# 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

□ <u>Us</u>

□ Individuals
□ Open membership
□ Just show up
□ Consensus
□ Engineers
□ T-shirts

□ <u>Them</u>

□ 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 Cariers
  - 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