ARTICLE 19

CENTER FOR DEMOCRACY & TECHNOLOGY

A Guide to the Internet Engineering Task Force (IETF)

for Public Interest Advocates

A Guide to the Internet Engineering Task Force (IETF) for Public Interest Advocates

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Contents

Why does the public have an interest in internet standards at the Internet Engineering Task Force (IETF)?

Because the internet is a globally distributed collection of heterogeneous networks, its governance is largely determined by a wide cast of actors that own, operate, and manage internet infrastructure. To ensure interoperability across this network of networks, these decision-makers implement Internet technologies in accordance with globally-recognized technical standards and policies. Fundamentally, these standards and policies govern how data moves across the internet. Given the increasingly central role that internet technologies play in peoples' lives, the specifications, guidelines, and requirements they delineate therefore have implications for peoples' freedom of expression, freedom of access to information, freedom of association, privacy, anonymity, and other human rights.

Like the internet itself, this governance is decentralized: internet standards and policies are set by a number of different organizations that address particular aspects of the internet through complementary – though at times competing – mandates. These organizations convene technical communities that primarily include representatives of internet technology developers, vendors, and implementers across the private sector, governments and the public sector, and academia. However, all people are impacted by internet standards, whether or not they use the internet every day, and have interests that are not represented by these stakeholders.

To ensure that the public interest is meaningfully represented in the development of internet standards and policies, the technical communities responsible for the internet must include stakeholders that represent the widest range of individuals and communities, with both technical and non-technical competencies, who put people at the centre of design decisions.

The term "multi-stakeholderism" was first used in the context of the internet in 2005, when a Working Group on Internet Governance (WGIG) at the United Nations World Summit on the Information Society (WSIS) related it to "policy dialogue." WGIG concluded that "existing Internet governance mechanisms lacked the conditions necessary for 'effective and meaningful participation of all stakeholders,' and presented the multistakeholder concept as a third option, or middle ground, between the contested alternatives of private versus public regulation of the Internet."[1]

For its relatively open process and impact, the Internet Engineering Task Force (IETF) is a bright star in the global technical policy and standards constellation. As such, it is particularly important to address the challenge of building robust and meaningful multi-stakeholderism within the IETF technical community.

The importance of becoming involved at the IETF

The IETF is a standards-developing organization (SDO) with a mission "to make the Internet work better by producing high quality, relevant technical documents that influence the way people design, use, and manage the Internet."[2] Specifically, the IETF formalizes internet protocols, extensions, and mechanisms as open standards that are freely available and developed through publicly

documented discussions and processes that are remotely accessible to all. While the adoption of internet standards is voluntary, the normative power of IETF standards is grounded in who participates in and follows their development. Major industry players that own, operate, and manage large portions of the global internet, including Google, Cisco, Ericsson, and Huawei, invest heavily in developing and complying with these standards; meanwhile, governments around the world use these standards as benchmarks for how they procure and deploy internet technologies.

In governing how data moves across the internet, the IETF develops standards across a wide range of technologies, including the Border Gateway Protocol (BGP), Domain Name System (DNS), the Transmission Control and User Datagram Protocols (TCP/UDP), and the Internet Protocol (IP). It also standardizes updates and extensions of related technologies, many of which are critical to protecting and promoting the public interest, such as Transport Layer Security (TLS), DNS over TLS (DoT), Hypertext Transfer Protocol Secure (HTTPS), DNS over HTTPS (DoH), Encrypted Server Name Indication (eSNI), and network authentication mechanisms.

