I E T F®

Making the Internet work better

IETF Annual Report 2019

A summary of Internet Engineering Task Force,
Internet Architecture Board,
Internet Research Task Force, and
RFC Editor community activities

2020-04-24

www.ietf.org

Introduction

This report provides a high-level overview of activities during 2019, organized by the following sections:

IETF Activities

Summary of Working Groups activity during 2019, Internet-Drafts adopted by Working groups, and IETF RFCs published.

IETF Meetings

An overview of in-person IETF and interim Working Group meetings during 2019.

IETF Hackathons

A brief look at events that bring to life the IETF's mantra of "running code" and help improve IETF standards.

IETF Administration LLC (IETF LLC)

A look at the IETF Administration LLC's ongoing operational support for the IETF.

IETF Global Hosts and Sponsors

These supporters helped ensure the sustainability of the IETF's work on open standards in 2019.

Internet Architecture Board (IAB)

A review of IAB programs and workshops during 2019, and an update on the RFC Editor.

Internet Research Task Force (IRTF)

A summary of notable IRTF Research Groups, workshops, and prizes that took place and were awarded in 2019.

Internet Engineering Task Force Activities

The Internet Engineering Task Force (IETF) is the premier Internet standards organization, developing open standards through open processes. The IETF brings together a large international community of network designers, operators, vendors, and researchers to work on the evolution of the Internet architecture and the smooth operation of the Internet. The IETF pursues its [mission](#) by adhering to cardinal principles of open processes, technical competence, volunteer participation and leadership, rough consensus and running code, and by taking responsibility for all aspects of its protocols.

Working Groups are the primary mechanism for developing IETF specifications and guidelines, many of which are intended to be standards or recommendations. Working Groups submit these specifications and guidelines for publication as RFCs. The RFC document series, which includes documents produced by the IAB, the IRTF, and the IETF—as well as individual submissions—contain technical and organizational notes about the Internet.

IETF Working Groups

As of 31 December 2019, there were 7 active Areas containing a total of **117 active IETF Working Groups**. The Internet Engineering Steering Group ([IESG](#)), consisting of the 14 Area Directors and the IAB Chair, is responsible for technical management of IETF activities and the Internet standards process. The active Areas are:

Applications and Real-Time (ART) Area
Develops application protocols and architectures in the IETF. The work in the area falls into roughly three categories: delay-sensitive applications, delay-tolerant applications, and building blocks for general use.

General (GEN) Area
Consists of WGs and other activities focused on supporting, updating and maintaining the IETF standards development process.

Internet (INT) Area
The primary technical topics covered include IP layer (both IPv4 and IPv6), implications of IPv4 address depletion, co-existence between the IP versions, DNS, DHCP, host and router configuration, mobility, and how IP will run over new link layer protocols.

Operations and Management (OPS) Area
The primary technical topics include: Network Management; Authentication, Authorization and Accounting (AAA); and various operational issues facing the Internet such as DNS operations, IPv6 operations, operational security, and routing operations.

Routing (RTG) Area

Responsible for ensuring continuous operation of the Internet routing system by maintaining the scalability and stability characteristics of the existing routing protocols, as well as developing new protocols, extensions, and bug fixes.

Security (SEC) Area

The home for working groups focused on security protocols. They provide one or more of the security services: integrity, authentication, non-repudiation, confidentiality, and access control. Since many of the security mechanisms needed to provide these security services employ cryptography, key management is also vital.

Transport and Services (TSV) Area

Works on mechanisms related to end-to-end data transport to support Internet applications and services that exchange potentially large volumes of traffic at potentially high bandwidths. A key focus are mechanisms to detect and react to congestion in the Internet, such as the congestion control algorithms in Internet transport control protocols such as TCP, Stream Control Transmission Protocol (SCTP), Multipath TCP, Datagram Congestion Control Protocol (DCCP), and QUIC.

New IETF Working Groups

The following new Working Groups were chartered during 2019:

- [GitHub Integration and Tooling (git)](#)
- [Remote ATtestation ProcedureS (rats)](#)
- [Relay User Machine (rum)](#)
- [Lightweight Authenticated Key Exchange (lake)](#)
- [General Area Dispatch (gendispatch)](#)
- [Media OPerationS (mops)](#)

Concluded IETF Working Groups

The following Working Groups were concluded during 2019:

- [TCP Increased Security (tcpinc)](#)
- [Real-Time Communication in WEB-browsers (rtcweb)](#)
- [Audio/Video Transport Payloads (payload)](#)
- [Metric Blocks for use with RTCP's Extended Report Framework (xrblock)](#)
- [Softwires (softwire)](#)

RFCs

The final form of the work undertaken in the IETF is captured in RFCs. In 2019, [180 RFCs were published](#).

