

IETF Annual Report

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

As of 31 December 2023



I E T F[®]

IETF by the Numbers in 2023

Participation

- 7,859** Participants in all IETF activities (mailing list posters, meeting participants, I-D authors)*
- 5,128** Registered participants at IETF Meetings
- 138,303** Email messages sent to IETF mailing lists
- 3,177** Individuals posting to IETF mailing lists

Documents

- 1,066** Internet-Drafts (I-Ds) submitted†
- 2,832** I-D authors
- 173** RFCs published

Working Groups

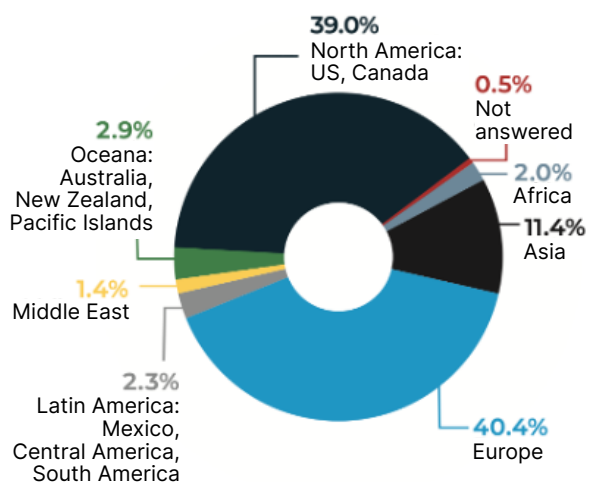
- 126** Active Working Groups
- 8** New Working Groups chartered
- 8** Working Groups concluded

*Based on unique email address used to register for IETF events, submit I-Ds, and post to IETF mailing lists.

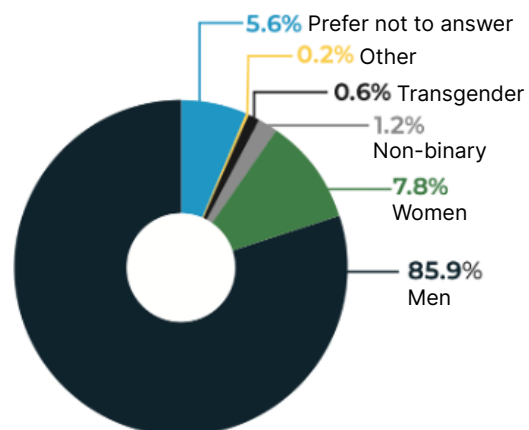
†Unique I-D names not counting different versions of the same I-D submitted to the IETF I-D archive.

IETF Community

by Geography



by Gender



People may declare multiple genders and, therefore, the total exceeds 100%.



I E T F[®]

Internet Engineering Task Force Activities

The Internet Engineering Task Force (IETF) is the premier Internet standards organization, providing a neutral venue for 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.

IETF Working Groups

Working Groups (WGs) 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.

IETF Working Groups are created with defined objectives and deliverables. Once they have completed, these groups are usually closed, though they may also be rechartered to take on subsequent related work. In 2023, 8 new Working Groups were chartered and 8 were concluded, resulting in 126 active working groups at the end of the year.

New IETF Working Groups

The following new Working Groups were chartered during 2023:

[Computing-Aware Traffic Steering \(cats\)](#)

The CATS working group is chartered to consider the problem of how the network edge can steer traffic between clients of a service and sites offering the service.

[Key Transparency \(keytrans\)](#)

The KEYTRANS working group is developing a standard for providing verifiability for identity-to-public-key bindings in an authentication service for an end-to-end encrypted communication service.

[More Instant Messaging Interoperability \(mimi\)](#)

The MIMI working group will specify the minimal set of mechanisms required to make modern Internet messaging services interoperable.

[Post-Quantum Use In Protocols \(pquip\)](#)

The PQUIP working group provides a standing venue to discuss Post-Quantum Cryptography (PQC) transition issues and experiences, as relevant to work in the IETF. The WG also provides a venue of last resort to discuss PQC-related issues in IETF protocols that have no associated maintenance WGs.