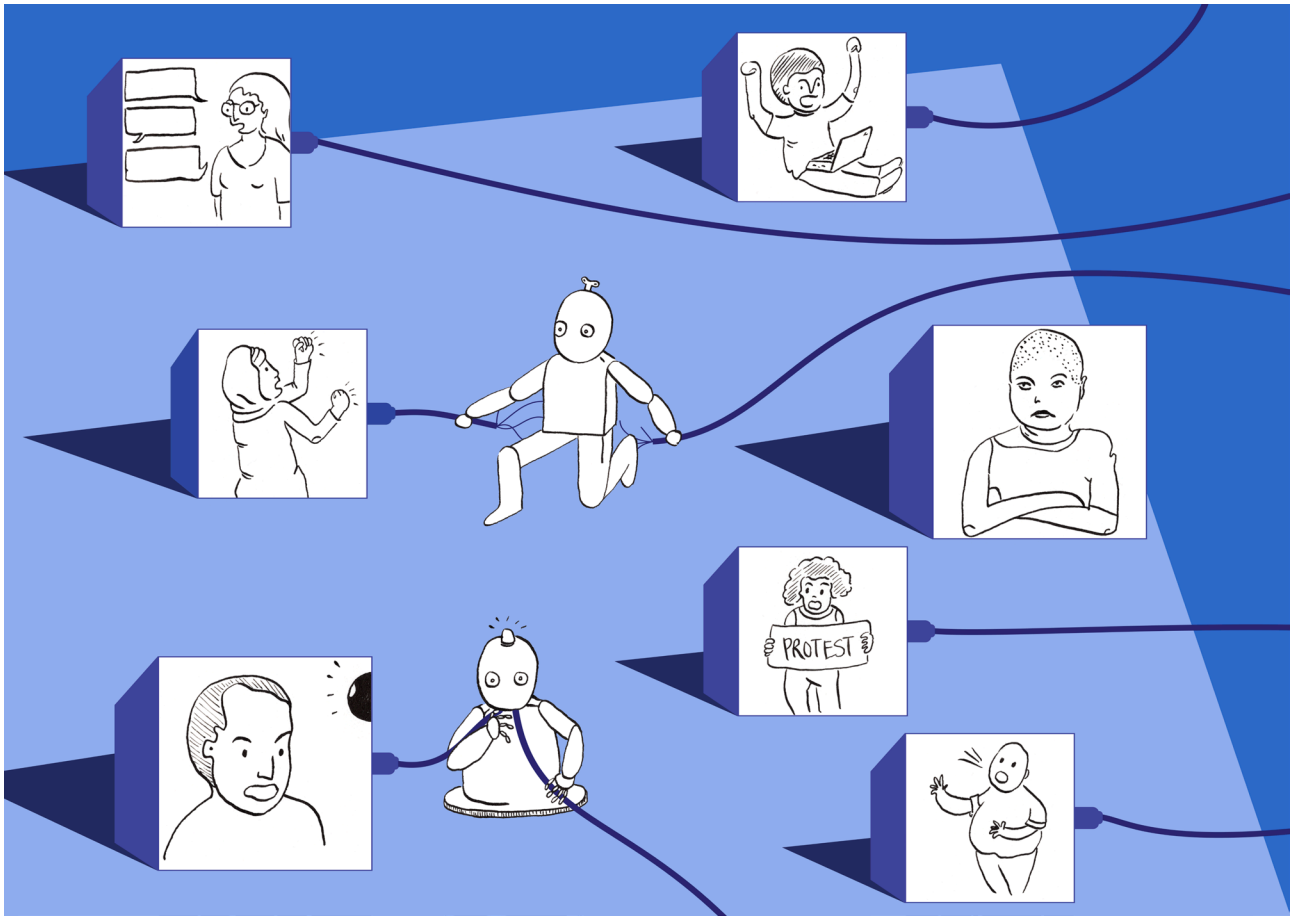
Standardization defines the way these technologies work, how they interoperate, and sets their capabilities and limitations. For instance, the WebRTC protocol, which is part of discussions being held at both the IETF and the World Wide Web Consortium (W3C), supports the videoconferencing tools that we use every day. However, the implementation of the protocol may be influenced by socio-economic or geographic contexts: a remote town in the mountains might have fast but unreliable connectivity; bandwidth might be limited and affect the quality of service; local privacy laws, if they exist, might not regulate the protection of the data handled by the protocol. To be truly useful to the breadth of internet users around the world, protocols must be written to take into consideration the various contexts and constraints in which they will be implemented.

Even though standards must be implemented with real world considerations, the technical community of the IETF is however largely composed of white, male, industry representatives from the Global North. If the people involved in the development of the WebRTC protocols don't have an understanding of what users in different contexts around the world need, those needs cannot be fully addressed. The end result of this monoculture is the publication of protocols that do not fully meet the varied and nuanced requirements of our lived experiences.

Even though diverse participation is encouraged by many in the IETF community, there is still a long road ahead to achieving robust and meaningful multistakeholder engagement.

To ensure that IETF standards truly "make the Internet work better" for everyone, voices that are currently missing in IETF discussions and processes must be sought out and actively included within its technical community.

Civil society representatives can be particularly valuable members of the IETF technical community, as they can represent the interests of people and communities that are often overlooked in technological design and development; serve as interlocutors between small or non-profit implementers, researchers, and governments; financially support the participation of smaller organizations and implementers; and build coalitions or knowledge-sharing networks among other



public interest technologists and advocates.

By infusing the space with more perspectives and voices of internet users around the world, we move closer to the goal of developing inclusive and human rights-respecting IETF standards – which, in turn, normalize and reinforce key public interest principles in the design and development of internet technologies before they are deployed.

