Human Rights Protocol Considerations Research Group
Internet-Draft
Intended status: Informational
Expires: November 30, 2018

N. ten Oever
University of Amsterdam
G. Perez de Acha
Derechos Digitales

May 29, 2018

Freedom of Association on the Internet
draft-tenoever-hrpc-association-05

Abstract

This document scopes the relation between Internet protocols and the right to freedom of assembly and association. Increasingly, the Internet mediates our lives, our relationships and our ability to exercise our human rights. The Internet provides a global public space, but one that is built predominantly on private infrastructure. Since Internet protocols play a central role in the management, development and use of the Internet, the relation between protocols and the aforementioned rights should be documented and any adverse impacts of this relation should be mitigated.

Status of This Memo

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1. Introduction

"We shape our tools and, thereafter, our tools shape us."
- John Culkin (1967)

The Internet is a technology which shapes modern information societies. The ordering that the Internet provides is socio-technical, in other words, the Internet infrastructure and architecture consists of social and technological arrangements [StarRuhleder]. This ordering is not always apparent because infrastructure also tends to hide itself in the societal woodwork [Mosco], or with [Weiser]: 'The most profound technologies are those that disappear'. Next to that infrastructure is often taken for

granted by those using it. Infrastructure therefore is mostly known by an epistemic community of experts [Haas] and only get recognized by the larger public when it fails. With the increasing societal use of the Internet the importance of the Internet is growing, and the decisions made about its infrastructure and architecture therefore also become more important. [RFC8280] established the relationship between human rights and Internet protocols, and in this document we seek to uncover the relation between two specific human rights and the Internet infrastructure and architecture.

The rights to freedom of assembly and association protect collective expression, in turn, systems and protocols that enable communal communication between people and servers allow these rights to prosper. The Internet itself was originally designed as "a medium of communication for machines that share resources with each other as equals" [NelsonHedlun], the Internet thus forms a basic infrastructure for the right freedom of assembly and association.

The manner in which communication is designed and implemented impacts the ways in which rights can be excercised. For instance a decentralized and resilient architecture that protects anonymity and privacy, offers a strong protection for the exercise of such freedoms in the online environment. At the same time, centralized solutions have enabled people to group together in recognizable places and helped the visbility of groups. In other words, different architectural designs come with different affordances, or characteristics. These characteristics should be taken into account at the time of design, and when designing, updating and maintaining other parts of the architecture and infrastructure.

This draft continues the work started in [RFC8280] by investigating the exact impact of Internet protocols on specific human rights, namely the right to freedom of assembly and association given their importance for the Internet, in order to mitigate (potential) negative impacts.

2. Vocabulary used

Architecture The design of a structure

Autonomous System (AS) Autonomous Systems are the unit of routing policy in the modern world of exterior routing [RFC1930].

Within the Internet, an autonomous system (AS) is a collection of connected Internet Protocol (IP) routing prefixes under the control of one or more network operators on behalf of a single administrative entity or domain that presents a common, clearly defined routing policy to the Internet [RFC1930].

The classic definition of an Autonomous System is a set of routers under a single technical administration, using an interior gateway protocol and common metrics to route packets within the AS, and using an exterior gateway protocol to route packets to other ASs [RFC1771].

Border Gateway Protocol (BGP) An inter-Autonomous System routing protocol [RFC4271].

Connectivity The extent to which a device or network is able to reach other devices or networks to exchange data. The Internet is the tool for providing global connectivity [RFC1958]. Different types of connectivity are further specified in [RFC4084]. The combination of the end-to-end principle, interoperability, distributed architecture, resilience, reliability and robustness are the enabling factors that result in connectivity to and on the Internet.

Decentralization Implementation or deployment of standards, protocols or systems without one single point of control.

Distributed system A system with multiple components that have their behavior co-ordinated via message passing. These components are usually spatially separated and communicate using a network, and may be managed by a single root of trust or authority. [Troncosoetal]

Infrastructure Underlying basis or structure for a functioning society, organization or community. Because infrastructure is a precondition for other activities it has a procedural, rather than static, nature due to its social and cultural embeddedness [PipekWulf] [Bloketal]. This means that infrastructure is always relational: infrastructure always develops in relation to something or someone [Bowker].