[Secure Asset Transfer Protocol \(satp\)](#)

The SATP working group aims to develop a standard protocol that operates between two peer gateways for the purpose of transferring digital assets between an originator in the origin network to a beneficiary in a destination network.

[Structured Email \(sml\)](#)

The SML working group will develop standards track specifications for annotating human-readable email content with a machine-readable version to enable more reliable and accurate content analysis and processing. The WG also will develop recommendations for security and trust mechanisms that should be applied when processing machine-readable content in email messages.

[Time-Variant Routing \(tvr\)](#)

The TVR working group is defining information and data models that address time-based, scheduled changes to a network, which may include changes to links, adjacencies, cost, and—in some cases—traffic volumes.

[Virtualized Conversations \(vcon\)](#)

The vCon working group focuses on leveraging the conversational data commonly generated and collected in business environments, from chat logs to transcripts to recordings. Most systems provide a way to store such information, but there are few standards and infrequent interoperability within the storage and transmission mechanisms and formats.

Concluded IETF Working Groups

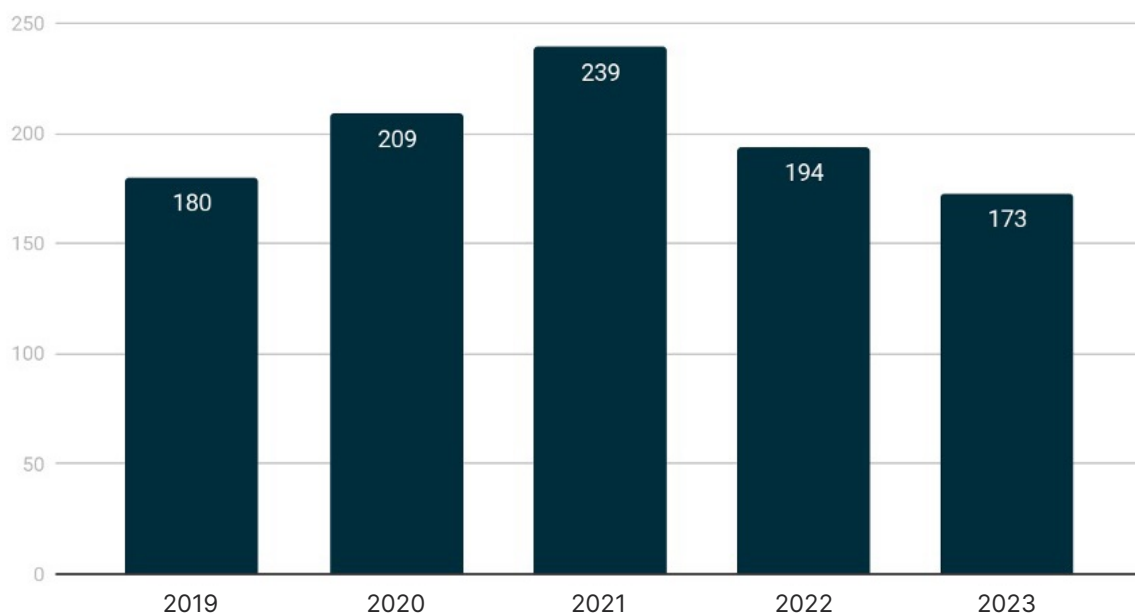
The following Working Groups were concluded during 2023:

- DDoS Open Threat Signaling ([dots](#))
- Home Networking ([homenet](#))
- IPv6 over the TSCH mode of IEEE 802.15.4e ([6tisch](#))
- Interface to Network Security Functions ([i2nsf](#))
- RTP Media Congestion Avoidance Techniques ([rmcat](#))
- Security Events ([secevent](#))
- Service Function Chaining ([sfc](#))
- Web Packaging ([wpack](#))

RFCs

The RFC document series contains technical and organizational notes about the Internet. The final form of the work undertaken in the IETF is captured in RFCs. RFCs are also published by the Internet Architecture Board (IAB), the Internet Research Task Force (IRTF), individual submissions, as well as Editorial Stream RFCs that specify and update policies, procedures, guidelines, rules, and related information regarding the RFC Series as a whole. In 2023, 173 RFCs comprising 4,222 pages were published.