How does the IETF work?

The IETF organizes its standards development across several Areas, each of which is comprised of working groups that correspond to the Area's focus. To learn more about the organizational structure of the IETF, particularly the working groups (WGs) where the work is largely carried out, read through *The Tao of IETF: A Novice's Guide to the Internet Engineering Task Force*.

To learn more about the Internet Research Task Force (IRTF), a parallel organization to the IETF, and its various research groups (RGs), visit the IRTF homepage. Both the IETF and IRTF operate under the governance of the Internet Architecture Board (IAB), with RG sessions scheduled during each IETF meeting.

IETF work items that are still under research or development are called Internet Drafts (I-Ds). A published IETF standard is called a Request for Comments (RFC). Every RFC starts out as an I-D. To learn more about what an I-D is, how to write one, and how to publish an RFC, you can refer back to the Tao. For more detailed explanations, you can read through the series of RFCs set out in the IETF's Current Best Practice (BCP) 9.

For public interest stakeholders, it's important to remember that everyone can contribute to the development of an I-D into an RFC,

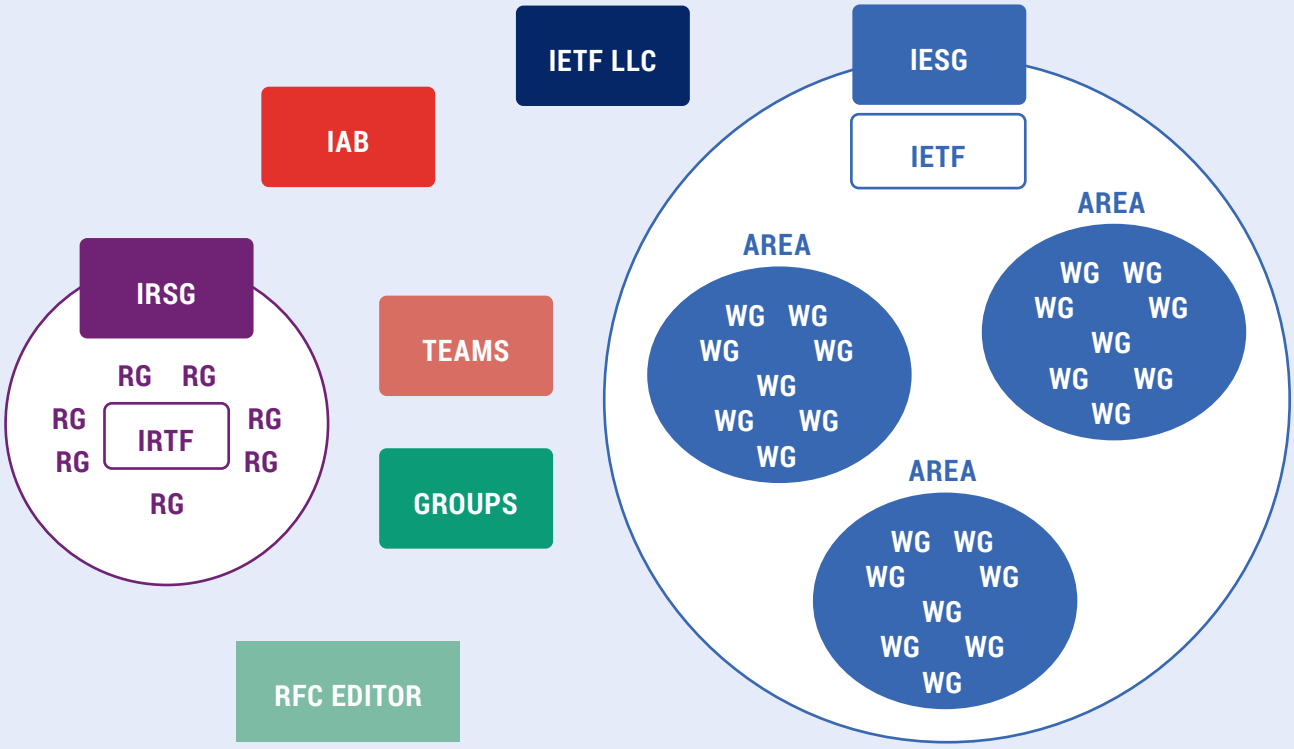
regardless of their areas of expertise, seniority in the IETF, or technical skill. There are two types of engagement:

- Contribute to I-Ds by researching, writing or reviewing the text and making technical edits and contributions, collaborating on the development of use cases, goals, requirements, and pieces of code.
- Contribute to the work of the group by networking with others, researching, testing, promoting the I-D across their networks, and providing editorial support.

