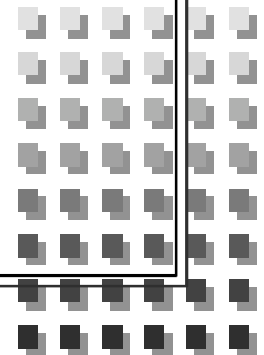# IETF Structure and Internet Standards Process

Scott Bradner
65th IETF
Dallas, TX, USA

I E T F

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

"We reject kings, presidents and voting. We believe in rough consensus and running code"

Dave Clark

I E T F

IETF Overview

Internet standards R us

does not exist, **no** members, **no** voting

1K to 2K people at 3/year meetings

many more on mail lists

123ish **working groups** (where the stuff happens)

8 **areas** (for organizational convenience) with **AD**s

APS, GEN, INT, O&M, RAI, RTG, SEC, TSV

IESG: management (ADs, chosen by community)

IAB: architectural guidance & liaisons

produces **standards** and other documents

I E T F

IETF "Standards"

standards only when people **use** them

  formal SDOs can create legally mandated standards

no formal recognition for IETF standards

  by governments or "approved" standards organization

  lack of formal government input "a problem"

    at least to some governments

no submitting to "traditional" bodies

  some keep trying to "help"

I E T F

The Role & Scope of the IETF

"above the wire and below the application"

 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 hard to clearly define IETF scope

 constant exploration of edges

I E T F

Scope of Other SDOs

Internet (and Internet protocols) very interesting to other standards development organizations (SDO)

other SDOs trying "fix" or "extend" IETF protocols

trying to figure out how to proceed when extensions break underlying protocol assumptions

see note to ITU-T

https://datatracker.ietf.org/public/liaison_detail.cgi?detail_id=127

I E T F

Top Level View of Organization
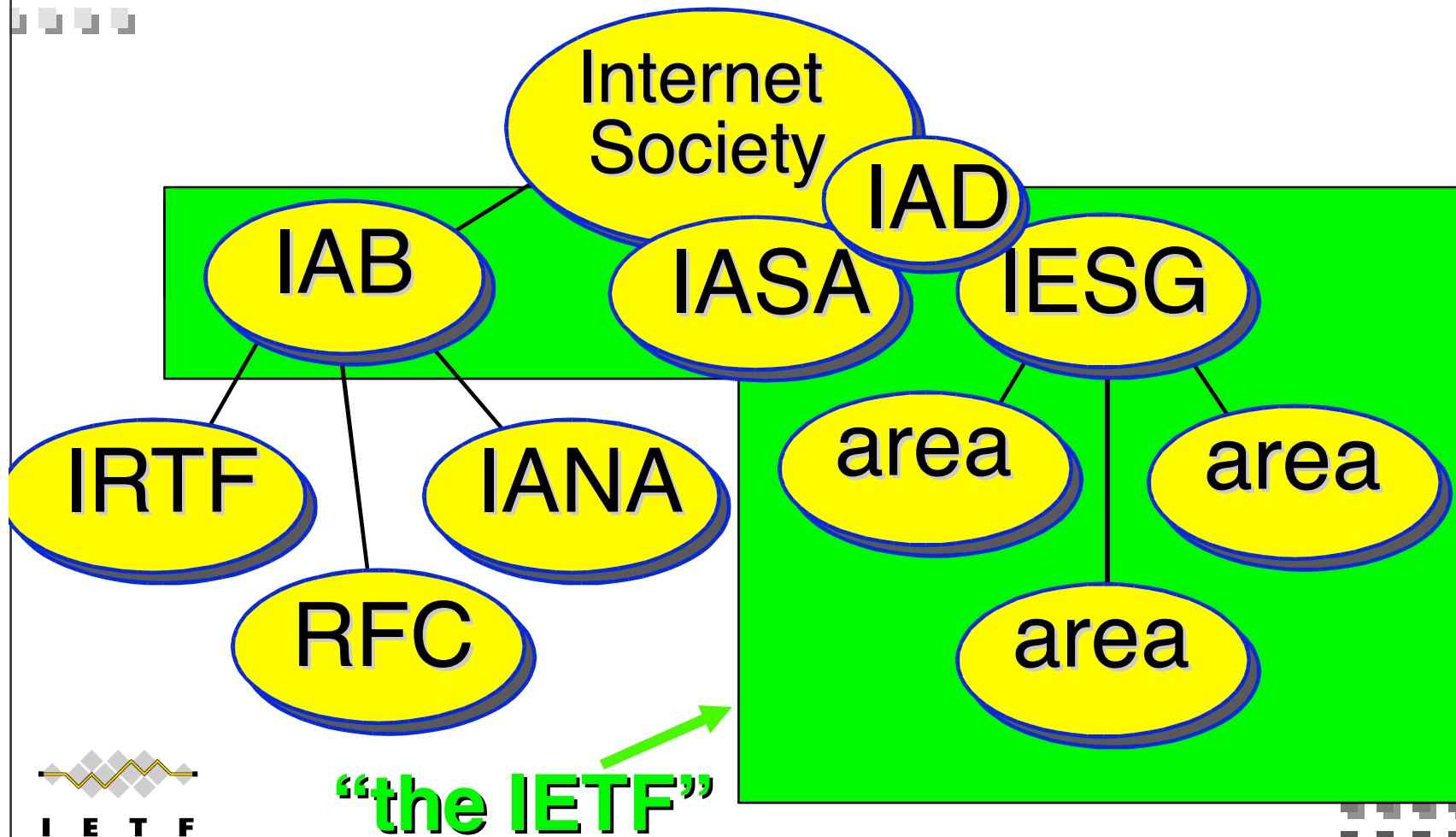
The Internet Society (ISOC)

