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Thoughts on the Role of the Internet Research Task Force (IRTF)

Abstract

This memo discusses the role of the Internet Research Task Force (IRTF) and its relation to the IETF. It represents the personal opinion of the author and has not yet been reviewed by the IRSG, IAB, or the wider community.

About This Document

This note is to be removed before publishing as an RFC.

The latest revision of this draft can be found at https://csperkins.github.io/draft-perkins-role-of-irtf/draft-perkins-role-of-irtf.html. Status information for this document may be found at https://datatracker.ietf.org/doc/draft-perkins-role-of-irtf/.

Source for this draft and an issue tracker can be found at https://github.com/csperkins/draft-perkins-role-of-irtf.

Status of This Memo

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Acknowledgments

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1. Introduction

The Internet Research Task Force (IRTF) promotes research of importance to the evolution of the Internet protocols, applications, architecture, and technology. It focusses on longer term research issues related to the Internet while the parallel organisation, the Internet Engineering Task Force (IETF), considers shorter term issues of engineering and standards making. The IRTF is a research organisation, not a standards development organisation.

The IAB has previously considered the role of the IRTF [RFC4440], and the Primer on the IRTF for IETF Participants [RFC7418] also considers the topic. This memo seeks to complement those prior discussions, in the light of experiences in the decades since they were written.

This memo is not an IETF product and is not a standard.

2. Research Groups

The IRTF is primarily structured around a number of research groups. These are generally, although not always, intended to be long-lived activities that provide a venue for ongoing discussions of research ideas, experimentation and prototyping, and the development of collaborations.

Some research groups focus on applied research and development, taking ideas from the research community that are interesting, but under-explored, and encouraging their development and use to see if they will really work on, in, or for the Internet. Other times, the

focus is on more open-ended research that explores a problem, issue, or concern that might become important to the Internet in future, or that encourages the development of a nascent technology where the IRTF can help the research community connect with people in the IETF who may have more practical Internet engineering or operational experience. And, in certain circumstances, short-lived and tightly focussed research groups may be chartered to consider, and perhaps provide advice to the IETF community about, a specific problem or concern.

Research groups can publish experimental or informational documents in the RFC series. Some groups make frequent and effective use of this publication venue, but RFCs are often not the focus of research groups. The main output of many research groups is knowledge and understanding, often expressed in the form of academic papers or proof-of-concept implementations of new ideas, rather than RFCs. IRTF research groups are successful if they stimulate discussion, produce relevant research and advance the state of knowledge, and make connections between the research and standards communities.

Sometimes, the outcome of a research group is the understanding that an idea is both practical and potentially useful. In this case it might be worth developing into a product or standard, but there is no automatic path into IETF, and outcomes of IRTF groups receive no special consideration in the IETF process.

Research groups typically have a relatively broad remit, but their charters are not open-ended. The focus is research, not engineering, so it’s not generally appropriate for a research group to have explicit milestones and deliverables in the manner of a standards development group, but the research should have a clear theme, direction, and goal. Compared to IETF working groups, which focus on effectively developing standards documents, IRTF groups have much greater flexibility in both how they work and what they are expected to produce.

3. Community

Participation in research groups is by individual contributors, rather than by representatives of organisations, and research groups generally have open membership and do their work in public.

The focus of most research groups is on supporting research collaborations and connecting people. There needs to be an appropriate community, that can bring together the right set of people to form collaborations and discuss ideas, if a research group is to succeed and add value. Accordingly, the IRTF isn’t always the right home for research, even if that research is about the Internet.

The IRTF often works best when bringing in new people, new ideas, and new work and making connections between the IETF community and new parts of the research community. Of course, research groups can still provide benefit when a research topic is mature and there are strong existing connections between the research community and IETF, by providing a venue where new researchers can engage and a neutral space for researchers, standards developers, and operators to discuss research ideas. Balancing such different aspects of IRTF work, and how to allocate available resources to each, is challenging but important.

Different communities can approach a problem from very different directions, and may have different perspectives and approaches, and in doing so may be able to find solutions that might otherwise be missed. Accordingly, there may be value in a research group considering a problem that is, or has been been, studied elsewhere. Generally, though, the IRTF tries to avoid competing with other organisations.

