

SANCTIONS

— AND THE —

INTERNET



DIGITALMEDUSA

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Summary

This report investigates the impact of economic sanctions on the access of ordinary people and non-sanctioned service providers to the global Internet, as well as how sanctions affect the interconnected nature of the Internet. The global interconnectivity of the Internet is a key objective for many nations, and this research can help policymakers develop effective sanction policies that preserve the global interconnectedness. The findings of this report will be of interest to policymakers, technology companies, civil society organizations and international organizations seeking to ensure the Internet remains a vital tool for communication and commerce.

The report contains case studies and instances that sanctions impacted access to the critical properties of the Internet. It also identifies the actors and Internet operations that are affected by various sanction regimes. By presenting an impact matrix, the study facilitates an assessment of the extent to which sanctions impact affected parties and third parties' access to the global Internet.

The recommendations focus on mitigating the impact of sanctions on critical properties of the Internet through legislative and regulatory remedies, policy strategies, human rights and proportionality arguments, facilitating compliance, and engaging with the appropriate policy forums.

To mitigate the impact of sanctions, companies and Internet operators can change their compliance strategies, but this can be costly. To reduce transaction costs, operators and companies can learn from each other and set best practices on how to remain compliant with sanctions and respond quickly to changes in legislation. The Internet community can also facilitate access to pro-bono compliance services. These coalitions can also include other sectors in the Internet value chain, such as financial institutions.

Regarding legislative and regulatory remedies and policy strategies, one solution is to pursue a derogation or exemption from sanctions. Advocates can rely on various resolutions about Internet access and human rights, as well as the issue of proportionality, to make a case for receiving a derogation. Another solution is to receive an exemption for all the layer 3 (the Network layer) operations for all sanctioned countries, which is a more effective but longer-term solution. However, the effectiveness of these solutions varies among sanctioned countries due to differing foreign relations strategies. By engaging with agencies that set those strategies and highlighting how sanctions can adversely impact third-party access to the Internet, it may be possible to achieve consistency.

In terms of policy forums, it is important to review and choose forums that involve relevant government actors, have discussed sanctions in the past or include authorities involved in imposing sanctions, and allow for stakeholder participation (even if limited). As sanctions are regulatory and legal initiatives, focusing on these groups can be more effective in influencing the agenda in relation to Internet sanctions.

Finally, studying how the humanitarian sector has successfully received exemptions and authorizations from sanctions to deliver aid and the processes they engaged with can shed lights on the effective paths forward on how to mitigate the impact of sanctions on access to the Internet.

I. Introduction to Sanctions and the Internet

A. Definitions

What are sanctions: Sanctions are economic measures to enforce international law against illegal and dangerous activities (such as war), weaken a state to change its behavior and not pursue its violent political agenda, and prevent conflicts. Enacted by sanctions regimes, sanctions curtail international privileges like trade, travel, and arms supplies among other various aspects of diplomatic relations. Types of sanctions include:

- Cyber sanctions: Cyber sanctions target state actors alleged to be involved in harmful cyber activities such as illegal darknet websites, virtual currency theft, and hacking. Cyber sanctions such as determining the source of a cyber-attack, denying access to cyber programs, and other uses are meant to attend to issues regarding illicit cyber activities. This is because processes in cyber activities are much more complicated than traditional foreign activities.¹
- Economic Sanctions: Economic sanctions are penalties on economic relationships between the target actor and other entities. These sanctions can cause the seizing of assets, prevention of trade, and restriction of travel. By cutting off economic growth sources, sanctions regimes hope to alter the economic activities of the targeted actors and ultimately halt any harmful activities. As a result, economic sanctions could be imposed when a State violates human rights.



B. Scope: Critical Properties Of The Internet And Economic Sanctions

The purpose of this research is to explore the degree in which economic sanctions impact the access of ordinary people and non-sanctioned service providers to the global Internet. Additionally, this research investigates how sanctions affect the global and interconnected nature of the Internet. As maintaining the global and interconnected nature of the Internet is a major strategy of many nation states, the research might also assist them with the policies that could

¹ For an example of cyber sanctions, refer to: <https://home.treasury.gov/news/press-releases/jy0701>; The US 2015 Cyber sanction implementation also provides a good picture of what cyber sanctions are: <https://www.state.gov/cyber-sanctions/>

preserve the global and interconnected Internet in the course of imposing sanctions. This research is not looking to evaluate whether sanctions are good or bad strategic mechanisms for the Internet, achieving diplomatic goals, or changing state behavior. Instead, it aims at providing a clear picture of how sanction policies could affect the Internet. It can be used by policy-makers to come up with effective sanction policy without impacting the interconnectivity and the global nature of the Internet.

C. A Brief History of Sanctions and Impact on the Internet

1999: One of the first reported cases of compliance uncertainty with [sanctions](#)² that were imposed upon the former Yugoslavian state, Serbia: An American satellite Internet feed provider reportedly was unclear how it could comply with the US government sanctions and still provide Internet satellite feed to Yugoslavia. The fears stemmed from Executive Order 13,121, which went into effect on [May 1, 1999](#)³, after the Kosovo attack. The Executive Order prohibited a range of trade and a broad supply of goods or services and any related transaction with Serbia and Montenegro. This event raised some of the earliest (but short lived) political and compliance uncertainty about sanctions and Internet connectivity. In this period, the US issued various [general licenses](#)⁴ that exempted certain technologies and software from sanctions in Serbia. For a clearer picture and more details see [Jelena Cosic's research](#)⁵ on this topic.

1999: UN sanctions [Afghanistan](#)⁶, EU issued a [Council Regulation](#) prohibiting the export of certain goods and services to Afghanistan. As the Taliban banned the Internet in Afghanistan, the effect of these sanctions on Internet access of people at that time is not known. However, Taliban allegedly maintained [a website since 1998](#).⁷

2001: 9/11 terrorist attack. The US began to use sanctions more aggressively. Sanctions also became more targeted (early smart sanctions—which are sanctions that target a group or individuals who run the country), but there was no Internet specific sanction relief yet. The Internet had been commercialized but had not achieved its later ubiquity. The US tightened [its sanctions on Afghanistan](#)⁸.

2002: Sudan faced problems operating its Country Code Top Level Domain (for example .US),

2 Federal Register. (1999, May 5). Blocking property of the governments of the Federal Republic of Yugoslavia (Serbia and Montenegro): The national emergency with respect to Yugoslavia (Serbia and Montenegro) (Executive Order 13121 of April 30, 1999). <https://www.federalregister.gov/documents/1999/05/05/99-11410/blocking-property-of-the-governments-of-the-federal-republic-of-yugoslavia-serbia-and-montenegro-the>

3 Federal Register

4 U.S. Government Publishing Office. (2001). Joint Resolution: To authorize the use of United States Armed Forces against those responsible for the recent attacks launched against the United States. <https://www.govinfo.gov/content/pkg/CDOC-107hdoc6/html/CDOC-107hdoc6.htm>

5 RIPE NCC. (2022, September 16). *Internet under sanctions: Then and now (BALCCON)*. RIPE Network Coordination Centre. <https://www.ripe.net/about-us/press-centre/publications/presentations/2022/internet-under-sanctions-then-and-now-balcon>

6 United Nations Security Council. (1999, October 15). Resolution 1267 (1999). Retrieved from <http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/1267%20SRES1267.pdf>

7 Watts, M. (2021, August 31). The Taliban's return to power is bad news for Afghanistan's internet. Wired. <https://www.wired.co.uk/article/afghanistan-taliban-internet>

8 U.S. Department of the Treasury. (n.d.). Sanctions programs and country information. Office of Foreign Assets Control. Retrieved from <https://ofac.treasury.gov/sanctions-programs-and-country-information>

seemingly because of international sanctions and by 2002 [it was essentially dead](#).⁹

2009: One of the potential events that led to provision of sanctions relief in the subsequent years was the Iranian uprising that used the Internet to effectively communicate to the world what was going on in Iran.

2010: US sanction relief for personal communication and the Internet [for Iran, Cuba](#)¹⁰ and Sudan (through amending the sanction regulations) – Iran has been [sanctioned](#)¹¹ since 1979, Sudan sanctions had been in [place since 1997](#)¹², [Sanctions on Cuba](#)¹³ started in the 60s.

2011: Reports that Cuba could not develop its Internet partly [due to US embargo](#)¹⁴, Europe [sanctioned Syria](#).¹⁵

2012: EU Sanctions (in place since 2007 after [the imposition of UN Sanctions](#))¹⁶ raised some concerns for Internet governance organizations and they had to re-ensure that they were in compliance with sanctions while [serving](#)¹⁷ certain countries.

2012: Iran's Datak Telecom (an Internet Service Provider) and Syria's SyriaTel were added to the Specially Designated Nationals list according to the Obama's Executive Order 13066 on Blocking the Property and Suspending Entry Into the United States of Certain Persons With Respect to Grave Human Rights Abuses by the Governments of [Iran and Syria via Information Technology](#).¹⁸

2013: Sudan's [civil society reported](#)¹⁹ frustration with how US sanctions affected their access to

9 Internet Assigned Numbers Authority (IANA). (2002, December 20). *Report on the investigation of the 2002-09-24 simultaneous cache poisoning attacks*. Retrieved from <https://www.iana.org/reports/2002/sd-report-20dec02.html>

10 U.S. Department of the Treasury. (n.d.). Office of Foreign Assets Control. Retrieved from <https://ofac.treasury.gov/>

11 U.S. Department of the Treasury. (n.d.). Sanctions programs and country information. Office of Foreign Assets Control. Retrieved from <https://ofac.treasury.gov/sanctions-programs-and-country-information>

12 U.S. Department of the Treasury. (n.d.). Sanctions programs and country information. Office of Foreign Assets Control. Retrieved from <https://ofac.treasury.gov/sanctions-programs-and-country-information>

13 Electronic Code of Federal Regulations. (n.d.). *Title 31: Money and finance: Treasury, Subtitle B—Regulations relating to money and finance, Chapter V—Office of Foreign Assets Control, Department of the Treasury, Part 515—Cuba*. Retrieved from <https://www.ecfr.gov/current/title-31/subtitle-B/chapter-V/part-515?toc=1>

14 Associated Press. (2007, February 13). *Cuban official calls for controlling 'wild colt' of new technologies*. The Mercury News. Retrieved from <https://www.mercurynews.com/2007/02/13/cuban-official-calls-for-controlling-wild-colt-of-new-technologies/>

15 Council of the European Union. (2022, May 31). *Syria: Council extends sanctions against the regime for another year* [Press release]. Retrieved from <https://www.consilium.europa.eu/en/press/press-releases/2022/05/31/syria-council-extends-sanctions-against-the-regime-for-another-year/>

16 Regulation (EU) No 1263/2012 of the European Parliament and of the Council of 12 December 2012 on European standardisation, amending Council Directives 89/686/EEC and 93/15/EEC and Directives 94/9/EC, 94/25/EC, 95/16/EC, 97/23/EC, 98/34/EC, 2004/22/EC, 2007/23/EC, 2009/23/EC and 2009/105/EC of the European Parliament and of the Council and repealing Council Decision 87/95/EEC and Decision No 1673/2006/EC of the European Parliament and of the Council. (2012, December 12). CELEX:32012R1263. Eur-Lex. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012R1263#ntr1-L_2012356EN.01003401-E0001

17 Athina Fragkouli. (18 March 2022). *EU sanctions and our Russian membership*. RIPE Labs. Retrieved from <https://labs.ripe.net/author/athina/eu-sanctions-and-our-russian-membership/>

18 U.S. Department of the Treasury. (2012, April 23). *Treasury targets key Beltran Leyva Organization operatives and businesses* [Press release]. Retrieved from <https://ofac.treasury.gov/recent-actions/20120423>

19 Pilger, C. (2014, January 22). *Sudanese civil society calls for change to US digital technology sanctions*. Index on Censorship. Retrieved from <https://www.indexoncensorship.org/2014/01/sudanese-civil-society-calls-change-us-digital-technology-sanctions/>

digital technology and to the Internet.

2014: [EU and US sanctions](#)²⁰ on Russia because of invading Crimea. Access to domain names in Crimea was hampered. Reportedly, [the US general licenses](#)²¹ did not apply to domain name registrations services.

2014: US issued [Iran General License](#)²² D-1, with Respect to Certain Services, Software, and Hardware Incident to Personal Communications.

2015: [Ease of US embargo on](#)²³ Cuba and specific attention to facilitate access to the Internet. To a certain extent, the sanctions relief worked but there were still reports of restrictions on access to [Internet services due to sanctions](#)²⁴. Cuba's sanctions were especially congressionally mandated so it was difficult to change some of it.

2017: The Pakistan Telecommunication Company Limited (PTCL), the largest fixed-line operator in Pakistan and the main legacy ISP had built cables to obtain fixed line connections between Pakistan and Iran. However, due to the sanctions against Iran, the cables were never used, because the equipment provider categorically refused its equipment be used for doing business with Iran, including Internet transit.²⁵

2019: RIPE NCC became aware that two of its member entities based in Iran and one member in Syria might [be on the sanction list](#).²⁶ They informed the members and created additional sanction screening processes.

2020: the Dutch Ministry of Foreign Affairs confirmed that they recognized IP resources to be economic resources, as defined in the EU sanctions regulations, and therefore RIPE NCC must [freeze the resource](#)²⁷ if it is provided to a sanctioned entity.

2021: US withdrawal from Afghanistan and Taliban takeover. Afghanistan IP addresses are still registered, but it is not clear what will happen in the future. It might be difficult to verify who is in control of these addresses.

2022: US and the EU impose sanctions against Russia because of Russia's invasion of Ukraine.

20 Council of the European Union. (n.d.). Restrictive measures against Russia over Ukraine. Retrieved April 23, 2023, from <https://www.consilium.europa.eu/en/policies/sanctions/restrictive-measures-against-russia-over-ukraine/>

21 Mueller, M. (2017, January 13). *ICANN's jurisdiction, sanctions, and domain names*. Internet Governance Project. Retrieved from <https://www.internetgovernance.org/2017/01/13/icanns-jurisdiction-sanctions-and-domain-names/>

22 Office of Foreign Assets Control. (n.d.). U.S. Department of the Treasury. Retrieved April 23, 2023, from <https://ofac.treasury.gov/>

23 The White House, Office of the Press Secretary. (2014, December 17). Fact sheet: Charting a new course on Cuba. Retrieved April 23, 2023, from <https://obamawhitehouse.archives.gov/the-press-office/2014/12/17/fact-sheet-charting-new-course-cuba>

24 Padgett, T. (2021, July 20). Cuban activists say sanctions have blocked them from social media platforms. Time. Retrieved April 23, 2023, from <https://time.com/6121348/cuban-activists-sanctions-blocked-platforms/>

25 This finding is based on Nowmay Opalinski research. Nowmay Opalinski is a Ph.D. Candidate at the French Institute of Geopolitics (Paris 8 University), his research is part of the "Exploring Pakistan's Internet Connectivity" (EPIC) bilateral research project with the Lahore University of Management Sciences (LUMS) Computer Science Department. The outcome of his research will be published on the website of geode.science (Geopolitics of the Data-sphere - research project).

26 Fragkouli, A. (2017, October 26). How sanctions affect the RIPE NCC. RIPE Labs. Retrieved April 23, 2023, from <https://labs.ripe.net/author/athina/how-sanctions-affect-the-ripe-ncc/>

27 Fragkouli, A.

The UK joins the US, Australia and the EU in imposing separate sanctions

2022: UK issued [a license](#)²⁸ and authorized limited transactions to facilitate Civilian Telecommunication Services which are either an “electronic communication network” or “electronic communications service” as defined by Section 32 of the Communications Act 2003 that is used for civilian purposes.

2022: The European Union usually calls sanctions “[European Restrictive Measures](#)”.²⁹ They also imposed sanctions on Russia and then a so-called “[Internet-carveout](#)”³⁰ was issued.