Internet The Network of networks, that consists of Autonomous Systems that are connected through the Internet Protocol (IP).

A persistent socio-technical system over which services are delivered [Mainwaringetal],

A techno-social assemblage of devices, users, sensors, networks, routers, governance, administrators, operators and protocols

An emergent-process-driven thing that is born from the collections of the ASes that happen to be gathered together at any given time. The fact that they tend to interact at any given time means it is

an emergent property that happens because they use the protocols defined at IETF.

3. Research questions

1. How does the internet architecture enable and/or inhibit freedom of association and assembly?

2. If the Internet is used to exercise the right to freedom of association, what are the implications for its architecture and infrastructure?

4. Methodology

In order to answer the research questions, first a number of cases have been collected to analyze where Internet infrastructure and protocols have either enabled or inhibited groups of people to collaborate, cooperate or communicate. This overview does not aim to cover all possible ways in which people can collectively organize or reach out to each other using Internet infrastructure and Internet protocols, but rather cover typical uses in an attempt at an an ethnography of infrastructure [Star]. Subsequently we analyze the cases with the theoretical framework provided in the literature review and provide recommendations based on the findings.

5. Literature Review

The rights to freedom of assembly and association protects and enables collective action and expression [UDHR] [ICCPR]. These rights ensure everyone in a society has the opportunity to express the opinions they hold in common with others, which in turn facilitates dialogue among citizens, as well as with political leaders or governments [OSCE]. This is relevant because in the process of democratic delibration, causes and opinions are more widely heard when a group of people come together behind the same cause or issue [Tocqueville].

In international law, the rights to freedom of assembly and association protect any collective, gathered either permanently or temporarily for "peaceful" purposes. It is important to underline the property of "freedom" because the right to freedom of association and assembly are voluntary and uncoerced: anyone can join or leave a group of choice, which in turn means one should not be forced to either join, stay or leave.

The difference between freedom of assembly and freedom of association is merely gradual one: the former tends to have an informal and ephemeral nature, whereas the latter refers to established and

permanent bodies with specific objectives. Nonetheless, one and the other are protected to the same degree.

An assembly is an intentional and temporary gathering of a collective in a private or public space for a specific purpose: demonstrations, indoor meetings, strikes, processions, rallies or even sits-in [UNHRC]. Association on the other hand has a more formal and established nature. It refers to a group of individuals or legal entities brought together in order to collectively act, express, pursue or defend a field of common interests [UNGA]. Within this category we can think about civil society organizations, clubs, cooperatives, NGOs, religious associations, political parties, trade unions or foundations.

The right to freedom of assembly and association is quintessential for the Internet, even if privacy and freedom of expression are the most discussed human rights when it comes to the online world. Online association and assembly are crucial to mobilise groups and people where physical gatherings have been impossible or dangerous [APC]. Throughout the world -from the Arab Spring to Latin American student movements and the #WomensMarch- the Internet has also played a crucial role by providing a means for the fast dissemination of information that was otherwise mediated by broadcast media, or even forbidden by the government [Pensado]. According to Hussain and Howard the Internet helped to "build solidarity networks and identification of collective identities and goals, extend the range of local coverage to international broadcast networks" and as platform for contestation for "the future of civil society and information infrastructure" [HussainHoward].

The IETF itself, defined as a ’open global community’ of network designers, operators, vendors, and researchers, is also protected by freedom of assembly and association [RFC3233]. Discussions, comments and consensus around RFCs are possible because of the collective expression that freedom of association and assembly allow. The very word "protocol" found its way into the language of computer networking based on the need for collective agreement among network users [HafnerandLyon].

We are aware that some of these examples go beyond the use of Internet protocols and flow over into the applications layer or examples in the offline world whereas the purpose of the following document is to break down the relationship between Internet protocols and the right to freedom of assembly and association. Nonetheless, given that protocols are a part of the socio-technical ordering of reality, we do recognize that in some cases the line between them and applications, implementations, policies and offline realities are often blurred and hard (if not impossible) to differentiate.

