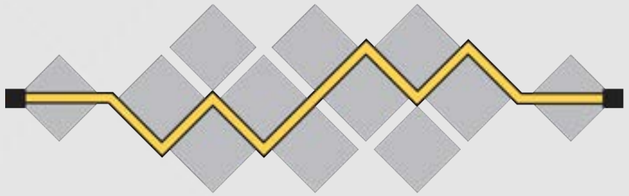
Enhancing APAC Regional and Operator Engagement in the IETF



IETF®

Making the Internet work better

February 2025

Agenda
APAC & IETF

- Introduction to the IETF (10 mins) - Dhruv Dhody
- Latest hot topics for the upcoming IETF 122 meeting in Bangkok (15 mins) - Gunter and Zahed
- Trends in Regional and Operator Participation, Why Should Operators Care (5 min) - Dhruv
- Panel Discussion (45 mins)
- Open Mic (15 mins)

Introduction to the IETF.

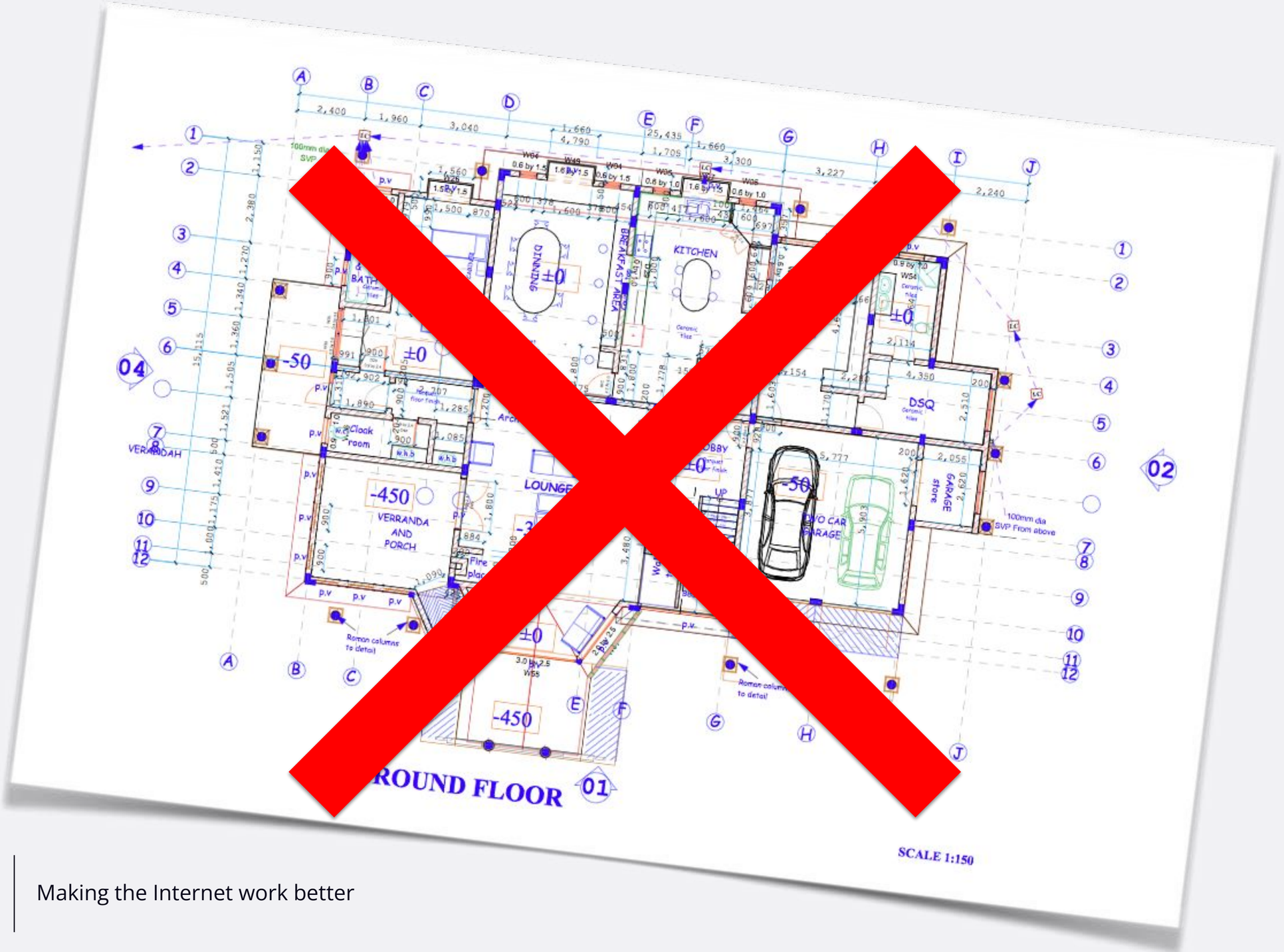
Internet Engineering Task Force (IETF)
Mission

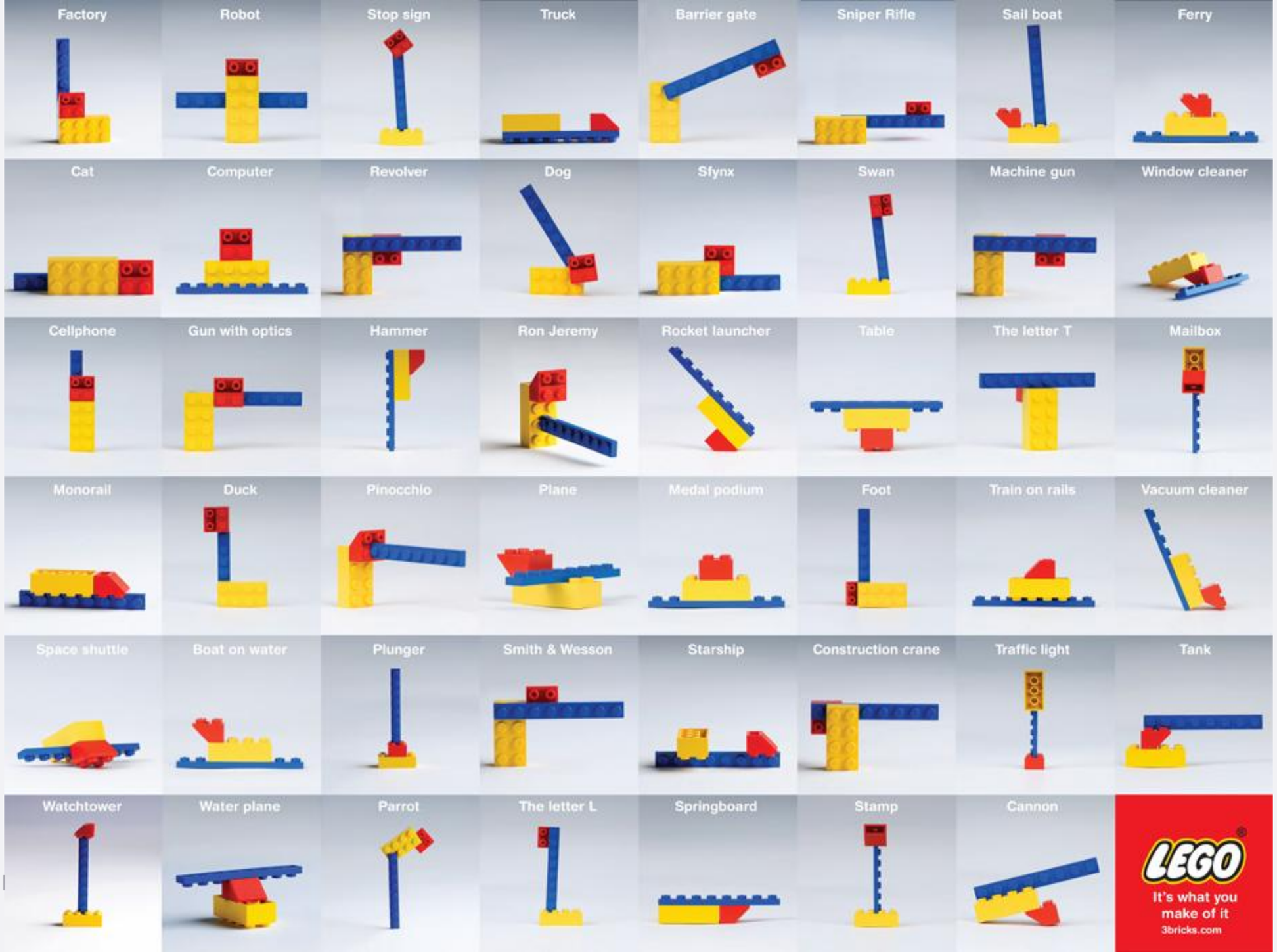
Make the Internet work better by producing high quality, relevant technical documents that influence the way people design, use, and manage the Internet.

