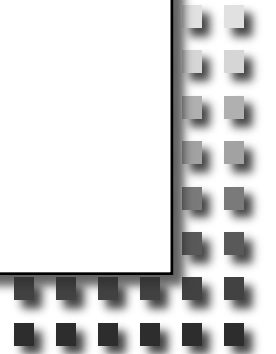




IETF Structure and Internet Standards Process

Scott Bradner
64th IETF
Vancouver, BC, Canada





The IETF

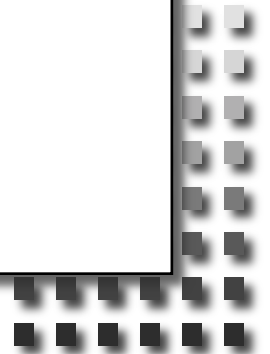
Internet Engineering Task Force
formed in 1986

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





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)

78 areas (for organizational convenience) with **ADs**

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

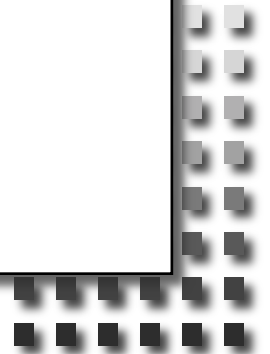
IESG: management (ADs, chosen by community)

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”



The Role & Scope of the IETF

“above the wire and below the application”

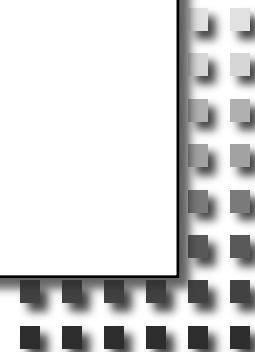
IP, TCP, email, routing, IPsec, HTTP, FTP, ssh, LDAP,
SIP, mobile IP, ppp, RADIUS, Kerberos, secure email,
streaming video & audio, ...

but wires are getting fuzzy

MPLS, GMPLS, pwe3, VPN, ...

generally hard to clearly define IETF scope

constant exploration of edges





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

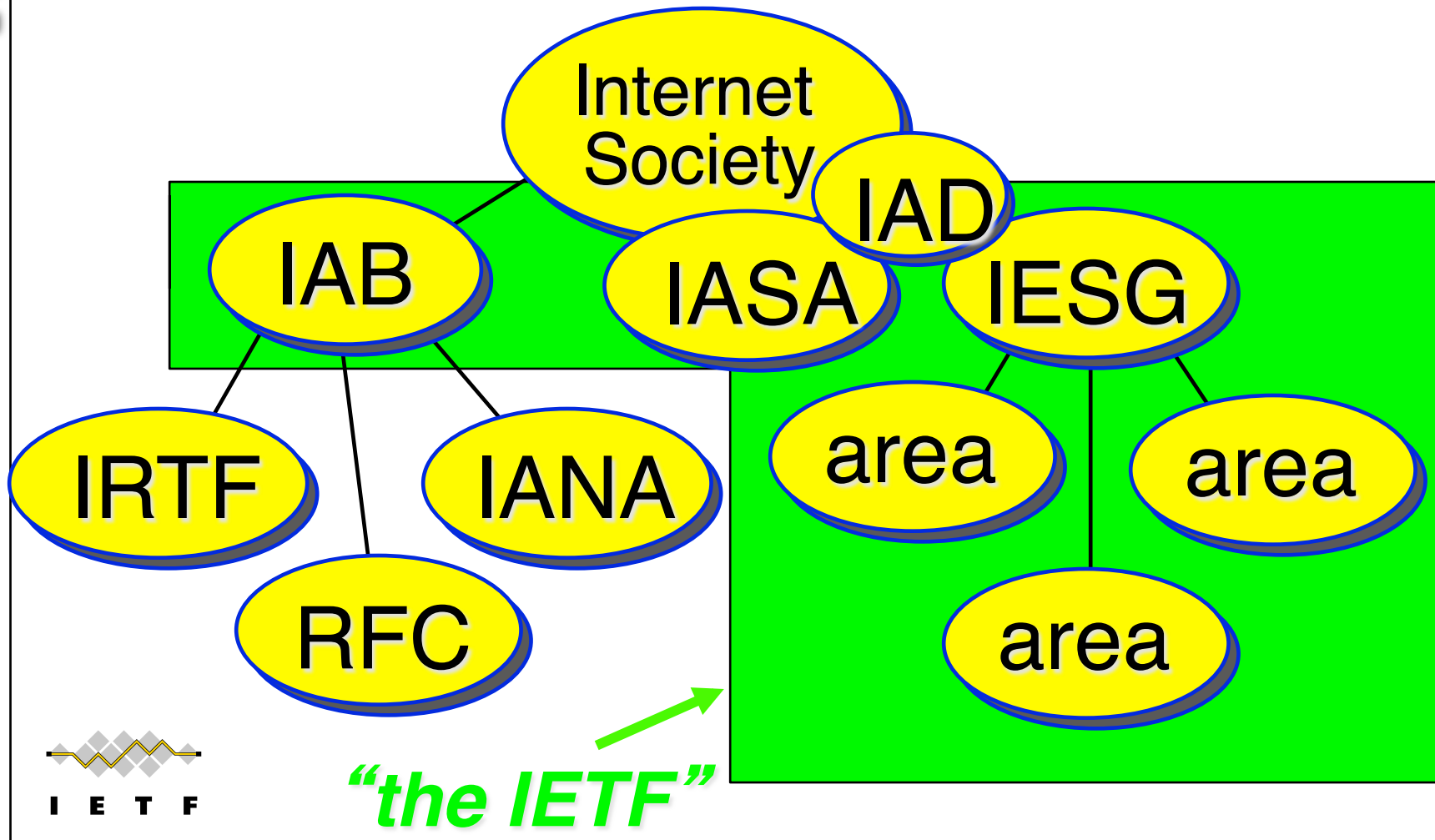
https://datatracker.ietf.org/public/liaison_detail.cgi?detail_id=127