2022: Most recent US sanction relief for Iran ([Iran GL D-2](#)³¹) to provide Internet services for the people of Iran as they are partaking in an uprising. It has imposed sanctions on the Minister of Communication along with others due to Internet censorship.

D. Research Method

The research method included desk research and interviews with various stakeholders. It was also presented in a few forums to receive feedback on the design and the method. Through case studies and interviews this report presents an impact matrix that can illustrate which operations in which Internet layer are mainly affected because of sanctions. Interviews were held with stakeholders from the governments, network operators, Regional Internet Registries, country experts, banks and coalitions, and trade associations.

28 UK Office of Financial Sanctions Implementation. (2022, October 20). Publication notice: Telecommunications and news services [PDF]. Retrieved April 23, 2023, from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1112464/INT20221875276_OFSI_Telecoms_and_News_Publication_Notice_Amendment_20.10.22.pdf

29 European External Action Service. (n.d.). Council decisions and legal acts - Common Foreign and Security Policy (CFSP) sanctions. Retrieved April 23, 2023, from https://eeas.europa.eu/archives/docs/cfsp/sanctions/docs/measures_en.pdf

30 European Union. (2022). Council Regulation (EU) 2022/880 of 30 May 2022 amending Regulation (EU) 269/2014 concerning restrictive measures in respect of actions undermining or threatening the territorial integrity, sovereignty and independence of Ukraine. Official Journal of the European Union, L 167/1. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R0880&from=SV>

31 US Department of the Treasury. (2022, April 21). Treasury Sanctions Four People Connected to Russia's Federal Security Service. Retrieved from <https://home.treasury.gov/news/press-releases/jy0974>

II. Internet Value Chain and Impact of Sanctions

This section maps all the actors involved in providing Internet access to understand whether and how they could be impacted by sanctions. This analysis will include Internet and non-Internet actors since this will serve as a cross-industry analysis. We have used and been inspired by a few sources in mapping the Internet services: 1) the sanction licenses, derogations, and others that have been issued to ease sanctions on services necessary for access to the Internet, 2) the Internet ecosystem studies led by Global Network Initiative and Business Social Responsibility 3) some elements of the [GSMA's Internet value chain](#)³² framework and 4) Internet Society's "who [makes the Internet work](#)"³³.

The GSMA's Internet value chain framework, which represents five main segments (content rights, on-line services, enabling technology and services, connectivity and user interface) in global revenues created by the Internet, is further mapped onto modified layers of the Internet in this paper. This is to illustrate the value chain and the interrelation of diverse actors more effectively. It is also an attempt to show the various degrees of the impact of sanctions on interconnectivity.

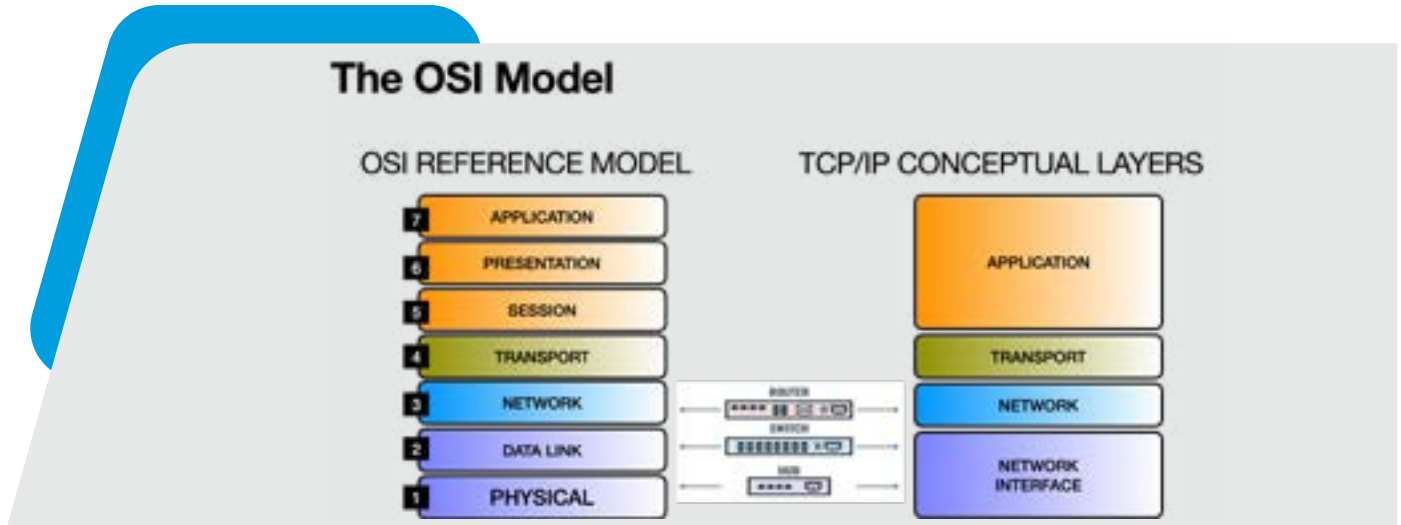


A. The OSI Model

To illustrate the value chain and the actors, the report uses the OSI model, or Open Systems Interconnection. The OSI showcases how different communications systems interconnect and consist of multiple layers in the following categories: 1) Physical 2) Data Link, 3) Network, 4) Transport, 5) Session, 6) Presentation and 7) Application. To make the layers more simplified, the more granular layers (the Transport, Session and Presentation layers) are not fit for our purposes. Therefore, we will focus on analyzing the rest of the four in terms of identifying distinct actors and functions in the layers.

³² The GSMA is a global organization that specializes in Internet connectivity. It represents mobile operators and organisation across the mobile ecosystem and adjacent industries and provides the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

³³ Internet Society. (n.d.). Who makes it work? The Internet ecosystem. Retrieved April 24, 2023, from <https://www.internetsociety.org/internet/who-makes-it-work/>



B. Impact Matrix

To have a better understanding of the impact of sanctions on Internet access and connectivity, we have also devised a method: We present existing sanction-directed approaches, identify potential indicators, and pose questions to understand the criticality of the service for the Internet and how/if sanctions impact them. This can help illustrate the impact matrix of sanctions on Internet connectivity. The indicators are as follows:

Legal alternative: When providing some Internet operations, there might be a legal alternative for complying with sanctions which enables the provision of the critical properties of the Internet (for example, registration of IP addresses) that maintain and preserve the connectivity of the Internet and basic usage. If such legal alternatives exist, then they might reduce the impact of sanctions on access to those services. The legal alternative could be certain compliance mechanisms or the existing licenses, waivers or exemptions. For example, in the case of access to IP addresses, instead of deregistering the IP addresses which could lead to disconnection or create security issues, RIPE NCC froze the registration of those IP addresses. In our analysis, if such mechanisms exist, then we consider them as indicators that can mitigate the impact of sanctions on connectivity. We do consider the sustainability and effectiveness of these alternatives when establishing the implementation complications.

Questions

- Are there compliance mechanisms that allow for providers to provide essential Internet services?
- Are there effective licenses, exemptions and waivers for the operation?

Technical alternative: This indicator reveals whether there are alternative technical solutions and providers that can be used in order to provide essential services. For example, if some organizations decide not to peer with sanctioned countries, there are other entities that can potentially peer with sanctioned countries and network operators in those countries, an approach called “peering”. The level of impact of sanctions on connectivity due to disruption of peering activities might be low, because there are alternative providers that can peer with sanctioned entities. This is not the case for IP addresses. There are no alternatives to replace IP addresses

and other than the RIRs, there are no alternative providers. So the level of impact on connectivity could potentially be high when there are no technical alternatives.

Question

- Are there technical alternatives and alternative providers that can provide necessary online services?

Impact on third parties: Governments over time have tried to apply sanctions in a way that it does not affect third parties but is more targeted towards the wrongdoers who are state officials. These so-called “smart sanctions” can include a list of designated people and entities. If the sanction applies to a person or an entity in charge of providing Internet services to the whole population of a country, it could potentially affect third party access to the Internet. Considering all the other indicators such as the legal and technical alternatives, this indicator will be used to show whether there is a probability of disproportionate impact on third parties’ access to the Internet.

Questions

- Are there third parties already affected?
- Could the third parties be affected in the future?

Implementation complications: Sometimes existing approaches regarding the above three indicators to mitigate the impact of sanctions are temporary, too costly and not resilient in the face of escalation and not comprehensive or consistent. Shortcomings of the solutions will have an impact on the effectiveness of the alternatives as well. It’s crucial to consider the degree of the effectiveness of the solutions by considering the implementation complications and the adverse impact they might have on security and other important aspects of the Internet operation.

- Are the licenses, exemptions and waivers for Internet operations effective and unambiguous? If yes, do they include all the service regions or only some of them?
- Are the solutions temporary or permanent?
- Do the solutions have an adverse impact on other aspects of the Internet (such as security in cyberspace)?

C. Physical Layer: Transmission Infrastructure Companies (Cables and Towers)

One of the most fundamental, physical Internet infrastructures is the transmission infrastructure: “Subsea or submarine cable companies lay fiber optic cables that connect countries across the world via cables laid on the ocean floor; tower companies construct, own, and/or operate communications towers and/or lease space to tenants.” Passive components of the networks, which include the equipment that are needed for connectivity and interconnectivity but that are not yet activated to talk to each other, are located here.

Sanctions have already affected backbone infrastructure support and expansion in multiple countries. In Iran, T-Mobile was set to provide foundational support to Iranian telecom operator (MTN) with

their consultancy, [Detecon consulting](#)³⁴, which provides services for infrastructure expansion. However, after the 2018 [reinstatement of US sanctions](#)³⁵, T-mobile decided to [pull out of the deal](#)³⁶ due to their extensive activities in the US. Similarly, recent sanctions have also impacted the Dutch-domiciled multinational telecommunications services company VEON. VEON is looking for a non-sanctioned Russian provider to purchase their subsidiary, VimpelCom, after financial and operational effects have [shown](#)³⁷ to be detrimental to the company. Telenor, [a Norwegian Telecom operator, had to sell](#)³⁸ their operation to a local Myanmarian operator due to sanctions against Myanmar.

The latest withdrawal of backbone providers was Cogent and Lumen, which provided fiber optic and other backbone services. Cogent [explained](#)³⁹ that the decision to terminate the backbone services it provided for Russia was mainly based on economic sanctions.

The indirect effect of sanctions on backbone and transit (traffic) providers is not entirely clear. In 2016, Sparkle, a backbone infrastructure provider based in Italy, [announced](#)⁴⁰ the start of the first phase of a project to launch a PoP in Iran. While sanctions are still in place, this project has not been stopped.

In late 2022, the [Biden Administration](#)⁴¹ urged the Federal Communications Commission (not due to sanctions) to deny a request from submarine cable operators, ARCOS-1 USA, to connect Cuba to the US through a new undersea cable. However, Orange, a French telecom operator and Cuba's state-run telecoms operator ETECSA, [announced](#)⁴² that they had all the permissions in place for the deployment of undersea cable. The reason Orange could offer a solution might be that Cuba is not sanctioned by the EU. Moreover, the US has clearly issued a "general license" indicating that, "Transactions, including payments, incident to the establishment of facilities, including fiber-optic cable and satellite facilities, to provide telecommunications services linking the United States or third countries and Cuba, including facilities to provide telecommunications services in Cuba, are authorized." (31 CFR § 515.542)

The following table maps the sanction activities against different regimes and their impact on the Physical layer: it considers actors involved in that layer, the effect on connectivity, available legal alternatives, technical alternative, technical and legal implementation complications and which third parties are or can be potentially impacted.

34 Detecon International GmbH. (n.d.). Integrated network infrastructure. <https://www.detecon.com/en/consulting/industries/telecommunications/integrated-network-infrastructure>

35 Detecon International GmbH.

36 Reuters. (2018, August 21). Germany to help Iran with €3 billion economic package to counter U.S. sanctions. Retrieved from <https://www.reuters.com/article/uk-iran-nuclear-germany-idUKKBN1L110P>

37 Bloomberg. (2022, August 8). Sanctions may freeze Veon's network rollout in Russia, CEO says. Bloomberg. <https://www.bloomberg.com/news/articles/2022-08-08/sanctions-may-freeze-veon-s-network-rollout-in-russia-ceo-says?leadSource=uverify%20wall>

38 European Times. (n.d.). Norway's Telenor Attempting to Evade Sanctions. Retrieved from <https://european-times.org/norways-telenor-attempting-to-evade-sanctions/>

39 Kentik. (2021, April 22). Cogent Disconnects from Russia. Retrieved from <https://www.kentik.com/blog/cogent-disconnects-from-russia/>

40 TISparkle. (2018, May 14). Sparkle and TIC Partner to Expand Seabone Global IP Network in Iran. Retrieved from <https://www.tisparkle.com/media/press-release/sparkle-and-tic-partner-to-expand-seabone-global-ip-network-in-iran>

41 Data Center Dynamics. (2021, April 22). US government urges FCC to block subsea cable connection to Cuba. Retrieved from <https://www.datacenterdynamics.com/en/news/us-government-urges-fcc-to-block-subsea-cable-connection-to-cuba/>

42 Reuters. (2021, December 8). Cuba, French telecoms operator Orange begin work on subsea cable to Martinique. Retrieved from <https://www.reuters.com/business/media-telecom/cuba-french-telecoms-operator-orange-begin-work-subsea-cable-martinique-2022-12-08/>

<p>Sanction Status</p>	<p>EU-sanctions regime</p> <p>Russia</p> <ul style="list-style-type: none"> - Restrictive measures in view of Russia’s actions destabilising the situation in Ukraine (sectoral restrictive measures) <p>Iran and Syria</p> <ul style="list-style-type: none"> - EU Sanctions Regulation Iran (Council Regulation (EU) No. 267/2012) - EU Sanctions Regulation Syria (Council Regulation (EU) No. 36/2012) <p>Syriatel is sanctioned</p> <p>US-sanctions regime</p> <p>Iran</p> <ul style="list-style-type: none"> - 31 CFR Part 535 - Iranian Assets Control Regulations - 31 CFR Part 560 - Iranian Transactions and Sanctions Regulations - 31 CFR Part 561 - Iranian Financial Sanctions Regulations - 31 CFR Part 562 - Iranian Human Rights Abuses Sanctions Regulations <p>Syria</p> <ul style="list-style-type: none"> - 31 CFR Part 542 - Syrian Sanctions Regulations <p>Cuba</p> <ul style="list-style-type: none"> - 31 C.F.R. part 515 (CACR) The Cuban Assets Control Regulations <p>Russia</p> <ul style="list-style-type: none"> - 31 CFR part 587 - Russian Harmful Foreign Activities Sanctions Regulations
<p>Actors involved</p>	<p>Backbone/infrastructure providers (Examples: Cogent, Lumen, T-Mobile)</p> <p>Financial institutions</p>
<p>Effect on connectivity</p>	<p>Temporary traffic congestion and effect on Internet development</p> <p>At this layer, if the country is already equipped with the physical infrastructure necessary for Internet connection (which most sanctioned countries are), then the withdrawal of equipment by foreign investors can potentially affect further Internet development but does not necessarily lead to Internet disconnection, as there might be alternative providers to provide those services.</p> <p>The disconnection of backbone services does not disconnect people from the Internet but it reduces the bandwidth, which may lead to congestion as the remaining international carriers will try to replace the services.</p>