RFCs Published in the past 5 years
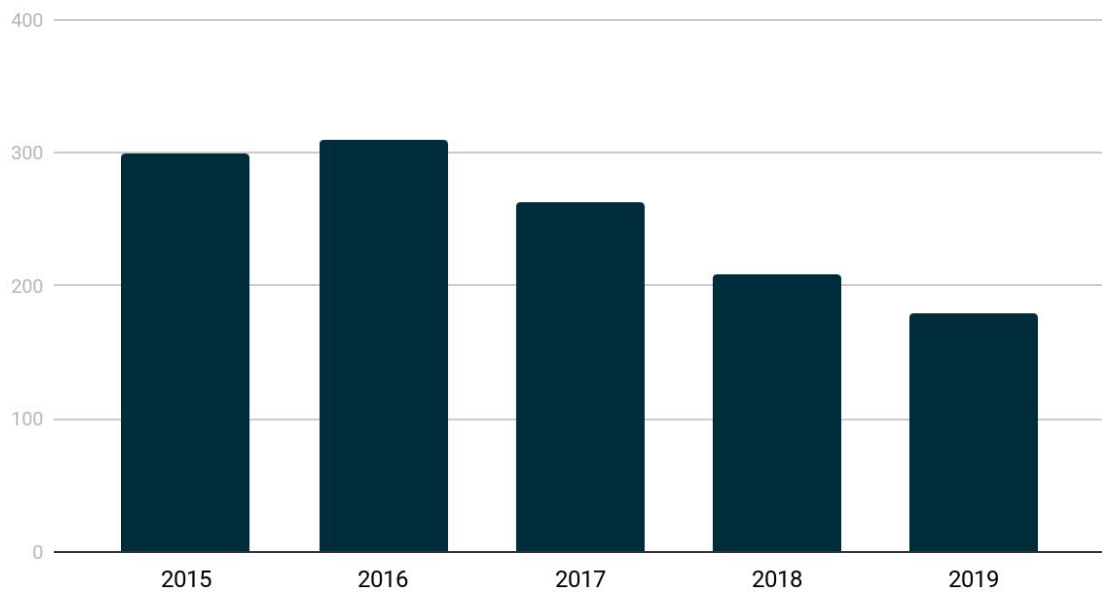
IETF Meetings

While the work of the IETF is largely conducted over mailing lists, the IETF community holds a variety of online and in-person meetings to make progress.

IETF 104 Prague

22-29 March 2019
Hosted by Cisco and CZ.NIC
1213 onsite attendees
864 remote attendees
Proceedings

IETF 105 Montreal

20-26 July 2019
Hosted by Comcast and NBCUniversal
1103 onsite attendees
861 remote attendees
Proceedings

IETF 106 Singapore

16-22 November 2019
Hosted by Nokia
1005 onsite participants
607 remote participants
Proceedings

Interim Meetings

In addition to IETF meetings, some working groups hold interim meetings, either face-to-face or virtually via conference calls. During 2019, IETF working groups held more than 120 interim meetings. More details, including agendas, minutes, and materials for each interim meeting can be found via the IETF Interim Meetings webpage.
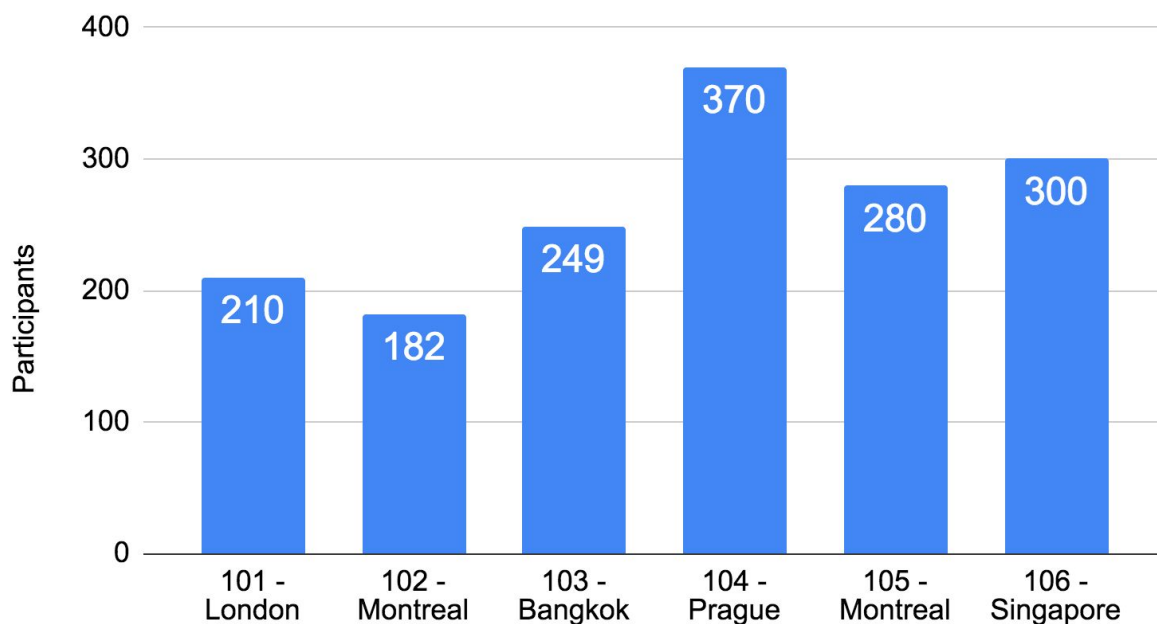
IETF Hackathons