6. Cases and examples

The Internet has become a central mediator for collective action and collaboration. This means the Internet has become a strong enabler of the rights to freedom of association and assembly.

Here we will discuss different cases to give an overview of how the Internet protocol and architecture facilitates the freedom of assembly and association.

6.1. Conversing

An interactive conversation between two or more people forms the basis for people to organize and associate. According to Anderson "the relationship between political conversation and engagement in the democratic process is strong." [Anderson]. By this definition, what defines the "political" is essentially assembly or association: a basis for the development of social cohesion in society.

6.1.1. Mailing Lists

Since the beginning of the Internet mailing lists have been a key site of assembly and association [RFC0155] [RFC1211]. In fact, mailing lists were one of the Internet’s first functionalities [HafnerandLyon].

In 1971, four years after the invention of email, the first mailing list was created to talk about the idea of using Arpanet for discussion. What had initially propelled the Arpanet project forward as a resource sharing platform was gradually replaced by the idea of a network as a means of bringing people together [Abbate]. More than 45 years after, mailing lists are pervasive and help communities to engage, have discussion, share information, ask questions, and build ties. Even as social media and discussion forums grow, mailing lists continue to be widely used [AckermannKargerZhang]. They are a crucial tool to organise groups and individuals around themes and causes [APC].

Mailinglist are still in wide use, also in the IETF because they allow for easy association and allow people to subscribe (join) and unsubscribe (leave) as they please. They also allow for association of specific groups on closed lists. Finally the archival function allows for accountabilty. The downsides of mailinglists are similar to the ones generally associated with e-mail, except that end-to-end encryption such as OpenPGP [RFC4880] and S/MIME [RFC5751] is not possible because the final recipients are not known. There have been experimental solutions to address this issue such as Schleuder [Schleuder], but this has not been standardized or widely deployed.

6.1.2. Multi-party video conferencing

Multi-party video conferencing protocols such as WebRTC [RFC6176] [RFC7118] allow for robust, bandwidth-adaptive, wideband and super-wideband video and audio discussions in groups. 'The WebRTC protocol was designed to enable responsive real-time communications over the Internet, and is instrumental in allowing streaming video and conferencing applications to run in the browser. In order to easily facilitate direct connections between computers (bypassing the need for a central server to act as a gatekeeper), WebRTC provides functionality to automatically collect the local and public IP addresses of Internet users (ICE or STUN). These functions do not require consent from the user, and can be instantiated by sites that a user visits without their awareness. The potential privacy implications of this aspect of WebRTC are well documented, and certain browsers have provided options to limit its behavior.' [AndersonGuarnieri].

While facilitating freedom of assembly and association multi-party video conferencing tools might pose concrete risks for those who use them. One the one hand WebRTC is providing resilient channels of communications, but on the other hand it also exposes information about those who are using the tool which might lead to increased surveillance, identification and the consequences that might be derived from that. This is especially concerning because the usage of a VPN does not protect against the exposure of IP addresses [Crawford].

The risk of surveillance is also true in an offline space, but this is generally easy to analyze for the end-user. Security and privacy expectations of the end-user could be made more clear to the user (or improved) which would result in a more secure and/or private excercise of the right to freedom of assembly or association.

6.1.3. Internet Relay Chat

Internet Relay Chat (IRC) is an application layer protocol that enables communication in the form of text through a a client/server networking model [RFC2810]. In other words, a chat service. IRC clients are computer programs that a user can install on their system. These clients communicate with chat servers to transfer messages to other clients.

For order to be kept within the IRC network, special clases of users become "operators" and are allowed to perform general maintenance functions on the network: basic network tasks such as disconnecting (temporary or permanently) and reconnecting servers as needed [RFC2812]. One of the most controversial power of operators is the

ability to remove a user from the connected network by 'force', i.e., operators are able to close the connection between any client and server [RFC2812].