<p>Legal alternatives (compliance mechanism)</p>	<p>Transit providers can receive specific licenses, waivers and Internet transit carve-outs. The US OFAC generally exempts telecom operators but other trade barriers might have an impact on providing equipment. The US general license specifically does not authorize import and export of equipment necessary for setting up Internet infrastructure.</p> <ul style="list-style-type: none"> - General UK License: The Russia (Sanctions) (EU Exit) Regulations 2019 : Continuation of Business and Basic Needs for Telecommunications Services and News Media Services INT/2022/1875276 - EU-Russia Derogation: COUNCIL REGULATION (EU) 2022/880 of 3 June 2022 amending Regulation (EU) No 269/2014 - US-Russia GENERAL LICENSE NO. 54 (a) Except as provided in paragraph (b) of this general license, all transactions ordinarily incident and necessary to the purchase or receipt of any debt or equity securities of VEON Ltd. that are prohibited by section 1(a)(i) of Executive Order (E.O.) 14071 are authorized, provided that the debt or equity securities were issued prior to June 6, 2022. - US-Cuba: An example of Cuba telecom operation license: 31 CFR § 515.542 - Mail and telecommunications-related transactions.31 CFR § 515.542 - Mail and telecommunications-related transactions. Section (b) All transactions, including payments, incident to the provision of telecommunications services related to the transmission or the receipt of telecommunications involving Cuba, including the entry into and performance under roaming service agreements with telecommunications services providers in Cuba, by persons subject to U.S. jurisdiction are authorized. Section (d) General license for telecommunications facilities. Transactions, including payments, incident to the establishment of facilities, including fiber-optic cable and satellite facilities, to provide telecommunications services linking the United States or third countries and Cuba, including facilities to provide telecommunications services in Cuba, are authorized.
<p>Technical alternatives</p>	<p>There are alternatives to US-based and EU transit providers.</p>
<p>Implementation complications</p>	<p>It will take some time to find the alternatives, which will have a temporary impact on Internet development. The authorizations issued by the US do not apply to all sanctioned countries consistently and might not authorize provision of backbone infrastructure in sanctioned countries.</p>
<p>Whose connectivity is impacted (impact on third parties)</p>	<p>Network operators in sanctioned countries, Network operators in neighboring countries, Users of the Internet located in those countries</p>

D. Data Link (The “Switch” Layer)

The second layer of the OSI model is Data Link. Internet Exchange Points (IXP) operate in this layer. IXPs are physical locations that contain network switches and consist of a host of members. They allow network providers to share transit outside of their own network which can reduce latency, using less bandwidth and [reducing operation costs](#)⁴³. To share the traffic through IXPs, network operators such as Content Delivery Networks and ISPs need to obtain network switches and become members of these IXPs. While obtaining network switches happens at this layer, “routing” between network operators takes place at layer 3 (the Network layer), which means selecting route packets along the network path.⁴⁴ Sanctions generally affect this layer and its actors (IXPs and the network operators that want to join the IXP) in the following ways:

1. IXPs might not want to include members from sanctioned countries. Therefore, sanctioned countries such as Syria and Iran can have trouble obtaining network switches from IXPs based in a jurisdiction with a sanction regime in place, even when they are not designated entities.
2. Once the member networks of IXPs are sanctioned, they cannot remain as members and use the IXP. This was the case when LINX - London Internet Exchange Point- found that two members from Russia were sanctioned.
3. If it is a paid peering arrangement for the IXP, the financial institutions might not want to facilitate the transactions for sanctioned entities.

43 Cloudflare. (n.d.). Internet Exchange Point (IXP). Retrieved from <https://www.cloudflare.com/learning/cdn/glossary/internet-exchange-point-ixp/>

44 Network routing is the process of selecting a path across one or more networks. <https://www.cloudflare.com/learning/network-layer/what-is-routing/>

<p>Sanction Status</p>	<p>UK-sanctions regime Russia - The Russia (Sanctions) (EU Exit) Regulations 2019 - General License: Continuation of Business and Basic Needs for Telecommunications Services and News Media Services INT/2022/1875276</p> <p>EU-sanctions regime Russia - Restrictive measures in view of Russia’s actions destabilising the situation in Ukraine (sectoral restrictive measures)</p> <p>Syria - EU Sanctions Regulation Syria (Council Regulation (EU) No. 36/2012) Syriatel is sanctioned. As argued in the regulation: Syriatel provides financial support to the regime: through its licensing contract it pays 50 % of its profits to the Government.</p> <p>US-sanctions regime Iran - 31 CFR Part 535 - Iranian Assets Control Regulations - 31 CFR Part 560 - Iranian Transactions and Sanctions Regulations - 31 CFR Part 561 - Iranian Financial Sanctions Regulations - 31 CFR Part 562 - Iranian Human Rights Abuses Sanctions Regulations - Executive Order 13606 of April 22 , 2012 Blocking the Property and Suspending Entry Into the United States of Certain Persons With Respect to Grave Human Rights Abuses by the Governments of Iran and Syria via Information Technology (SyriaTel, and Datak Telecom were specifically sanctioned)</p> <p>Syria - 31 CFR Part 542- Syrian Sanctions Regulations - Executive Order 13606 of April 22 , 2012 Blocking the Property and Suspending Entry Into the United States of Certain Persons With Respect to Grave Human Rights Abuses by the Governments of Iran and Syria via Information Technology (SyriaTel and Datak Telecom were sanctioned)</p> <p>Cuba - The Cuban Assets Control Regulations, 31 C.F.R. part 515 (CACR)</p> <p>Russia - Russian Harmful Foreign Activities Sanctions Regulations 31 CFR part 587</p>
<p>Actors involved</p>	<p>Internet Exchange Points (IXPs) Internet Service Providers Content Delivery Networks Financial institutions</p>

Effect on connectivity	<p>When ISPs and CDNs cannot receive a network switch at a popular exchange point, they cannot peer with others at that IXP. Sanctions can block access to the switch at the IXPs. The effect on connectivity might be temporary as there might be other IXPs from which to receive a switch.</p>
Legal alternatives (compliance mechanism)	<p>Transit exemptions (EU)</p> <ul style="list-style-type: none"> - EU- Russia: Derogation: COUNCIL REGULATION (EU) 2022/880 of 3 June 2022 amending Regulation (EU) No 269/2014 Telecom operators general license (US) - Iran CFR 560.508 (a) Telecommunications and mail transactions authorized. (a) All transactions with respect to the receipt and transmission of telecommunications involving Iran are authorized. - Syria 31 CFR 542.519(a)(1) Except as provided in paragraph (a) (2) of this section, all transactions with respect to the receipt and transmission of telecommunications involving Syria are authorized, provided that no payment pursuant to this section may involve any debit to a blocked account of the Government of Syria on the books of a U.S. financial institution, or any transaction with a person whose property and interests in property are blocked pursuant to § 542.201(a) other than the Government of Syria.
Technical alternatives	<p>Network operators can use IXPs that are not subject to sanction regimes.</p>
Implementation complications	<p>Peering does not solely rely on a bilateral agreement between the two parties. If the parties decide to do private peering, they need to use the equipment located in the Data Center, arrange communication channels and/or cross patch between the equipment of the peering partners. So arrangement of a peering connection is not limited to the actions of two parties. Third parties are always involved in the process of arranging peer to peer connections. When organizing transactions with third parties the peering partners have to conclude agreements with such third parties, for example for equipment colocation, organization of cross patching, smart hands services and others. If the third parties are not willing to deal with organizations that have sanctioned members, then it becomes more complicated to find alternatives.</p> <p>If the IXPs do not seek general licenses or specific licenses, they have to comply with the law and stop serving the members that are sanctioned. The members are generally ISPs that provide connectivity to the global Internet for ordinary people in the sanctioned country.</p> <p>The general licenses might also not be effective. One interpretation of the UK "general license" that was issued is that it was a specific license that only exempted a handful of telecom operators.</p>
Whose connectivity is impacted (impact on third parties)	<p>ISPs Network operators End users (consumers and businesses)</p>

E. Network

This third layer refers to the interconnection that takes place between various Internet operators through the Border Gateway Protocol (BGP) connection. The Network layer is IP-based communications and includes any actor that requires an IP address. Network operators such as “last mile” ISPs, telecom service providers and content delivery networks are all relevant actors in this layer.⁴⁵

1. Active Transit Services

In 2017, the Pakistan Telecommunication Company Limited (PTCL), the largest fixed-line operator in Pakistan and the main legacy ISP, had built cables to obtain fixed line connections between Pakistan and Iran. However, due to the sanctions against Iran, the cables were never used, because the equipment provider categorically refused its equipment be used for doing business with Iran, including Internet transit.⁴⁶

Some network operators provide Internet services that fall under different OSI layers. As previously mentioned in the case of sanctions against Russia, in 2021, Cogent claimed that it was affected by economic sanctions and suspended its backbone services, while also [announcing](#) that it would reclaim all its ports and IP address space and deactivate colocation equipment. It also announced blocking access and disconnecting ISPs’ servers after the termination of service. This case indicates that both the Physical and Data Link layers overlap with the Network layer and can be subsequently compromised once the Network layer is broken by sanctions.

The Network layer is where interconnectivity takes place, so most actors who operate in other layers might also appear in this layer. CDNs and other network operators that peer through Internet Exchange Points, carry out the transit in this layer.

The following two tables show how active transit and routing are impacted by sanctions. The tables are organized in a way that highlights the different types of actors concerned, the effect on connectivity, and the technical and legal alternatives available.

45 Definition of ISPs and network operators: “A Network Operator is a provider of wired and wireless communications services that owns or controls the infrastructure necessary to sell and deliver services to Mobile Network Operators (MO), Virtual Network Operators, and end users”. ; “Backbone ISPs are typically large telecoms and ISPs with expansive, hi-speed network coverage across geographies that sell services to smaller, “last-mile” ISPs. They are distinct from “last mile ISPs” because backbones ISPs carry the majority of internet traffic to a majority of customers, but don’t concern themselves with ensuring the final connection to end-users networks.”; “Last Mile ISPs & Telecom Operators Companies that provide voice and data services to users. Telecom operators are granted licenses to operate and obtain spectrum allocation by governments. Last-mile ISPs bridge the final distance between the backbone service provider’s network and the end- customer. These services may be provided through fixed lines, wirelessly, or via satellite.” Retrieved from a glossary provided by Dialogic: <https://www.dialogic.com/glossary/network-operators>

46 This finding is based on Nowmay Opalinski research. Nowmay Opalinski is a Ph.D. Candidate at the French Institute of Geopolitics (Paris 8 University), his research is part of the “Exploring Pakistan’s Internet Connectivity “ (EPIC) bilateral research project with the Lahore University of Management Sciences (LUMS) Computer Science Department. The outcome of his research will be published on the website of geode.science (Geopolitics of the Data-sphere - research project).

Sanction Status	<p>EU sanction regime</p> <p>Russia</p> <ul style="list-style-type: none"> - Restrictive measures (sectoral restrictive measures) - in view of Russia’s actions destabilising the situation in Ukraine <p>Iran and Syria</p> <ul style="list-style-type: none"> - EU Sanctions Regulation Iran (Council Regulation (EU) No. 267/2012) - EU Sanctions Regulation Syria (Council Regulation (EU) No. 36/2012) <p>Syriatel is sanctioned</p> <p>UK sanction regime</p> <ul style="list-style-type: none"> - The Russia (Sanctions) (EU Exit) Regulations 2019 <p>US sanction regime</p> <p>Iran</p> <ul style="list-style-type: none"> - 31 CFR Part 535 - Iranian Assets Control Regulations - 31 CFR Part 560 - Iranian Transactions and Sanctions Regulations - 31 CFR Part 561 - Iranian Financial Sanctions Regulations - 31 CFR Part 562 - Iranian Human Rights Abuses Sanctions Regulations <p>Syria</p> <ul style="list-style-type: none"> - 31 CFR Part 542- Syrian Sanctions Regulations <p>Cuba</p> <ul style="list-style-type: none"> - The Cuban Assets Control Regulations, 31 C.F.R. part 515 (CACR) <p>Russia</p> <ul style="list-style-type: none"> - Russian Harmful Foreign Activities Sanctions Regulations 31 CFR part 587
Actors involved	<p>Backbone/infrastructure providers</p> <p>Internet Exchange Points (IXPs)</p> <p>Internet Service Providers</p> <p>Content Delivery Networks</p> <p>Financial institutions</p>
Effect on connectivity	<p>Temporary traffic congestion:</p> <p>The disconnection of transit services might not disconnect people from the Internet but it reduces the bandwidth, which may lead to congestion as the remaining international carriers will try to replace the services. This will also affect not only the targeted sanctioned country but also other countries that rely on transit services. For example, when Cogent stopped its services in Russia, there were some downstream impacts into Kazakhstan, Tajikistan and Uzbekistan .</p> <p>Sanctions at this layer may cause de-peering. De-peering “forces changes in routing paths” and the packets may take really long paths or may not even reach the destination even if the paths exist.” This delay in receipt of packets or packet loss can affect connectivity.</p>

Legal alternatives (compliance mechanism)	<p>Transit providers can receive specific licenses, waivers and Internet transit carve-outs. The US OFAC generally exempts telecom operators but other trade barriers might have an impact on providing equipment.</p> <ul style="list-style-type: none"> - The Russia (Sanctions) (EU Exit) Regulations 2019 General UK License: Continuation of Business and Basic Needs for Telecommunications Services and News Media Services INT/2022/1875276 - Derogation: COUNCIL REGULATION (EU) 2022/880 of 3 June 2022 amending Regulation (EU) No 269/2014: "Article 2 shall not apply to funds or economic resources that are strictly necessary for the provision of electronic communication services by Union telecommunication operators, for the provision of associated facilities and services necessary for the operation, maintenance and security of such electronic communication services, in Russia, in Ukraine, in the Union, between Russia and the Union, and between Ukraine and the Union, and for data centre services in the Union.' - An example of Cuba telecom operation license: 31 CFR § 515.542 - Mail and telecommunications-related transactions.31 CFR § 515.542 - Mail and telecommunications-related transactions. Section (d) General license for telecommunications facilities. Transactions, including payments, incident to the establishment of facilities, including fiber-optic cable and satellite facilities, to provide telecommunications services linking the United States or third countries and Cuba, including facilities to provide telecommunications services in Cuba, are authorized.
Technical alternatives	<p>There are alternatives to US-based and EU transit providers. Network operators can use IXPs that are not subject to sanction regimes. Content Delivery Networks that are not subject to EU and US sanction regimes might help.</p>
Implementation complications	<p>It will take some time to find the alternatives which will have a temporary impact on traffic congestion</p> <p>The general licenses might not be effective. The UK "general license" that was issued was (according to an interpretation) really a specific license that only exempted a handful of telecom operators.</p> <p>Even after the general licenses are issued, from a business operation perspective it is tenuous and not clear if the servers for example can be placed in sanctioned countries.</p> <p>Reportedly, the US general licenses that have been newly issued are also ineffective as the service providers do not want to restore service.</p>
Whose connectivity is impacted (impact on third parties)	<p>Network operators in sanctioned countries, Network operators in neighboring countries, Users of the Internet located in those countries</p>

2. IP Addresses

Internet protocol⁴⁷ “provide[s] for transmitting blocks of data ... from sources to destinations, where sources and destinations are hosts identified by fixed length addresses.” Internet protocol (IP) addresses, and Autonomous System (AS) numbers, help computers on the Internet communicate with each other through long strings of numbers. Policies, regulations, and technical problems that curtail the distribution of IP addresses might have the highest impact on the unity of the global Internet in the sense of excluding potential users. If IP addresses are unregistered due to political or technical intervention, they are invalid on the Internet, which means that entire Internet Service Providers (ISPs) can be taken offline. Lack of access to IP addresses prevents people from being connected online in the first place, as opposed to being denied certain services once they are online.