I E T F



Top Level View of Organization





The Internet Society (**ISOC**)

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

100 organizational and 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





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



I E T F

For more information see <http://www.irtf.org>





Internet Architecture Board (**IAB**)

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

approves IESG slate from nomcom

step in appeals chain

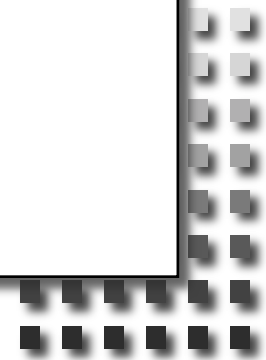
provides “oversight” of IETF standards process

deals with IETF external liaisons

appoints IRTF chair

selects IETF-IANA

appoints & oversees RFC Editor



IAB, contd.

how IAB provides architectural advice & oversight:
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
community & IESG review step
participate in WG discussions

IAB Members

Bernard Aboba

Loa Andersson

Brian Carpenter

(as IETF Chair)

Leslie Daigle

(IAB chair)

Patrik Fältström

Bob Hinden

Kurtis Lindqvist

Dave Meyer

Pekka Nikander

Eric Rescorla

Pete Resnick

Jonathan Rosenberg

Lixia Zhang



I E T F



Internet Assigned Number Authority (**IANA**)

assigns numbers and keeps them from colliding

protocol numbers

IP addresses

mostly delegated to IP 5 regional Address registries

domain names

deals with top level domains (TLDs)

mostly delegated to DNS name registries

functions split with the creation of **ICANN**

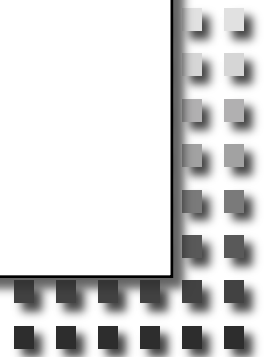
Internet Corporation for Assigned Names and Numbers

(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)

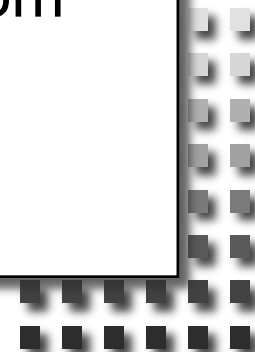
ADs sitting as a body (includes IETF Chair)

Internet Architecture Board

IETF chair also

IETF Chair, ADs & IAB members selected by nomcom

two year terms



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 you
selected by nomcom

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





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

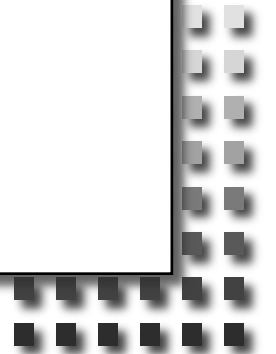
charters then go to IESG & IAB for final approval

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: be 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)

Ted Hardie <hardie@qualcomm.com>

Scott Hollenbeck <sah@428cobrajnet.ne>

Internet (**int**) (26 WGs)