IRC servers may deploy different policies for the ability of users to create their own channels or 'rooms', and for the delegation of 'operator'-rights in such a room. Some IRC servers support SSL/TLS connections for security purposes [RFC7194]. This helps stop the use of packet sniffer programs to obtain the passwords of IRC users, but has little use beyond this scope due to the public nature of IRC channels. TLS connections require both client and server support (that may require the user to install TLS binaries and IRC client specific patches or modules on their computers). Some networks also use TLS for server to server connections, and provide a special channel flag (such as +S) to only allow TLS-connected users on the channel, while disallowing operator identification in clear text, to better utilize the advantages that TLS provides.

6.2. Peer-to-peer networks and systems

At the organizational level, peer production is one of the most relevant innovations from Internet mediated social practices. According to [Benkler], it implies 'open collaborative innovation and creation, performed by diverse, decentralized groups organized principally by neither price signals nor organizational hierarchy, harnessing heterogeneous motivations, and governed and managed based on principles other than the residual authority of ownership implemented through contract.' [Benkler].

In his book The Wealth of Networks, Benkler significantly expands on his definition of commons-based peer production. According to Benkler, what distinguishes commons-based production is that it doesn't rely upon or propagate proprietary knowledge: "The inputs and outputs of the process are shared, freely or conditionally, in an institutional form that leaves them equally available for all to use as they choose at their individual discretion." [Benkler] To ensure that the knowledge generated is available for free use, commons-based projects are often shared under an open license.

6.2.1. Peer-to-peer system achitectures

Peer-to-peer (P2P) is esentially a model of how people interact in real life because "we deal directly with one another whenever we wish to" [Vu]. Usually if we need something we ask our peers, who in turn refer us to other peers. In this sense, the ideal definition of P2P is that "nodes are able to directly exchange resources and services between themselves without the need for centralized servers" and where each participating node typically acts both as a server and as

a client [Vu]. In RFC 5694 P2P has been defined as peers or nodes that should be able to communicate directly between themselves without passing intermediaries, and that the system should be self-organizing and have decentralized control [RFC5694]. With this in mind, the ultimate model of P2P is a completely decentralized system, which is more resistant to speech regulation, immune to single points of failure and have a higher performance and scalability. Nonetheless, in practice some P2P systems are supported by centralized servers and some others have hybrid models where nodes are organized into two layers: the upper tier servers and the lower tier common nodes [Vu].

Since the ARPANET project, the original idea behind the Internet was conceived as what we would now call a peer-to-peer system [RFC0001]. Over time it has increasingly shifted towards a client/server model with "millions of consumer clients communicating with a relatively privileged set of servers" [NelsonHedlun].

Whether for resource sharing or data sharing, P2P systems are enabling freedom of assembly and association. Not only do they allow for effective dissemination of information, but because they leverage computing resources by diminishing costs allowing for the formation of open collectives at the network level. At the same time, in completely decentralized systems the nodes are autonomous and can join or leave the network as they want, which also makes the system unpredicable: a resource might be only sometimes available, and some other resources might be missing or incomplete [Vu]. Lack of information might in turn make association or assembly more difficult.

Additionally, when one architecturally asseses the role of P2P systems one can say that: "The main advantage of centralized P2P systems is that they are able to provide a quick and reliable resource locating. Their limitation, however, is that the scalability of the systems is affected by the use of servers. While decentralized P2P systems are better than centralized P2P systems in this aspect, they require a longer time in resource locating. As a result, hybrid P2P systems have been introduced to take advantage of both centralized and decentralized architectures. Basically, to maintain the scalability, similar to decentralized P2P systems, there are no servers in hybrid P2P systems. However, peer nodes that are more powerful than others can be selected to act as servers to serve others. These nodes are often called super peers. In this way, resource locating can be done by both decentralized search techniques and centralized search techniques (asking super peers), and hence the systems benefit from the search techniques of centralized P2P systems." [Vu]

6.2.2. Version control

Ever since developers needed to collaboratively write, maintain and discuss large code basis for the Internet there have been different approaches of doing so. One approach is discussing code through mailing lists, but this has proven to be hard in case of maintaining the most recent versions. There are many different versions and characteristics of version control systems.