Allocation of IP addresses is coordinated by [Regional Internet Registries](#).⁴⁸ When the Internet was in its infancy in the early to mid-90s, it was largely designed to disregard jurisdictional borders. In keeping with that vision, nations and even regions were mostly not considered when allocating numbers and connecting to other networks. However, since the Internet Assigned Numbers Authority (led by Jon Postel) was based in the US, the decision to assign IP addresses was gradually influenced by the US’s geopolitical interests. Every decade, the US list of sanctioned countries would expand. Given this historical circumstance, it was not possible to enable a global interconnected network based exclusively on US relations with other nation-states. By 1990 it was already clear that handling all number registrations in one single registry was not able to match the growth of the Internet, and the Internet Activities Board recommended to the US Federal Networking Council [that mechanisms of delegation be embraced](#)⁴⁹. By 1993, the emergence of regional allocation authorities was [acknowledged](#)⁵⁰, and by 1996 the use of Regional Internet Registries (RIRs) had become [a best practice](#)⁵¹.

Sanctions effect on RIR operations

When the Internet was still in its infancy, it was not clear in the US that commercial traffic was permitted on the Internet (or the parts connected to the National Science Foundation’s NSFNet). Commercial pressures towards institutionalization were new, and organizations such as the RIRs had to feel their way through the implications of international sanctions regimes. The regional division might have made it easier for organizations like the RIRs to be granted immunity from sanction regimes they were not based in. This, however, did not last long. By the end of the 90s and especially after 9/11, the US sanction regime underwent an evolution. The US Treasury re-designed the system so that the private and especially the financial sector globally became

47 Postel, J. (1981). Internet Protocol. Network Working, J. Group. Request for Comments: 791. Retrieved from <https://tools.ietf.org/pdf/rfc791.pdf>

48 Regional Internet Registries (RIRs) are nonprofit corporations that administer and issue Internet Protocol (IP) address space and Autonomous System (AS) numbers within a defined region. RIRs also work together on joint projects.

49 Internet Engineering Task Force. (1990). IAB recommended policy on distributing internet identifier assignment. RFC 1174. <https://tools.ietf.org/html/rfc1174>

50 Marshall, T. R. (1993). Guidelines for management of IP address space. IETF. <https://www.rfc-editor.org/rfc/rfc1466>

51 American Psychological Association. (1996). A standard for the transmission of IP datagrams over experimental ATM networks. Retrieved from <https://www.rfc-editor.org/rfc/rfc2050.pdf>

entangled with the US sanction regime.⁵² Later, the EU and Australia also followed suit and established their own sanction regimes.

The twin pressures of simultaneous expansion of the Internet over the years and the expansion of various sanction regimes maintained by the US and EU meant that inevitably, the allocation of Internet resources became subject to these sanctions. This sometimes happened directly, when RIRs were unable to provide services to sanctioned countries or persons. Or, it happened indirectly, when the financial services necessary to pay [Internet registries](#)⁵³ service fees were unavailable to users in the sanctioned regimes. It also affected the development and partnership of global network operators. The issue of sanctions that RIRs faced could also be attributed to the commercialization of IP addresses in 2012.

Legally, whatever can be categorized as a “transaction” may be subject to sanctions. RIRs’ services can be affected because of the jurisdiction in which they are located as well as third-party service providers’ jurisdiction. At a minimum, the following can be affected:

- Payment systems

Payment systems such as banks, credit card companies and financial entities may not provide services to entities that have members from sanctioned countries, refuse to provide service to those members directly, or both.

- Software providers

Software providers that RIRs procure to provide services such as dual-factor authentication might refrain from providing their services to members from sanctioned countries.

- RIRs new membership, assignment, allocation or transfer requests (including [End User requests](#))⁵⁴

RIPE NCC, one of the RIRs, has been [clear about the need](#)⁵⁵ to undertake due diligence in relation to several services that it provides to sanctioned members, namely new membership, assignment, allocation, or transfer requests.

52 Zarate, J. (2013). Treasury’s War: The Unleashing of a New Era of Financial Warfare. New York: Public Affairs.

53 Fragkouli, A. (2021, August 25). How Sanctions Affect the RIPE NCC. RIPE Labs. <https://labs.ripe.net/author/athina/how-sanctions-affect-the-ripe-ncc/>

54 Silveira, F. V. (2019, November 13). Using Third Parties to Automate Our Due Diligence. RIPE Labs. https://labs.ripe.net/author/felipe_victolla_silveira/using-third-parties-to-automate-our-due-diligence/

55 Silveira, F. V.

3. Registration of IP Addresses

IP addresses allow networks to “talk” to each other. If networks do not communicate, our online presence is diminished. Thus, one important effect of revoking or deregistering IP addresses from a network is that other networks will not be able to communicate with them. As a result, the sanctioned network cannot connect to global networks and provide Internet access to the end users. In the case of deregistering (de-assigning) IP addresses, while networks might still be able to make announcements, other networks might not accept those announcements. In other words, external networks may not respond to them.

Sanction Status

EU sanction regime

Russia

- Restrictive measures (sectoral restrictive measures) in view of Russia's actions destabilising the situation in Ukraine

Iran

- EU Sanctions Regulation Iran (Council Regulation (EU) No. 267/2012) (EU) No 267/2012 of 23 March 2012 concerning restrictive measures against Iran and repealing Regulation (EU) No 961/2010

More specifically, Article (14) which states that in consideration of Iran's attempts at circumventing the sanctions, it should be clarified that all funds and economic resources belonging to, owned, held or controlled by persons, entities or bodies listed in Annexes I or II to Decision 2010/413/CFSP are to be frozen without delay, including those of successor entities established to circumvent the measures set out in this Regulation.

- [COUNCIL REGULATION \(EU\) 2020/1998](#) of 7 December 2020 "concerning restrictive measures against serious human rights violations and abuses"

Syria

- Restrictive measures against Syria (Regulation (EU) No 36/2012)- Freezing of funds and economic resources ([Article 14 and 15](#))⁵⁶

[COUNCIL REGULATION \(EU\) 2020/1998](#) of 7 December 2020 "concerning restrictive measures against serious human rights violations and abuses"

US sanction regime

Iran

31 CFR Part 535 - Iranian Assets Control Regulations

31 CFR Part 560 - Iranian Transactions and Sanctions Regulations

31 CFR Part 561 - Iranian Financial Sanctions Regulations

31 CFR Part 562 - Iranian Human Rights Abuses Sanctions Regulations

Syria

31 CFR Part 542- Syrian Sanctions Regulations

Russia

PART 587 - RUSSIAN HARMFUL FOREIGN ACTIVITIES SANCTIONS REGULATIONS

Australia sanction regime

[Autonomous Sanctions Regulations 2011](#) (under review)

See a comprehensive list of regime types and their own criteria to satisfy permit requirements

⁵⁶ Regulation (EU) No 267/2012 of the European Parliament and of the Council of 23 March 2012 concerning the conservation of endangered species of wild fauna and flora. (2022, June 29). EUR-Lex. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02012R0267-20220629>

Actors involved	<p>Local Internet Registries Regional Internet Registries Financial institutions Content Delivery Networks (CDNs) Internet Service Providers</p>
Effect on connectivity	<p>IP addresses are needed for devices and network operators to talk to each other. If they cannot obtain IP addresses or if they are de-registered, they cannot operate on the Internet.</p> <p>In the age of routing security, it is very possible that no network will take announcements from de-registered IP addresses</p>
Legal alternatives (compliance mechanism)	<p>It is unclear whether the derogations and licenses apply to registration of IP addresses.</p> <p>EU derogation: "Article 2 shall not apply to funds or economic resources that are strictly necessary for the provision of electronic communication services by Union telecommunication operators, for the provision of associated facilities and services necessary for the operation, maintenance and security of such electronic communication services, in Russia, in Ukraine, in the Union, between Russia and the Union, and between Ukraine and the Union, and for data centre services in the Union."</p> <p>US Licenses: Iran General License (No. D-2) - General License with Respect to Certain Services, Software, and Hardware Incident to Communications Sudan: The Department of the Treasury's Office of Foreign Assets Control ("OFAC") is amending the Sudanese Sanctions Regulations and the Iranian Transactions Regulations to authorize the exportation of certain services and software incident to the exchange of personal communications over the Internet. Cuba: Similarly, OFAC is amending the Cuban Assets Control Regulations to authorize the exportation of certain services incident to the exchange of personal communication over the Internet.</p>
Technical alternatives	<p>There are no alternatives to IP addresses</p>

Implementation complications	<p>In order for sanctioned entities to obtain new IP addresses, the RIR or the registrant should apply for a derogation or exemption. RIPE NCC has attempted to do that but the Dutch MFA is yet to consider and issue the derogation.</p> <p>At the moment, there are no compliance mechanisms that can facilitate obtaining new IP addresses by sanctioned entities. But the IP resources do not have to be deregistered – their registration is simply frozen. The current EU derogation might also have some shortcomings: it applies to telecom operators and e-communications which are not the functions of the RIRs. The EU derogation is also limited to Russia. It reads as, “such electronic communication services, in Russia, in Ukraine, in the Union, between Russia and the Union, and between Ukraine and the Union, and for data centre services in the Union.”</p>
Whose connectivity is impacted (impact on third parties)	<p>Network operators in sanctioned countries, Network operators in neighboring countries, Users of the Internet located in those countries</p>

4. Transfers

A [transfer occurs when IP](#)⁵⁷ addresses and/or AS numbers (Internet number resources) are moved from one legal entity (the source) to another (the recipient). A transfer is different from an organizational legal entity name change. Transfer of IP addresses can [take place due to](#)⁵⁸ (as laid out by ARIN):

- 1) the assets of the organization are acquired by another entity
- 2) an organization with unused IPv4 space decides to transfer the assets.

Sanctions affect transfer of IP addresses. Sometimes network operators would want to transfer a range of IP addresses to other network operators. But if their IP addresses are frozen, they cannot do so as these transfers are recognized legally as transactions.

⁵⁷ APNIC. (n.d.). Transfer resources. Retrieved April 23, 2023, from <https://www.apnic.net/manage-ip/manage-resources/transfer-resources/#:~:text=A%20transfer%20occurs%20when%20IP,organizational%20legal%20entity%20name%20change>.

⁵⁸ American Registry for Internet Numbers (ARIN). (n.d.). Transfers. Retrieved April 23, 2023, from <https://www.arin.net/resources/registry/transfers/>

Sanction Status	<p>EU Sanction Regime</p> <ul style="list-style-type: none"> - Iran Restrictive measures in relation to the non-proliferation of weapons of mass destruction (WMD) - Restrictive measures against Syria (Regulation (EU) No 36/2012)- Freezing of funds and economic resources (Article 14 and 15) - Syria sanction timeline - Russia EU sanctions timeline and policies <p>US Sanction Regime</p> <ul style="list-style-type: none"> - 31 CFR Part 535 - Iranian Assets Control Regulations - 31 CFR Part 560 - Iranian Transactions and Sanctions Regulations - 31 CFR Part 561 - Iranian Financial Sanctions Regulations - 31 CFR Part 562 - Iranian Human Rights Abuses Sanctions Regulations - 31 CFR Part 542- Syrian Sanctions Regulations - 31 CFR Part 587 - Russian Harmful Foreign Activities Sanctions Regulations <p>Australia Sanction Regime</p> <ul style="list-style-type: none"> - Autonomous Sanctions Regulations 2011 (under review) - See a comprehensive list of regime types and their own criteria to satisfy permit requirements: https://www.dfat.gov.au/international-relations/security/sanctions/sanctions-regimes
Actors involved	<p>Local Internet Registries Regional Internet Registries Financial institutions</p>
Effect on connectivity	<p>Being unable to transfer the IP addresses can affect connectivity in at least two ways:</p> <ol style="list-style-type: none"> 1. If an organization in a sanctioned country has purchased IP addresses (from sanctioned entities), it will require inbound transfer. Even if the organization is not sanctioned, it will be incapable of doing so. If IP addresses are not transferred, other network operators might misroute or treat the affected network operator traffic as hijacked 2. If a network operator decides to escape the sanctioned regime and set up an operation somewhere else, the organization cannot transfer the IP addresses
Legal alternatives (compliance mechanism)	<p>Inbound transfers of IP addresses at the moment is not possible at least at RIPE NCC. There are no alternative compliance mechanisms. It might be possible to receive a derogation/or exception.</p>
Technical alternatives	<p>There are no technical alternatives.</p>

Legal and technical alternative Implementation complications	No alternative compliance mechanisms. It might be possible to receive an exception/ a derogation.
Whose connectivity is impacted (impact on third parties)	Non-sanctioned Network operators End Users

5. Maintaining RIR Databases

RIRs maintain databases of [IP addresses that contain](#)⁵⁹:

- 1) The records of allocations and assignments of IP address space Assignments of Autonomous System Numbers (AS Numbers)
- 2) Reverse DNS registrations
- 3) Contact information
- 4) Routing policy information (in the Internet Routing Registry).

It is possible that due to sanctions, some of these functions can not be carried out for sanctioned entities. For example they might not be able to access the registry database.

Sanction Status	<p>EU:</p> <ul style="list-style-type: none"> - Iran Restrictive measures in relation to the non-proliferation of weapons of mass destruction (WMD) - Restrictive measures against Syria (Regulation (EU) No 36/2012)- Freezing of funds and economic resources (Article 14 and 15) - Syria sanction timeline - Russia EU sanctions timeline and policies <p>US:</p> <ul style="list-style-type: none"> - 31 CFR Part 535 - Iranian Assets Control Regulations - 31 CFR Part 560 - Iranian Transactions and Sanctions Regulations - 31 CFR Part 561 - Iranian Financial Sanctions Regulations - 31 CFR Part 562 - Iranian Human Rights Abuses Sanctions Regulations - 31 CFR Part 542- Syrian Sanctions Regulations
Actors involved	Local Internet Registries Regional Internet Registries Financial institutions Third party authentication software providers

⁵⁹ RIPE NCC. (n.d.). Querying the RIPE database. Retrieved April 23, 2023, from <https://www.ripe.net/manage-ips-and-asns/db/support/querying-the-ripe-database>

Effect on connectivity	<p>The working of the Internet is based on trust. As recognized in RFC 7020 accuracy, public availability of Internet registry data is often an essential component in researching and resolving security and operational issues on the Internet. Not having the accurate information can lead to other networks not accepting announcements and disconnection.</p> <p>If the holders of IP resources transfer them to other organizations and it cannot be accurately reflected in the database, it devalues the whole registration system due to the divergence, which will have severe impact on global coordination of the IP addresses. It leads to inaccuracy and can disable the acceptance of announcements from certain IP addresses or hamper trust and security of IP address space due to the lack of accurate information.</p>
Legal alternatives (compliance mechanism)	<p>As RIPE NCC has found, the assets can be frozen but do not need to be deregistered and the network operators can still have access to the database to update it.</p> <p>Another legal alternative would be to receive a derogation or an exemption for this specific function or a general exemption for this specific function.</p>
Technical alternatives	<p>A technical alternative to the database could be the Internet Routing Registry. IRR is not only provided by the RIRs but also by organizations such as RADB, NTT, and Level3 among others. IRR “is a globally distributed routing information database that consists of several databases run by various organizations. Network operators use the IRR to publish their routing policies and routing announcements in a way that allows other network operators to make use of the data.”However, the authoritative, accurate record is held by the RIR database. So sanctions might lead to inaccuracy in IRR as well.</p>
Implementation complications	<p>It is possible for the competent authorities that impose sanctions in the future to consider access to the database and generally keeping IP addresses registered as a violation of sanction policies. In this case, the solution to just freeze the assets but allow for access to the database will not be effective. Although the IRR can help with having access to information, in order to keep it updated it still needs to rely on RIRs accurate registration information in order to keep an accurate database.</p>
Whose connectivity is impacted (impact on third parties)	<p>Network operators globally (as they do not have access to accurate information which, can hamper routing)</p> <p>End users</p>

6. The Current Impact On Each RIR

Sanctions have impacted RIPE NCC’s mission already, and the other RIRs (APNIC) anticipate that sanctions will affect their mission in the future especially if they have members residing in sanctioned countries. ARIN does not see any substantial impact to the RIR mission or anticipate substantial impact in the future. The lower level of impact might be because of the jurisdictions RIRs and the members of RIRs reside in. The jurisdictions might provide exemption processes. For

example, the United States (as mentioned in this report) provides waiver/licenses processes especially when it comes to providing access to the Internet for personal use. Members of ARIN,⁶⁰ if affected by sanctions under lawful circumstances, could obtain a license or the general licenses might be applicable to the services they provide.