non-profit, non-governmental, international, professional membership organization

more than 100 organizational and more than 20,000 individual members in over 180 nations

organizational and administrative home for IETF

legal umbrella, insurance, IASA home, etc

ISOC BoT part of appeal chain

ISOC president appoints chair of nomcom

IAB chartered by ISOC

ISOC president is on the IAB list & calls

IETF (through IAB) appoints 3 ISOC trustees

join at www.isoc.org

I E T F

Internet Research Task Force (IRTF)

- Focused on **long term** problems in Internet

  Anti-Spam Research Group (ASRG)

  Crypto Forum Research Group

  Delay-Tolerant Networking Research Group (DTNRG)

  End-to-End Research Group

  Host Identity Protocol (HIP)

  Internet Measurement Research Group

  IP Mobility Optimizations (Mob Opts) Research Group

  Network Management Research Group Charter (NMRG)

  Peer-to-Peer Research Group

  Routing Research Group

  Transport Modeling Research Group

  Internet Congestion Control Research Group

For more information see **http://www.irtf.org**

I E T F

Internet Architecture Board (IAB)

provides overall **architectural advice** & **oversight**
  to IESG, IETF & ISOC

approves IESG slate from nomcom

step in appeals chain

provides "oversight" of IETF standards process

deals with IETF external liaisons

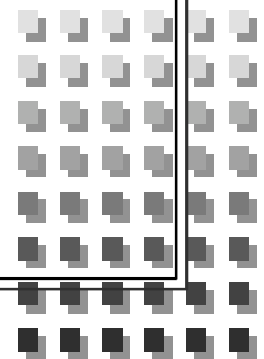appoints IRTF chair

selects IETF-IANA

appoints & oversees RFC Editor

I E T F

IAB, contd.

how IAB provides architectural advice & oversight:

review BOFs

provide input to IESG on WG formation & charters

sponsor & organize IRTF

convene topic-specific workshops

organize ad-hoc expert groups to adjudicate technical disputes

write ID/RFCs stating IAB opinion

includes community & IESG review steps

participate in WG discussions

I E T F

IAB Members

Bernard Aboba

Loa Andersson

Brian Carpenter
(as IETF Chair)

Leslie Daigle
(current IAB chair)

Elwyn Davies

Kevin Fall
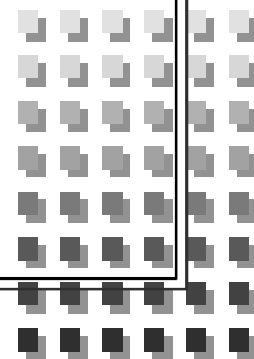
Olaf Kolkman

Kurtis Lindqvist

Dave Meyer

Pekka Nikander

David Oran

Eric Rescorla

Lixia Zhang

as of the end of this week

I E T F

Internet Assigned Number Authority (IANA)

assigns numbers and keeps them from colliding

protocol numbers (for IETF but not paid for by IETF)

IP addresses

mostly delegated to the 5 regional IP Address registries

domain names

deals with top level domains (TLDs - e.g., .com, .fr, ...)

mostly delegated to DNS name registries
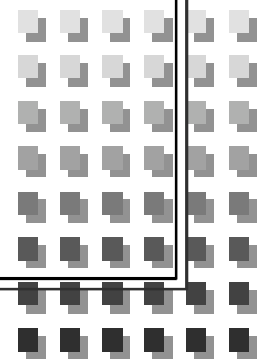
functions split with the creation of **ICANN**

Internet Corporation for Assigned Names and Numbers

(semi) independent corp. to take over IANA functions
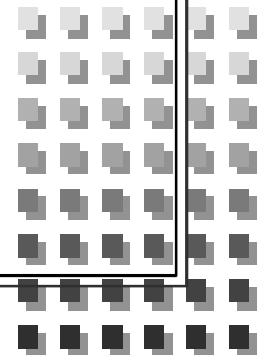
(continuing) contract with US government

I E T F

Protocol Parameters

IP protocol numbers

well known TCP/UDP ports

PPP protocol ids

MIME types

etc.