[RFC 3935]

IETF
Ethos

- **Everyone** may participate
- Make all work available for **free**
- Judge contributions on **technical merits**
- Determine success by **voluntary deployment**

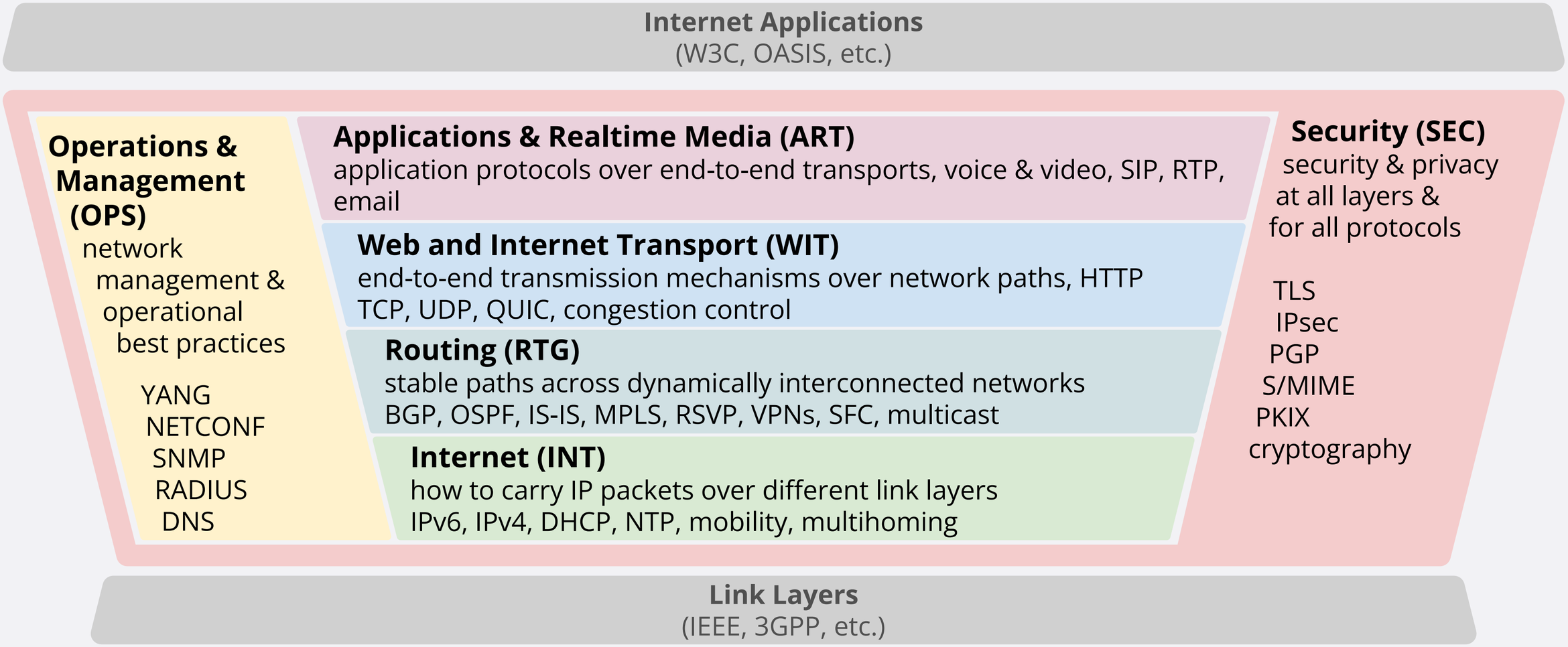

KITCHEN
DINNING
BREAKFAST AREA
LOUNGE
VERRANDA AND PORCH
Cloak room
DSQ
GARAGE
store
TWO CAR GARAGE
VERRANDAH
Roman columns to detail
100mm dia SVP From above
ROUND FLOOR
01
02
04
SCALE 1:150


Factory
Robot
Stop sign
Truck
Barrier gate
Sniper Rifle
Sail boat
Ferry
Cat
Computer
Revolver
Dog
Sfynx
Swan
Machine gun
Window cleaner
Cellphone
Gun with optics
Hammer
Ron Jeremy
Rocket launcher
Table
The letter T
Mailbox
Monorail
Duck
Pinocchio
Plane
Medal podium
Foot
Train on rails
Vacuum cleaner
Space shuttle
Boat on water
Plunger
Smith & Wesson
Starship
Construction crane
Traffic light
Tank
Watchtower
Water plane
Parrot
The letter L
Springboard
Stamp
Cannon
LEGO
It's what you make of it
3bricks.com