The lack of impact does not mean that other RIRs do not undertake due diligence. They undertake extensive vetting before providing services to organizations and they believe these processes are sufficient for remaining compliant with sanctions rules and regulations. These compliance processes have long been in place, so they did not have to update them in light of new sanctions.

F. Application Layer

The application layer in the OSI model includes protocols and functionalities that software applications used to provide services to the users. [The Application layer includes](#)⁶¹, inter alia, the Domain Name System, HTTP and SMTP (Simple Mail Transfer protocol). In this report, we will deviate from this definition and include some of the software applications and other operations that make using and offering online services and content possible.

1. Maintaining and Modifying the Root Zone File

Located in the Domain Name System, the root zone is part of the global domain name database that “contains the authoritative record of the operators of various top-level domains.”⁶² Its oversight has been authorized to be coordinated by the Internet Corporation for Assigned Names and Numbers (ICANN) created in 1998 as a private non-profit organization under the laws of the State of California. ICANN develops and implements policies through a multi-stakeholder governance mechanism. Sometimes, the coordination of allocation and assignment of names can involve political and legal issues, which ICANN must deal with and resolve.

Conflicts over the root zone were related to its management and the decision-making processes, which involve delegating and re-delegating the top-level domains to a manager and adding the Top-Level Domains (TLDs) to the root zone. TLDs are the last labels of a domain name following a dot (.com, .org, .net, .gov, .biz and .edu) and include country-code-top-level-domains (ccTLDs) like .DE for Germany or .PE for Peru, and generic-top-level-domains (gTLDs). gTLDs are TLDs that are not tied to any specific nation-state and, therefore, are generic, Anyone can use them anywhere. TLDs like .com, .org, .net are all considered as “generic TLDs”.

Sanctions mainly affect access to registration of domain names and they make requests applying for new gTLDs and redelegation of ccTLDs difficult. Up until now, sanctions up until now have not affected access to the whole root zone and it might technically not be possible to block access to the root zone.

60 Written interview with ARIN

61 Cloudflare. (n.d.). What is Layer 7 (L7)? Cloudflare Learning Center. Retrieved April 23, 2023, from <https://www.cloudflare.com/learning/ddos/what-is-layer-7/>

62 Internet Assigned Numbers Authority, ‘Root Zone Management’ (IANA) <<https://www.iana.org/domains/root>>

2. Domain Name Registries, Registrars and Resellers

In order to activate a website, an email or a host of other services on the Internet, a “domain name” must be registered for these services. Usually domain name registration is managed by domain name registrars. The rules related to registration are, to a certain extent set by ICANN and the domain name registry. A domain name registry delegates the registration of domains to registrars, sets up policies (in accordance to ICANN overarching rules) and enforces them on registrars. However, in some cases where there is a direct relation between the domain name registry and the domain name registrants, the registry can be involved with the registration of the domain names. Resellers are entities that are not registrars accredited by ICANN but they have agreements with the registrars to sell domain names.⁶³

Domain name registrations are specifically sanctioned by OFAC in the US for some countries, such as Iran. This is not the case in the EU but sometimes European registrars over comply with sanctions and do not provide their services to US-sanctioned countries.

63 See ICANN, <https://www.icann.org/resources/pages/reseller-2013-05-03-en#:~:text=A%20reseller%20is%20a%20third.be%20able%20to%20help%20you>.

EU sanction regime

Russia

The Russia (Sanctions) (EU Exit) (Amendment) (No. 17) Regulations 2022 Substitution of regulation 60DA (trade: exception relating to professional and business services) 14. For regulation 60DA (including the heading) substitute—
“Trade: exceptions relating to professional and business services

(6) The prohibitions in regulation 54C, in so far as they relate to IT consultancy and design services, **are not contravened by the provision of—**
(a) an “electronic communications network” or an “electronic communications service” (within the meanings given by section 32 of the Communications Act 2003(1)) that is used for civilian purposes, or
(b) services that are incidental to the exchange of communications over the internet, including— (i) instant messaging, (ii) videoconferencing, (iii) chat and email, (iv) social networking, (v) sharing of photos, audio, videos, films or documents, (vi) web browsing, (vii) blogging, (viii) web hosting, and (ix) **domain name registration services.**

US sanctions-regime

Iran

PART 560—IRANIAN TRANSACTIONS AND SANCTIONS REGULATIONS

§ 560.540: Exportation of certain services and software incident to Internet-based communications.

(b) This section does not authorize: (4) The direct or indirect exportation of web-hosting services that are for purposes other than personal communications (e.g., web-hosting services for commercial endeavors) **or of domain name registration services.** [Emphasis added by the author]

The general license D2 that was issued in 2022 did not resolve the issue but it clarified that domain name registration services cannot be offered to a “person located in Iran”.

Note 3 to paragraph (4) The exportation or reexportation, directly or indirectly, of web-hosting services that are for websites of commercial endeavors located in Iran or of domain name registration services for or on behalf of a person located in Iran or the Government of Iran. [Emphasis added by the author]

Russia

- Russian Harmful Foreign Activities Sanctions Regulations, 31 CFR part 587, GENERAL LICENSE NO. 25, Authorizing Transactions Related to Telecommunications, and Certain Internet-Based Communications

- (b) Except as provided in paragraph (c) of this general license, the exportation or reexportation, sale, or supply, directly or indirectly, from the United States or by U.S. persons, wherever located, to the Russian

	<p>Federation of services, software, hardware, or technology incident to the exchange of communications over the internet, such as instant messaging, videoconferencing, chat and email, social networking, sharing of photos, movies, and documents, web browsing, blogging, web hosting, and domain name registration services, that is prohibited by the RuHSR, is authorized.</p> <p>Cuba Part 515 - Cuban Assets Control Regulations 515.578 Exportation, reexportation, and importation of certain internet-based services; importation of software. a) Except as provided in paragraph (b) of this section, the following transactions are authorized: (1) Certain internet-based services. The exportation or reexportation, directly or indirectly, from the United States or by a person subject to U.S. jurisdiction to Cuba of services incident to the exchange of communications over the internet, such as instant messaging, chat and email, social networking, sharing of photos and movies, web browsing, blogging, web hosting provided that it is not for the promotion of tourism, and domain name registration services.</p>
Actors involved	<p>Internet Corporation for Assigned Names and Numbers (ICANN) Domain name registries Domain name registrars Domain name resellers Financial institutions</p>
Effect on connectivity	<p>Lack of access to domain names or suspension of already registered domain names can create more barriers for the user to maintain their presence online. With the centralization and consolidation of registrars primarily located in jurisdictions with heavy sanction regimes, access to domain names becomes more difficult. This affects the resellers as well. Regardless of where they are located, resellers might not be able to serve sanctioned countries because of their contract with the registrars.</p>
Legal alternatives (compliance mechanism)	<p>Receiving a specific license Issuance of a general license</p>
Technical alternatives	<p>Not all registries and registrars are subjected to sanction regimes and it is possible for them to serve people based in sanctioned countries.</p>
Implementation complications	<p>Even after the issuance of a general license or a specific license, the registry or registrar might find it difficult to change its compliance process, so it might continue to refrain from serving ordinary people in sanctioned countries. Certain actors in the financial industry might refuse to facilitate the transaction.</p>
Whose connectivity is impacted (impact on third parties)	<p>Service providers (businesses and NGOs: domain name registrants) End users (consumers)</p>

3. Hosting Services and Cloud Service Providers

Hosting services store website and other contents and can be provided by cloud providers. For example, Google Cloud provides [web hosting](#).⁶⁴ Cloud service providers offer a cloud-based platform for infrastructure, application or storage services. Recently, Cloud service providers and hosting providers have reacted to the economic sanctions against Russia by terminating their services to Russian and Belarusian customers.

[AWS \(Amazon\) issued a statement](#)⁶⁵ that they did not have any infrastructure or data center in Russia, and they stopped allowing new signups in Belarus and Russia. But that did not impact companies that are headquartered outside of the country while maintaining some development teams in Russia. [Azure \(Microsoft cloud service\)](#)⁶⁶ argued that they are working with the sanction authorities in the US, EU and the UK to comply with sanctions. VMware [also announced termination](#)⁶⁷ of business and service to comply with sanctions.⁶⁸

Hosting services provide storage for content and service providers data. American hosting companies have long refused to provide hosting services to [countries such as](#)⁶⁹: Cuba, Iran, North Korea, Syria, Region of Crimea. Hosting providers also do not provide their services for Country Code Top Level Domain Names such as .IR, .KP, and .SY.

cPanel, which provides web hosting control panel software, does not allow its customers, no matter where they are located, to provide services to countries that are sanctioned by the United States.⁷⁰ This affects a large number of providers that use cPanel, other hosting providers, domain name registrars, and web developers.

64 Google Cloud. (n.d.). Web hosting on Google Cloud Platform. Retrieved from <https://cloud.google.com/solutions/web-hosting>

65 Amazon. (2014, March 5). Amazon's assistance in Ukraine [Press release]. Retrieved from <https://www.aboutamazon.com/news/community/amazons-assistance-in-ukraine#Feb28>

66 Smith, B. (2022, March 4). Microsoft suspends sales to Russia amidst Ukraine conflict [Blog post]. Microsoft On the Issues. Retrieved from <https://blogs.microsoft.com/on-the-issues/2022/03/04/microsoft-suspends-russia-sales-ukraine-conflict/>

67 VMware. (2022, February 24). VMware statement regarding Ukraine [Press release]. Retrieved from <https://news.vmware.com/releases/vmware-statement-regarding-ukraine>

68 A compilation of the statements can be found here: <https://www.channelfutures.com/cloud-2/all-major-u-s-cloud-providers-have-stepped-back-from-business-in-russia>

69 A2 Hosting. (n.d.). Do you comply with U.S. Treasury embargo restrictions? A2 Hosting Knowledge Base. Retrieved from <https://www.a2hosting.com/kb/does-a2-hosting-support/do-you-comply-with-us-treasury-embargo-restrictions>

70 cPanel legal agreement, "9.15 Export Controls. The parties agree to comply fully with all Applicable Laws of the United States, or of any foreign government to or from where a party is shipping, to in connection with the import, export or re-export, directly or indirectly, of the Software in connection with this Agreement. You specifically agree that you shall not, directly or indirectly, supply or permit any other party to supply the Software to an individual or organisation in a country or region against which the U.S. government imposes an embargo (presently, Crimea, Cuba, Iran, North Korea and Syria) or an individual or organisation on the U.S. Treasury Department's List of Specially Designated Nationals and Blocked Persons or other individual who or organisation that is the subject of a U.S. legal measure that provides for sanctions blocking of property or that otherwise generally forbids U.S. citizens to transact with the individual or organisation." <https://www.cpanel.net/legal-store/>

EU sanction regime

Russia

The Russia (Sanctions) (EU Exit) (Amendment) (No. 17) Regulations 2022 Substitution of regulation 60DA (trade: exception relating to professional and business services)

14. For regulation 60DA (including the heading) substitute—
“Trade: exceptions relating to professional and business services

(6) The prohibitions in regulation 54C, in so far as they relate to IT consultancy and design services, are not contravened by the provision of—
(a) an “electronic communications network” or an “electronic communications service” (within the meanings given by section 32 of the Communications Act 2003(1)) that is used for civilian purposes, or
(b) services that are incidental to the exchange of communications over the internet, including— (i) instant messaging, (ii) videoconferencing, (iii) chat and email, (iv) social networking, (v) sharing of photos, audio, videos, films or documents, (vi) web browsing, (vii) blogging, (viii) web hosting, and (ix) domain name registration services.

US-sanctions regime

Iran:

PART 560—IRANIAN TRANSACTIONS AND SANCTIONS REGULATIONS

§ 560.540: Exportation of certain services and software incident to Internet-based communications.

(b) This section does not authorize: (4) The direct or indirect exportation of web-hosting services that are for purposes other than personal communications (e.g., web-hosting services for commercial endeavors) or of domain name registration services. [Emphasis added by the author]

The general license D2 that was issued in 2022 did not resolve the issue but it clarified that domain name registration services cannot be offered to a “person located in Iran”.

(4) The exportation or reexportation, directly or indirectly, of web-hosting services that

are for websites of commercial endeavors located in Iran or of domain name registration services for or on behalf of a person located in Iran or the Government of Iran. [Emphasis added by the author]

Cuba

PART 515 - CUBAN ASSETS CONTROL REGULATIONS

§ 515.578 Exportation, reexportation, and importation of certain internet-based services; importation of software. (a) Except as provided in paragraph (b) of this section, the following transactions are authorized: (1) Certain internet-based services. The exportation or reexportation, directly or indirectly, from the United States or by a person subject to U.S.

jurisdiction to Cuba of services incident to the exchange of communications over the internet, such as instant messaging, chat and email, social networking, sharing of photos and movies, web browsing, blogging, web hosting provided that it is not for the promotion of tourism, and domain name registration services.

Effect on connectivity	As some hosting providers do not provide their services to sanctioned countries, sanctioned countries might use local hosting providers that are not streamlined and access to those websites globally might be slowed down.
Actors involved	Cloud Service Providers Hosting providers, Web developers
Legal alternatives (compliance mechanism)	There are general licenses issued in the US that exempt cloud service providers and hosting services. Russia: Russian Harmful Foreign Activities Sanctions Regulations 31 CFR part 587 GENERAL LICENSE NO. 25 The exportation or reexportation, sale, or supply, directly or indirectly, from the United States or by US persons, wherever located, to the Russian Federation of services, software, hardware, or technology incident to the exchange of communications over the Internet, such as instant messaging, videoconferencing, chat and email, social networking, sharing of photos, movies, and documents, web browsing, blogging, web hosting, and domain name registration services, that is prohibited by the RuHSR, is authorized,
Technical alternatives	There are other providers.
Implementation complications	When hosting providers and cloud services come up with a compliance system, even after issuance of general licenses, it is costly to make changes to those compliance mechanisms and processes. So the providers might decide not to provide their services to the sanctioned countries despite having general licenses in place.
Whose connectivity is impacted (impact on third parties)	Online service providers Web developers Network operators (resellers and other hosting providers) Ordinary users

4. Browser Services and App Stores

Web browser services such as Firefox, Chrome and other browsers allow the users to access, display and view websites; app stores host the apps that provide content and services. Although browser services are not much affected by sanctions and there are no reports to that effect, app stores are frequently subject to sanction regimes in several jurisdictions.