Research groups with limited membership are permitted [RFC2014], but none exist at the time of this writing and they are now rarely chartered. If limited membership groups are to be chartered, this must be done with care and sensitivity, for reasons that are well-defined and clearly explained, so as to maintain trust in the integrity of the IRTF process and avoid unnecessary fragmentation of the research community.

4. Workshops, Prizes, and Other Activities

In addition to its research groups, the IRTF sponsors a number of other activities. At the time of this writing, these include the Applied Networking Research Prize (ANRP), organised in conjunction with the Internet Society, and the ACM/IRTF Applied Networking Research Workshop (ANRW).

The ANRW provides a venue for publication of academic research in the form of a workshop that co-locates with the July IETF meeting. It is co-sponsored by ACM SIGCOMM, the papers are published in the ACM Digital Library, and it’s increasingly widely recognised by the academic research community. PhD students and Faculty can benefit from attending to publish research results, and in the process also gain the opportunity to engage with IRTF and IETF more broadly, and to make useful connections with standards developers and other researchers.

The ANRP, similarly, has been successful in bringing new people into the IRTF community, and helping them make connections to the IETF standards work, while raising awareness of the IRTF in the research community. Several prize winners have brought their work into the

IRTF or IETF, leading to publication of a number of RFCs and improvements to several IETF standards and to operational practise.

These activities play an important role in connecting the IRTF to the academic research community and in providing an opportunity to potentially translate research results into concrete impact via connections with the standards community and broader industry.

5. Relation to the IETF

The IRTF and IETF are closely related organisations, but have distinct focus and goals. The IRTF promotes and conducts research; the IETF is an engineering and standards development organisation.

The IRTF seeks to inform and educate the IETF community about the latest advances in research in areas where the IETF operates, to help ensure IETF standards and practises track the state of the art.

The IRTF seeks to introduce new research ideas to the IETF, and to raise awareness of topics that might form the basis for future standards in new areas as technology evolves in different directions.

The IRTF seeks to provoke the IETF community, introducing contrary perspectives and new ideas, critiquing methods and approaches, and challenging assumptions to help ensure the IETF community remains open to new ideas and new ways of working.

The IRTF seeks to inform the research community about current challenges relating to standards development, protocol engineering, and network operations, arising from IETF activities, where further research may be needed.

And the IRTF can act as a resource for the IETF, helping to connect standards developers with experts who might help to review ideas or proposals that need specialist expertise not otherwise be available. This has been especially evident in the field of cryptography, where the Crypto Forum Research Group coordinates expert advice on the appropriate use of cryptographic algorithms, but it is not limited to that domain.

In general, the IRTF seeks to encourage and facilitate connections and collaboration between the research community and the standards development and operations communities in the IETF, and to help facilitate knowledge transfer, in both directions, and to provide a neutral space for collaboration and discussion.

6. Outreach

The research discussed in the IRTF often aligns closely with that promoted by professional societies such ACM, IEEE, USENIX, etc., so

it is desirable for the IRTF to maintain good relations with those organisations and with others conducting research that relates to the Internet. The ANRW is an example of such collaboration. Participants in IRTF research groups also regularly help to organise workshops associated with ACM and IEEE conferences.

The range of IRTF research groups, and the relatively broad remit of their charters, gives the opportunity to engage with a wide range of communities. The research groups focussed on human rights, privacy, and the process of standards-setting, for example, have made connections with NGOs and advocacy groups, economists, sociologists, ethnographers, policymakers, Internet governance organisations, and many others, as part of their research. They've learned from the differing perspectives and experiences of those communities and have, hopefully, offered useful new insights in return.

Broad consultation, discussion, and debate is a necessary part of research. IRTF research groups are encouraged to make broad connections with researchers, and other interested parties, to understand their interests, concerns, and points of view, and to share knowledge and expertise.

A key role of the IRTF is in providing a venue where those studying the Internet can interact with those developing and operating the Internet. That extends not just those studying Internet technologies, but also to those studying the wider implications and uses of the Internet, and its impact on economics, privacy, human rights, and society more broadly. Helping those who develop and operate the Internet to understand the broader implications of their work, and helping researchers studying the wider use and impact of the Internet to understand how and why the Internet works as it does, is an important part of role of the IRTF.

7. Security Considerations

This document has no direct security implications.

Research discussed in IRTF has the potential to significantly impact the security and privacy of users of the Internet. Researchers must consider potential security risks and benefits when conducting their work.

8. IANA Considerations

This document has no IANA actions.

9. Informative References

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