Notice that not all of these contributions require technical expertise or programming experience. Diversity in competencies at any internet SDO, including the IETF, is necessary and welcome.

It is also important to note the value of public interest stakeholders participating in the IRTF. The goal of IRTF RGs is not to produce technical standards, but to consider long-term research questions relevant to the operation of the internet, including issues relevant to the public interest such as internet measurement and privacy, and producing historic, informational or experimental

standards development organigram



Legend
IAB - Internet Architecture Board
IESG - Internet Engineering Steering Group
IETF - Internet Engineering Task Force
IETF LLC - IETF Administration, Limited Liability Company
IRTF - Internet Research Task Force
IRSG - Internet Research Steering Group
RFC - Request For Comments
RG - research group
WG - working group

documents.[3] However, sometimes when a research proposal reaches maturity through discussions in the IRTF Area's RGs, and it's ready for the community to work on a protocol implementation for it, it is common that such an IRTF proposal will then be pitched to a new or existing IETF WG for standardization.

Participation in the IETF

The standards developed at the IETF are open to contributions from anyone who wants to become involved. In practice, there are several challenges to participation at the IETF.

The IETF does not have a membership fee to become part of its community. While it's active all year, it officially holds only three annual meetings, which do incur an attendance fee.

These meetings are the focal points of the IETF calendar. Each meeting is a one-week event; usually the first meeting is held in Europe, the second is held in Canada or the United States, and the third is held in Asia. When in-person convenings aren't possible, they take place online according to the time zone of the city where the in-person meeting would have been held. An IETF meeting is more than a series of WG and RG sessions; it's a space for business, networking, collaboration, and defining new areas of work. Many would argue that the real value of an IETF meeting lies not in the sessions, but in the hallway conversations.

Despite their importance, if you can't attend these meetings in person, you can still participate in the IETF. You can contribute to the development of I-Ds year-round by participating in mailing list discussions and making GitHub contributions. Even in-person IETF meetings provide a platform for remote attendance, and interim meetings held by individual WGs and RGs are commonly held virtually.

IETF participants include router manufacturers, automobile manufacturers, mobile phone manufacturers, software developers, technology implementers, network operators, researchers, civil society organizations, anyone relying on any of these organizations or individuals for their own businesses, and end users. These stakeholders make up the IETF community.

Officially, the IETF considers each participant as an individual, rather than a representative of an organization or company pushing a corporate or political agenda. Despite that being the IETF's official position, the reality is that standardization is an element of the political economy of the internet. Although prestige and recognition are some of the benefits that businesses and organizations receive through their representatives' involvement, the real value of their investment lies in setting the specifications for compliance or interoperability in accordance with their patents and technologies. It is an express goal of the IETF to make the internet work better and it does that by incentivizing the implementation of standards through adoption of companies' products and services that comply with those standards in the global market. While standardization sometimes precedes wider implementation and deployment, it's common for representatives to pitch a technology at the IETF after it's already undergone extensive research and development within their company or organization. Such has been the case for protocols such as Privacy Pass, an open source cryptographic algorithm notably used by the Brave browser, and QUIC, a transport protocol that originated at Google.