[IETF Hackathons](#) encourage developers to collaborate and develop utilities, ideas, sample code and solutions that show practical implementations of IETF standards. IETF Hackathons are collaborative events, not competitions. Past IETF Hackathons have covered a range of topics, including: DNS, HTTP 2.0, NETVC, OpenDaylight, ONOS, VPP/FD.io, RiOT, SFC, TLS 1.3, WebRTC, YANG/NETCONF/RESTCONF.

Photos by Minzayar Oo

Since beginning in 2015 with approximately 50 participations, IETF Hackathons have grown dramatically, averaging more than 300 registered participants at the IETF Hackathons held in 2019.

Support for IETF Hackathons is provided by [Cisco DevNet](#). [ICANN](#) generously sponsored IETF Hackathons held in conjunction with [IETF 105](#) and [IETF 106](#).

IETF Administration LLC Updates

Established in 2018 after an extensive community process to update the administrative arrangements supporting the work of the IETF, the IETF Administration LLC (IETF LLC) completed its first full year of operation in 2019. A key element of the IETF LLC's operation is transparency. To that end, board meetings are open to observers except for items such as legal, contracts, and personnel matters, with meeting agendas published prior to the meeting and minutes published afterwards.

Accomplishments during 2019 include:

- Engaging Jay Daley as the permanent IETF Executive Director
- Finalizing and implementing Conflict of Interest (CoI) and other key policies and procedures
- Announcing awards for several key contracts, including Secretariat services.
- Finalizing the IETF LLC 2020 budget
- Transferring the IETF Endowment from the Internet Society to the IETF LLC

IETF Administration LLC 2019 Budget

A summary chart is provided below. [Full details and further financial reports](#) are posted on the IETF LLC web pages.

Revenue	
Non-Meeting Revenue	
ISOC Contribution	5,000,000
Administrative In-Kind Contribution	80,560
Other	3,000
Total Non-Meeting Revenue	**5,083,560**
Meeting Revenue	**3,941,880**
Total Revenue	**9,025,440**

Expenses	
Meeting Expenses	**3,836,325**
Operating Expenses	
RFC Services	1,225,000
IETF Secretariat	1,410,210
Administration	1,608,000
IETF Trust Contribution	65,258
RFP Management Expenses	150,000
Special Projects	50,000
Tools	326,399
Total Operating Expenses	**4,834,867**
Total Expenses	**8,672,193**
Net Income	353,247
IETF Capital Investment	190,550

IETF Global Hosts and Sponsors

Work in the IETF is supported by contributions from dozens of sponsors each year. Significant ongoing support is provided by IETF Global Hosts. Global hosts have made sustained commitments to ensure the standards that power the Internet remain open for permissionless innovation. See the IETF website for more information about IETF sponsors and how they support the IETF.

Internet Architecture Board Activities

The Internet Architecture Board (IAB) provides long-range technical direction for Internet development, ensuring the Internet continues to grow and evolve as a platform for global communication and innovation. The IAB provided reports to the community throughout 2019:

- IAB report to the community for IETF 104
  This report noted the approval of two documents approved for publication as RFCs: Transport Protocol Path Signals (RFC 8558) and The Wire Image of a Network Protocol (RFC 8546)

- IAB report to the community at IETF 105
  Ahead of IETF 105, the IAB provided an update on changes to the RFC Series Editor model and the ongoing community discussion underway to determine a way forward.

- IAB report to the community for IETF 106
  As part of their report in advance of IETF 106, the IAB noted their statement calling out the unintended consequences of policy and regulatory proposals.

The IAB publishes a list of documents on its website, with active Internet-Drafts and published RFCs available via the IETF Datatracker.