A version control system is a piece of software that enables developers on a software team to work together and also archive a complete history of their work [Sink]. This allows teams to be working simultaneously on updated versions. According to Sink, broadly speaking, the history of version control tools can be dividied into three generations. In the first one, concurrent development meant that only one person could be working on a file at a time. The second generation tools permit simultaneous modifications as long as users merge the current revisions into their work before they are allowed to commit. The third generation tools allow merge and commit to be separated [Sink].

Interestingly no version control system has ever been standardized in the IETF whereas the version control systems like Subversion and Git are widely used within the community, as well as by working groups. There has been a spirited discussion on whether working groups should use centralized forms of the Git protocol, such as those offered by Gitlab or Github. Proponents argue that this simplifies the workflow and allows for a more transparent workflow. Opponents argue that the reliance on a centralized service which is not merely using the Git protocol, but also uses non-standardized options like an Issue-Tracker, makes the process less transparent and reliant on a third party.

The IETF has not made a decision on the use of centralized instances of Git, such as Github or Gitlab. There have been two efforts to standardize the workflow vis a vis these third party services, but these haven’t come to fruition: [Wugh] [GithubIETF].

6.3. Grouping together (identities)

Collective identities are also protected by freedom of association and assembly. Acording to Melucci these are ’shared definitions produced by several interacting individuals who are concerned with the orientation of their action as well as the field of opportunities and constraints in which their action takes place.’ [Melucci] In this sense, assemblies and associations are an important base in the maintenance and development of culture, as well as preservation of minority identities [OSCE].

6.3.1. DNS

Domain names allow hosts to be identified by human parsable information. Whereas an IP address might not be the expression of an identity, a domain name can be, and often is. On the other hand the grouping of a certain identity under a specific domain or even a Top Level Domain brings about risks because connecting an identity to a hierarchically structured identifier systems creates a central attack surface. Some of these risks are the surveillance of the services running on the domain, domain based censorship [RFC7754], or impersonation of the domain through DNS cache poisoning. Several technologies have been developed in the IETF to mitigated these risks such as DNS over TLS [RFC7858], DNSSEC [RFC4033], and TLS [RFC5246]. These mitigations would, when implemented, not make censorship impossible, but rather make it visible. The use of a centralized authority always makes censorship through a registry or registrar possible, as well as by using a fake resolver or using proposed standards such as DNS Response Policy Zones [RPZ].

The structuring of DNS as a hierarchical authority structure also brings about a specific characteristic, namely the possibility of centralized policy making vis a vis the management and operation of Top Level Domains, which is what (in part) happens at ICANN. The impact of ICANN processes on human rights will not be discussed here.

6.3.2. Autonomous Systems

In order for edge-users to connect to the Internet, they need to be connected to an Automous System (AS) which, in turn, has peering or transit relations with other AS'es. This means that in the process of accessing the Internet, edge-users need to accept the policies and practices of the intermediary that provides them access to the other networks. In other words, for users to be able to join the 'network of networks', they always need to connect through an intermediary.

While accessing the Internet through an intermediary, the user is forced to accept the policies, practices and principles of a network. This could impede the rights of the edge-user, depending on the implemented policies and practices on the network and how (if at all) they are communicated to them. For example: filtering, blocking, extensive logging, slowing down connection or specific services, or other invasive practices that are not clearly communicated to the user.

In some cases it also means that there is no other way for the edge-user to connect to the network of networks, and is thus forced into accepting the policies of a specific network, because it is not trivial for an edge-user to operate an AS and engage in peering

relation with other ASes. This design, combined with the increased importance of the Internet to make use of basic services, forces edge-user to engage in association with a specific network eventhough the user does not consent to the policies of the network.

It can be noted also that there is no standard and deployed way for the edge-user to choose the routes her packets will go through. [RFC0791], section 3.1, standardized "source routing" but it was never deployed, mostly because of serious security issues. There is not even a way for the edge-user to know about the routes that packets have actually taken, and which ASes a packet has traversed. [RFC0791], section 3.1, standardized "record route" but it was never deployed. In practice, the user must accept policies of ASes he has no relationship with, and didn't choose. For instance, there is no way to direct the packets to avoid the Five Eyes, not even to know after the fact where the packet went. [FiveEyes] [SchengenRouting] (Traceroutes give you an idea but the path may change before and after the traceroute.)