I E T F

IETF Management

IETF Chair

    AD for General Area, chief spokesman

Area Directors

    manage individual areas

Internet Engineering Steering Group (IESG)

    ADs sitting as a body (includes IETF Chair)

Internet Architecture Board

    IETF chair also

IETF Chair, ADs & IAB members selected by nomcom

    two year terms
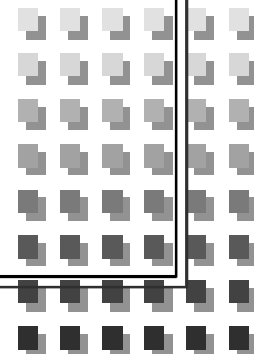
I E T F

IETF Chair

Brian Carpenter <chair@ietf.org>

    also chair of the **IESG**

    also director of the **General Area**

    also ex officio member of the **IAB**

nominated by IETF community - this includes <u>you</u>

selected by nomcom

IETF's "CTO" - "Chief Talking (& Traveling) Officer"

I E T F

Area Directors (ADs)

most Areas have 2 ADs

　　all but General Area

responsible for setting direction in Area

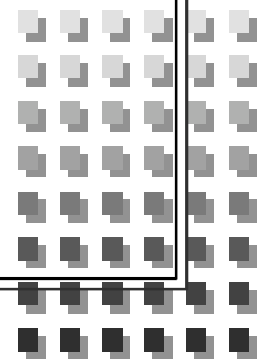responsible for managing process in Area

　　approve BOFs & working groups

　　　　charters then go to IESG & IAB for final approval

reviews working group documents

　　prior to IESG review

I E T F

IESG

Internet Engineering Steering Group

ADs + IETF Chair

process management and RFC approval body
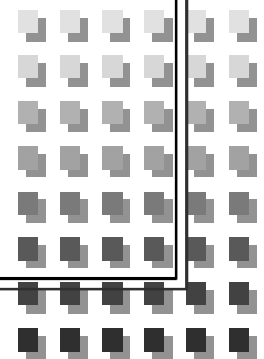
approves WG creation (with IAB advice)

provides technical review & approves publication of IETF documents

reviews and comments on non-IETF submissions

multi-disciplinary technical review group

I E T F

Selecting IETF Management

picked by a nominations committee (nomcom)

    nomcom chair appointed by ISOC president

    process described in RFC 3777

members selected randomly from list of **volunteers**

    requirement: you were at 3 of last 5 IETF meetings

    very random process to select from volunteers: RFC 3797

get list of jobs to fill from IETF chair

    IETF Chair, IESG, IAB & IAOC members

nominate one person for each job

    IESG & IETF Chair approved by IAB, IAB approved by
    ISOC BoT, IAOC approved by IESG

I E T F

IETF Areas

IETF Chair & AD for General Area (gen) (2 WGs)

    Brian Carpenter <chair@ietf.org>

Applications (app) (14 WGs)

    Lisa Dusseault

    Ted Hardie

Internet (int) (26 WGs)

    Jari Arrko

    Mark Townsley

Operations & Management (ops) (21 WGs)

    David Kessens

    Dan Romascanu

I E T F

IETF Areas (cont.)

Real-time Applications and Infrastructure

  Cullen Jennings

  Jon Peterson

Routing (rtg) (15 WGs)

  Ross Callon

  Bill Fenner

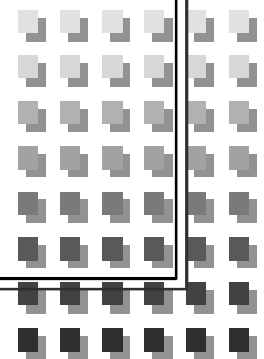Security (sec) (19 WGs)

  Sam Hartman

  Russ Housley

Transport Services (tsv) (26 WGs)

