July 2018

Internet Engineering Task Force

Internet Society

What is the IETF?

The IETF is the Internet's premier technical standards body

It gathers a large community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet

The mission of the Internet Engineering Task Force (IETF) is to make the Internet work better by producing high quality, relevant technical documents that influence the way people design, use, and manage the Internet

Tech accomplishments at the IETF

Some accomplishments at IETF

IPv6

- Fundamental to realizing the vision of an "Internet of Things"

The Domain Name System(DNS) is a unified global address book

-Advances the trustworthiness of the domain names that are key to the online presence of companies, organisations and individuals

• Now accommodates domain name in languages such as Arabic & Chinese making the Internet accessible to people who do not use Latin scripts

Some accomplishments at IETF

Strengthening Trust in the Internet

- Best practices for existing application protocols such as instant messaging and email

   - Using encrypted connections more routinely

OPUS audio codec

- An alternative to proprietary encoding and decoding of audio streams

Some accomplishments at IETF

Making Collaboration Frictionless

RTCWEB

-The IETF in co-ordination with World Wide Web Consortium (W3C) worked on RTCWEB protocol allowing Web browser real-time collaboration with other Web browsers without need of a central server

Open video codec

- Work Is underway at to unlock the potential of video-based communications and collaboration

IETF Participation and Structure

At a glance

- There is no membership or voting at the IETF

- The IETF is made of volunteers

- The actual standards work takes place on
  mailing lists and attendance at f2f meetings
  is to help resolve "big" issues and to get to
  know people

IETF work team

- Document editors edit individual documents

- 129ish working groups -- an evolving number

- 7 Areas/ 18 Area Directors(AD)

- Working group Chairs who manage working group

- IETF Chair who is also AD of the General Area

- Internet Engineering Steering Group(IESG) is the 1st point of appeal with escalation through the IAB and ultimately to Internet Society's Board of Trustees

- Internet Architecture Board(IAB) check for overlap with other Standards Development Organisations (SDOs) and provides architectural oversight. They appoint RFC editor, provides Internet standards process oversight and manage IETF protocol parameter registries

Working Groups (WG)

- Primarily where IETF gets its work done

- Very tightly scoped to work

- Generally proposed by IETF participants [i.e. "bottoms up"]

- Announcement goes to other Standards Developing Organisations (SDO) to check for overlaps

- IESG has the final say on the Charter and believes that it is relevant to IETF community

- Working Groups are frequently rechartered once initial work items have been completed

Work at the IETF

How IETF work gets done

1. Tech development is done in Working Group(but can be individual effort)
2. Proposal published as a working document "Internet Draft"
3. Working document revised & re-published based on discussion

4. Working document submitted to IESG via AD
5. AD performs technical & process review of document & returns doc with comments if AD finds issues
6. When AD satisfied, IESG issues "Last call" for comments IETF wide

7. IESG performs interdisciplinary tech review of proposal & reviews Last Call comments
8. IESG returns documents to WG with comments if finds issues
9. When IESG is satisfied ,the document is sent to RFC Editor for publication as RFC

Multiple, working, useful, interoperable implementations are the chief requirements before an IETF proposed specification can become a standard. Draft endorsement elevates its status

Rough Consensus

- Does not require unanimity
  - But ensures that everyone has their say

- No formal voting
  - Show of hands or hum but no count

- Disputes resolved by discussion
  - On mailing list & in face-to-face meetings

- Final decisions must be verified on mailing list
  - But taking into account face-to-face discussion

IETF Documents and RFC

- All IETF documents are open
  - May be downloaded and copies made in full

- Internet Drafts are IETF working documents

- Anyone can submit an Internet Draft at any time

Request For Comment

- Archival publications which are never changed once
  published

- Update or correction gets new RFC number

RFCs

There are now over 8,000 RFCs—these include:

Standards

Best Current Practices (BCP)

Policies or procedures (best way we know how)

- Experimental

- Informational

- Not all RFCs come from the IETF. Some RFCs come from the IAB, the IRTF, or are independent submissions