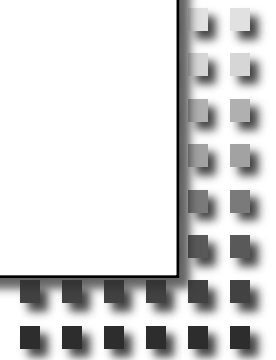
Mark Townsley <townsley@cisco.com>

Margaret Wasserman <margaret@thingmagic.com>

Operations & Management (**ops**) (21 WGs)

David Kessens <david.kessens@nokia.com>

Bert Wijnen <bwijnen@lucent.com>





IETF Areas (cont.)

Routing (**rtg**) (15 WGs)

Bill Fenner <fenner@research.att.com>

Alex Zinin <zinin@psg.com>

Security (**sec**) (19 WGs)

Sam Hartman <hartmans-ietf@mit.edu>

Russ Housley <housley@vigilsec.com>

Transport Services (**tsv**) (26 WGs)

Allison Mankin <mankin@psg.com>

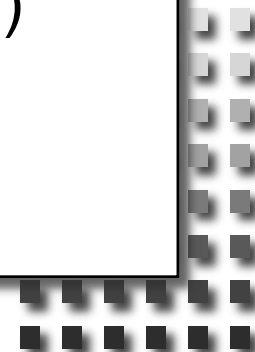
Jon Peterson jon.peterson@neustar.biz

Real-time Applications and Infrastructure (**rai**) (soon)

TBD/TBD



I E T F





IETF Secretariat

(currently) Fortec - Reston Virginia

move “soon” to new vendor to be managed by the
IASA

IETF Administrative Support Activity

funded from IETF meeting fees & ISOC

runs

plenary meetings, mailing lists,

Internet-Draft directory, IESG teleconferences

coordinates

day to day work of IESG and working groups





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

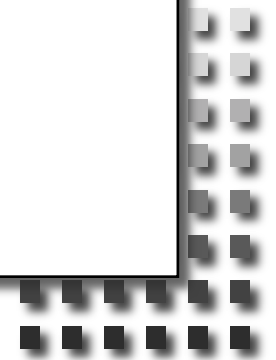
money from meeting fees & ISOC

responsible for IETF finances

contracts for IETF support functions

Secretariat functions, RFC Editor & IETF-IANA

deals with IETF IPR



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

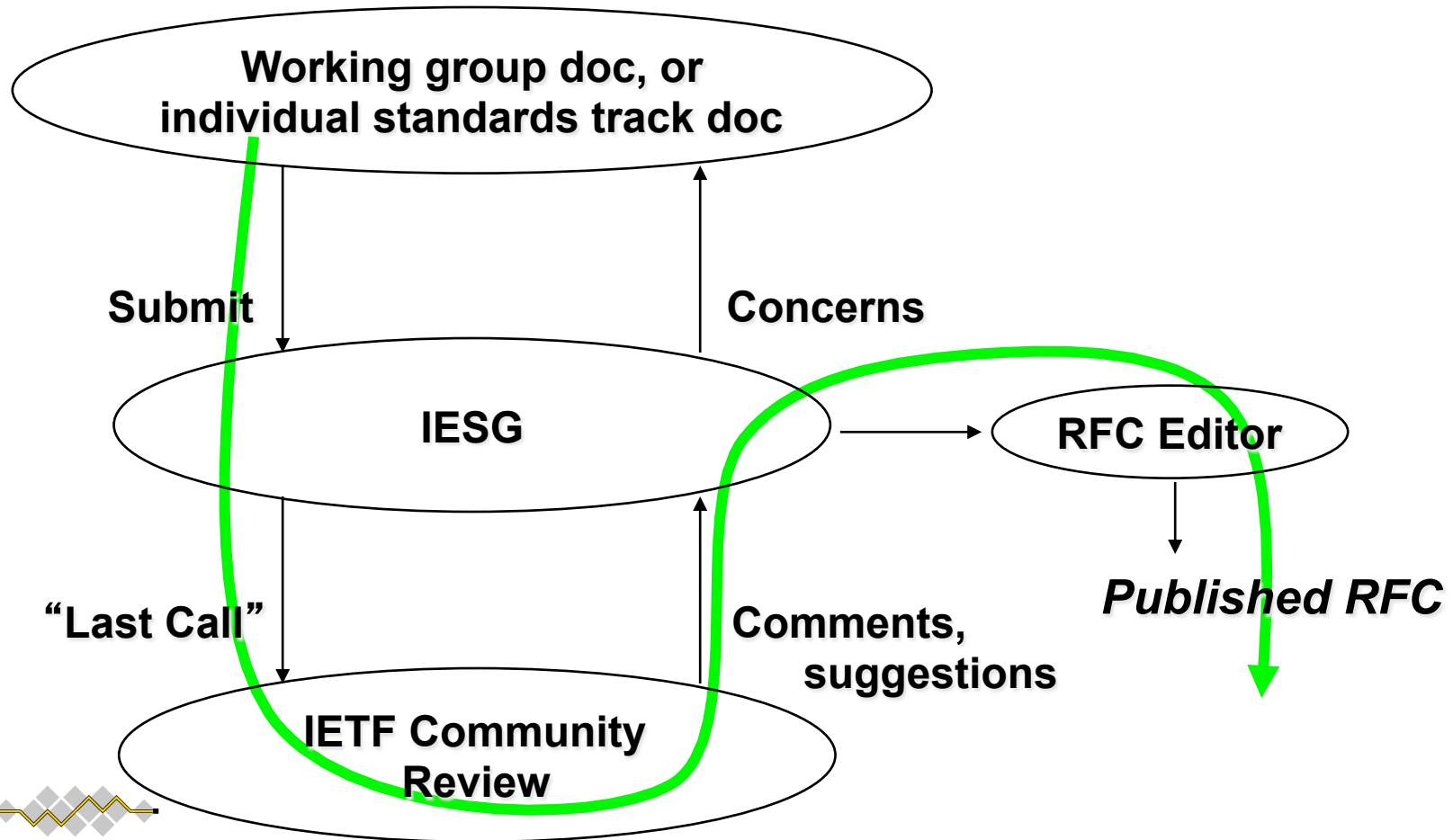
IETF Last-Call (4-week if no Working Group)