  Magnus Westerlund

  TBD

I E T F

IETF Secretariat

NeuStar Secretariat Services - Sterling Virginia, USA

    managed by IETF Administrative Support Activity IASA)
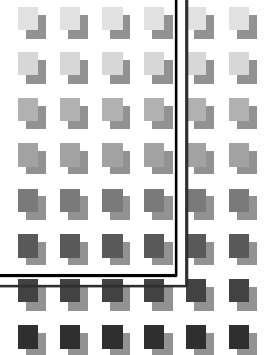
runs

    plenary meetings, mailing lists,

    Internet-Draft directory, IESG teleconferences

coordinates

    day to day work of IESG and working groups

I E T F

IETF Administrative Support Activity (IASA)

provides the administrative structure required to

support the IETF standards process

has no authority over the standards process

housed within the Internet Society

creates budget for IETF

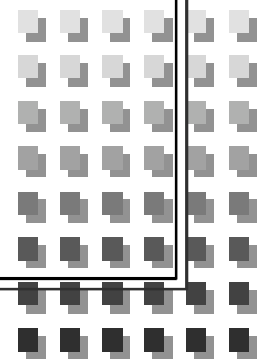money from IETF meeting fees & ISOC

responsible for IETF finances

contracts for IETF support functions

Secretariat functions, RFC Editor & IETF-IANA

deals with IETF IPR

I E T F

IASA, contd.

- includes
  - IETF Administrative Director (**IAD**) - Ray Pelletier
    - ISOC employee
    - day to day operations oversight
  - IETF Administrative Oversight Committee (**IAOC**)
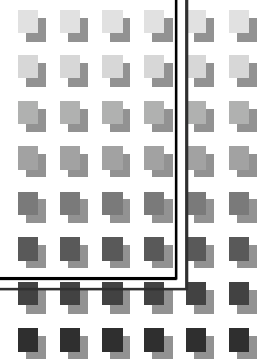   - 8-member body - IAB & IETF chairs & ISOC prez
    - plus
   - members selected by nomcom, IAB, IESG & ISOC
    - IASA oversight

I   E   T   F

Dots

🔴 IAB member (red)

🟡 IESG member (yellow)

🔵 Working Group chair (blue)

🟠 nomcom (orange)

🟢 Local host (green)

I E T F

Standards Procedure

generally Birds of a Feather (BOF) first

most work done in a Working Group

  proposals published as Internet Drafts

proposal reviewed by AD

  can be sent back to working group

IETF Last-Call (4-week if no Working Group)

IESG review

  last call comments + own technical review

  can be sent back to working group

publication as RFC

I E T F

IETF Submission

Working group doc, or
individual standards track doc

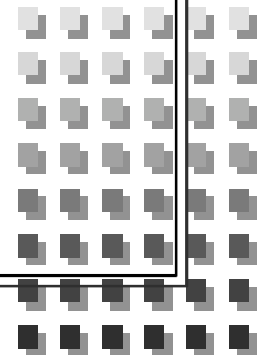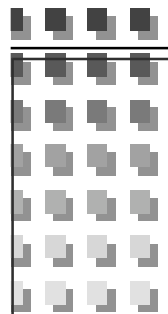Submit

