The IETF

or

Where do all those RFCs come from, anyway?

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What's an IETF?

- "Internet Engineering Task Force".
  - Has no legal standing...
- Standardizes protocols for the Internet.
- Sometimes like a herd of cats...
How Do I Join the IETF?

- Just show up at a meeting -- no formal membership.
  - The IETF isn't even incorporated.
  - Dress code extremely compatible with Usenix style.
- Or join one or more mailing lists.
How the IETF Differs

- **Us**
  - Individuals
  - Open membership
  - Just show up
  - Consensus
  - Engineers
  - T-shirts

- **Them**
  - Organizations
  - Often closed
  - Formal membership
  - Ballots and voting
  - Suits
  - Ties
The Organization of the IETF

- Real work done by working groups.
- Working groups organized into Areas.
- Each Areas has one or two Area Directors.
- Collectively, the ADs form the IESG (Internet Engineering Steering Group).
- There’s also the Internet Architecture Board; it provides overall architectural guidance and handles Layer 9 issues.
Related Organizations

- RFC Editor - publishes RFCs
- IANA (Internet Assigned Numbers Authority)
  - Keeps track of unique protocol values
- IAB chartered by the Internet Society (with IETF consent); RFC Editor funded by ISOC; IANA funded by ICANN, per an MOU approved by the IAB.
Selecting IETF Management

- A nominating committee is randomly selected from a pool of eligible volunteers.
- The nomcom fills vacant IAB and IESG slots.
  - Terms are two years.
- The IAB confirms IESG nominees.
- The ISOC board confirms IAB nominees.
Suppose You Have an IDEA?

- Suppose you want everyone to use your whizzy new protocol.
- Do you publish an RFC?
  - How is this done?
- Do you bring it do the IETF?
  - Can you? Should you?
  - How?
What is the IETF Interested In?

- Internet protocols
  - LAN-resident protocols generally aren't eligible.
  - Layer 1 and 2 aren't eligible, except for their relationship to layer 3 and above.

- Open standards
  - Proprietary standards need not apply for IETF standardization.
  - But sometimes a vendor will turn over change control to the IETF.
Patents and the IETF

- **Theory:**
  - Patented technologies acceptable if patent owner pledges reasonable, non-discriminatory licensing.
  - Active WG participants *must* disclose any patents they know of or hold.
  - Submarine patents a serious issue.

- **Practice:**
  - Most IETFers dislike patents, and try to avoid standardizing protocols that rely on them.
IETF Areas

- Internet (IPv6, DNS, ICMP, etc.)
- Transport (TCP, QoS, VoIP, SCTP, etc.)
- Applications (email, some Web, ldap, etc.)
- Routing (OSPF, BGP, etc.)
- Operations and Management (SNMP, etc.)
- Security (IPsec, TLS, S/MIME, etc.)
- SubIP (MPLS, IPoλ, traffic eng, etc.)
- General (miscellaneous, process)
The Paths to Standards-Track RFCs

- Working group documents
  - Complex process
  - Can be time-consuming
- Individual submissions
  - Comparatively rare path for IETF standards
  - Reviewed for conflicts with IETF working groups
Types of RFCs

- **Standards Track**
  - Used for IETF standards (Proposed, Draft, Full)

- **Informational**
  - May explain a standards-track protocol
  - May describe a proprietary protocol
  - April 1...

- **Experimental**
  - *Not* a standard. Don’t implement without consulting with the author.

**NOT ALL RFCs ARE STANDARDS!!**
Let Me Repeat That

NOT ALL RFCs ARE STANDARDS!
RFC: Proposed Standard

- Generally stable
- Believed to be well understood
- Appears to be valuable
- Implementation and operational experience useful but not required
- *Immature spec; may change* -- but the Internet runs on Proposed Standards.
RFC: Draft Standard

- At least two independent, interoperable implementations
  - Documentation of interoperability required
  - Must have a MIB
  - For patented technologies, two independent exercises of the licensing process
- Well understood, quite stable, unlikely to change unless major problems are found.
RFC: Internet Standard

- Significant implementation and operational experience
- High degree of technical maturity
- Believed to provide significant benefit
Forming a Working Group

- First, hold a BoF
  - IETF BoFs are *formal* entities, not informal get-togethers. (That role is filled by Bar BoFs...)
  - Any AD can authorize a BoF
- Must have:
  - Concise problem statement
  - Agenda
  - A mailing list (sometimes an *active* list)
  - Some I-Ds (Internet Drafts) if possible
  - A chair
Changing a BoF to a WG