RFCs Published, 2019–2023



Internet-Drafts

Internet-Drafts (I-Ds) are working documents of the IETF, its Areas, and its Working Groups, as well as groups, such as IRTF Research Groups. While only some I-Ds become RFCs, I-Ds are the focal points for much of the day-to-day work and discussion of the IETF. During 2023, I-Ds posted to the IETF I-D repository included:

- 1,066 I-Ds of all types*
- 2,832 Different I-D authors†

*This is a count of unique -00 versions of I-D submitted to the IETF I-D repository during 2023, not counting different versions of the same I-D.

†The total number of individuals listed on any version of an I-D submitted to the IETF I-D repository during 2023.

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 meetings continued with a hybrid approach in 2023, with remote registrations leveraging ongoing investments in improving online participation capabilities.



[IETF 116 Yokohama](#)

25–31 March 2023

Hosted by the WIDE Project

993 onsite participants

586 online participants



[IETF 117 San Francisco](#)

22–28 July 2023

Hosted by Nokia

890 onsite participants

544 online participants

[IETF 118 Prague](#)

4–10 November 2023

849 onsite participants

666 online participants

[Interim Meetings](#)

Complementing the three IETF-wide meetings held each year, interim meetings are a way for groups to allocate dedicated time to make progress and supplement the ongoing work occurring on mailing lists and in interim group meetings. In 2023, IETF groups held more than 290 interim meetings—20% more interim meetings than in 2022, and nearly three times the number of interim meetings held just a few years ago. More details, including agendas, minutes, and other materials for each interim meeting can be found on the [past meetings page](#) in the IETF Datatracker.

IETF Global Hosts and Supporters

Work in the IETF is supported by contributions from dozens of sponsors each year. Significant ongoing support is provided by IETF Global Hosts and Global Supporters, who have made sustained commitments to ensure that 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.



Diversity and Inclusivity Sponsors

The work of the IETF benefits from a broad range of technical perspectives. Diversity and Inclusion sponsors help more individuals participate in the work of the IETF.

Gold Sponsors



Bronze Sponsors



Running Code Sponsors

We believe in rough consensus and running code is an unofficial mantra of the IETF and underscores the value the community puts on work that makes a difference in the real world. Running Code sponsors support some of the IETF's most-attended events, such as IETF Hackathons, while also supporting the technical tools used day-to-day by IETF participants.

Gold Sponsor



Silver Sponsor



Bronze Sponsors



Sustainability Sponsors

As a forward-looking community focused on the Internet's continued growth and evolution, the IETF recognizes the importance of sustainability in both Internet technologies and our global environment. Support from Sustainability sponsors enables the IETF to become a more sustainable organization by sourcing and using eco-friendly materials in all of its meeting materials.

Gold Sponsor



Equipment and Services Sponsors

Equipment and Services sponsors provide in-kind support for IETF meetings and other activities that bring the community together throughout the year, fostering vital communication and collaboration.