IETF
Open Internet Standards

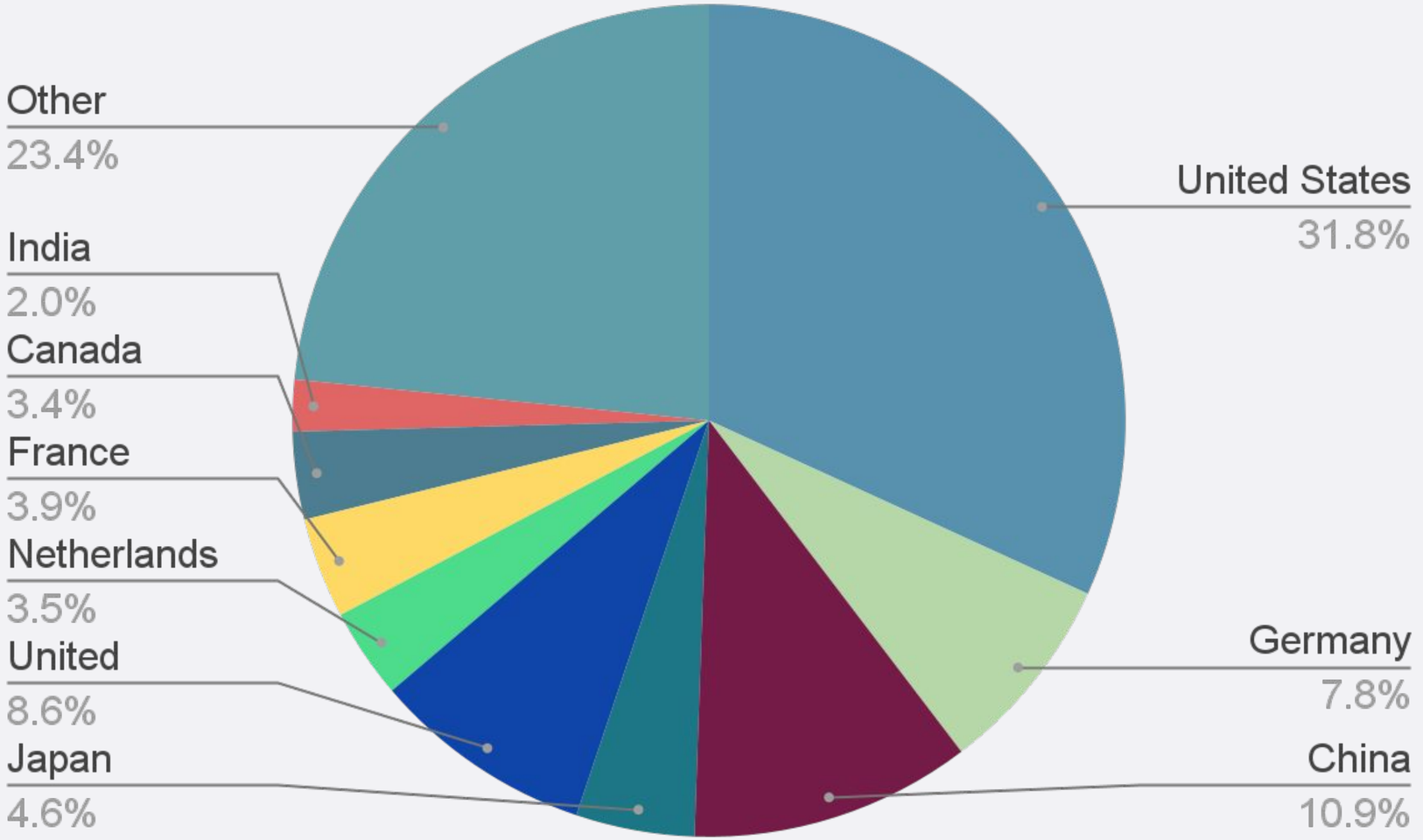
- Open standards are key to allow devices, services, and applications to **interoperate across a interconnected, heterogeneous, and global network of networks**
  - All IETF standards are available **online at no charge**, thus facilitating adoption of them.
  - The IETF determines its success by **technical quality and voluntary deployment**
- The IETF process is **open**, **transparent**, and relies on a **bottom-up consensus-building**
  - **Everybody may participate**, no membership
  - All work like Internet-Drafts and email archives are **publicly available**
  - Decisions are based on **rough consensus**
- **Openness** in both the technical standards itself as well as the standards development process is the basis for **innovation** in and on top of the Internet and **key to its success**.

IETF
Work Areas and Key Protocols



Global IETF Community

IETF 121 Dublin, November 2024
1591 onsite and remote participants



IETF Snapshot 2023

https://www.ietf.org/blog/ietf-snapshot-2023

7,859 Participants
in all IETF activities (mailing list posters, meeting participants, I-D authors)*

5,128 Registered
IETF Meeting participants

138,303 Messages
sent to IETF mailing lists

3,177 Individuals
posting to IETF mailing lists

Documents

1066 Internet-Drafts (I-D) submitted†

2832 I-D authors

173 RFCs published

Working groups

126 Active Working groups

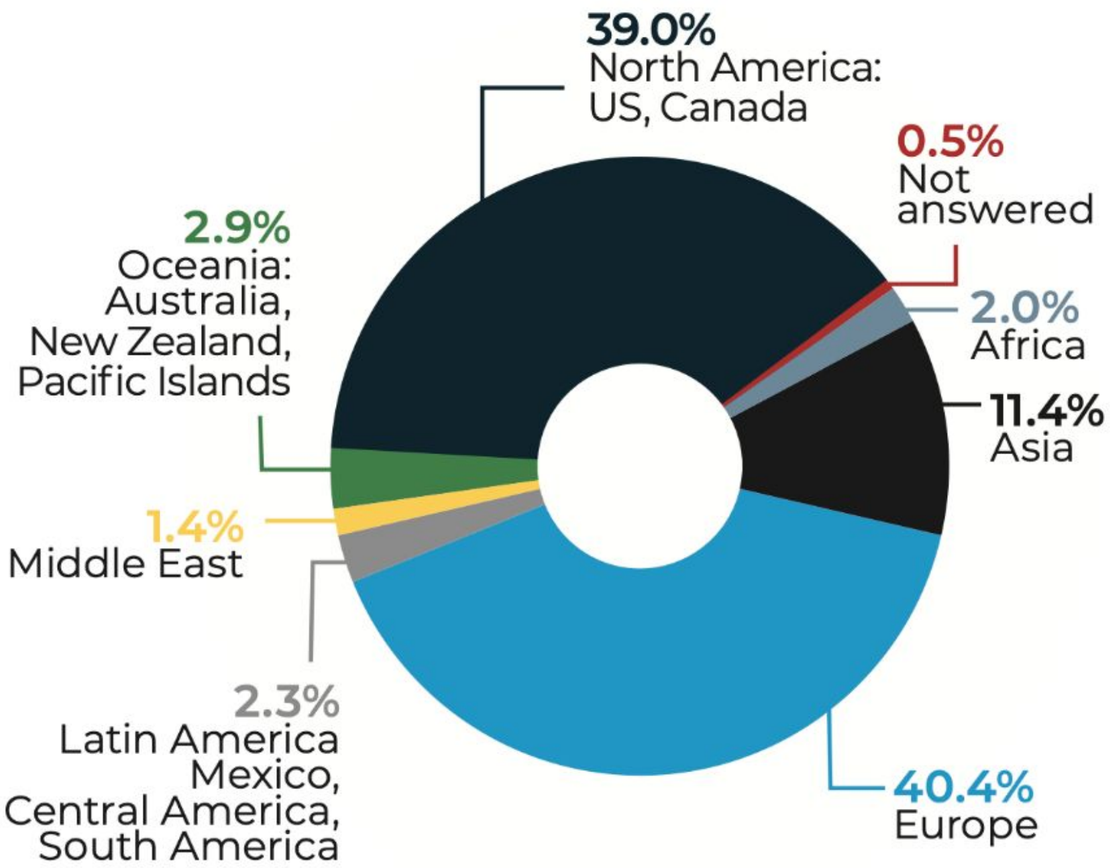
8 of new Working Groups chartered during 2023

8 IETF Working Groups concluded during 2023

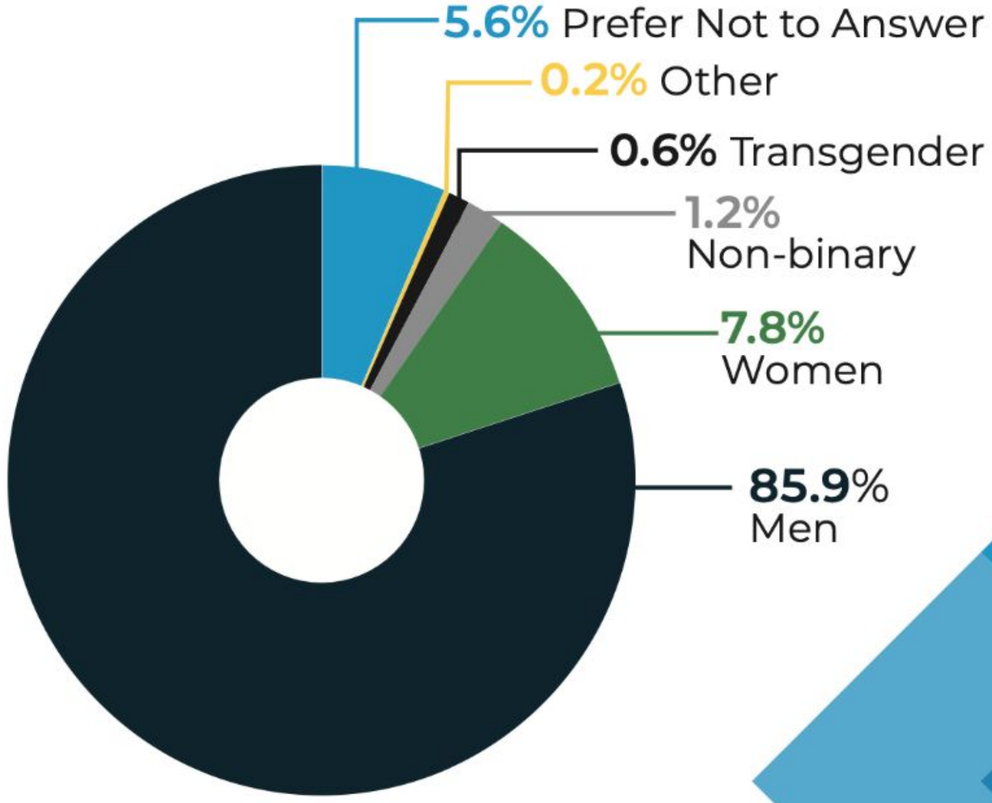
** based on unique email address used to register for IETF events, submit I-Ds, and post to IETF mailing lists*