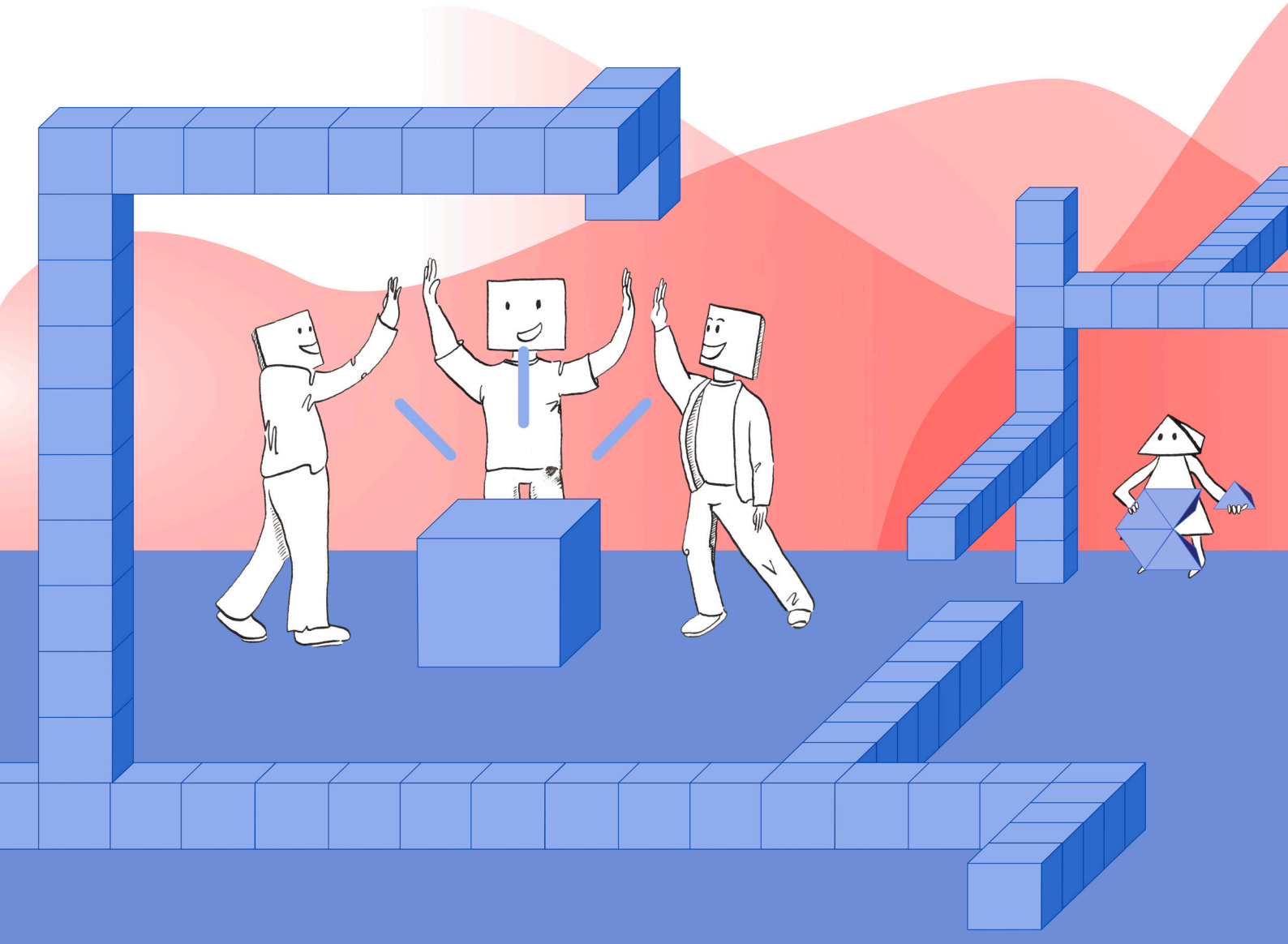
Although IETF participants have traditionally made a point of steering away from "political" or policy-related matters, the community has

become increasingly aware of the impact of its work on people and society. For example, RFC 6973 recognizes that IETF standards may have implications for privacy and provides guidance for developing privacy considerations in internet protocols. RFC 8280 sets out broader guidance for developing human rights considerations in internet protocols. RFC 8890 clarifies the IAB's position that the interests of end users must be prioritized over other interests where they conflict in IETF standards development. However, high-level guidelines and informational documents alone cannot change long-standing dynamics. Voices that represent the needs of end users themselves must participate in standards development to put the principles introduced in these RFCs into practice.

The culture change needed in the IETF to achieve a diverse, equitable, and inclusive environment that enables these voices starts with questioning assumptions and reframing existing approaches. How can the community include underrepresented groups? How does the community consider trade-offs and decide between divergent interests and values among different stakeholder groups? What types of research and development are truly vital to technology and society?

Barriers to participation

As a space with confusing and unique jargon, procedures, and technical know-how – where



information on almost any internet-related topic is usually available, yet hard to find – as well as a high financial burden on individuals wishing to participate in person, it doesn't come as a surprise that there aren't enough civil society organizations, academics, public interest technologists, and Global South representatives in the IETF.

Given that this space is primarily designed for Global North industry representatives who have access to generous benefits and budgets that allow them to participate in both personal and professional capacities, the costs, time, and knowledge required for regular, year-round participation is expensive for civil society and academia – often prohibitively so. And even when they do have sufficient resources to attend meetings and contribute to mailing list discussions and GitHub repositories, civil society's participation can still be perceived by some inside the IETF as shallow, as these public interest advocates may not be technologists, may make non-technical interventions or may spread their limited time thin by participating across many groups.

Global South civil society and other underrepresented groups are further disadvantaged for the following reasons:

- Geographic: In-person meetings are never held in Africa or Central and South America, which means that participants from these regions must always cover longer travel lengths, navigate border controls and incur the costs of accommodation in cities where their local currencies are often weaker.