7. Discussion: Protocols vs Platforms

The Internet is increasingly becoming a vehicle for commercial, propietary, non-interoperable platforms. The Internet has always allowed for closed-off networks, but the current trend show the rise of a small number of very large non-interoperable platforms. Chat has moved from XMPP and IRC to Facebook Messenger, Whatsapp and WeChat and there has been a strong rise of social media networks with large numbers of users, such as Facebook, Twitter and Instagram. A similar trend can be found among e-mail providers, with the significant difference that e-mail is interoperable.

Often these non-interoperable platforms are built on open-protocols but do not allow for inter-operability or data-portability. In the case of these large platforms this leads to strong network externalities, also know as a network effect; because the users are there, users will be there. The use of social-media platforms has enabled groups to associate, but is has also led to a 'tactical freeze' because of the inability to change the platforms [Tufekci]. Whereas these networks are a ready-to-hand networked public sphere, they do not allow their inhabitants to change, or fully understand, their workings.

This potentially has a significant impact on the distributed nature of the Internet [RFC1287].

8. Conclusions

This document scopes the relation between Internet protocols and the right to freedom of assembly and association. For this reason, the current research started out with two main questions. First, how does the internet architecture enable and/or inhibit freedom of association and assembly? And secondly: if the Internet is used to exercise the right to freedom of association, what are the implications for its architecture and infrastructure?

Communities, collaboration and joint action lie at the heart of the Internet. Even at at linguistical level, the words "networks" and "associations" are close synonyms. Both interconnected groups and assemblies of people depend on "links" and "relationships" [Swire]. Taking legal definitions given in international human rights law jurisprudence, we could assert that the right to freedom of assembly and association protect collective expression. These rights protect any collective, gathered either permanently or temporarily for "peaceful" purposes. It is voluntary and uncoerced.

Regarding the first question, we argued that given that the Internet itself was originally designed as a medium of communication for machines that share resources with each other as equals, the Internet is one of the most basic infrastructures for the right to freedom of assembly and association. Since Internet protocols play a central role in the management, development and use of the Internet, we established the relation between some protocols and the right to freedom of assembly and association.

Regarding the second question, after reviewing protocols that allow mailing lists, to multi-party video conferencing, IRC, peer-to-peer architectures, version control or the functioning of autonomous systems, we can conclude that the way in which infrastructure is designed and implemented impacts the exercise of freedom of assembly and association. This is because different architectural designs come with different affordances, or characteristics. If a decentralized architecture protects anonymity and privacy, both freedoms in the online environment will be enabled. On the other hand, centralized solutions have allowed users to group together and visibilise groups. enabled people to group together in recognizable places and helped the visbility of groups.

Lastly, the increasing shift towards closed and non-interoperable platforms in chat and social media networks have a significant impact on the distributed and open nature of the Internet. Often these non-interoperable platforms are built on open-protocols but do not allow for inter-operability or data-portability. The use of social-media platforms has enabled groups to associate, but is has also rendered

users unable to change platforms, therefore leading to a sort of "forced association" that stirs faraway from freedom.

9. Acknowledgements

- Fred Baker, Jefsey, and Andrew Sullivan for work on Internet definitions

- Stephane Bortzmeyer for several concrete text suggestions that found their way in this document (such as the AS filtering example)

- Mark Perkins for finding a lot of typos

- the hrpc mailinglist at large for a very constructive discussion on a hard topic.

10. Security Considerations

As this draft concerns a research document, there are no security considerations.

11. IANA Considerations

This document has no actions for IANA.

12. Research Group Information

The discussion list for the IRTF Human Rights Protocol Considerations Research Group is located at the e-mail address hrpc@ietf.org [1]. Information on the group and information on how to subscribe to the list is at https://www.irtf.org/mailman/listinfo/hrpc [2]

Archives of the list can be found at: https://www.irtf.org/mail-archive/web/hrpc/current/index.html [3]

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Authors' Addresses

Niels ten Oever
University of Amsterdam

EMail: mail@nielstenoever.net

Gisela Perez de Acha
Derechos Digitales

EMail: gisela@derechosdigitales.org