Sanction Status	<p>EU sanction regime Iran and Sudan</p> <p>Iranian Transactions and Sanctions Regulations. 31 C.F.R. Part 560 Annex - Services, Software, and Hardware Incident to Personal Communications. Authorized for Exportation, Reexportation, or Provision to Iran by Paragraph (a)(3) of ITSR General License D-1</p> <p>Mobile operating systems, online application for mobile operating systems (app) stores, and related software, including apps designed to run on mobile operating systems, designated EAR99 or classified under ECCN 5D992.c; and services necessary for the operation of such software.</p> <p>Sudanese Sanction Regulation: Appendix B—Services, Software, and Hardware Incident to Personal Communications Authorized for Exportation, Re-exportation, or Provision to Sudan by Paragraph (a)(3) of § 538.533</p>
Effect on connectivity	<p>At the moment the effect on connectivity due to unavailability of apps on app stores might not be grave.</p> <p>However, over-reliance on apps that are available through dominant app stores (such as Apple or Google) might still affect a single open Internet. Today's global Internet users are very much reliant on phone-based applications for taking taxis, checking maps, authenticating users, and accessing countless other services and even access to email services.</p> <p>The app store might have restrictive measures to host the app. Some services limit their own usage to apps only and do not allow the use of the service via general-purpose web browsers, which exacerbates any limits imposed by app stores and the app providers themselves. If downloading certain apps is not possible or the app store or the app provider block access of certain users, the unity of online services is diminished.</p>
Actors involved	<p>App store providers App developers Financial institutions</p>
Legal alternatives (compliance mechanism)	<p>Receiving specific licenses for each service and related app</p>
Technical alternatives	<p>It is possible to use the websites of services and alternative app stores</p>
Implementation complications	<p>App providers and app stores usually do not seek specific licenses and have reportedly asked the app providers and app developers to seek a specific license themselves.</p>
Whose connectivity is impacted (impact on third parties)	<p>App Developers App providers App users</p>

5. Cache Servers

A cache server is a dedicated network server usually installed at a CDN. [It speeds up data access](#)⁷¹ and reduces demand on bandwidth, improves application performance, reduces database costs, provides predictable performance (which is very important during crises), and increases Read Throughput (IOPS).

Cache servers are usually installed by online service providers. If they are a major service/content provider such as Google or Meta, the existence of caches in local CDNs for access to data becomes very important.

Whether service providers withdraw or deactivate their caches due to sanctions is disputed. There are some claims that Google has withdrawn its caches from the [ISPs in Russia due](#)⁷² to sanctions recently. In countries that have been heavily sanctioned by the US since before the Internet became ubiquitous, it is very rare that American service providers such as Google and Facebook install caches in those local ISPs.

6. DNS Servers (Name Server)

Domain Name System (DNS) servers translate the domain name into the IP address that is needed to communicate with that site. DNS servers are usually assigned by the Internet Service Providers but the user can also change the DNS servers. Public DNS servers that are free [of charge](#)⁷³ Google, Quad9, OpenDNS, Cloudflare, CleanBrowsing, and others. There are no reported cases of sanctions that affect DNS servers for now.

7. Third-Party Authentication Software Providers and Certification Authorities

Third party authentication software providers and certification authorities have reportedly refrained from providing their services to sanctioned countries or to organizations that have members from sanctioned countries.

G. Sanctions and Connectivity Impact Matrix

This is an experimental impact matrix subject to change. As mentioned in the second section of the Internet value chain and impact matrix in this report, if 1) there are few or no technical alternatives, 2) many operations are impacted and 3) no effective legal alternatives exist, the effect on connectivity of third parties and ordinary Internet users that are not the intended targets of sanctions are higher.

The levels of effects of sanctions can further be defined as follows:

Low:

- Not many operations affected

71 Amazon Web Services. (n.d.). Caching. Retrieved from <https://aws.amazon.com/caching/>

72 Cimpanu, C. (2022, April 7). Google shut down caching servers at two Russian ISPs. BleepingComputer. Retrieved from <https://www.bleepingcomputer.com/news/technology/google-shut-down-caching-servers-at-two-russian-isps/>

73 Fisher, T. (2022, January 11). 17 Best Free and Public DNS Servers (Updated April 2022). Lifewire. Retrieved from <https://www.lifewire.com/free-and-public-dns-servers-2626062>

- Plenty of technical alternatives exist
- Few barrier for the implementation of the alternatives, and legal alternatives that are consistent exist

Medium:

- A few operations are affected
- The technical alternatives might exist but there are not plenty
- Legal alternatives exist but they are not consistent and not clear.

Severe:

- More than two operations are affected
- There are no technical alternatives
- Legal alternatives do not exist or are unclear, inconsistent and difficult to come by

A visual illustration of degrees of effect is presented below:

Layer	Affected Operations	Affected actors	Impact considering technical alternatives	Impact considering Implementation complications	Impact on third parties	Impact considering legal alternatives
Physical	Providing Backbone Infrastructure	Tier 1 Internet Service Providers, Infrastructure providers	Medium	Medium	Medium	Medium
Data Link	Access to Switch Fabric	Internet Exchange Points, Network Operators	Low	Low	Low	Low
Network	Transit services, Routing, IP inbound transfer, IP registry database, registration of IP addresses	Regional Internet Registries, Content Delivery Networks, Other Network Operators	Severe	Severe	Severe	Severe

Application	Registration and transfer of domain names, Application for new gTLDs, Complications of delegation of Country Code Top Level Domains Root Zone	Domain name registries, registrars, resellers, Internet Corporation for Assigned Names and Numbers	Medium	Medium	Medium	Medium
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H. Operators And Internet Actors In Sanctioned Countries Narratives

During this research we interviewed some Internet service providers affected by sanctions to have a better understanding of the impact on their operations. A few themes emerged from these interviews:

Inconsistent enforcement of sanctions

Local website and app providers are affected by sanctions. The enforcement is, however, inconsistent. For example, in Europe one jurisdiction decides to block access to the app provider services and one jurisdiction decides not to.

Impact on Internet traffic

Most interviewees argue that the Internet traffic is not impacted in a way that causes disconnection or disrupts business. For example, they argue even if all the European companies terminate their contracts with Russian companies, the traffic will flow through Asia to Europe and alternative networks such as Chinese networks can be used. It will be however more costly.

Third parties refuse to perform existing agreements, unreasonably refuse to perform settlements under the agreements and execute and perform their tasks. In the current situation, in order to serve the need of the users for high-quality Internet traffic, the providers are forced to look for not the best but for the possible traffic routes to grant the users access to the global Internet. The current sanction regimes also affect the CDNs, forcing market players to switch to private peering or reroute a part of their traffic through upstream providers.

But re-routing through upstream providers is affected too. Some interviewees are of the opinion that CDN operation resiliency that was done by arranging additional routes for rerouting CDN traffic in case of emergencies or overload is also affected by sanctions. Sanctions resulted in market participants choosing not to re-route and make additional capacity with upstream providers. Sanctions led to the refusal of individual market participants to arrange the rerouting because it was more complicated and increased the associated transaction costs.

Concerns about connecting to the global Internet

The online service providers expressed concerns about being cut off from the global Internet. They mentioned that while there might be alternatives to be connected, they care about being connected to the global Internet and want to operate globally. Sanction policies of many countries do not fully take into account the peculiarities of the global Internet and limit access to the global Internet.

Effect during emergency situations and on non-sanctioned countries

Networks and communication means are used by the emergency services to share information with those in need of assistance. Network overload due to equipment shortage, traffic growth and non-optimal traffic routes may entail risks associated with the provision of emergency assistance to citizens, which, in turn, can affect the health, and, in some cases, the life of citizens facing emergency situations. In February 2023, after the strongest earthquake in Turkey and Syria, rescue services from different countries were sent to the regions affected by the disaster. While providing emergency assistance to the injured, the rescuers had to communicate not only with the regional and Turkish information resources, but also with the information resources of the rescue services of their corresponding states. The quality of the process of providing assistance to earthquake victims directly depends on the availability of the necessary equipment, the optimal traffic routes and the network occupancy level.

Equipment matters

The interviewees were of the opinion that the general licenses and exemptions do not usually work especially when it relates to hardware and equipment needed for connectivity. This was due to the fact that general licenses explicitly mention that they do not address Export Administration Regulations.

III. Compliance Mechanisms

Blanket country level compliance: this is the most aggressive and risk averse compliance mechanism that we see in domain name registries and registrars for example. For example, if the registry or registrar finds out that the domain name registrant is national of a sanctioned country or serves the sanctioned country nationals, it can suspend (or confiscate) the domain name. This mostly happens in new gTLDs such as .MARKET or .ASIA. This kind of over-compliance can also be seen in connectivity hardware providers, such as in the case of Nokia not allowing Pakistan to use its transit to connect to Tehran



List-based approaches: Usually companies with more nuanced approaches to compliance hire third-party firms that keep an updated sanction list to stay informed and be warned about changes to the sanction list. Different actors on the Internet react differently if the updated list includes a sanctioned person that has an official direct or indirect role in the organization they are serving. For example, RIPE NCC freezes the IP addresses, which means that updates to the registry database cannot happen and no transfer can take place. However, RIPE NCC does not de-register the IP address.

Receiving a specific license or advocating for a general license: If it aligns with the mission of a company to provide its services globally and indiscriminately, then the companies might apply for a specific license in some cases. The incentives for a company to seek a specific license or help with getting general licenses could be that: 1) the company has a large market and demand for its services and products in the sanctioned country 2) providing services globally is its mission. GitHub is one of the tech companies that received a specific license to provide its services to developers in Iran, because it has the mission to be maximally available around the world. The reason GitHub sought a specific license was that the general licenses usually only exempt “personal” communication. It is extremely difficult and costly to differentiate between the two. Demand for GitHub by the Iranian community was high as well.

Internal compliance mechanism suitable for the Internet operation: The service providers might develop their own internal compliance mechanism. For example, if there is no third-party firm that provides compliance services tailor-made to the needs of the company, the company might internalize the cost. Some companies such as domain name registries have their own compliance software in order not to provide the registration for the specially designated nationals.⁷⁴ Sometimes, if the Internet operators have the resources, they provide their own in-house software or even financial institutions (for example [Orange started its own bank in 2017](#))⁷⁵ so as not to deal with third party actors that are not willing to comply with sanctions but also provide their services to sanctioned countries.

⁷⁴ Interview with a cloud provider

⁷⁵ Blamont, E., & Rose, M. (2017, November 2). Exclusive: French banks’ telecoms networks under close watch of national cyber agency. Reuters. Retrieved from <https://www.reuters.com/article/us-france-banks-telecoms-exclusive-idUSKBN1D0298>

IV. Global Forums to Address Internet Sanctions

There have been multiple global forums where various issues of Internet governance are discussed among actors. This section provides a list of these forums, describes their processes, and analyzes their effects on actual Internet policy at the government level, especially those concerning solutions to Internet sanctions.

Global Network Initiative

[Global Network Initiative \(GNI\)](#)⁷⁶ is a multistakeholder forum that works with technology companies, governments, and academics that address the question of how can technology companies best respect the freedom of expression and privacy rights of their users in the face of government regulations and requests to restrict access to communications services or provide access to user data.

- Process

The GNI has a set of principles that the member companies commit themselves to. It also provides an implementation guideline for responsible company decision-making in support of freedom of expression and privacy rights.

- Authorities involved

GNI is a multistakeholder forum, but no members from the governments are present. Active members include: ICT companies, civil society organizations, academics, and investors and cover Africa, Europe, Latin America, North America, and the Middle East.

- Past sanction-related experience

Despite the fact that GNI does not have members from the governments, it holds conferences with governments and tech companies. These convenings specifically include US government officials from various agencies, including the State Department, OFAC, and National Telecommunication and Information Administration (NTIA).

- Effect

GNI is a non-binding forum and does not have the authority to control sanctions. But tech companies perceive GNI's convenings on sanctions as effective when it comes to clarifying regulations and licenses about sanctions that affect their operations. These meetings can potentially



76 Global Network Initiative. (n.d.). About GNI. Retrieved from <https://globalnetworkinitiative.org/about-gni/>

affect tech companies' compliance mechanisms in place when dealing with sanctions.

GNI can also facilitate meetings with sanction officials and authorities to bridge the gap between the sanction authorities and technology focussed officials.

- Shortcomings

While GNI has the key actors involved, the government authorities involved are mainly from the United States. This may restrict the forum from gathering diverse opinions of stakeholders from other countries.

GNI activities might be effective and show results in the long term but as the processes are not binding, they might not be a good solution when a nation is facing immediate effects on Internet access.

United Nations Internet Governance Forum (UN-IGF)

UN-IGF was convened in 2006 by the United Nations to facilitate multistakeholder discussions on Internet governance issues, including universal access, digital inclusivity and digital divide, and more recently Internet fragmentation.

- Process

IGF has various groups that work on specific issues such as Net Neutrality, Digital Inclusion, and Domain Name System (DNS). There is also intersessional work consisting of [best practice forums, policy networks, and dynamic coalitions](#)⁷⁷ on various topics. It provides an annual conference for various stakeholders to interact and discuss Internet governance issues. It also brings together national and regional IGF initiatives to showcase their work and their local digital issues.

- Authorities involved

The government authorities involved with IGF generally include digital ambassadors, foreign ministers, and government department officials that are involved with Internet governance. From a cursory review of past events, those authorities imposing sanctions are not as involved.

- Past sanction-related experience

Other than holding one session organized by the private sector and a few civil society organizations about sanctions and new gTLDs in 2012, IGF has not streamlined the issue of sanctions for years. In 2022, a well-received workshop titled "Protecting a Global Internet in an Age of Economic Sanctions"⁷⁸ was held by RIPE NCC, APNIC, and Digital Medusa.

- Effect

IGF does not make binding decisions. However, governments and other stakeholders might be able to create an accessible space at IGF to discuss the impact of sanctions on access to the Internet and Internet development. This might be more effective for the long-term goal of maintaining the open, global Internet. Since IGF decisions are not binding and the sanction regulators are usually not active in that space, it might be difficult to convince the governments of Inter-

⁷⁷ United Nations. (n.d.). Thematic Intersessional Work. Internet Governance Forum. Retrieved from <https://intgovforum.org/en/content/thematic-intersessional-work>

⁷⁸ For more details about the session and report of the workshop, please visit: <https://www.intgovforum.org/en/content/igf-2022-ws-342-protecting-a-global-internet-in-an-age-of-economic-sanctions>. on the website of the United Nations Secretariat of Internet Governance Forum.

net-related carve-outs and exemptions related to sanctions through IGF.

- Shortcomings

It is difficult to measure the contribution of IGF processes to resolving imminent and long-term issues that Internet governance has been facing or to attribute concrete actions to its processes.

Moreover, the authorities generally involved with IGF are not directly engaged with sanctions and imposing sanctions.

Freedom Online Coalition

The Coalition was established in 2011 at the inaugural Freedom Online Conference in The Hague, the Netherlands, at the initiative of the Dutch Foreign Ministry. Today, the Coalition has 34 members from Africa to Asia, Europe, the Americas, and the Middle East. They undertake their work under the following streams: diplomatic coordination, shaping global norms and multistakeholder collaboration. In [diplomatic coordination](#)⁷⁹, there is a unique informal diplomatic space where participants share information and concerns about current developments that threaten Internet freedom, while also facilitating diplomatic coordination in relevant forums to advance an open, free and secure Internet. They also shape [global norms by issuing statement](#)⁸⁰ on worrying or positive developments related to online freedoms. The multistakeholder collaboration takes place through the Advisory Network, the FOC-AN, which was established to engage with member governments.

- Process

It seems that all three engagement processes (diplomatic coordination, global norms and multistakeholder collaboration) at FoC can be used to address sanctions. In particular, governments can discuss sanctions informally at the diplomatic coordination group. FOC-AN can also bring the issue of sanctions and how it impacts Internet development to the attention of the diplomats.

- Authorities involved

FoC comprises 35 countries or governments. While it has members from Europe, the European Union is not a member. It is also not clear which government agencies are involved with FoC.

- Past sanction-related experience

FoC does not appear to have been active on the issue of sanctions, at least publicly.

- Effect

Long-term effect: Making sanctions an agenda item for FOC or FOC-AN might encourage governments to give more thoughts to policies that do not have an adverse impact on access to the Internet when imposing sanctions.

Short-term effect: FOC might be used as an informal process to discuss the issue of access and sanctions during a crisis.

79 Freedom Online Coalition. (n.d.). Diplomatic Coordination. Retrieved from <https://freedomonlinecoalition.com/diplomatic-coordination/>

80 Freedom Online Coalition. (n.d.). Shaping Global Norms. Retrieved from <https://freedomonlinecoalition.com/shaping-global-norms/>

- Shortcoming

The European Union is not a member of FoC. This might make it more difficult to influence EU sanction laws.

