IETF Structure and Internet Standards Process
Suppose you wanted to build an open organization to control and management a large network…

*Originally: Scott Bradner*
The IETF

- Internet Engineering Task Force
- Formed in 1986
- Was not considered important for a long time - good!!
- Not government approved - great!!
- People not companies
- www.ietf.org

“*We reject kings, presidents and voting. We believe in rough consensus and running code*”

Dave Clark
IETF Overview

• IETF has no members, no voting
• 1,200 to 2000 at 3/year meetings, more on mail lists
• 124ish working groups (where real work happens)
• If it matters to the Internet, it matters to IETF
• 7 areas (for organizational convenience)
  – APP, RAI, INT, OPS, RTG, SEC, TSV
• IETF Management: IESG (ADs, chosen by community)
• Architectural guidance & liaisons: IAB (also chosen by community)
• Produces standards and other documents
• www.ietf.org
IETF “Standards”

• IETF standards not standards “because we say so”
• Only standards if/when people use them
• No formal recognition
• No submitting to “traditional” standards bodies
• Formal process of implementation and use makes something a standard
Organization of the IETF

- Internet Society
- IAB
- IRTF
- IANA
- RFC
- IESG
- area
- area
- area
- area

“the IETF”
The Internet Society (ISOC)

• Non-profit, non-governmental, international, professional membership organization
• 100 organization and 20,000 individual members in over 180 countries
• Provides organizational and administrative home for IETF
• Legal umbrella, insurance, etc.
• The ISOC Board of Trustees part of IETF appeal chain
• The ISOC president appoints chair of IETF nomcom
• IAB chartered by the ISOC
• The ISOC president is on the IAB mailing list & calls
• IETF (through IAB) appoints 3 ISOC trustees
• join at www.isoc.org
Internet Research Task Force (IRTF)

- Focused on **long term** problems in Internet
  - Anti-Spam
  - Crypto Forum
  - Delay-Tolerant Networking
  - Internet Congestion
  - Internet Measurement/Management
  - IP Mobility Optimizations
- For more information see [http://www.irtf.org](http://www.irtf.org)
Internet Architecture Board (IAB)

- Provides overall architectural advice to the IESG, the IETF & the ISOC
- Advises the IESG on IETF working group formation
- Deals with IETF external liaisons
- Appoints the IRTF chair
- Selects the IETF-IANA
- Oversees the RFC Editor
- Hosts workshops
- Chartered by the ISOC
Internet Assigned Number Authority (IANA)

- Assigns parameters and keeps them from colliding
  - protocol numbers and port numbers
  - IP addresses
  - mostly delegated to the 4 (going on 5) IP Address registries
  - domain names
  - deals with top level domains (TLDs)
  - rest delegated to DNS name registries

- Functions split with the creation of ICANN
  - Internet Corporation for Assigned Names and Numbers
  - Independent corporation to take over IANA functions
  - Under contract with US government
  - Now IETF-IANA and non-IETF-IANA
RFC Editor

- Historically Jon Postel and helpers
- Now a small group funded by the ISOC
  - rfc-editor@rfc-editor.org
- Semi-independent
  - Gets requests to publish IETF IDs from IESG
  - Gets requests to publish independent informational and experimental RFCs
  - asks IESG for advice on publishing independent RFCs but can exercise own discretion
  - presumption is to publish technically competent IDs which sometimes is a conflict with IESG
Organization of the IETF

Internet Society

IAB

IRTF

IANA

RFC

IESG

area

area

area

"the IETF"
Area Directors (ADs)

- Nominated by the community – this include all IETF members
- Selected by nomcom - a volunteer nomination committee
- Responsible for setting direction in Area
- Responsible for managing process in Area
  - approve BOFs & working group charters
  - then go to IESG & IAB for final approval
- Reviews working group documents - 2000 pages/month
- Most Areas have 2 ADs
Internet Engineering Steering Group (IESG)

- IETF Chair + rest of ADs
- IETF process management and RFC approval body
- Approves WG creation
- Reviews & approves publication of IETF documents
  - reviews and comments on non-IETF submissions
- Multi-disciplinary technical review group
IETF Secretariat