The role & scope of the IETF

Above the wire & below the user interface

- IP, TCP, email, routing, IPsec, HTTP, FTP, ssh, LDAP, SIP, mobile, IP, ppp, RADIUS, Kerberos, secure email, streaming video & audio

But wires are getting fuzzy

- MPLS, GMPLS, pwe3, VPN

Generally, it's hard to clearly define its scope— IETF is constantly exploring the edges eg, IP telephony


BENEFITS OF LIVE STREAMING VIDEO

- Added Authenticity
- Urgency Created
- Real-time delivery of Value
- Expanded Boundary
- Massive Social Following
- Guaranteed Reach

Internet Research Task Force (IRTF)

The IRTF promotes important research for Internet evolution through focused, long-term research groups that work on Internet protocols, applications, architecture and technology

- Crypto Forum Research Group (CFRG)

- Human Rights Protocol Considerations Research Group (HRPC)

- Global Access to the Internet for All Research Group (GAIA)

- Internet Congestion Control Research Group (ICCRG)

- Information Centric Networking Research Group (ICNRG)
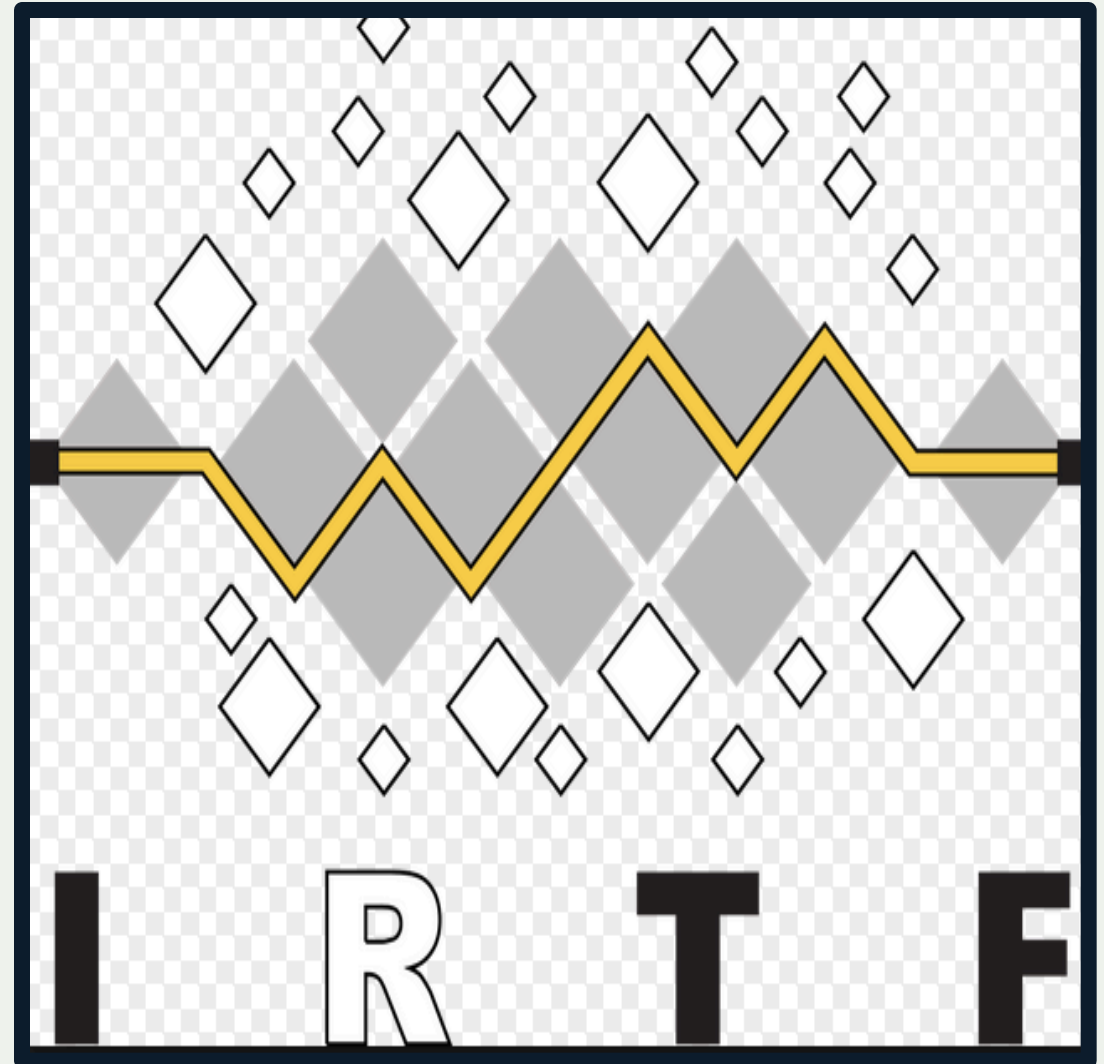
Internet Research Task Force (IRTF) II