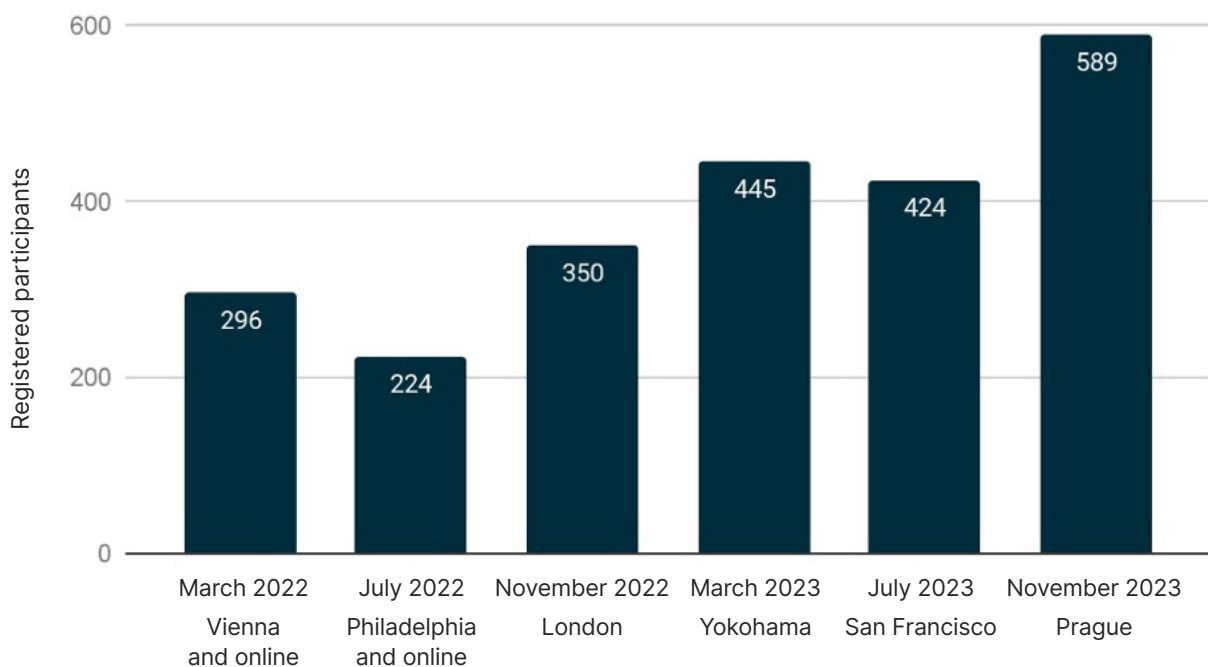


IETF Hackathons

IETF Hackathons encourage developers to collaborate and develop utilities, ideas, and sample code and solutions that show practical implementations of IETF standards. They 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, and YANG/ NETCONF/RESTCONF.

Since the first IETF Hackathon in 2015 with approximately 50 participants, Hackathon participation has grown dramatically. All Hackathons In 2023 averaged more than 486 in-person and online participants, with a peak of 589 registered participants at the event in Prague.

IETF Hackathon Participation 2022–2023



IETF Endowment

Established in 2012, the [IETF Endowment](#) is a designated investment fund created to ensure the long-term financial sustainability of the IETF and its activities. Building on a significant financial commitment made by the Internet Society in 2020, a renewed effort to grow the IETF Endowment was launched in 2021. Donations to the IETF Endowment are bolstered by the Internet Society's generous 2:1 matching program. Those donations, combined with their matching funds and yearly gains on the fund's existing monies, contributed more than \$1 million to the IETF Endowment in 2023.

By December 2023, the fund totaled more than \$5 million.

IETF Endowment Donors



IETF Administration LLC Updates

The IETF Administration LLC ([IETF LLC](#)) was established in 2018 following an extensive community process to update the administrative arrangements supporting the work of the IETF. In 2023, it completed its fifth year of operation.

As the corporate legal home for the IETF, the IAB, and the IRTF, the IETF LLC supports the organizations' ongoing operations, manages their finances and budgets, raises money, and establishes and enforces policies that ensure their compliance with applicable laws, regulations, and rules. IETF LLC board meetings are guided by the principles of trust, responsiveness, and transparency. To that end, board meetings are open to observers, with meeting agendas published prior to each meeting and minutes published afterward. Limited exceptions include legally restrictive items, such as legal actions, contracts, and personnel matters.

Noteworthy accomplishments and developments during 2023 include:

[IETF Meeting venue consultation](#)

The IETF Administration LLC sought community input on potential locations for future IETF Meetings. Based on initial evaluations, several locations were considered for IETF 125, scheduled for 14–20 March 2026. The aim was to add to the pool of potential locations, in compliance with the core values set out in BCP 226. Based on the feedback, Beijing, Shenzhen, and Kuala Lumpur will be considered for upcoming meetings.