IESG review

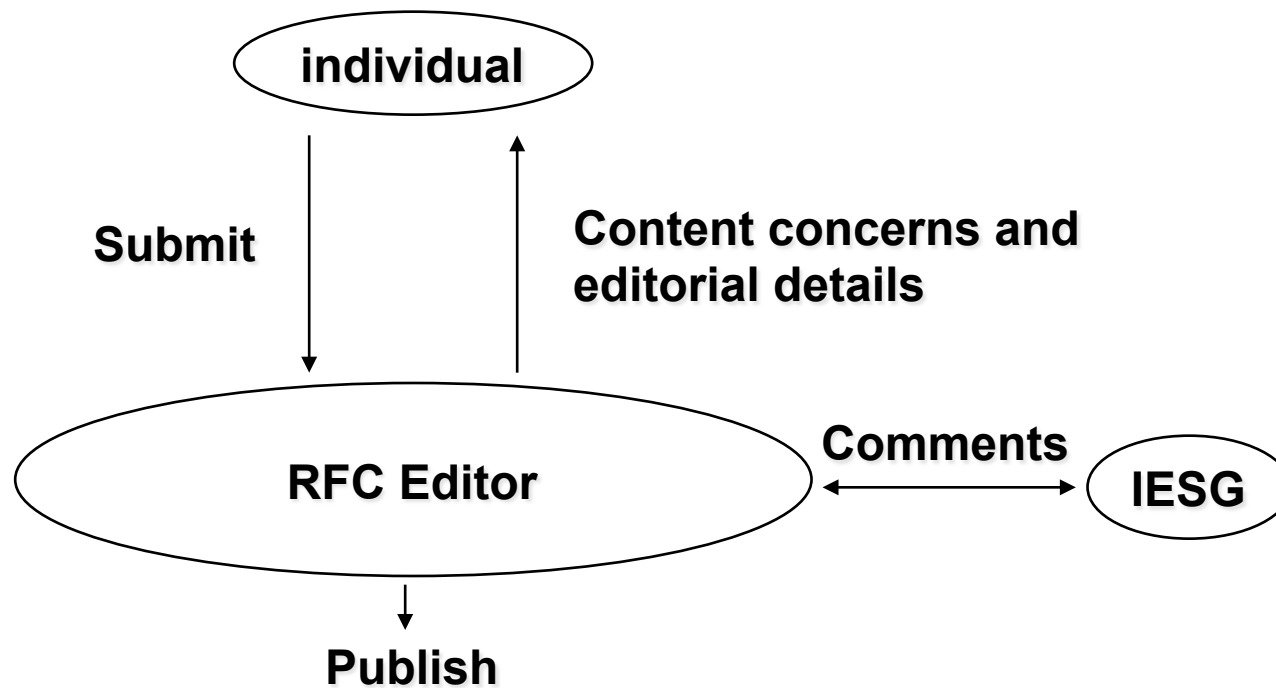
can be sent back to working group

publication as RFC

IETF Submission



Non-IETF Submissions





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

BOFs generally only meet once

can lead to a W G or can be a one time thing



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

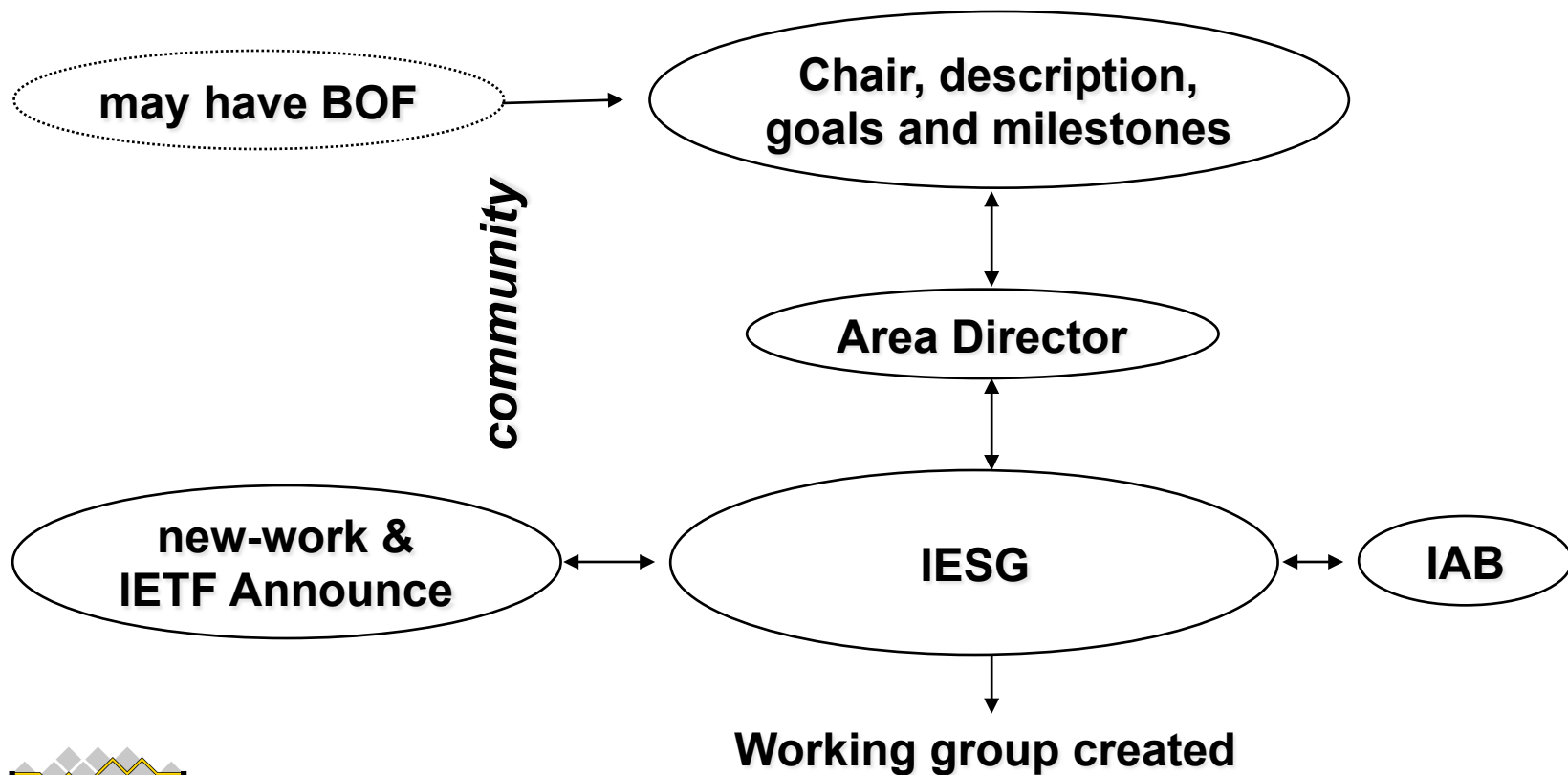
restrictive charters with milestones

working groups closed when their work is done

charter approved by IESG with IAB advice

AD with IESG has final say on charter

Working Group Creation





Working Groups. contd.

no defined membership

just participants

“***Rough consensus** and running code...*”

no formal voting

can do show of hands or hum - but **no** count

does **not** require unanimity

disputes resolved by discussion

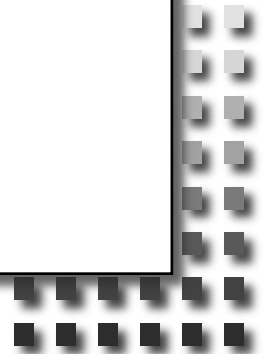
mailing list and face-to-face meetings

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!**)



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



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** ...