The IRTF promotes important research for Internet evolution through focused, long-term research groups that work pn Internet protocols, applications, architecture and technology

- Measurement & Analysis for Protocols Research Group(MAPRG)

- Network Management Research Group(NMRG)

- Network Function Virtualization Research Group(NFVRG)

- Network Coding Research Group(NWCRG)

- Thing-to-Thing Research Group(T2TRG)
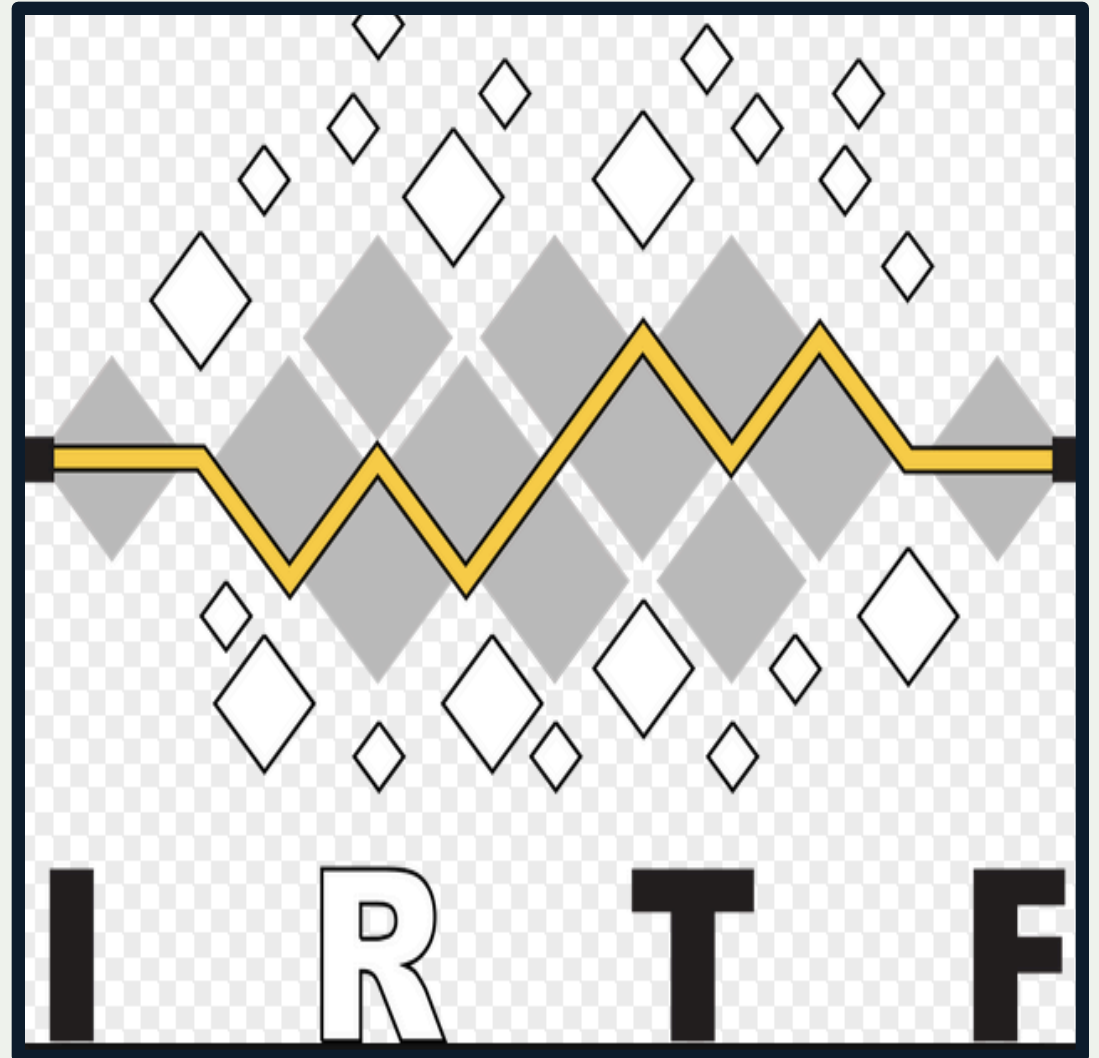
Internet Architecture Board(IAB)