- Organizes/Coordinates
  - plenary meetings
  - mailing lists hosted by IETF
  - Internet-Draft directory
  - IESG teleconferences
  - day to day work of IESG and working groups
- Provided by some company
- Funded from IETF meeting fees & (soon) ISOC
Selecting IETF Management

- RFC 3777/6869 describes process
- IESG & IAB members normally have 2-year terms
- Picked by a nominations committee (nomcom)
  - nomcom chair appointed by the ISOC president
- nomcom selects community nominees for each job
  - reviews one half of the IESG, half of the IAB each year
  - includes the IETF chair
  - IESG approved by IAB, IAB approved by the ISOC BoT
- nomcom selected randomly from list of volunteers
  - volunteers have to have been at 3 of last 5 IETF meetings
  - very random selection process
Working Groups

- This is where the IETF primarily get its work done
- RFC 2418/3934 describes WG operation
- Working group focused by charter agreed between chair(s) and area director
  - restrictive charters with deliverables and milestones
  - working groups closed when their work is done
- Charter approved by IESG with IAB advice
- AD with IESG has final say on charter & chair(s)
Working Groups (continued)

- “...rough consensus and running code.”
- No formal voting
  - can do show of hands or hum
- Does not require unanimity
- Disputes resolved by discussion and implementation
- Mailing list and face-to-face meetings
  - most work happens on mailing lists
  - all decisions must be verified on mailing list
  - face-to-face discussion to resolve disagreements
IETF Documents

• All open - no “confidential contributions”
• Developed as Internet-Drafts
  – anyone can submit - “expire” in 6 months
  – some IDs are working group documents
• Published as RFCs
  – archival publications (never changed once published)
  – different types: (not all RFCs are standards!)
    • informational, experimental, BCP, standards track, historic
• 3-stage standards track
  – Proposed Standard, Draft Standard, Internet Standard
• Interoperability not conformance
Working Documents

• Internet-Draft - IDs
  – input to the process or for background information
  – no admissions control other than IPR statements
  – anyone can submit an ID
  – zapped from IETF directory after 6 months
    • but many mirrors exist
  – almost all RFCs must pre-exist as IDs
    • exceptions: some RFCs created by IANA or RFC Editor
What is a RFC?

• IETF document publication series
• RFC == Request for Comments
  – now just a name
  – now tend to be more formal documents than early RFCs
• Over 6000 RFCs
  – RFC 1 *Host Software* - Apr 7 1969
• “Not all RFCs are standards”
  – see RFC 1796
  – though some vendors imply otherwise
• Many types of RFCs, key to understanding significance
RFC Repository Contains:

- Standards track
  - OSPF, IPv6, IPsec ...
- Obsolete Standards
  - RIPv1
- Requirements
  - Host Requirements
- Policies
  - Classless InterDomain
  - Routing
- April fool’s day jokes
  - IP on Avian Carriers ...
    - ... updated for QoS
- Poetry
  - ‘Twas the night before startup
- White papers
  - On packet switches with infinite storage
- Corporate documentation
  - Ascend multilink protocol (mp+)
- Experimental history
  - Netblt
- Process documents
  - IETF Standards Process
Standards Track RFCs:

- **Start at Proposed Standard (PS)**
  - good idea, no known problems
  - implementation required at AD discretion
- **Advance to Draft Standard (DS)**
  - stable Proposed Standard specification
  - multiple interoperable implementations
  - note IPR restriction
- **Advance again to Internet Standard (STD)**
  - Draft Standard with wide deployment and use
- **Best Current Practices (BCP)**
  - generally policies or IETF procedures
  - (best way we know how)
IETF Standards Process

• (Protocol) Specification published as Internet Draft
• Discussed in a working group - creates revised IDs
• ID sent to IESG after working group consensus
• IESG issues IETF Last Call (2 weeks)
  – anyone can comment
  – IESG considers comments and its own review
    may approve publication as standards track RFC
    may point out issues to working group & return
    ID
IETF RFC Submission Process

1. Working group doc, or individual standards track doc
2. Submit
3. Concerns
4. IESG
5. Comments, suggestions
6. "Last Call"
7. IETF Community Review
8. RFC Editor
9. Published RFC

CS 125 - myietf