- Cultural: Systemic discrimination is embedded in the IETF, which can alienate participants that identify outside its white, male, Global North monoculture. It manifests in the terminology used by the community (e.g., the geographically erroneous use of the term "Latin America," use of "he" as the default third-person pronoun in RFCs, use of racially insensitive or offensive terms such as "master" and "slave," etc.). It is also reflected in certain operational decisions, such as organizing meetings in countries with poor records on LGBTQIA rights.

- Linguistic: Work is done almost exclusively in English, and rapid conversation with technical jargon is common in meetings. Participation by non-English speakers, speakers for whom English is a second language, or attendees with disabilities may be infeasible or more difficult.

Online participation provides a major avenue for overcoming many of these barriers. While there is a fee to attend meetings in person, it is typically free to participate remotely, or at a discounted rate. The free availability of the mailing list archives of most WGs and RGs provides an excellent resource for prospective participants that wish to narrow down areas of interest, find like-minded individuals, or scope out where and how their contributions may be valuable without the need for in-person participation. Similarly, the free availability of the IETF's online platforms, including its mailing lists, GitHub repositories, and chat channels, allow participants to climb the steep learning curve, process information, and contribute at their own pace. Finally, these online platforms can facilitate anonymity for participants that are concerned with navigating certain cultural or social biases within the IETF.

Fighting to overcome these barriers while being effective in this space is a challenge in itself; however, the following section sets out ideas and opportunities for the way ahead.

How can you be effective at the IETF?

Whether you're a newcomer or a returning participant, opportunities to actively contribute to the IETF are not limited to the three annual meetings; in fact, many IETF participants don't attend the in-person meetings at all and focus instead on the various WG and RG mailing lists. Effectiveness cannot be achieved in a single meeting, nor by following conversations in a WG or RG over a few months. It requires long-term engagement sustained over years. The work required to create real change – updating I-D text, coding implementations, researching, testing, editing, etc. – spans several iterations and depends on the availability of the other people working with you. An update to an I-D or an outcome to a conversation usually happen months later, either at the next meeting or via the mailing lists. The standardization process, from I-D adoption to RFC publication, therefore varies between six months to two or more years.

This is not to discourage prospective participants from making sporadic contributions, since both short- and long-term engagement can bring important perspectives to the table; rather, this is to set realistic expectations for how to achieve lasting impact, especially as seniority within the community matters tremendously in these conversations.

Regardless, to be effective, you can't rely only on formal discussion spaces. Backchannels, from corridor conversations to side meetings, are often important to persuade others and move drafts forward.

Before you consider attending an in-person meeting, the most important step is to identify WGs and RGs of interest. Reviewing their discussions in the mailing list archive will provide a sense of their work, as well as the individuals behind that work. Identifying and connecting with those participants provide a platform for network building, which is, in turn, vital for continuing to find areas where your contributions will be of higher value.

Speaking with a WG or RG chair before beginning your engagement in a new area of work within the IETF can help you understand the deeper aims of the group and how to contribute effectively to their work. Since the chairs are often responsible for the benchmarking and planning related to their group's work, working with them is key if you plan to author an I-D: you might need guidance on which group is the best home for your proposal, and you'll definitely want their support on early versions of your draft to increase the likelihood that the group will adopt it as an I-D.

While technical expertise is not a requirement for participating in the WGs and RGs, it is important for public interest advocates to not be perceived in the IETF community as aiming to be "regulators" or external monitors.

Asking, for example,

> "How can we prevent an impact to the confidentiality of metadata in this protocol?"

not

> "Your protocol impacts the confidentiality of protocol metadata!"

will help protocol developers and implementers see you as a collaborative member of the

community, which will contribute to reducing the pushback and shifting the IETF towards greater cross-collaboration and stronger consideration of human rights. Sometimes having an open question considered and noted in a document is a strategic goal in-and-of itself.

By becoming accepted as a member of the IETF community, you will gain a better position to affect internal change that results in a more inclusive culture and environment.

"Do-ers" are highly valued in the IETF community.

Civil society participants directly contribute to standards development related to public interest issues such as DNS security, browser privacy, and censorship circumvention. Additionally, they must help their counterparts outside the IETF community understand the background of these discussions, while engaging with engineers within the IETF community to center public interest frameworks and principles including openness, diversity, security, privacy, and human rights. In this regard, researchers studying the IETF itself can help in determining the impacts and consequences of the standards development process, as well as in raising greater awareness and interest.