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

IETF Community by Geography



IETF Community by Gender



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

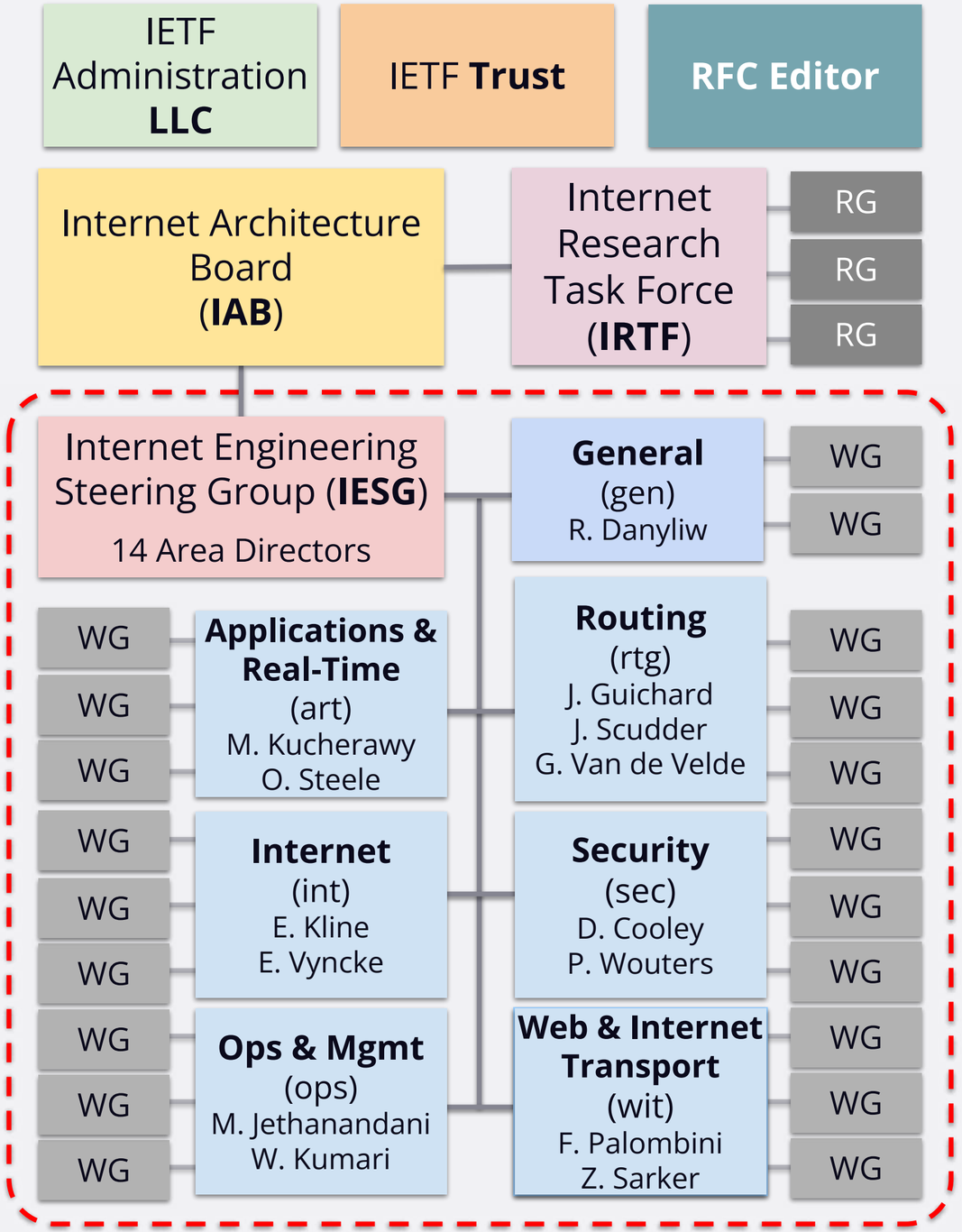
From the IETF Community Survey 2023

We believe in: Rough consensus and running code

David Clark, 1992

IETF
Organizational Structure

- IETF is structured into seven **areas**
  - Each with area directors (**AD**s)
- Areas are structured into **working groups** (**WG**s)
  - Each with WG chairs
- Internet Engineering Steering Group (**IESG**) = all ADs
  - Approves all Internet Standards
  - Manages technical work
  - Starts/ends WGs
- We have some new members to IETF leadership seated in the March meeting



IETF
Internet Architecture Board (IAB)

- The IAB supports the operation of the IETF by providing **long term technical direction**.
  - It provides **architectural oversight** into IETF technical activities as well as sponsoring and organizing work in the **IRTF**.
  - The IAB acts as a source of advice and guidance concerning **technical, architectural and procedural** matters pertaining to the Internet and its enabling technologies.
- It is chartered both as a committee of the IETF and as an advisory body of the Internet Society (ISOC).
  - Architectural Oversight
    - Workshops
    - Programs
  - External Liaison
  - Advice to ISOC
  - Outreach
  - IANA
  - IRTF Chair
  - Standards Process Oversight and Appeal
  - IESG Confirmation

IETF
Processes and Safeguards

- **Open** participation, **transparent** processes, and **distributed** decision-making
- **Rough consensus**, no voting
- Judgments on the basis of **technical merit** and **architectural alignment**
  - Leadership judges consensus rather than offering personal opinions
- Leadership **nominations committee** (“NomCom”)
  - Randomized selection of committee members from pool of active IETF volunteers
  - Two-per-organization limit on committee members
  - Decisions on the basis of community feedback
- Leadership **diversity norms**; soft per-company limits

IETF
Document Types

Internet-Draft (I-D)

- Active **working documents**
  - *Not finalized and not stable*
- **Anyone can submit an I-D**
  - draft-*yourname*-...
- Only **some I-Ds are Working Group documents**
  - draft-**ietf**-*wgname*-...

RFC (Request For Comments)

- **Archival** publication series
  - RFCs never change once published
- **Not all RFCs are standards**
  - Also: Informational, Experimental
- **Not all RFCs are IETF documents**
  - Also Internet Architecture Board (IAB), Internet Research Task Force (IRTF), independent track (ISE)...