Concerns
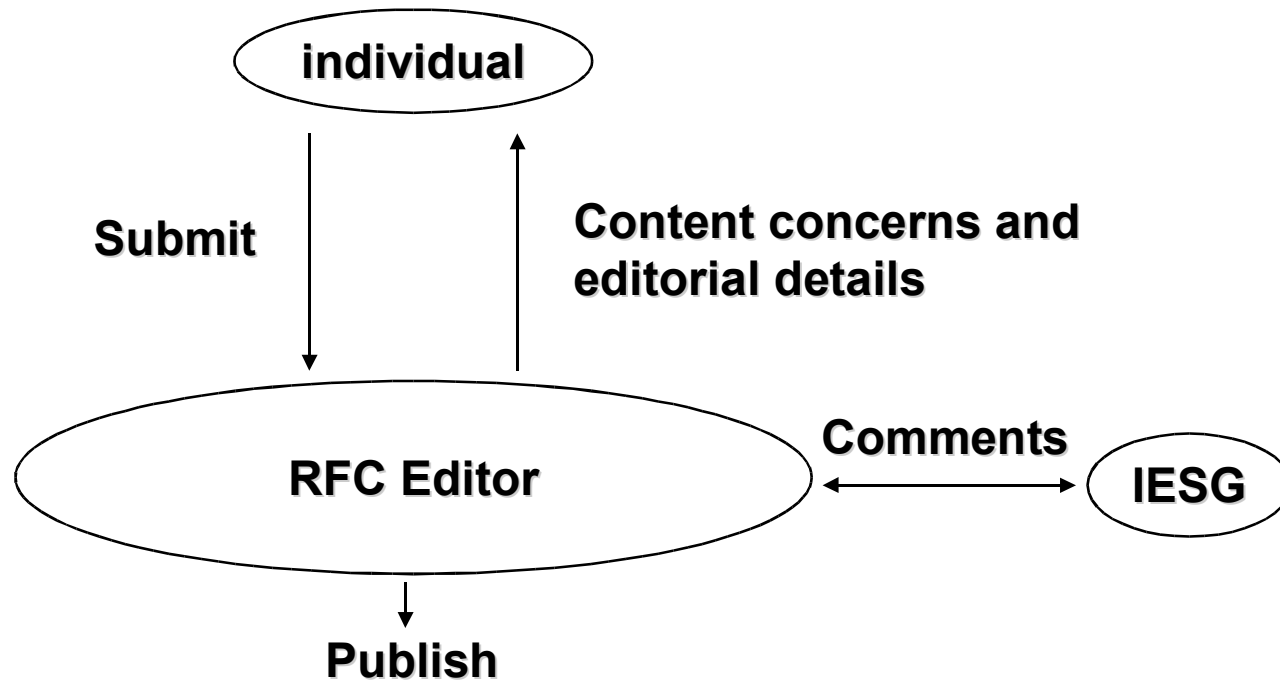
IESG

RFC Editor

"Last Call"

Comments,
suggestions

Published RFC

IETF Community
Review

I E T F

Non-IETF Submissions

individual

Submit

Content concerns and
editorial details

RFC Editor

Comments

IESG

Publish

I E T F

Birds of a Feather Sessions (BOF)

usually precede formation of a Working Group

group of people interested in a topic

convince an AD that they have a good idea - one worth exploring

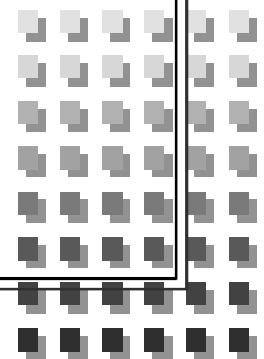need description and agenda before a BOF can be scheduled

and sometimes a draft charter

BOFs generally only meet once

can lead to a WG or can be a one time thing

I E T F

Working Groups

- this is where the IETF primarily get its work done
  - on mailing list
  - face-to-face meetings focused on key issues (ideally)
    - note: face-to-face meetings generally very short
- working group focused by charter agreed between chair and area director
  - restrictive charters with milestones
  - working groups closed when their work is done
- charter approved by IESG with IAB advice
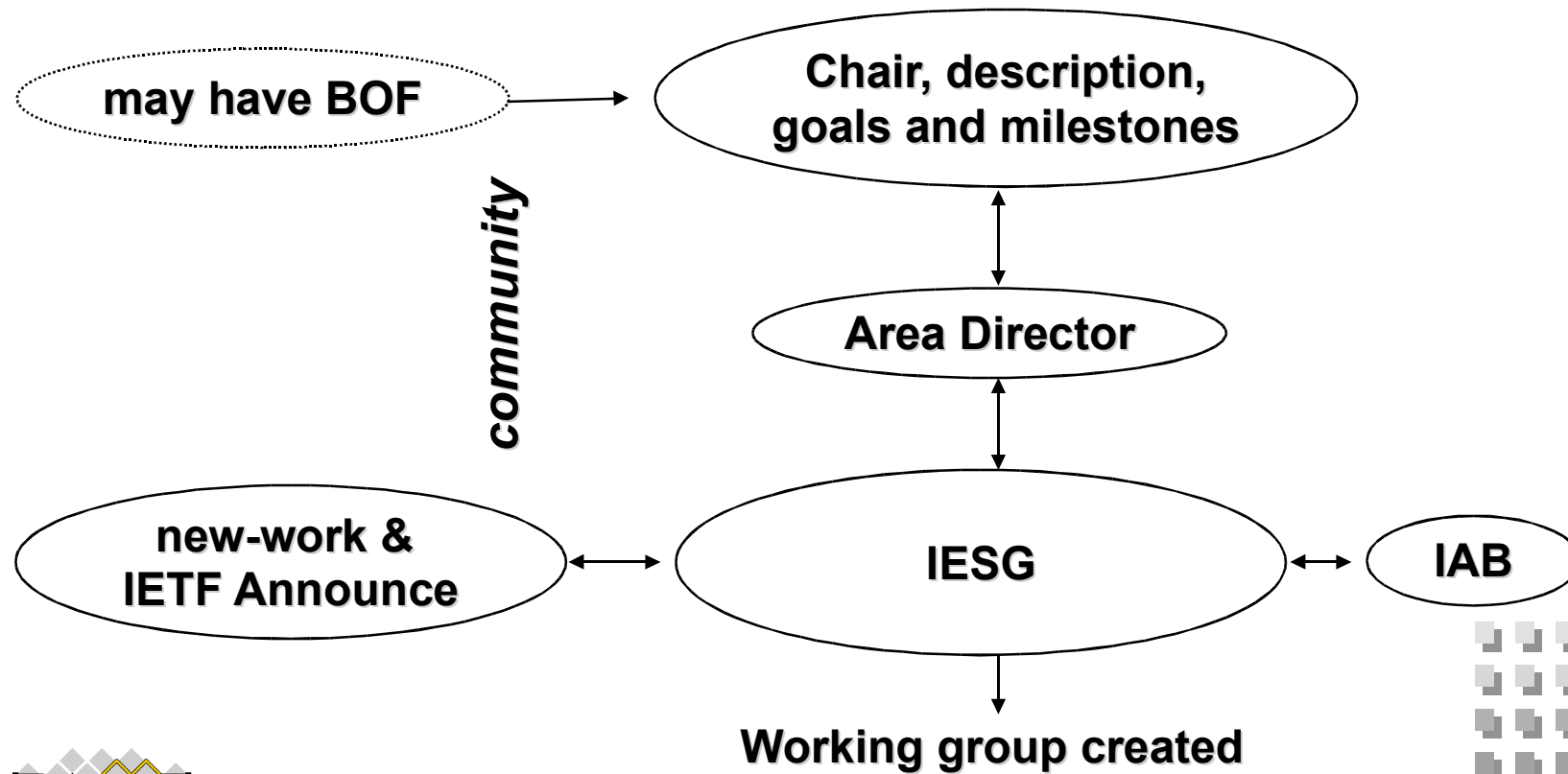- AD with IESG has final say on charter