Examples and opportunities for effective participation

Contributions to the technical community are largely agenda-motivated. For corporates, this agenda might be product-related. For civil society, this agenda is political: the open and interoperable internet should be designed in the public interest, resistant to censorship, pro-privacy and anti-surveillance, and enable meaningful connectivity. This can sometimes mean simply keeping an eye on the work driven by profit and identifying tensions or resonance with privacy, or other public interest goals.

While different WGs and RGs may be relevant to different people, depending on your particular public interest goals, the following list is intended to provide a starting point for those who are currently identifying where these intersections exist:

- The Human Rights Protocol Considerations (HRPC) RG researches whether standards and protocols can enable, strengthen, or threaten human rights, as defined in the Universal Declaration of Human Rights (UDHR) and the International Covenant on Civil and Political Rights (ICCPR), specifically, but not limited to the right to freedom of expression and the right to freedom of assembly. The creation of HRPC itself is a success story for the public interest as it acknowledges the synergies between the UDHR as a defacto standard that bears implementations in technology design. The publication of RFC 8280 "Research into Human Rights Protocol Considerations" has been a high point in the arc of defining the benefits of these synergies.

- The Privacy Enhancements and Assessments Research Group (PEARG) is a general forum for discussing and reviewing privacy-enhancing technologies for network protocols and distributed systems in general, and for the IETF in particular. It follows IETF work on attacks on societal, community, and individual privacy, and protocol-specific documents such as DNS privacy in RFC 7626 and pervasive monitoring (RFC 7258). Similar to HRPC, PEARG's chartering is evidence that privacy issues are central to internet

protocol design and should be studied in the long term so as to influence protocol development.

- The Domain Name System Operations (DNSOP) WG develops technical information and guidance for the operation of DNS software and services, and for the administration of DNS zones. DNS privacy is a major area of focus for the technical community, and has a direct impact on user privacy as well as free expression and access to information. The standardization of encrypted DNS protocols like DNS-over-HTTPs or DNS-over-TLS protect user privacy and anonymity and mark a welcome, wider shift toward a more rights-respecting internet infrastructure.

- The primary goal of the Messaging Layer Security (MLS) WG is to develop a standard messaging security protocol for human-to-human(s) communication with the above security and deployment properties so that applications can share code, and so that there can be shared validation of a single end-to-end encrypted communications protocol.

- The Global Access to the Internet for All (GAIA) RG tackles the long-term internet problem of the digital divide as access to the internet becomes ubiquitous. Through community network implementers, GAIA creates visibility for and tracks some of the most innovative and challenging aspects of the environmental, political, and socioeconomic barriers to implementation of internet protocols.

New participants can take advantage of formal opportunities for engagement in the IETF by:

- Taking part in the IETF Guides program and attending newcomer webinars and sessions;

- Attending Technology Deep Dives and live sessions for better understanding a group or topic;

- Organizing a "Birds of a Feather" (BoF) meeting, which is an informal type of convening that allows a group of like-minded individuals to get together to explore whether there is a need for setting up a formal WG or RG on a particular issue;

- Suggesting a topic and convening a team for the IETF hackathon, a two-day event which takes place before every IETF meeting;

- Proposing a topic for and attending an ad hoc IAB workshop;

- Joining the "Systers" mailing list and meetings, which are for members who self-identify as womxn and are aimed at improving the gender balance of participation at the IETF.

The IETF recognizes its high barrier to entry and has invested in onboarding newcomers and retaining effective leaders.

In particular, the Education, Mentoring, and Outreach Directorate (EMODIR) coordinates resources for both new and recurring IETF participants, such as The Tao of IETF and opportunities for guidance and training. However, while the EMODIR directorate encourages existing members of the community to care about and shepherd newcomers, it is often up to the new participant to join the welcome webinars, watch videos,

and attend the newcomer sessions and trainings in order to become comfortable to comment on lists, present to WGs/RGs, and develop I-Ds.

Some external programs designed to help participants overcome barriers for participation are:

- IRTF Diversity Travel Grants, available per-IETF meeting;
- The IETF Policy Program, supported by the Internet Society (ISOC);
- The Internet of Rights (IoR) Fellowship, supported by ARTICLE 19; and
- The Public Interest Technology Group (PITG) travel assistance fund.

Through these programs, public interest advocates can travel to the IETF to build and grow their networks of like-minded stakeholders across civil society, academia, and even industry. It is the RGs like HRPC and PEARG, and groups like PITG that offer a community of practice for those advocates to collaborate and work on issues of importance to human rights and the public interest.