IETF
How To Engage

- Working groups and materials
  - **All working groups are open to anyone and free to join**
  - All working materials are freely available online
  - Most work is conducted online
- Meetings and events
  - **IETF plenary meetings** are held three times a year (rotating around the globe)
  - Some working groups schedule **interim meetings** at various times and places
  - **Full remote participation** is available for all meetings (since before the pandemic)
  - Open source **IETF Hackathons** are collocated with plenary meetings
- Get started at: **www.ietf.org/participate**

IETF
How New Work Starts

- **Contribution-driven**, bottom-up process
  - Participants identify a **problem that needs solving**
- The **problem fits** one of the IETF Areas
  - And **aligns with architectural principles** of the Internet
- **Scope is well defined** and understood
  - Research is complete, **engineering work** is needed
  - Agreement on **timetables and milestones**
- **Willing people** to do the work
  - Typically not just initial proponents

Upcoming: IETF 122 Bangkok meeting 15-21 Mar 2025

https://www.ietf.org/meeting/122

Area Hot Topics
Routing (RTG)

- **SRv6** is very alive and kicking (SRv6 Compressed SID (CSID) draft approved and arrived in RFC-Editor queue)
- **MNA** (MPLS Network Action) and MPLS Network Programming
- **Multicast** (**IGMPv3** and **MLDv2** achieving full **Internet Standard**)
- Growing interest for **Data Center Routing**
- **Link State Routing** Flooding optimisations
- **BGP Enabled ServiceS (BESS)** - EVPN multihoming & redundancy continue
- Enhance **BGP-based path selection and traffic steering** (CAR/CT) in multi-domain and SR environments

Area Hot Topics
Web & Internet Transport (WIT)

- **QUIC**: defined new E2E encrypted and multiplexed transport protocol, current focus on multipath extension.
- **MASQUE**: Multiplexed Application Substrate over QUIC Encryption - defining proxying over QUIC, provides enhanced privacy and enable explicit network collaboration.
- **SCONE**: Standard Communication with Network Elements - designing mechanism for network throughput guidance for adaptive applications.
- **CCWG**: Congestion Control Working Group - deals with modern congestion control practices across various transport protocols and defines standard congestion control algorithms..

IETF 122 BoFs - Birds of Feather
New Work Proposals

- **NASR:** Network Attestation for Secured foRwarding
  - aims to enhance network security by providing **verifiable evidence** that data traverses only through **trusted network elements**, ensuring predictable and transparent forwarding behaviors.

- **SKEX:** Symmetric Key Establishment and Exchange
  - aims to develop a secure and scalable framework for establishing **symmetric keys** between authenticated parties, optimizing performance while addressing challenges in existing cryptographic protocols.

New WGs
In the process of chartering... Not a WG yet!

- **DIEM:** Digital Emblems
  - presenting and validating digital emblems across applications and platforms, extending identification from the physical to the digital realm.

- **IANABIS:** Update to IANA Considerations
  - tasked with **updating IANA procedures** for IANA Considerations sections in the RFCs.

New WGs
Recently chartered - Z+G+D

- **DKIM:** Domain Keys Identified Mail - enables email senders to digitally sign messages using cryptographic authentication. WG active again to fix known issues such as ensuring DKIM signature validity across message forwarding, mitigating DKIM replay attacks, preventing backscatter from unauthorized sender addresses etc.
- **TIPTOP:** Taking IP To Other Planets - adapting IP networking for space environments, addressing challenges like long delays and intermittent connectivity to enable end-to-end IP communications on celestial bodies such as the Moon and Mars.
- **AIPREF** - AI Preferences - creating vocabularies for the publishers to express their preferences for content collection and processing for the AI model development
- **HAPPY** - Heuristics and Algorithms to Prioritize Protocol deploYment - update the “Happy Eyeballs” algorithm addressing developments like QUIC, new DNS resource records, TLS Encrypted Client Hello, and the rise of IPv6-only networks.
- **RPP:** RESTful Provisioning Protocol - aims to develop a new provisioning protocol using REST architecture and JSON for domain name registries and registrars.
- **DELEG:** DNS Delegation - enhance DNS to let parent zones to convey additional delegation information about child zones
- **SRv6OPS:** SRv6 Operations - operational aspects of deploying and managing Segment Routing over IPv6 (SRv6) networks

Hot Topics
Of Operator Interest

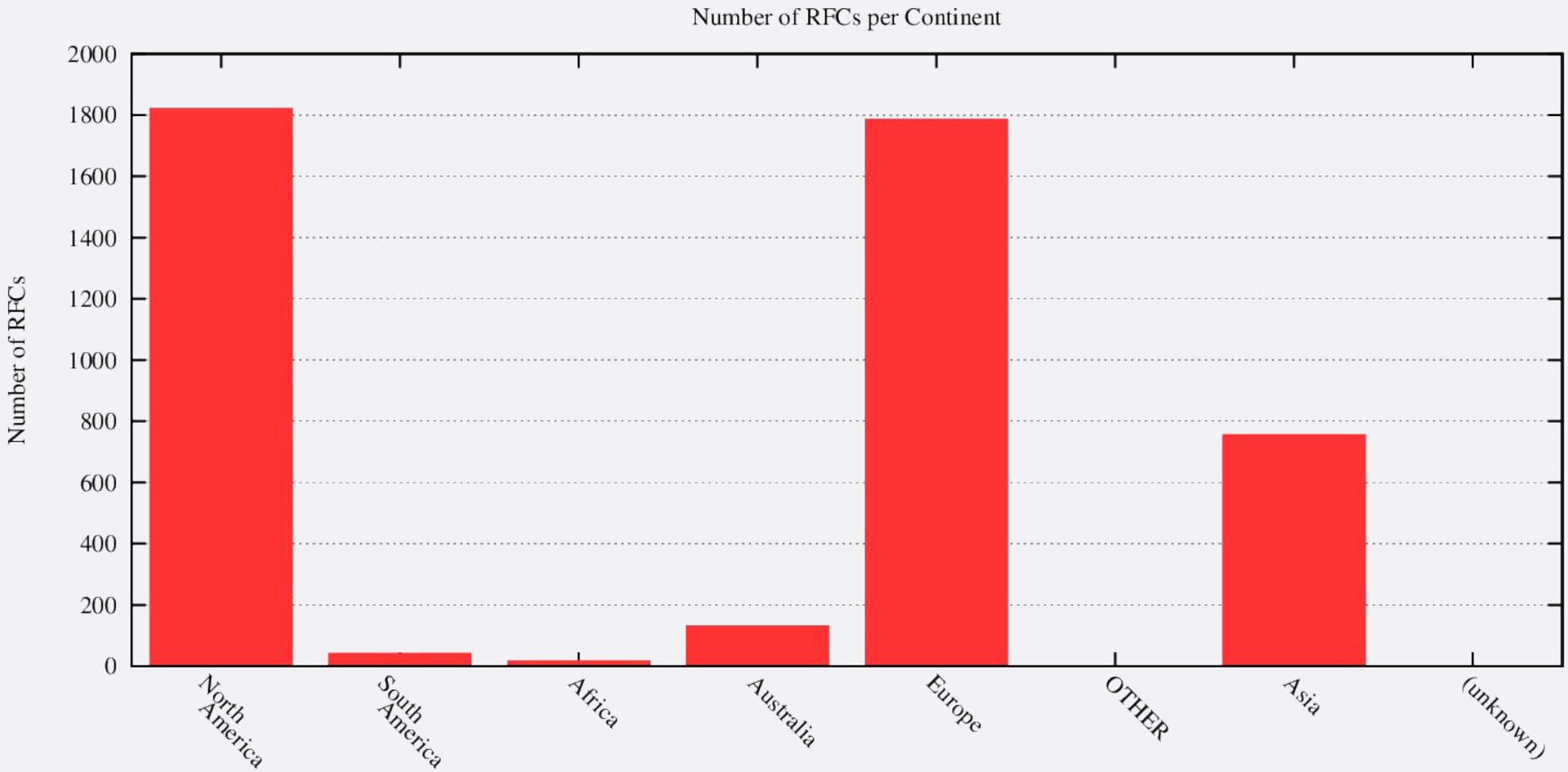
- **V6OPS:** IPv6 Operations - IPv6-mostly, IPv6-only, CLATs, XLATs....
- **DNSOPS:** DNS Operations - DNSSEC Signing pipeline, Domain Control Validation...
- **GROW:** Global Routing Operations - BMP, RPKI...
- **SIDROPS:** SIDR Operations - RPKI, manifests, AS Provider Authorization (ASPA), AS relationship authorization (ASRA)...
- **NMOP:** Network Management Operations - YANG-kafka integration, Service & Infrastructure Maps (SIMAP), Anomaly detection...
- YANG related work: NETMOD, NETCONF, IVY (Network Inventory YANG)
- **GREEN:** Getting Ready for Energy-Efficient Networking - energy efficiency metrics
- **SUSTAIN RG:** Sustainability and the Internet Proposed Research Group - multidisciplinary research for developing environmentally, socially, and economically sustainable networking practices.
- **E-IMPACT**: IAB Program looking at environmental and sustainability topics not yet ready for IETF/IRTF