The IAB provides overall architectural advice & oversight to the IESG, IETF, IRTF,& ISOC. Some of their work includes

- Deals with IETF external liaisons

- Appoints IRTF chair and RFC editor

- Chartered by and advises the ISOC Board

- Steps in appeals chain

- Provides input to IESG to IESG on WF formation and charter

IETF Trust and Note Well

-The IETF Trust holds, maintains & licenses existing and future Intellectual Property and other property used in connection with Internet standards process and its administration

- This is for the advancement of science & technology associated with the Internet & related technology

- **Note Well defines "contribution" and requires obeying IETF rules**

- **In effect a "contribution" is anything you say or write with the intent to effect the IETF standards process**
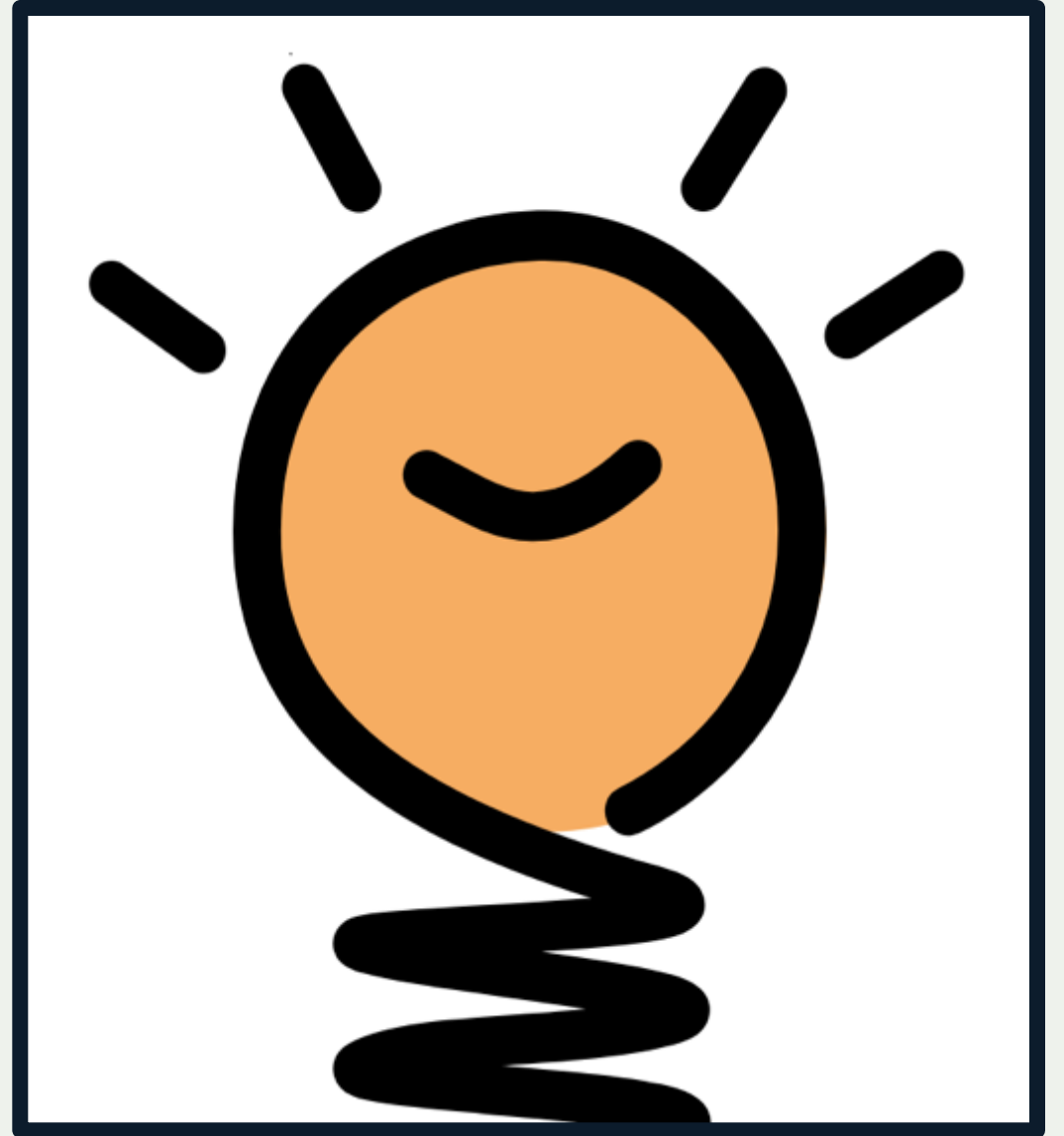
What are they working on now?