Resources

IETF main website
https://www.ietf.org

The Tao of the IETF
https://www.ietf.org/about/participate/tao

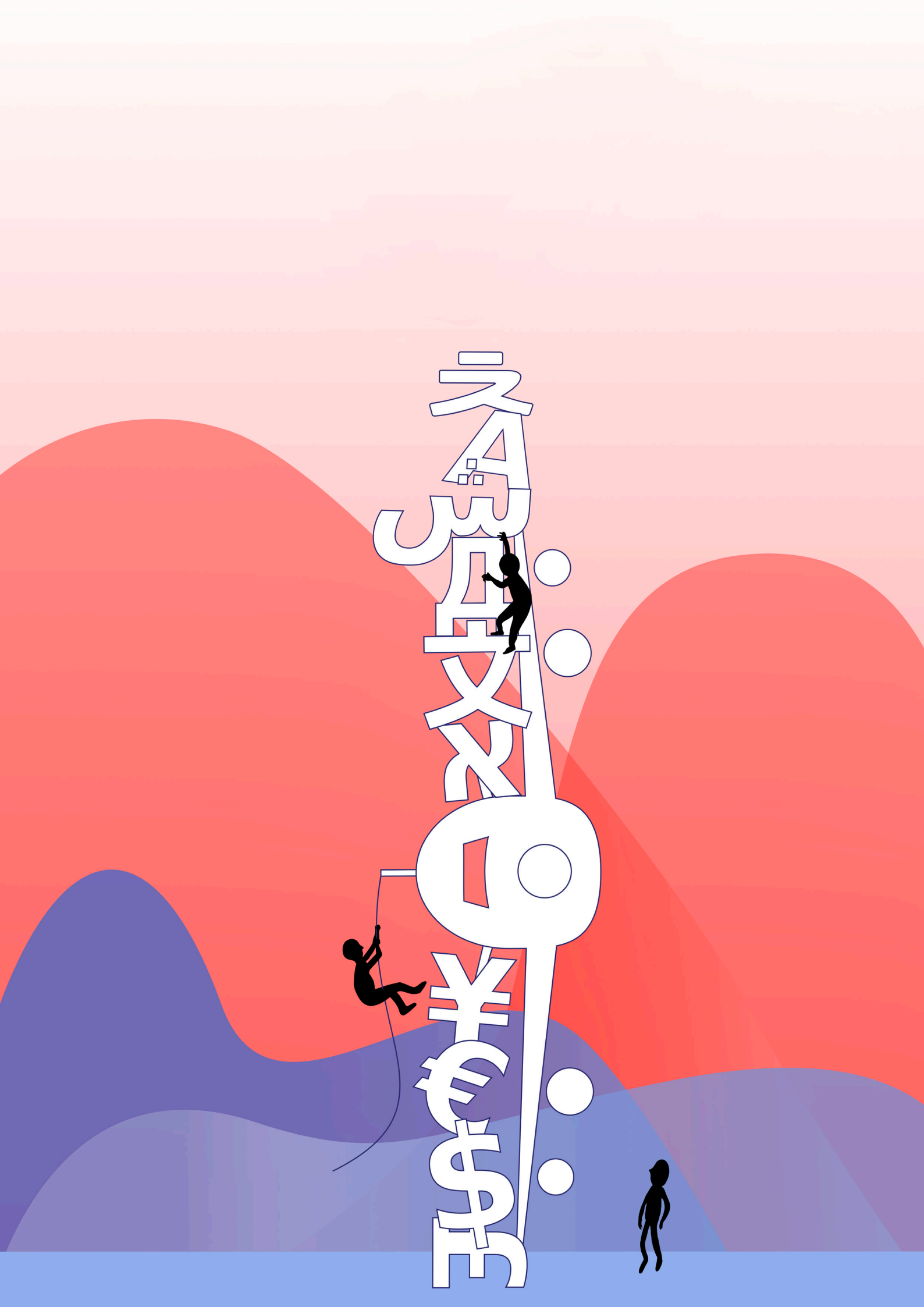
IETF mailing lists
https://www.ietf.org/mailman/listinfo

IRTF mailing lists
https://www.irtf.org/mailman/listinfo

Getting started at the IETF
https://www.ietf.org/about/participate/get-started

IETF database Datatracker
https://datatracker.ietf.org

RFC editor
https://www.rfc-editor.org



Notes

1 https://www.tandfonline.com/doi/full/10.1080/23738871.2016.1158303

2 https://www.ietf.org/about/mission

3 https://www.ietf.org/standards/process/informational-vs-experimental

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