IETF 122
Important Sessions

- **IEPG**: Informal gathering focusing on operational topics, deployment issues, and research.
- **IAB Open**: IAB activities and WSIS+20 process
- **IRTF Open**: Award winning research paper
- **Dispatch** sessions: guides new work on how to proceed it in the IETF
  - BoF, existing WG, out of scope etc
- **Hackathons**: Produce running code to accompany the standards
  - Excellent opportunity for implementers to participate
- **Side Meetings**: https://trello.com/b/R7yDMPyl
  - Network Operations in Telecom Cloud (NeoTec), Multi-path TE, PQC, Adaptive Routing, HP-WAN, Distributed Mesh…
- Blog: https://www.ietf.org/blog/ietf122-new-topics/
- IETF 122 Agenda: https://datatracker.ietf.org/meeting/122/agenda

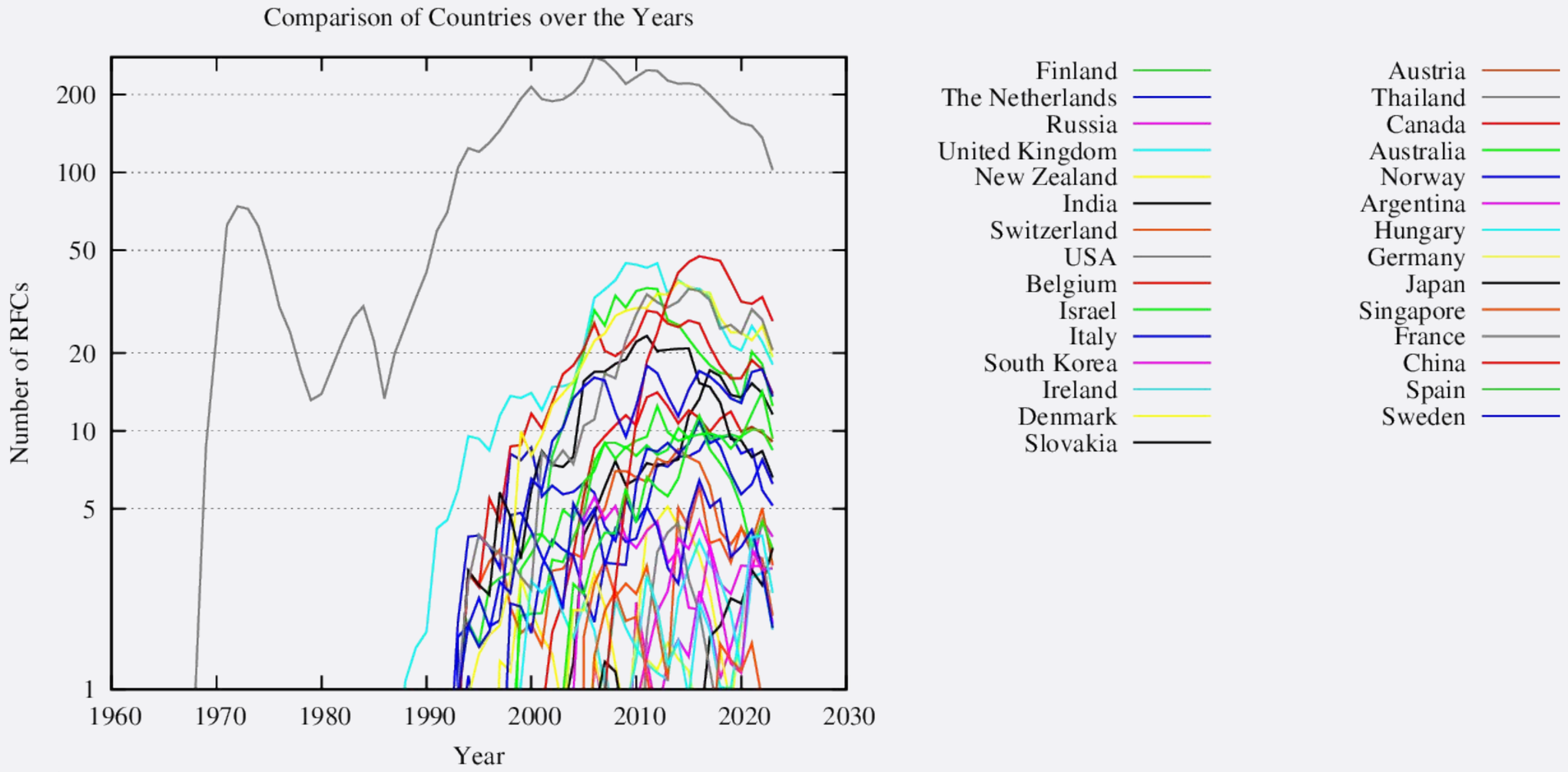
Trends in Participation at the IETF

IETF – Activities by Regions
RFC authors by continent



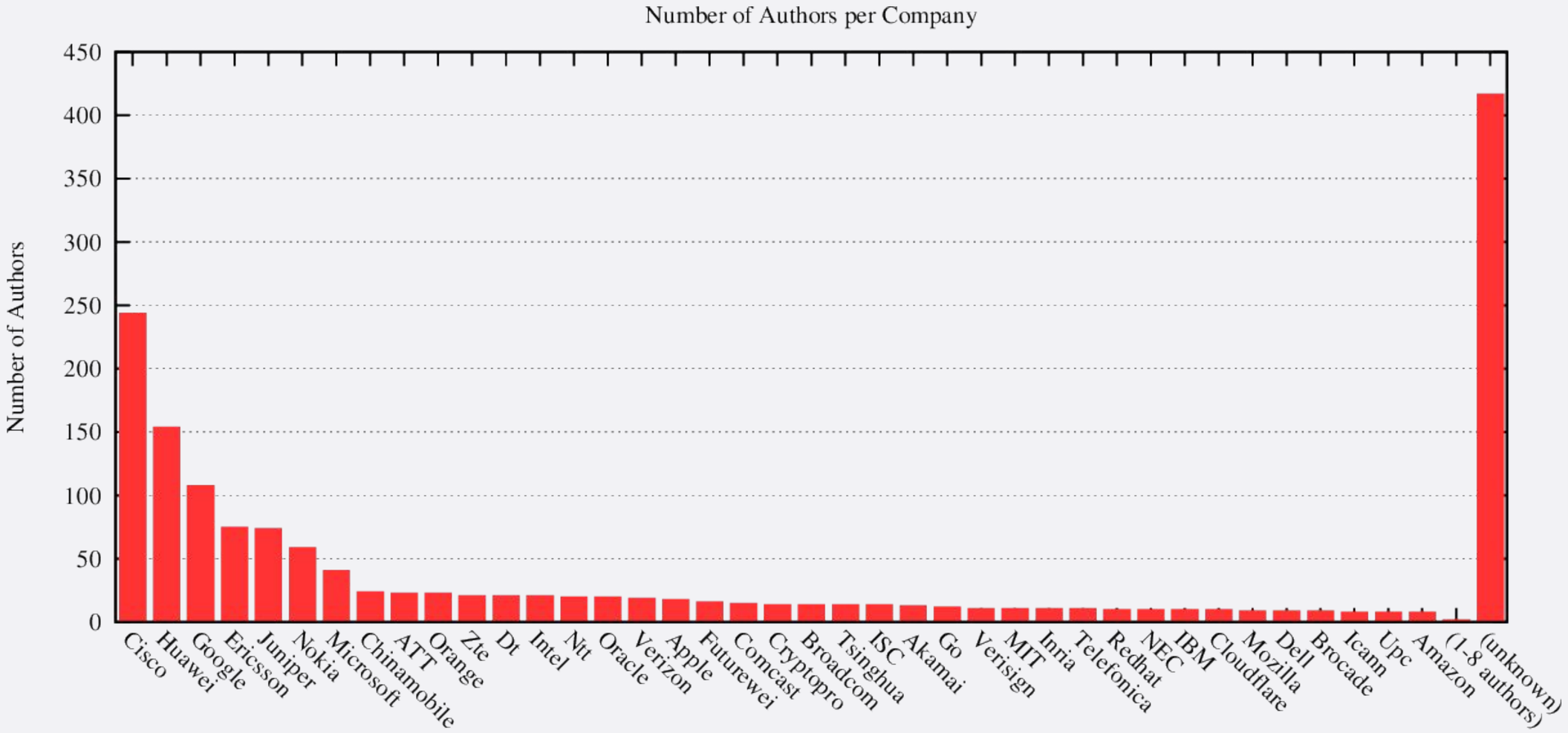
https://www.arkko.com/tools/recrfcstats/d-contdistr.html
Retrieved March 2024