- Must draft a *charter* (often a primary task for the BoF and/or the mailing list).
- The charter is a *contract* between the working group and the IESG. It specifies:
  - What the WG can work on
  - What the WG can't work on
  - What documents are to be produced
  - When are they due
Approving a Working Group

- The IAB looks for architectural issues and/or conflicts.
- The AD negotiates charter terms with the chairs.
  - The ADs can select new chairs.
  - Current practice is for narrowly-focused WGs.
- The IESG approves the charter.
- The AD monitors WG compliance.
Policies on Working Groups

- Working groups should have a narrow focus
- Working groups should terminate in finite time
  - It should be easy to tell if a working group is on schedule
- A successful working group -- i.e., one that is a credit to its chair -- is one that finishes, not one that hangs around indefinitely
How Do Working Groups Work?

- Most work is done on the mailing list.
- Discussion at IETF meetings (3 per year) should focus on issues raised by I-Ds.
  - Not all I-Ds are rough drafts of RFCs, but some are.
  - Meetings should not have presentations of I-Ds.
  - Participants are expected to have read the drafts.
- Decisions reached at a meeting must be ratified on the mailing list.
What Goes on at the IETF?

- Six or seven parallel tracks.
- BoFs meet once; working groups meet once or (sometimes) twice at an IETF.
- Two evening plenaries, for the IAB and IESG.
  - Broad technical presentations.
  - Management issues discussed.
- An optional reception.
- Excellent 802.11 coverage, Internet access.
Decision Process

"We reject presidents, kings, and voting. We believe in rough consensus and running code." (Dave Clark)
When a Document is Done

- Standards-track documents – that is, protocol definitions – usually go through WG "last call".
  - The WG chairs assess WG consensus.
- When that is concluded, the chair asks the AD to schedule an IETF last call.
  - The entire community gets to pick apart your document.
- Then the fun begins....
IESG Processing

- All of the ADs read each standards-track document.
- IESG discusses each RFC via email and at bi-weekly telechats.
- Most documents are sent back to the WG at least once, either by the AD or by the IESG.
Individual Submissions

- Generally progress through a series of I-Ds.
- Sometimes last-called by an AD; generally sent directly to the RFC editor.
- IESG checks for conflict with (or end run around) a working group.
- If no conflict, it suggests to the RFC editor whether or not it should be published.
- The RFC editor is *not* bound by this (and doesn't publish everything regardless).
What's in an RFC?

- Format has gotten more formal over the years.
- Always ASCII – no Postscript, HTML, proprietary formats.
  - Postscript and PDF are legal secondary formats.
- All RFCs are freely redistributable.
- For standards-track documents, the IETF retains change control, to permit evolution of standards.
Some April 1 RFCs

- 748 - Telnet randomly-lose option
- 1149 - Standard for IP on Avian Carriers
  - Implemented!
- 1437 - Extension of MIME Content-Types to a New Medium
- 1605 - SONET to Sonnet Translation
- 2324 - Hyper Text Coffee Pot Control Protocol
Major IETF Issues

- Security
- Internationalization
- Congestion control
Security

- *All* RFCs must have a "Security Considerations" section.
- This section must describe the limitations, weaknesses, etc., of the protocol being described.
- The IESG will not knowingly approve an insecure protocol.
  - Plaintext passwords are by definition insecure...
Internationalization

- Many of the world's languages can't be represented in 7-bit ASCII.
- All user-visible text in new protocols must be in UTF-8.
- Current challenge: internationalization of the DNS, plus protocols that use domain names.
Congestion Control

- All protocols must use approved congestion control mechanisms:
  - TCP
  - SCTP
  - Other forms of backoff, preferably load-sensitive.
- The Internet is not a LAN!
Major Process and Structure RFCs

- 2026 - The Internet Standards Process
- 2277 - IETF Policy on Character Sets
- 2418 - IETF Working Group Guidelines
- 2727 - IAB and IESG Selectrion
- 2850 - Charter of the IAB
- 2914 - Congestion Control Principles
- 3184 - IETF Guidelines for Conduct
- 3233 - Defining the IETF
What's the IETF?

- A reasonably functional standards organization
- Creakier with age, but still very functional
- (Usually) a good place to do sound technical work that can have an impact on the world