[IT infrastructure transition](#)

In the last quarter of 2023, work began on the definition and deployment of a new, cloud-based infrastructure approach for the services that support the work of the IETF, and the movement of those services onto the new infrastructure. The transition effort included services such as the IETF mailing lists, websites, (i.e., wikis and www.ietf.org), Author Tools, and the YANG Catalog. Work will occur throughout 2024, with transitions carefully scheduled to minimize disruptions to ongoing IETF interim meetings and the timelines of the year's IETF Meetings.

[Continuing toward a Net Zero IETF](#)

Building on the trial calculations conducted in 2022, the IETF LLC calculated the carbon footprint of the IETF's 2023 activities, including meetings and ongoing operations. This effort began in 2022, with the development of a method to calculate carbon emissions related to IETF activities, and the exploration of a plan to offset them. The calculations have proven useful and have informed various discussions within the IETF community; plans for offsetting carbon emissions have been put on hold.

IETF Administration LLC 2023 Financials

The IETF LLC received an unqualified audit opinion in the [IETF LLC 2023 audited financial statement](#), indicating that the [IETF LLC](#) financial statements were fairly and appropriately presented, without any identified exceptions, and in compliance with the generally accepted accounting principles (GAAP). The year's Statement of Activity is below, followed by important footnotes.

Statement of Activity, 2023

	2023 ACTUAL	BUDGET
NONMEETING REVENUE		
Contributions	\$7,173,70	\$8,200,000
ISOC Contribution Cash	6,750,00	6,750,000
Endowment Contributions	133,077	1,150,000
ISOC Endowment Match	265,626	300,000
Contribution to IETF Trust	25,000	–
Administrative In-Kind Contribution¹	58,050	58,050
Other (including Investment Interest and Unrealized Losses)²	2,824,231	2,006,200
TOTAL NONMEETING REVENUE, NET OF UNREALIZED LOSSES	\$10,055,984	\$10,264,250
MEETING REVENUE		
Registration Fees	\$2,599,939	\$1,936,125
Sponsorship (including In-Kind)	1,588,941	1,545,000
Hotel Commissions/Rebates/Comps	122,910	136,628
Miscellany (including Insurance Claim)	192,992	68,038
TOTAL MEETING REVENUE	\$4,504,782	\$ 3,685,791
TOTAL REVENUE	\$14,560,766	\$13,950,041
MEETING EXPENSES		
Venue Costs	\$1,742,691	\$1,869,723
Travel and Expenses	519,537	706,448
Meeting Support	1,186,595	1,158,520
NOC Support	862,500	712,975
Other	224,969	461,824
Site Visits (formerly Future Meetings)	24,185	24,325
TOTAL MEETING EXPENSES	\$4,560,477	\$4,933,815

Continued on next page.

	2023 ACTUAL	BUDGET
OPERATING EXPENSES		
Administration	\$2,315,881	\$2,301,599
Staff Costs	1,154,946	1,041,503
Operations	304,656	371,724
Board Costs	26,571	87,000
Secretariat–Admin	437,751	437,364
CPA Services	207,679	178,008
Legal Services	184,278	186,000
RFC Services	\$1,659,698	\$1,697,852
RFC Production Center	1,545,980	1,546,852
RFC Series Editor	113,718	142,000
Independent Submissions Editor	–	9,000
Community Leadership	\$664,197	\$841,935
Secretariat–Community Leadership	598,932	598,935
IESG Support	13,700	41,500
IAB Support	15,052	41,500
IRTF Support	4,703	18,000
NomCom Support	1,310	2,000
Community Leadership Training	12,500	40,000
Outreach and Diversity Programs	18,000	100,000
IETF Trust Contribution	\$335,216	\$310,216
Special Projects	\$17,165	\$100,000
Tools	\$1,313,888	\$1,102,047
Staff Costs	696,685	563,299
Secretariat–IT	480,837	479,148
Management/Planning	101,665	28,500
Research/Analysis/Design	241,128	165,500
Software Development	336,191	390,750
Operations (nonSecretariat)	199,343	177,250
Review/Audit	–	50,000
Capitalisation Adjustment	(741,961)	(752,400)
Depreciation³	\$291,550	–
TOTAL OPERATING EXPENSES	\$6,597,595	\$6,353,649
TOTAL EXPENSES	\$11,158,072	\$11,287,464
NET INCOME/LOSS (AFTER CAPITAL EXPENDITURE)	\$3,402,694	\$2,662,577
Capital Investment	\$741,961	\$752,400

