0-100%)
 - Transit: country-level transit influence (CTI) (0-1)
- Descriptive plots
- OLS regressions
 - Controls: country-level factors
 - Results presented as average predicted outcomes

Influence of National Providers: Access



Legend: Non-state provider (teal), State provider (orange)

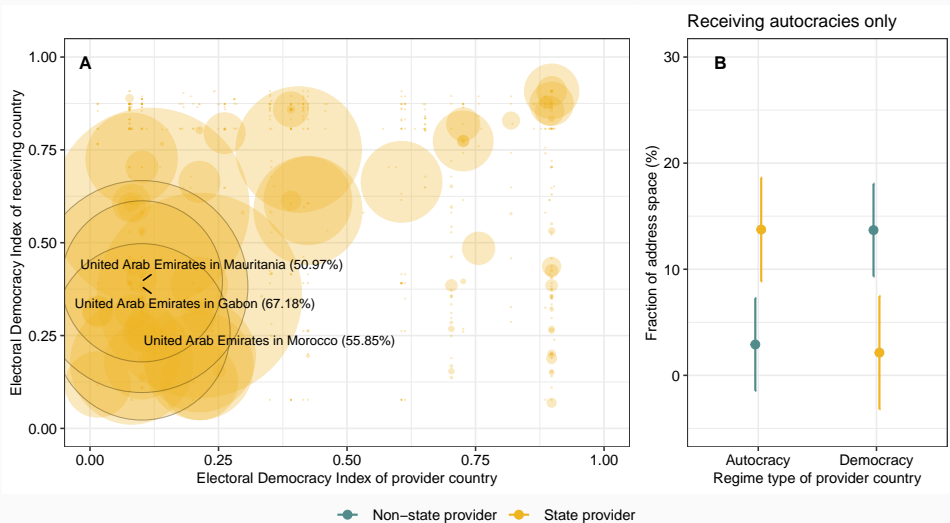
Influence of National Providers: Transit



Role of Providers Abroad

- Across borders, providers operate primarily as access providers
- Two questions:
 - In which other countries are providers active?
 - Are these providers primarily state-owned?

Access Providers in Foreign Autocracies



Conclusion

- Evidence that at the domestic level, autocratic governments retain traffic control via state-owned *transit* providers: more effective (at a higher network level)
- Internationally, state providers from autocracies are more influential at the access level in other autocracies than non-state providers.
- Topology provides direct means for autocrats to observe and tamper with internet traffic both domestically and across borders.