50 Years of Standardisation in the Internet

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EPSRC - Streamlining Social Decision Making for Improved Internet Standards (SODESTREAM)
The Internet is a conspiracy
One where we know the conspirators
And have the “minutes”
From before it started
The Internet is a conspiracy

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From before it started

Coordination  Standardisation  Interoperability

IETF Mails and RFCs
How has the Internet evolved?

How to “coordinate” better?
Data and Objectives

- Measure success/effectiveness in the standards process
- Identify successful protocols
- Improving IETF Diversity
- Cross-WG/area review effectiveness

**Publications:** RFC, Drafts and edits

**Mailing:** Mail-lists & emails

**Physical meetings:** Attendance, minutes, audio/video

Relevance of different communication modalities

Measure progress in the standards process

Identify phases in protocol development

Identify individuals/groups/areas that help/hinder the process
Preliminary analysis: trends in RFCs production

Do RFC publications reflect the underlying Internet ecosystem?

Is it increasingly harder to publish an RFC?

Publications: RFC, Drafts and edits

Mailing: Mail-lists & emails

Physical meetings: Attendance, minutes, audio/video
RFCs reflect the underlying ecosystem

Many informational RFCs are proposed
Few are advanced to full standards
Some RFCs become obsolete
Many standards are proposed
Privatisation of the Internet
ARPANET decommissioned
Internet starts
ARPANET starts
RFC publication growth reduction

RFC publication growth reduction

0 1000 2000 3000 4000 5000 6000 7000 8000 9000
Publication Count

Publication Year
Evolution: from research

- RFC publication reflects the underlying stakeholders
- From academic institutes

Nodes in the early ARPANET
Evolution: to industry

- RFC publication reflects the underlying stakeholders
  - From academic institutes
  - To commercial giants

- Rise of Internet giants: CISCO
- Rise of new giants: Huawei
Competition for talent (RFC authors)
Is publishing an RFC becoming harder?
RFCs involve more…

More:
- People
- Institutions
- Countries
- Dependencies (WGs/Areas)
RFCs are longer
RFCs take longer (to be published)

More days from draft to RFC publication
Is it harder to publish an RFC and why?

Documents become longer, include more references, and authors, is that making the publication process longer?
Preliminary analysis: trends in RFCs production

- Email trends
- WG activity
- Publications: RFC, Drafts and edits
- Mailing: Mail-lists & emails
- Demographics
- Topics
- Physical meetings: Attendance, minutes, audio/video
Datatracker users are responsible for most emails

- Most emails have a datatracker ID
- Small percentage of emails with no ID
- Growing percentage of automated emails
- Outburst in 2006?

Most emails have a datatracker ID
Is the IETF growing?

Outburst in 2006?

Dropping numbers?
Spam? Unlikely according to SpamAssasin

Lower average

Change of policy in 2013?
Is the IETF aging?

- Age = IETF-age = 
  # years of email activity of a person
- 2020=0

Why this waves?

What happened in 2014?
Elders and newbies are most active

% of emails sent in 2020 (100%=all emails sent in 2020) by IETFers of IETF-age=20 (ie, 20 years of IETF email-activity)
Elders and newbies are most active

Are newcomers discouraged after the initial excitement?

Are most seniors dominating the conversation?
Mailing activity reflect RFC production by WGs

- **Many emails, few RFCs**
- **Few emails, many RFCs**
Recent decrease of draft submissions

Decreasing number of RFC submissions

Covid-19?

Decreasing # of first draft submissions
The sooner the leafs join the more similar the WGs are.
The further the leafs join the more different the WGs are.
Topic similarity (of the emails) within areas
Open questions

- How can we improve the standards process?
  - Is diversity an issue?
  - What is the relevance of affiliation?
  - How to keep participants? An ossified or a dynamic forum?
  - Enough cross area collaboration?
  - What makes a successful WG?
- How does the IETF stay ahead of the game?
  - Covid impact
- Are there other IETF datasets?
  - E.g., historic mail-list subscriber)?
- How can these finding be communicated?
  - E.g., what tooling would be useful
What other aspects/problems we should be looking at?

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