I E T F

... 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

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

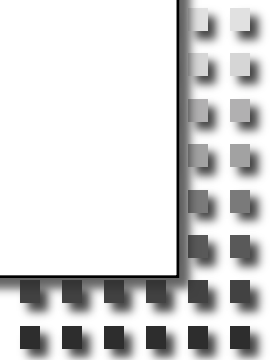
note: **interoperability** not conformance

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?
demand open 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 patents?

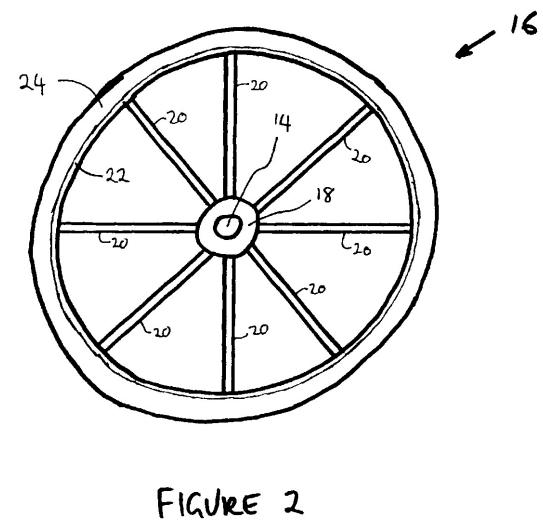
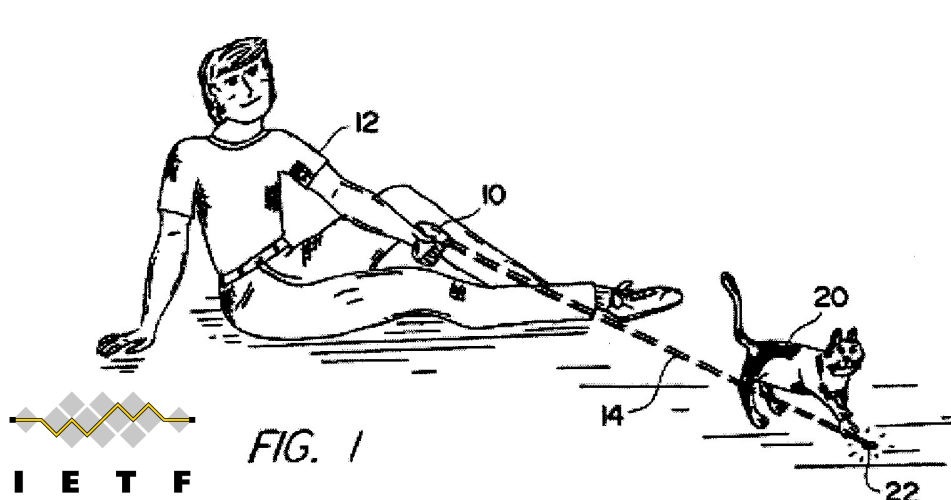
Patents - Issues

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)





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



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



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



IETF IPR Trust

legal trust

container for IETF-related IPR e.g.:

copyrights

domain names

software

documents

not a patent pool

IETF owns no patents

in process



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 ...



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 ...

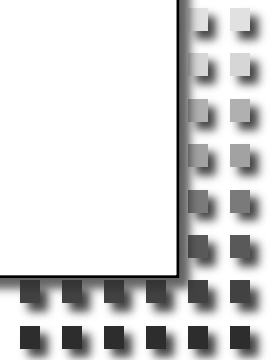


Note Well (3)

“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.”





Other IETF Training/Tutorials

1300 - 1430 Newcomer's Training (English)

1300 - 1500 Security Tutorial

1500 - 1700 Introduction to WG Leadership: Chairs & Editors

1500 - 1700 DNS for Programmers

1700 - 1900 Welcome Reception

(talking to IETF people is often an education!)



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