Declaration for the Future of the Internet

[Declaration for the Future of the Internet \(DFI\)](#)⁸¹ is a government partnership led by the US. The declaration is a political commitment among partners to advance a positive vision for Internet digital technologies. It also reaffirms and recommits its partners to a single global Internet that is truly open and fosters competition, privacy, and respect for human rights.

- Process

There is an open call for all governments or relevant authorities willing to commit and implement the declaration vision. There is no set process for involvement, but the US government states that it has worked with partners from various stakeholders to reaffirm the vision of an open, free, global, interoperable, and secure Internet.

- Authorities involved

[Sixty countries](#)⁸² and the European Commission have signed the declaration. The government departments and agencies are not known in this case either. The usefulness of the initiative has been acknowledged by actors such as [Microsoft](#)⁸³ and [analysts](#)⁸⁴.

- Past sanction-related experience

This is a relatively new initiative. However, the leader of the initiative, Peter Harrell, who is Special Assistant to the President and Senior Director for International Economics and Competitiveness on the White House National Security Council staff for the Biden administration, worked on sanctions and the Internet at the US State Department. He argued that DFI has been used and can be used for sanction related issues. He argued that DFI was used during the latest imposition of sanctions on Russia to coordinate with the UK and other government [counterparts to refrain from](#)⁸⁵ affecting access of ordinary people to the Internet when imposing sanctions.

- Effect

The declaration and its process are heavily [criticized by civil society](#)⁸⁶ and other stakeholders. Some speculated that it might not even continue in the future, because its development was not [consultative enough](#) and some key countries such as Brazil have not joined it.

81 U.S. Department of State. (2022, April 8). Declaration for the Future of the Internet. Retrieved from <https://www.state.gov/declaration-for-the-future-of-the-internet/>

82 U.S. Department of State. (2022, April 8). Declaration for the Future of the Internet. Retrieved from <https://www.state.gov/declaration-for-the-future-of-the-internet/>

83 Smith, B. (2022, April 28). The declaration for the future of the internet: Advancing cybersecurity and effective governance. Microsoft On the Issues. Retrieved from <https://blogs.microsoft.com/on-the-issues/2022/04/28/declaration-future-internet-cybersecurity-governance/>

84 West, D. M. (2022, May 9). The Declaration for the Future of the Internet is for wavering democracies, not China and Russia. Brookings TechTank. Retrieved from <https://www.brookings.edu/blog/techtank/2022/05/09/the-declaration-for-the-future-of-the-internet-is-for-wavering-democracies-not-china-and-russia/>

85 Asia Society Policy Institute. (2019, September). The Future of the Internet. Retrieved from <https://asiasociety.org/policy-institute/future-internet>

86 Access Now. (2022, April 7). A Declaration for the Future of the Internet: Take Back Control of Technology. Retrieved from <https://www.accessnow.org/declaration-for-future-internet/>

The mission of the DFI and the presence of US support permit a global, open and interconnected Internet. Expertise in sanctions also exists in the DFI, where sanction regimes are involved. Thus, the DFI might be a good venue to discuss sanctions to mitigate the effect of sanctions on the Internet

- Shortcoming

Since the DFI is only a declaration and no process is established at the moment, it might not be as effective as other more established forums.

Multilateral tech coordinations

There are some multilateral tech coalitions whose states coordinate on tech policies. Monitoring these initiatives and trying to discuss sanctions issues might be useful. Below, we discuss the U.S.-EU initiative.

U.S.- E.U. Trade and Technology Council (TTC)

[The TTC is a trade initiative](#)⁸⁷ which aims to promote the U.S. and EU competitiveness, property protection and the spread of democratic, market-oriented values by increasing transatlantic trade and promoting investment in products and services of emerging technologies.

- Process

The Council has 10 working groups. These working groups focus on tech standards, climate and green tech, secure supply chains, information and communications technology and services security and competitiveness, data governance and tech platform regulation, misuse of technology threatening security and human rights, export controls, investment screening, promoting SME access to and use of digital technologies, and global trade challenges. The group usually holds stakeholders' roundtable discussions which are worth attending and paying attention to.

- Authorities involved

The co-chairs are the U.S. Trade Representative, the Secretary of Commerce as well as the Secretary of State. The EU has appointed the European Commission Executive Vice Presidents as co-chairs.

- Past sanction-related experience

This is a new initiative and it is not clear whether it has worked on the issue of sanctions and technology. However, the issue of sanctions could be discussed under tech-standards, or even as a stand alone agenda item.

- Effect

The objectives of the Council are aligned with the value of an open, global Internet. Also, since key representatives from the US State Department and especially the Trade Department are present, they might have the authority and the power to address the issue of sanctions.

87 Office of the United States Trade Representative. (n.d.). United States-European Union Trade and Technology Council (TTC). Retrieved from <https://ustr.gov/useuttc>

V. Delivery of Humanitarian Aid and Sanctions

Since humanitarian organizations have faced many issues delivering humanitarian aid in crisis stricken areas due to sanctions, this section briefly documents how they ultimately received the licenses and exemptions both in Europe and the US. This section only aims to provide some information about another group that has had to deal with sanctions and learn lessons from it. Despite the fact that the Internet is used heavily during crises and by humanitarian groups, it is still not possible to argue that lack of access to it could completely undermine delivery of humanitarian aid.

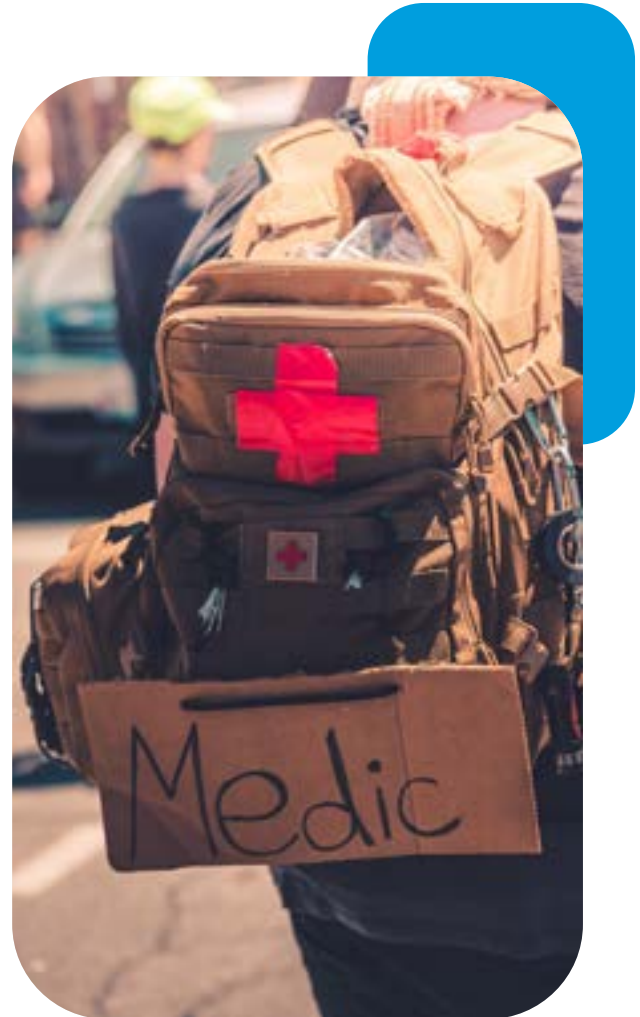
The Humanitarian “Carve-out” at the UN

In late 2022, The Security Council adopted Resolution 2664 (2022) [on UN Sanctions regimes](#)⁸⁸.

- The carve-out, unlike some of the national “Internet carver-outs” was cross-cutting for all UN sanctions regimes and it even included 1267 ISIL/al-Qaida regime.
- The carve-out ensured that any financial transactions or provision of goods and services necessary for humanitarian assistance and basic human needs “are permitted and not a violation of the asset freeze” measures.

The resolution was quite an achievement as it was adopted during an ongoing war and across all the sanction regimes. This was due to humanitarian organizations consistent efforts and years of advocacy by humanitarian organizations, civil society groups and member states as well as counterterrorism practitioners.

Another factor for success was that the different stakeholders changed the approach of those countries with fierce sanction regimes such as the United States. They changed the foreign policy of the US and encouraged it to change its priorities.



⁸⁸ Lewis, A. (2022, April 19). New Humanitarian Carve-Out for UN Sanctions Regimes. The Global Observatory. Retrieved from <https://theglobalobservatory.org/2022/04/new-humanitarian-carve-out-un-sanctions-regimes/>

The US Humanitarian Sanctions Exceptions

The humanitarian organizations changed the US approach and priorities and foreign policy to the extent that the US along with Ireland held the pen and wrote the UN resolution. The US then became the first country to [enforce the resolution](#)⁸⁹.

The US approach changed gradually, In 2021, the treasury decided to publish a review of the economic sanctions programs. The report concluded that sanctions have to be legitimate and calibrated carefully to help address the adverse impact on legitimate humanitarian aid. It also recommended that the US has to globally address the challenges associated with conducting humanitarian activities.

Multistakeholder Working Groups

In order to reach a global understanding and exemption when humanitarian organizations are affected by sanctions, advocates used different strategies and one was convening multistakeholder groups. In the US for example, to overcome the challenges that the financial institutions created for humanitarian aid organizations, the [Center for Strategic and International Studies](#)⁹⁰ convened a working group. The working group had the aim to reconcile the knowledge and interests of key stakeholders to build a shared understanding of various regulatory, compliance, and risk related issues and explore practical solutions to promote financial access for humanitarian aid organizations.

89 U.S. Department of the Treasury. (2022, April 21). Treasury Releases Report on Macroeconomic Impact of American Jobs Plan. Retrieved from <https://home.treasury.gov/news/press-releases/jy1175>

90 CSIS. (2022, January 13). Mitigating Financial Access Challenges. Retrieved from <https://www.csis.org/analysis/mitigating-financial-access-challenges>

VI. Legislative and Regulatory Remedies

This section discusses the remedies and solutions made available by legislative processes in major in the EU. It discusses the various legal options countering sanction policies and evaluates their effectiveness. It is especially targeted at Internet operators and entities that are affected by sanctions and would like to stay compliant but still provide their services to third parties through legislative remedies.

EU processes

Exceptions from EU sanctions usually take the form of derogations or exemptions. Derogations are similar to specific licenses issued in the US. They can be issued by competent authorities that authorize prohibited actions to be carried out. Derogations can also be issued by the EU.

Exemptions are conditions where sanctions do not apply when the purpose of the action coincides with the scope of the exemption. As a result, the activity falling within the scope of exemptions can be carried out. Exemptions are more similar to general licenses in the US sanction regime.

Amending a sanction regulation and introducing a derogation

The process for amending a sanction regulation to provide exceptions for certain activities has both legal and political angles. Exceptions can take place at the EU level as an amendment to a “restrictive measures regulation” suggesting a derogation.

Receiving an exception for a certain activity at the EU level includes the following steps:

1. the competent authority of an EU country (usually the foreign ministry) brings up the need for the exception to the Foreign Affairs and Security Policy-related working party.
2. The group in charge of bringing best practices and changes for the implementation of sanctions is called RELEX, the Working Party of Foreign Relations Counselors. RELEX is composed of members of the Council. The members are composed of Foreign Office attachés from each member state permanent representation in Brussels. Through their political processes, they discuss the need for derogation and exception and make a suggestion to the High Representative of the Union for Common Foreign and Security Policy. They also periodically meet to discuss and evaluate the [effect of sanctions](#)⁹¹
3. The joint proposal for amendment should be presented to the High Representative, the European Commission, and the EU Council. The Council has to approve the amendment unanimously.

⁹¹ Council of the European Union. (2018). Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EC) No 1236/2005 concerning trade in certain goods which could be used for capital punishment, torture or other cruel, inhuman or degrading treatment or punishment (ST-5664-2018-IN-IT). Retrieved April 21, 2023, from <https://data.consilium.europa.eu/doc/document/ST-5664-2018-IN/IT/en/pdf>

- Review process

All the [EU sanctions \(restrictive measures\)](#)⁹² in force are constantly reviewed. This means that they can be changed. The designated list can be revised and exemptions and derogations can be considered. The sanctions that are implemented due to UN Security Council Resolutions do not have an end date. The only time they can be amended or lifted is when the UN takes a decision that effect.

Proposals for listing or delisting an entity, related to a country-specific EU autonomous sanction “should be submitted by the Member States or by the EEAS. These proposals should form part of the broader policy approach agreed by the Council.”⁹³

- Appeal process

Listed persons and entities can submit a request to the Council with supporting documentation to request that the decision to list them be reconsidered. They can also challenge the Council decision before the General Court of the European Union, in accordance with the paragraph of Article 275 and the fourth and sixth paragraphs of Article 263 of the Treaty on the Functioning of the European Union. If the [General Court ‘annuls’](#)⁹⁴ (strikes down) the sanction, the judgment only comes into effect two months and ten days after the date of delivery. Within this time, the Council can and often does, re-list the same individual or company, but on amended statements of reasons. The General Court is the first-instance EU court, which hears all applications to annul sanctions listings. The EU’s apex court, the Court of Justice of the EU hears appeals from the General Court.

Seeking exceptions

- Derogations based on humanitarian grounds

In the EU, derogations can be obtained based on humanitarian grounds. This can be done through the sanction [competent authorities](#)⁹⁵ since they are in charge of [the enforcement of sanctions](#)⁹⁶. If the competent authority does not grant the derogation, there is an appeals mechanism that the parties can resort to. Applicants for Humanitarian Derogations may, in principle, request an administrative or judicial review of the decision of the NCA dismissing the application. Reviews are subject to specific time limits, statutory limitations, and legal requirements established by Member State national rules and the administrative procedures of the NCA issuing the negative decision”

The legal grounds upon which the humanitarian derogation can be issued should be mentioned

92 Council of the European Union. (n.d.). Sanctions: adoption and review procedure. Retrieved April 21, 2023, from <https://www.consilium.europa.eu/en/policies/sanctions/adoption-review-procedure/>

93 Proposals for restrictive measures: <https://data.consilium.europa.eu/doc/document/ST-5664-2018-INIT/en/pdf>, page 47

94 UK Parliament. (2017). Brexit: Gibraltar: Chapter 5. Retrieved April 21, 2023, from <https://publications.parliament.uk/pa/ld201617/ldselect/lddeucom/102/10205.htm>

95 Sanctions Map. (n.d.). Retrieved April 21, 2023, from <https://www.sanctionsmap.eu/#/main/authorities>

96 European Commission. (2022, April). EU restrictive measures: Humanitarian derogations. Retrieved from https://finance.ec.europa.eu/system/files/2022-04/eu-restrictive-measures-humanitarian-derogations-factsheet_en.pdf

in the relevant Council Regulation. For example, for Syria, Article 16a(2, 3) of Council Regulation (EU) 36/2012 of 18 January 2012 considers a Derogation to “release certain frozen funds or economic resources belonging to a natural or legal person, entity or body listed, or the making available of certain funds or economic resources to a natural or legal person, entity or body listed, where the provision of such funds or economic resources is necessary for humanitarian purposes.”

Exemptions

In the EU, [exemptions mean](#)⁹⁷ that a restriction does not apply when the purpose of the action is to provide humanitarian aid. Humanitarian operators can carry out the action at hand without delay or further action. Exemptions are also included in the Regulation. Exemptions are generally more effective and better suited for urgent cases as they do not rely on the decision of a national authority.

Internet-related sanctions and guidelines (Commission guidance note) and best practices

The European Union sometimes issues guidelines and best practices for implementing sanctions. See guidelines for sanction derogations on the provision of humanitarian aid in compliance with [EU restrictive measures \(sanctions\)](#)⁹⁸.