Big Internet trends

- New protocols such as HTTP/2 & QUIC

- Security and privacy

- Improving the security of protocols

- Role of open source development

Security, Privacy and Network Management

- IETF is committed to improving its protocols for communication security

- IETF since Snowden revelations has worked on

   - TLS 1.3, algorithms, UTA, DPRIVE...

      • RFC 7258 on surveillance is just another security threat

- Larger and larger fraction of all Internet traffic is encrypted & it affects network management

Importance and Benefits of Open Standards

- Less chance of being locked in by a specific technology and/or vendor

- Easier for systems using different technologies to interoperate and communicate with one another

- It may be possible to mix and match solutions to provide best-of-breed solutions as far as possible

Where do you start?

What are you interested in?

IETF Areas

IETF Areas	Description
General Area (gen)	supporting, updating and maintaining the IETF standards development process
Security (sec)	security protocols, services:integrity, authentication, non-repudiation, confidentiality, access control, key management is also vital
Application & Real Time (art)	protocols for delay sensitive communications and building blocks to be used across a wide variety of applications
Operations & Management (ops)	network management, AAA,operational issues such as DNS, IPv6, operational security, routing operations
Transport Services(tsv)	mechanisms related to end-to-end data transport
Routing (rtg)	ensuring continous operation of the Internet routing system
Internet (int)	IP layer(both IPv4 & IPv6), DNS,mobility, VPNs and pseudowires,various link layer technologies

Real Time Applications and Infrastructure Area

Delay-sensitive interpersonal communications

Internet Area

Different ways of moving IP packets and DNS information

Applications

Protocols seen by user programs, such as email and the web

General

IETF process, and catch-all for WGs that don't fit in other Areas (which is very few)

Routing Area

Getting packets to their destinations

Security Area

Authentication and privacy

Transport Area

Special services for special packets

How can you participate?

IETF 103 -- Bangkok, Thailand

- CodeStand https://codestand.ietf.org

  -IETF Authors create CodeRequests and students create projects referencing the documents used for their code

- Join a mailing or discussion list

- Write a Draft

- Join the Hackathon - Its free to attend and open to the public

What's in an IETF Hackathon?

Thank you.

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