¹ In-Kind Contribution is calculated at \$4,875 a month for 150 Webex users.

² Realized and unrealized gains were \$2,322,936.

³ Depreciation expense was not included in the budget.



Internet Architecture Board Activities

The Internet Architecture Board (IAB) provides long-range technical direction for Internet development, thereby ensuring the Internet continues to grow and evolve as a platform for global communication and innovation. The IAB provided reports to the community throughout 2023.

[IAB Report to the Community for IETF 116](#)

This report included the announcement of reports from the M-TEN and e-impact workshops held in 2022, as well as details about comments provided as input to public requests for feedback.

[IAB Report to the Community for IETF 117](#)

The IAB solicited community feedback on a new program, Wholistic Human-Oriented Discussions on Identity Systems (WHODIS).

[IAB Report to the Community for IETF 118](#)

This report highlighted the opportunity to submit papers to the Barriers to Internet Access of Services (BIAS) scheduled for January 2024, and it promoted the Environmental Impacts of Internet Technology (eimpact) program as a venue for discussing the environmental impacts and sustainability of Internet technology.

IAB Technical Programs and Administrative Support Groups

IAB Technical Programs and Administrative Support Groups are structured approaches managed and maintained by the IAB in order to support the IAB in more effectively executing its chartered responsibilities (see RFC2850 Section 2.1); in particular improving the long-term perspective on the Internet informed by technical and architectural considerations.

Active Technical Programs

- Evolvability, Deployability, and Maintainability (edm)
- Environmental Impacts of Internet Technology (eimpact)

Administrative Support Groups

- IAB-ISOC Policy Coordination
- IETF-3GPP
- IETF-IANA
- IETF-IEEE



Internet Research Task Force Activities

The Internet Research Task Force (IRTF) promotes research of importance to the evolution of 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 (RGs) that work 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.

The following Research Groups were active as of 31 December 2023:

- Crypto Forum Research Group (cfrg)
- Computing in the Network Research Group (coinrg)
- Decentralized Internet Infrastructure (dinrg)
- Global Access to the Internet for All (gaia)
- Human Rights Protocol Considerations (hrpc)
- Internet Congestion Control (iccr)
- 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)
- Quantum Internet Research Group (qirg)
- Thing-to-Thing (t2trg)



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, policymakers, and scientists of the IETF and the IRTF. Out of 21 nominations received for the 2023 edition of the ANRP, awards were presented to the following 6 researchers: Arthur Selle Jacobs, Siva Kakarla, Boris Pismenny, Ram Sundara Raman, Simon Scherrer, and Dennis Trautwein.



Applied Network Research Workshop

The Association for Computing Machinery (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, workshops are colocated with IETF meetings once a year and organized in a way that enables ample time for discussion and interaction.

The ANRW 2023 was held in conjunction with the IETF 117 San Francisco meeting. The day-long workshop program consisted 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.

The ANRW series receives financial support from Akamai and Comcast.

Information Resources

Internet Architecture Board (IAB)

[IAB website](#)

[IAB on Twitter](#)

Internet Engineering Task Force (IETF)

[IETF website](#)

[IETF Datatracker](#)

[IETF Mail Archive](#)

[IETF on Twitter](#)

IETF Administration LLC (IETF LLC)

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Internet Research Task Force (IRTF)

[IRTF website](#)

[IRTF on Twitter](#)

RFC Editor

[RFC Editor website](#)