IAB Programs

Programs are activities managed by the IAB to more effectively execute its chartered responsibilities. As of 31 December 2019, there were four active IAB programs, and two programs had been concluded during 2019.

Active Programs

- IANA Program
- Liaison Oversight Program
- Plenary Planning Program
- RFC Editor Program: The RFC Series Oversight Committee (RSOC)

Concluded Programs

- IP Stack Evolution Program
- Privacy and Security Program

IAB Workshops

Workshops provide a way to bring together experts on a focused topic of interest to the work of the IAB. In 2019, the following IAB Workshops were held:

- Exploring Synergy between Content Aggregation and the Publisher Ecosystem (ESCAPE) Workshop (18-19 July 2019)
- Design Expectations vs. Deployment Reality in Protocol Development (DEDR) Workshop (4-5 June 2019)

RFC Series Editor update

In a series of meetings leading up to and at IETF 106 held in November 2019, the IAB asked the Internet technical community about what process to use to consider a further evolution of the RFC Editor model. As a result, an open IAB program called the RFC Editor Future Development Program was proposed, to be modeled closely on an IETF working group with completely open participation.

As of 31 December 2019, the IAB was seeking feedback on the proposed program.

Internet Research Task Force Activities
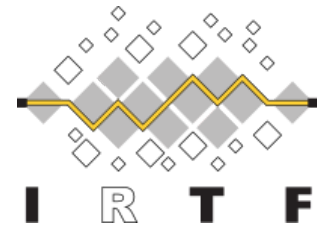
The Internet Research Task Force ([IRTF](#)) promotes research of importance to the evolution of the Internet protocols, applications, architecture and technology. The IRTF is managed by the IRTF Chair in consultation with the Internet Research Steering Group ([IRSG](#)).

Research Groups

The IRTF consists of a number of focused and long-term Research Groups working on topics related to Internet protocols, applications, architecture, and technology. Research Groups have the stable long-term membership needed to promote the development of research collaboration and teamwork in exploring research issues. Participation is by individual contributors, rather than by representatives of organizations. Research Groups active as of 31 December 2019 were:

- Crypto Forum Research Group ([cfrg](#))
- Decentralized Internet Infrastructure ([dinrg](#))
- Global Access to the Internet for All ([gaia](#))
- Human Rights Protocol Considerations ([hrpc](#))
- Internet Congestion Control ([iccrg](#))
- Information-Centric Networking ([icnrg](#))
- Measurement and Analysis for Protocols ([maprg](#))
- Network Management ([nmrg](#))
- NetWork Coding for efficient Network Communications Research Group ([nwcrg](#))
- Path Aware Networking RG ([panrg](#))
- Privacy Enhancements and Assessments Research Group ([pearg](#))
- Thing-to-Thing ([t2trg](#))
- Computing in the Network Research Group ([coinrg](#)) was chartered as a full RG in December 2019.

Also, the chartering of the Quantum Internet Proposed Research Group ([qirg](#)) is being considered.

Applied Network Research Prize

The Applied Networking Research Prize ([ANRP](#)) is awarded for recent results in applied networking research that are of potential interest to the Internet standards community. Researchers with relevant, recent results are encouraged to apply for this prize, which offers the opportunity to present and discuss their work with the engineers, network operators, policy makers, and scientists that participate in the IETF and the IRTF. During 2019, five awards were presented, to

Brandon Schlinker, Florian Streibelt, Taejoong Chung, Neta Rozen Schiff, and Weiteng Chen.

Applied Network Research Workshop

The ACM/IRTF Applied Networking Research Workshop (ANRW) provides a forum for researchers, vendors, network operators, and the Internet standards community to present and discuss emerging results in applied networking research. The workshop offers an opportunity for academics to transition research back into IETF standards and protocols and to find inspiration from topics and open problems discussed at the IETF. To foster this cross-community collaboration, the workshops are co-located with IETF meetings once a year and organized in a way that allows ample time for discussion and interaction.

The ANRW 2019 was held in Montreal in conjunction with the IETF 105 meeting. The workshop consisted of a mix of invited talks, submitted talks, and submitted short papers. Video recordings from the workshop are available from the IRTF website. Workshop proceedings have been published by the ACM.

Information Resources

Internet Architecture Board (IAB)

[IAB website](#)

[IAB on Twitter](#)

Internet Engineering Task Force (IETF)

[IETF website](#)

[IETF Datatracker](#)

[IETF Mailarchive](#)

[IETF on Twitter](#)

IETF Administration LLC (IETF LLC)

[IETF LLC webpages](#)

[IETF LLC on LinkedIn](#)

Internet Research Task Force (IRTF)

[IRTF website](#)

[IRTF on Twitter](#)

RFC Editor

[RFC Editor website](#)