While these best practices are not of binding nature, since the issuing authority has the power to make binding decisions, the guidelines it provides might still be more effective and authoritative. The authority that issues guidelines about the implementation of sanctions is the Directorate General for Financial Stability, Financial Services and Capital Markets Union (DG FISMA) which works with the Commission Expert Group on Union restrictive measures and extra-territoriality.⁹⁹ They recently issued a fact sheet summarizing the most common rules and procedures that are in place in different Member States and are applied by their National Competent Authorities (‘NCAs’) when assessing requests and granting Humanitarian Derogations under [EU Sanctions Regulations](#)¹⁰⁰. FISMA provides other [sanction implementation](#)¹⁰¹ guidelines for other countries (Myanmar, for example) or other exigent circumstances and crises (such as COVID-19).

Evaluation of the remedies

In most jurisdictions, when a sanction license is issued, it is given for a particular act/service.

97 European Commission. (2022, April). EU restrictive measures: Humanitarian derogations. Retrieved from https://finance.ec.europa.eu/system/files/2022-04/eu-restrictive-measures-humanitarian-derogations-factsheet_en.pdf

98 European Commission. (2022, June 30). Humanitarian Aid Guidance Note. Retrieved from https://finance.ec.europa.eu/system/files/2022-07/220630-humanitarian-aid-guidance-note_en.pdf

99 Commission Expert Group on Union restrictive measures and extra-territoriality (E03773), See the register of commission expert groups <https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups-consult?lang=en&groupID=3773>, rules and operating procedures can be found at: <https://ec.europa.eu/transparency/expert-groups-register/core/api/front/expertGroupAdditionalInfo/42231/download>

100 European Commission. (2022, April). EU restrictive measures: Humanitarian derogations. Retrieved from https://finance.ec.europa.eu/system/files/2022-04/eu-restrictive-measures-humanitarian-derogations-factsheet_en.pdf

101 European Commission. (n.d.). Humanitarian assistance in environments subject to EU sanctions. Retrieved from https://finance.ec.europa.eu/eu-and-world/sanctions-restrictive-measures/humanitarian-assistance-environments-subject-eu-sanctions_en

The requester of exemptions has to speculate all the services affected by sanctions and request the license to apply to each activity. For network operators, it is difficult to ask and speculate on each service, as they undertake many operations to provide access. Identifying all the activities that can be categorized as “transactions” is also difficult. Moreover, derogations, especially in the EU, might apply only to the jurisdiction that has issued them. While other EU countries can respect the derogation, they are not obligated to do so.¹⁰² As many Internet operations have a trans-border nature, receiving one derogation might not be that effective.

Derogations should also have a legal basis (especially in the EU). For example, the Council [Regulation \(EU\) 2020/1998 of 7 December 2020](#)¹⁰³ concerning restrictive measures against serious human rights violations and abuses predicts a few derogations that apply to “economic resources.”

General licenses, as they apply to a broader range of actors and activities, might be more effective. The inconsistencies between the general licenses issued for each country, however, will increase the cost of compliance and create ambiguity. Receiving general licenses also might be ineffective when the financial industry does not respect them and does not facilitate transactions.

Proportionality and human rights: the winning arguments?

The EU (and other jurisdictions that have smart sanctions in place) tries to impose sanctions in a way that is proportionate and does not affect third parties. The European Commission states: “EU sanctions are carefully targeted, and designed to be proportionate to the objectives they seek to achieve. As such, they are aimed at those responsible for policies or actions the EU wants to influence, while reducing as much as possible any [unintended consequences](#).”¹⁰⁴

As laid out in this report, sanctions can disproportionately affect access to the Internet of third parties, especially at the Network layer. Sanctions can:

- weaken or slow-down the connectivity of ordinary users
- affect the Internet governance system by diminishing trust in the registry database which can lead to nodes not to talk to each other
- affect the most optimal routing options that can affect connectivity of ordinary users

Sanctions disproportionately could affect connectivity of ordinary people and those who are not targeted by sanctions. When sanctions are not targeted and have unintended consequences

¹⁰² For example, “While Humanitarian Derogations granted by another NCA are not automatically recognised by other Member States, NCAs usually give them due consideration.” https://finance.ec.europa.eu/system/files/2022-04/eu-restrictive-measures-humanitarian-derogations-factsheet_en.pdf

¹⁰³ Regulation (EU) 2020/1998 of the European Parliament and of the Council of 25 November 2020 on measures for a sustainable and competitive European fishing fleet, repealing Regulation (EU) No 508/2014 of the European Parliament and of the Council and Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 1006/2008, (EC) No 1007/2008 and (EC) No 973/2001. (2020). EUR-Lex. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R1998>

¹⁰⁴ European Commission. (2022, April 12). EU-UK relations: Frequently asked questions. Retrieved from https://ec.europa.eu/commission/presscorner/detail/en/qanda_22_1401

for the Internet, they can also go against the very resolutions that the EU issues about the importance of Internet connectivity during a crisis or protest. For example, in January 2023, the EU issued a resolution which was a response to the protests and executions in Iran.¹⁰⁵ The resolution called on the Member States to commit to enabling “enabling Iranians to access a free Internet in spite of the regime’s massive Internet censorship; suggests that the necessary technical and financial resources could be provided through an EU fund;” and “called on the commission, the EEAS and Member Statesto extend and enhance tangible support for the democratic aspirations of the people of Iran, notably by enhancing support for independent human rights and civil society organisations, as well as independent media platforms, and by supporting the efforts of like-minded partners to maintain internet connectivity in Iran”.¹⁰⁶ The advocates for bringing regulatory and legislative change to sanction regimes could point to these resolutions and the legislative aspirations in order to make a stronger argument for targeted sanctions that do not hamper access to the Internet for the people.

105 JOINT MOTION FOR A RESOLUTION on the EU response to the protests and executions in Iran 18.1.2023 - (2023/2511(RSP)) [https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2023/2511\(RSP\)](https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2023/2511(RSP))

106 2023/2511(RSP) Resolution on the EU response to the protests and executions in Iran Paragraph 30, [https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2023/2511\(RSP\)](https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2023/2511(RSP))

VII. Internet Development and Sanctions (Access to Global Internet)

Using the Internet Society [Internet impact assessment toolkit](#)¹⁰⁷, this section briefly describes how sanctions-related laws and regulation and over-compliance with sanctions among some Internet actors and operators can affect access to the global Internet. As explained in Section II, the Network layer is the most affected layer that could lead to possible connectivity issues in the future and disproportionately affect third parties. This section will detail out how the critical properties of the Internet are affected by sanctions. According to the Internet Society, [critical properties of the Internet](#)¹⁰⁸ are:



1. An Accessible Infrastructure with a Common Protocol
2. Open Architecture of Interoperable and Reusable Building Blocks
3. Decentralized Management and a Single Distributed Routing System
4. Common Global Identifiers
5. A Technology Neutral, General-Purpose Network.

The report discusses each of these critical properties except the technology neutral and general purpose network which is unlikely to be affected by sanctions.

A. Sanctions and an accessible infrastructure with a common protocol

The principle behind this critical property is that the operator does not need permission from a central authority to connect. There is no international policy on who can connect or what they should pay. Every node has a common, open, Network layer protocol available: the Internet protocol. The benefits of an open and accessible infrastructure, according to Internet Society, are global connectivity and Internet development (growth).

Although there are no international policies about who can connect to the Internet or what they should pay, sanctions create barriers. When access to for example IP addresses become limited

¹⁰⁷ Internet Society. (2022). How to do an Internet Impact Brief: Infographic. Retrieved from <https://www.internet-society.org/wp-content/uploads/2022/10/How-to-do-an-Internet-Impact-Brief-Infographic.pdf>

¹⁰⁸ Internet Society. (2020). Critical Properties of the Internet. Retrieved from <https://www.internetsociety.org/resources/doc/2020/internet-impact-assessment-toolkit/critical-properties-of-the-internet/>

then it might hamper users connectivity.

As explained in this document (section related to the Network) different sanction regimes can affect access and registration of IP addresses. The EU sanction regimes have directly impacted registration of IP addresses. IP addresses are recognized as economic resources and hence subject to sanctions. RIPE NCC has managed to preserve access to IP addresses and not deregister them. However, registering new IP addresses and IP transfer cannot take place if the sanctioned nationals are still in some ways involved with the operators.

The issue is not just having access to IP addresses, it is also for the Regional Internet Registry to keep an accurate and updated registry database about what entities operate which IP addresses. An accurate registry is an important part of having access to a common protocol that allows different nodes anywhere in the world to talk to each other. Sanctions affect the regular updating and accuracy of the database. If network operators do not trust the registry database they would not talk to certain nodes and networks. It can be argued that sanctions could hamper access to the infrastructure, as other nodes might not talk to the legitimate node. This can prevent the network from growing organically to support the needs of its users.

B. Open Architecture of Interoperable and Reusable Building Blocks

The open architecture of interoperable and reusable building blocks means that technology building blocks work together to provide services to applications and end users. These building blocks support different network types, ensure reliable transport, enable security or provide name resolution. Sanctions do not necessarily have an impact on these building blocks, for example the name resolution. There have been name resolvers that after Russia sanctions announced they will still continue resolving Russian queries, but it is not clear if they have been affected by sanction regimes.

The open architecture might still be accessible to third parties and residents of sanctioned countries. For example an app designer located in sanctioned countries is not blocked from accessing the open architecture of the Internet to design the app.

However, the dominance and consolidation of app stores means that sanctions might have an effect on innovation, as the app designers might not be able to provide their apps in dominant app stores.

C. Decentralized Management and a Single Distributed Routing System

Nearly 70,000 independent networks on the Internet choose to collaborate and connect together. Each runs on a common, open, protocol (Border Gateway Protocol, BGP). The BGP allows exchange of routing information between two networks and each network decides how to route the traffic based on its own policies and needs, which generally comes down to what is the fastest and most efficient route. There should not be any central direction or a controller dictating how and where connections are made. This way the network grows organically and considers the local interests. (Internet Society, [the Internet Way of Networking](#))¹⁰⁹ As discussed in this report, the optimal routing takes place in IXPs. Sanctions sometimes affect such optimal routing

109 Internet Society. (2020). Critical Properties of the Internet. Retrieved from <https://www.internetsociety.org/resources/doc/2020/internet-impact-assessment-toolkit/critical-properties-of-the-internet/>

(as reported by IXPs and other network operators) as there have to be agreements between two networks, and some actors might not agree to do so because of sanctions. The problem of routing, while it can eventually affect the quality of connectivity, can be overcome because of the common distributed routing system. However, one important element of having a single distributed routing system is to keep an accurate routing table and a registry database. As explained, sanctions can affect the accuracy of the registry database and in turn that might affect a single distributed routing system.

D. Common Global Identifiers

Common global identifiers are unambiguous and universal. They provide consistent addressability and a coherent view of the network. (Internet Society, [The Internet Way of Networking](#))¹¹⁰. These global identifiers are the IP addresses and the Domain Name System. IP addresses have to be unique and consistently provide addressability so that the packets know where to go. Another set of identifiers are domain names that are supported by the Domain Name System. In this report we explained how IP addresses and the Domain Name System are potentially affected by sanctions. While domain names are an important part of the Internet, we need to set apart the domain name registration and other important but narrow functions that ICANN does. While sanctions affect the changes that ICANN can make to the root zone, they do not hamper ICANN's control over the root zone. For example, while ICANN has to follow the US sanction regime when allocating new gTLDs, sanctions do not necessarily affect the security and stability of the root zone. Sanctions might affect domain name registrations and the ability for the residents of sanctioned countries or registrars based in sanctioned countries to register domain names in certain strings (for example .ASIA or .NGO).¹¹¹ They might also create inconvenience for businesses and service providers and lead to confiscation of their domain names. But so far, sanctions that affect the domain name registration and new gTLDs have not had a major impact on online presence. This however might change. When domain name registrants are sanctioned, they generally move to their Country Code Top Level Domain Name (for example .SY or .IR). As access to global hosting providers become scarce and the local ccTLD could potentially resolve the queries coming from abroad more slowly, global access to websites and services in that ccTLD will be hampered.

110 Papadopoulos, C., & Massey, D. (2020). Defining the critical properties of the Internet. Internet Society. Retrieved from <https://www.internetsociety.org/wp-content/uploads/2020/09/IWN-IIAT-Defining-the-critical-properties-of-the-Internet.pdf>

111 Farzaneh Badii (2022) .OneWorld .SomeInternet: New gTLD Registries and Sanctioned Countries, <https://circleid.com/posts/20220217-oneworld-.someinternet-new-gtld-registries-and-sanctioned-countries>

VIII. Recommendations

1. There is inconsistency of sanction licenses across countries for similar services due to the differing foreign relations strategies. By talking to agencies that set those strategies, such as the US State Department or the EU (for example the European External Action Service or the EU Council Working Party for Foreign Relations Counselors) it might be possible to overcome these problems in the long run and have a more consistent approach that also fits the “preserving the global Internet” agenda that these countries have.
2. After the issuance of licenses or lifting of sanctions, companies have to change their strategies completely, which is costly and means that they usually do not provide their services to these countries immediately. This happens especially if it concerns exporting equipment. It is important to forge relations with these companies or create a coalition so that different Internet actors can learn from each other how to remain compliant with sanction regimes and respond quickly to changes in legislation but still provide their services.
3. Pursue receiving a derogation or an exemption from sanctions. In the EU, receiving a derogation might be easier, and the advocates can rely on the various resolutions about Internet access and human rights as well as the issue of proportionality to make a case for receiving a derogation. As well as derogation, receiving an exemption for at least the operations that happen at layer three (the Network layer) for all the sanctioned countries is a more effective but longer-term solution.
4. Learn from other initiatives and the steps taken to raise awareness about how sanctions affected certain groups or services and what the solutions have been. These initiatives may be dealing with issues far removed from Internet operations, but the authorities they reached out to and how they addressed various issues related to sanctions can create a roadmap. One such initiative is the humanitarian groups that recently received general licenses in the US and exemptions in the EU.
5. Review the “Forum” analysis in this report and decide which one to monitor, participate in and influence the agenda in relation to Internet sanctions. Sanctions are regulatory and legal initiatives so it might be more effective to focus on groups that have 1) relevant government actors involved 2) have discussed sanctions in the past or include the authorities involved are in charge of imposing sanctions 3) allows for stakeholder participation (even if limited)
6. Work on collective action with willing actors. Being the only voice that raises the awareness of sanctions and its effect on the Internet is ineffective. Use this report to develop a good understanding of other affected Internet actors and have a dialogue with them. If possible, form a coalition among these actors. Certainly, it is difficult to form any coalitions and sanctions is an extremely sensitive issue so it will take some time as differ-

ent actors maintain differing levels of secrecy and transparency about their compliance mechanism. Those that have a mission oriented toward a global Internet, or those that might be already affected by sanctions, may be more willing to share their experience and expertise.

7. Create a set of “Internet impact” criteria for choosing the third party “compliance” firms that offer advice on whether the organization is compliant and when the list of sanctioned individuals and organizations get updated. It would be useful if these firms are trained or already experienced in how the Internet works.
8. Writing and reporting on in-house compliance mechanisms might help other Internet-related organizations and even encourage them not to over comply. Using open source software and contributing to initiatives that facilitate compliance and lowers the transaction costs can potentially encourage the Internet operators to fairly serve sanctioned countries while complying with the laws.
9. Work with DG FISMA and other stakeholders and financial institutions to provide guidelines on how financial institutions should implement and comply with sanctions in order not to affect Internet connectivity.
10. Find like-minded country officials and those who have pledged to keep the Internet global and open. Often the Cyber Ambassadors can be effective at bringing the issues to the relevant authorities in their country and are quite well versed on the importance of open global Internet. Talking to foreign ministries of countries that have had experience with receiving sanction licenses and exceptions is also a good first step. For example, Sweden championed the so-called Internet carve-out to the EEAS.