IETF – Activities by Regions
Document authors over time (I-Ds and RFCs)



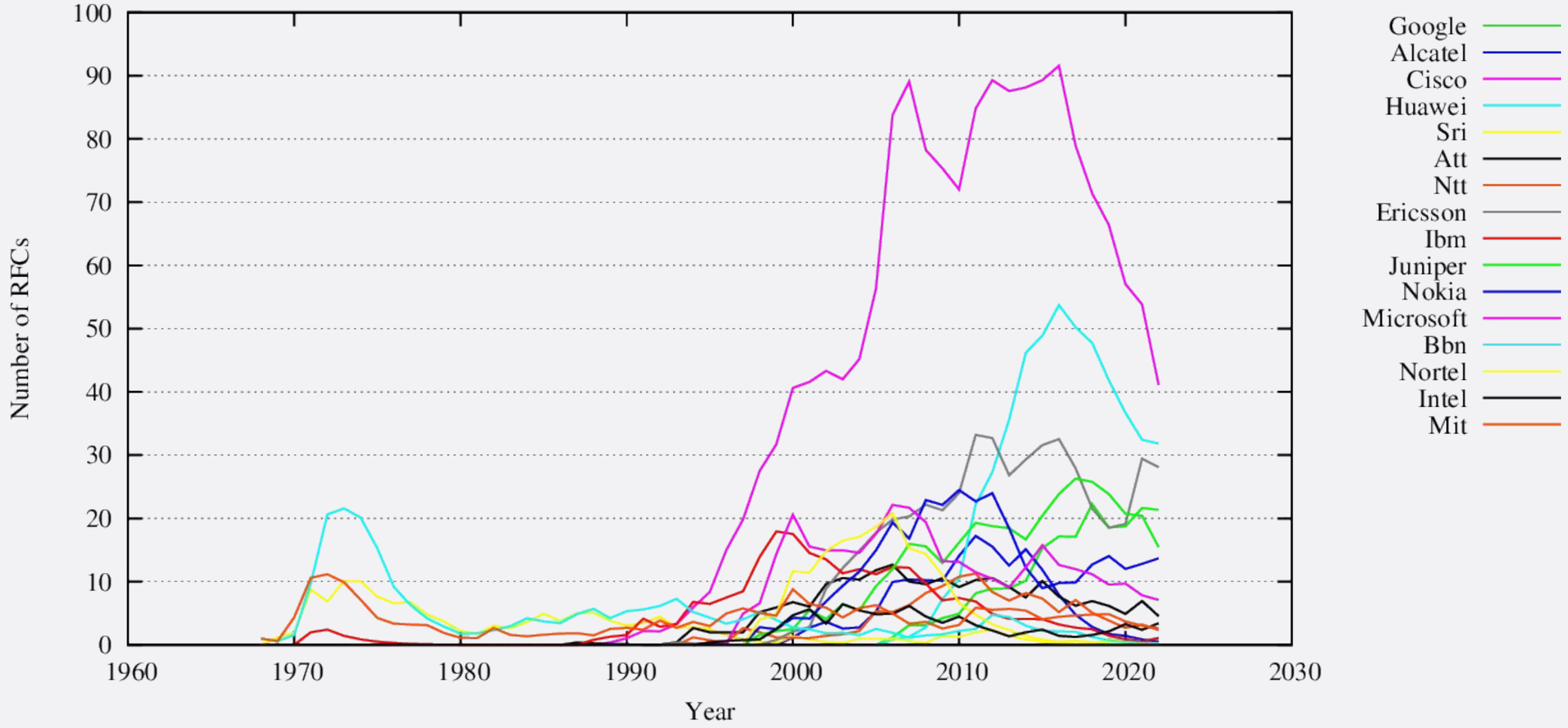
Source: https://www.arkko.com/tools/rfcstats/countrydistrhist.html October 2022

IETF – Most Active Organizations
Recent RFCs by Organization



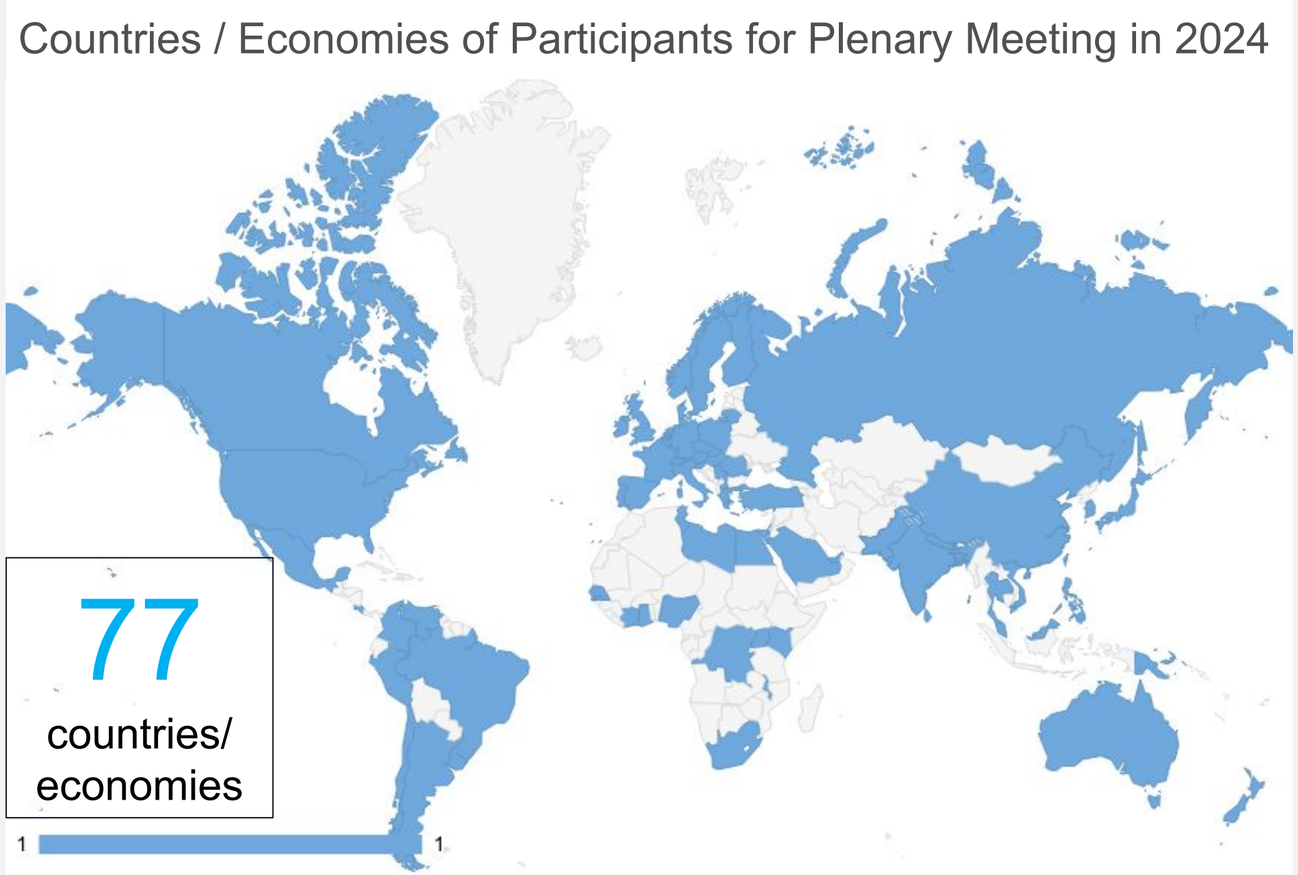
Source:https://datatracker.ietf.org/stats/document/authors/ October 2022