I E T F

Working Group Creation

may have BOF

Chair, description, goals and milestones

community

Area Director

new-work & IETF Announce

IESG

IAB

Working group created

I E T F

Working Groups. contd.

- no defined membership
    - just participants
- "*Rough consensus* *and running code...*"
    - no formal voting - can not define constituency
        - can do show of hands or hum - but **no** count
    - does **not** require unanimity
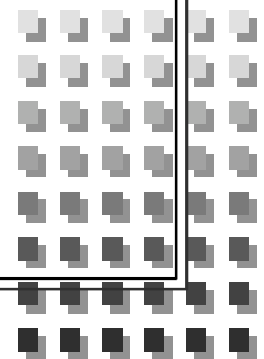   - disputes resolved by discussion
    - mailing list and face-to-face meetings
    - final decisions must be verified on mailing list
        - taking into account face-to-face discussion

I E T F

IETF Documents

all IETF documents are **open**

Internet Draft

    IETF working documents

    some I-Ds are working group documents

RFC

    archival publications (never changed once published)

    different types: (**not all RFCs are standards!**)

I E T F

IETF Working Documents

Internet-Draft

> random or non-random thoughts
>
> input to the process
>
> **no admissions control** other than boilerplate (see IPR)
>
> **zapped** from *IETF* directory after 6 months
>
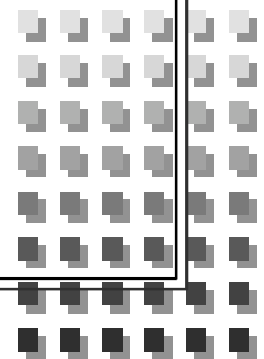> > but many mirrors exist
>
> all RFCs must pre-exist as IDs
>
> > to deal with IPR handoff
> >
> > other than IANA or RFC Editor created ones

I E T F

What is a RFC?

RFC used to stand for Request for Comments

> now just a (brand) name

> tend to be more formal documents than early RFCs

IETF document publication series

RFC 1 *Host Software* - Apr 7 1969

now over 4000 RFCs

not all RFCs are standards!

> see RFC 1796

> though some vendors imply otherwise

many types of RFCs

I E T F

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

I E T F

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

RFC Editor

IETF publication arm

rfc-editor@rfc-editor.org

funded by the Internet Society

semi-independent

- gets requests to publish IETF IDs from IESG
- also gets requests to publish independent IDs for info or exp RFCs
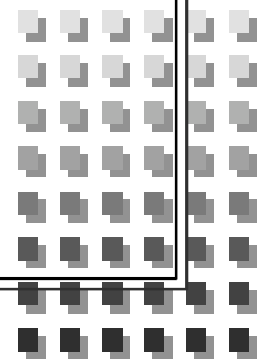 - asks IESG for advice on publishing independent RFCs
  - but can exercise own discretion
  - presumption is to publish technically competent IDs
    - which sometimes is a conflict with IESG

I E T F

Standards Track RFCs:

Best Current Practices (**BCP**)

  policies or procedures (best way we know how)

3-stage standards track (currently under review)

  Proposed Standard (**PS**)

    good idea, no known problems

  Draft Standard (**DS**)

    stable

    multiple interoperable implementations

    note: **interoperability** not conformance

  Internet Standard (**STD**)
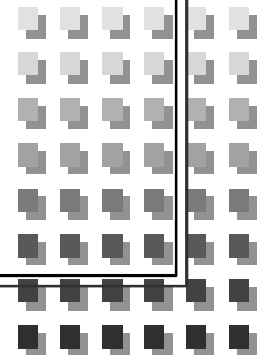
    wide use

I E T F

Other RFC Types

Informational

Experimental

Historical

I E T F

Appeals Process

IETF decisions can be appealed

    start level above decision being appealed

1st to the WG chair(s)

only then to the Area Director

only then to the IESG

only then to the IAB

if claim is that the process has not been followed,

    only then an appeal can be made to the ISOC Board

it is OK to appeal decisions – people do

    but appeals are not quick
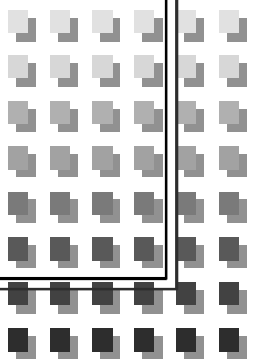
        starting "low" is the right thing to do

I E T F

Intellectual Property Rights

IPR is a very big issue in standards bodies

what to do if there is a patent on the technology

what about patent applications?

what if you do not know until it's already a standard?

patent questions:

should you demand free rights to implement?

require "fair & non-discriminatory" licensing?

what if IPR claim is false?

e.g. an attempt to block the standard

should the standards body evaluate validity of patents?

I E T F

Patents - Issues

getting pressure from the open source folk for standards with no (known?) IPR

maybe in some parallel universe

see AU "Innovation Patent" AU 2001100012 A4 (8/01)
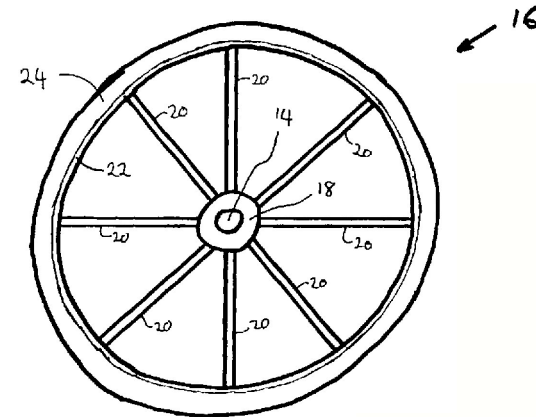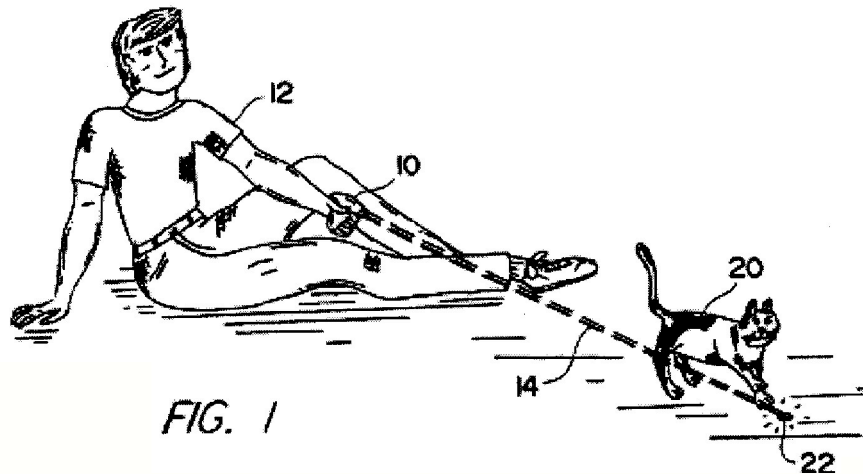
also U.S. Patent 5,443,036 (8/95)

FIG. 1

FIGURE 2

IPR (Patents)

RFC 2026 revised IETF IPR rules

- used to require "fair & non-discriminatory" licensing
- some standards blocked using old process

now use standards sequence to check IPR issues

- require multiple implementations based on multiple licenses to progress to Draft Standard or Internet Standard
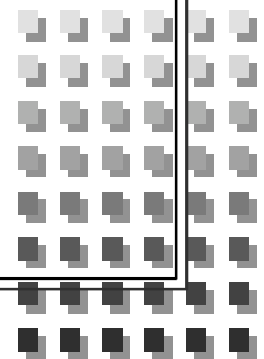
but a worry about "submarine patents"

IPR working group

- clear up fuzzy language in RFC 2026
- produced RFC 3978 and RFC 3979
  - now working on an update of RFC 3979

I E T F

IPR, contd.

IETF IPR (patent) rules (in RFC 3979)

   require timely **disclosure** of your own IPR in your own submissions & submissions of others

   "**reasonably and personally**" known IPR

      i.e., no patent search required

WG takes IPR into account when choosing solution

   RFC 3669 gives background and guidance

push from open source people for RF-only process

   consensus to not change to mandatory RF-only

      but many WGs **tend** to want RF or IPR-free

I E T F

IPR (Copyright)

author(s) need to give non-exclusive publication rights to ISOC (IETF) if to be published at all

also (normally) the right to make derivative works

author(s) **retain** all other rights

mandatory ID boilerplate statement

> 1/ agreement that IPR disclosures have been (or will be) made
>
> 2/ (optional) no right to produce derivative works
>
> not permitted for standards track documents
>
> 3/ (optional) just publish as ID
>
> 4/ Copyright statement

I E T F

IETF IPR Trust

legal trust

container for IETF-related IPR e.g.:

    copyrights

    domain names

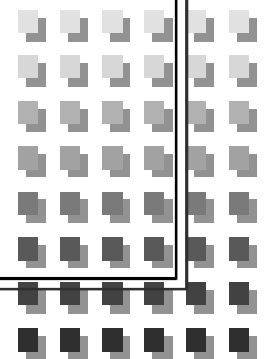   software paid for by IETF

    internal IETF documents

not a patent pool

    IETF owns no patents

I E T F

Note Well (1)

The "Note Well" statement shows up a lot at the IETF.

Mailing lists, registration, meeting openings, etc.

"**Any submission to the IETF intended by the Contributor for publication as all or part of an IETF Internet-Draft or RFC and any statement made within the context of an IETF activity is considered an "IETF Contribution".**

continued ...

I E T F
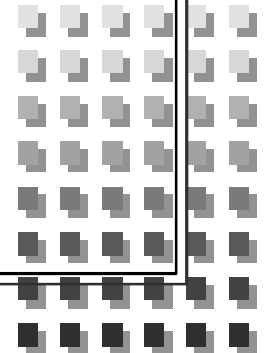
Note Well (2)

"Such statements include oral statements in IETF sessions, as well as written and electronic communications made at any time or place, which are addressed to:

- the IETF plenary session
- any IETF working group or portion thereof
- the IESG, or any member thereof on behalf of the IESG
- the IAB or any member thereof on behalf of the IAB
- any IETF mailing list, including the IETF list itself, any working group or design team list, or any other list functioning under IETF auspices
- the RFC Editor or the Internet-Drafts function"
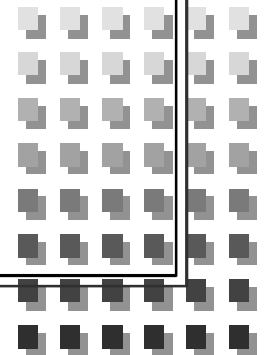
continued ...

I E T F

Note Well (3)

"All IETF Contributions are subject to the rules of RFC 3978 and RFC 3979.

Statements made outside of an IETF session, mailing list or other function, that are clearly not intended to be input to an IETF activity, group or function, are not IETF Contributions in the context of this notice.

Please consult RFC 3978 for details."

I E T F

Other IETF Training/Tutorials

1300 - 1500 Newcomer's Training

1300 - 1500 Editing and RFC Tutorial - **Monet Ballroom**

1300 - 1500 Security Tutorial - **Cortez AB**

1500 - 1700 Introduction to WG Leadership: Chairs & Editors - **Cortez CD**

1500 - 1700 Introduction to xml2rfc - **Coronado A**

1500 - 1700 Routing, Bridging and Switching Tutorial - **Coronado BCD**

1700 - 1900 Welcome Reception

(talking to IETF people is often an education!)

I E T F

What next?

join mailing lists

> *this is where the work happens*

read the drafts

don't be shy

talk to people

look for common ground

help people

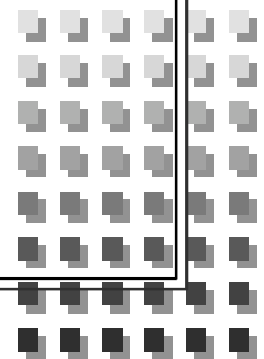*don't settle for second-rate*

I E T F

Questions?

I E T F