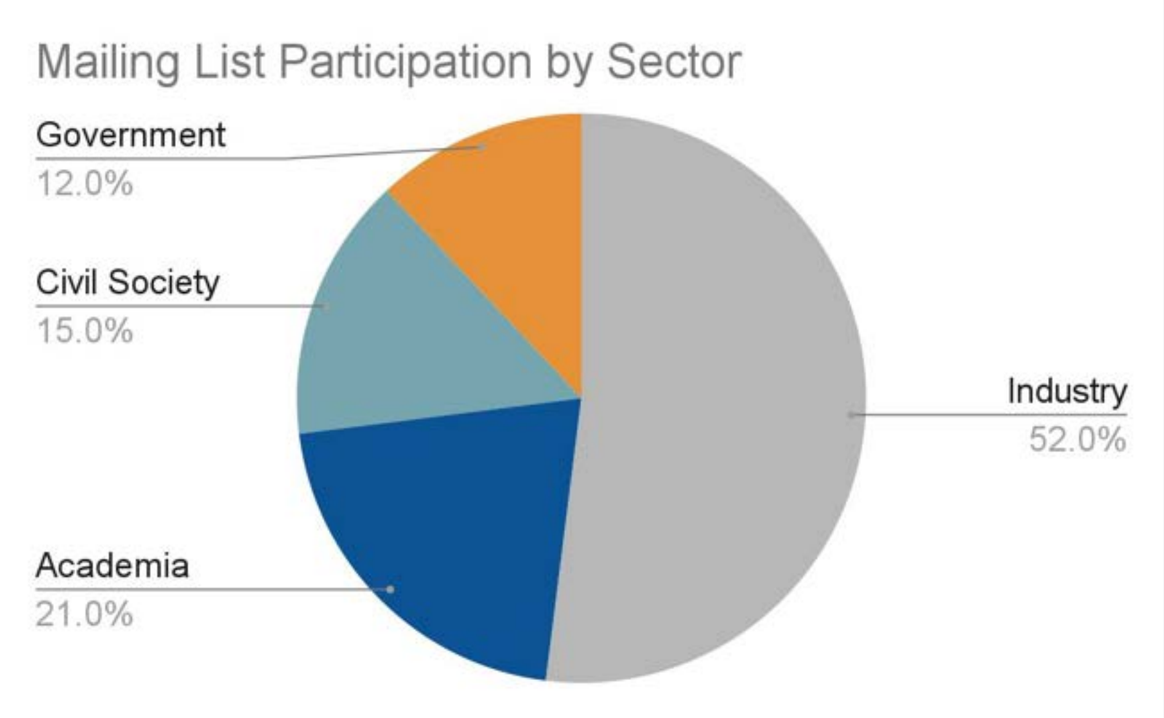
IETF – Most Active Organizations
By RFCs Over Time



Source: https://www.arkko.com/tools/rfcstats/companydistrhist.html October 2022

IETF Meeting and mailing list participation





Source: [2023 IETF Community Survey]
(49,005 unique email addresses)

Operators @ IETF

Hope to see more operators from our region…

IETF
Why participate in IETF?

- IETF mission “**make Internet work better**” is everyone’s mission!
- The quality of the standards and documents impacts everyone in the industry!
  - It impacts **Interoperability**
  - It impacts network **operations and stability**
  - It impacts **features and services**
- Open process allows for anyone interested in providing technical contributions
  - Standards involve balancing various (and sometimes competing) interests!
  - You are likely to be impacted, if your interests are not well represented during deliberations.

IETF
Why Network Operators need to participate?

- Be on top of the **new** internet protocols and extensions
- Lot of work explicitly on **Network Operations**
  - input of operators is quite valuable to keep this work vibrant and relevant.
- Why should you care?
  - Are these **real problems** that impact you?
  - Are these real network **requirements**? What's missing?
  - Are these in sync with operator's **reality**?
  - Is this going to be easy to **deploy**?
  - How would I **troubleshoot** this?

You are likely to deploy it later on BUT it's usually too late to make any major changes that late....

IETF
How to get your voice heard...

- Tell your **requirements** directly to the IETF -
  - Don't let vendors and researchers tell what the operator needs!
  - Bust myths with clear evidence and insights
  - Rationalize requirements that are of immediate need
- Provide **insights** that only you as an operator has -
  - Operational considerations are sometimes an after-thought, you can make sure that is not the case!
- **Don't shy away** from using your “operator” card!
  - Your voice is the most important one, as it will be you who would be operating the network when a new feature/protocol is deployed!

IETF
Tips to Participate...

- Identify what interest you, **pick 1-2 key WG**, monitor a few more!
  - Join with mailing list (use digest mode for a single email) if you are worried about number of emails...
  - Use IMAP to read when free (if you don't want to subscribe)
  - Start reviewing stuff and provide inputs via mailing list (and github)
- Start with **remote participation** to IETF meetings
  - Use **fee waivers** if necessary
  - Participate in IEPG, Hackathon, technology deep dives, and other “side” events!
- Pay special attention to **new work**
  - where it is easier to join in and the operators input is needed!
  - Dispatch WG also see proposals for new work
- Ask for help! **Guides** available for new participants!

Panel

Panelist
APAC & IETF

Noelle Francesca De Guzman
ISOC

Dhruv Dhody
IAB

Gunter Van de Velde
IESG

Zaheduzzaman Sarker
IESG

Raj Singh
APNIC Foundation

Takashi Tomine
WIDE Project

Mohit P. Tahiliani
NITK Surathkal

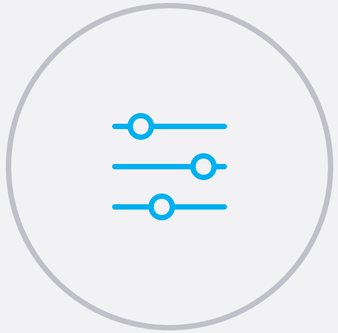
thank you.

Backup.

IETF
Examples of Current Work

Improving security and privacy

to ensure the Internet is trusted as a medium for communications and collaboration



Automating network management

to improve the efficiency of operating networks that are increasingly large and complex

Developing new transport technology

to enhance the ability of applications to send data across a growing and diverse Internet

Enabling the Internet of Things

by infusing connectivity among objects, sensors, and other devices with constrained capabilities

IETF
Recent Major Protocol Development Efforts