IETF Structure and Internet Standards Process

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77th IETF
Anaheim, California, USA



Agenda

history & overview
role & scope
structure & associated groups
management & selection
process & procedure
working group session
IPR



The IETF

Internet Engineering Task Force formed in 1986

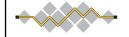
evolved out of US government activities

ARPA's Internet Configuration Control Board (ICCB) (1979) and Internet Activities Board (1983)

was not considered important for a long time - good!! not government approved - great!!

but funding support from U.S. Government until 1997 people not companies

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



Dave Clark (1992)



IETF Overview

Internet standards R us

does not exist (in a legal sense), no members, no voting

The IETF is an organized activity of the Internet Society

1K to 2K people at 3/year meetings

many many more on mail lists

107ish working groups (where the stuff happens)

8 areas (for organizational convenience) with ADs

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

IESG: management (ADs + IETF Chair)

IAB: architectural guidance & liaisons

IETF produces standards and other documents



I E T F

IETF "Standards"

standards: not standards "because we say so"
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
but some government standards refer to IETF standards
lack of formal government input "a problem"
at least to some governments
no submitting to "traditional" bodies



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 IETF is constantly exploring the edges



Scope of Other SDOs

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

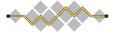
other SDOs trying "fix" or "extend" IETF protocols

they may be trying to solve a different problem or are making different assumptions

problem: what happens when these extensions break underlying protocol assumptions or make non-interoperable versions?

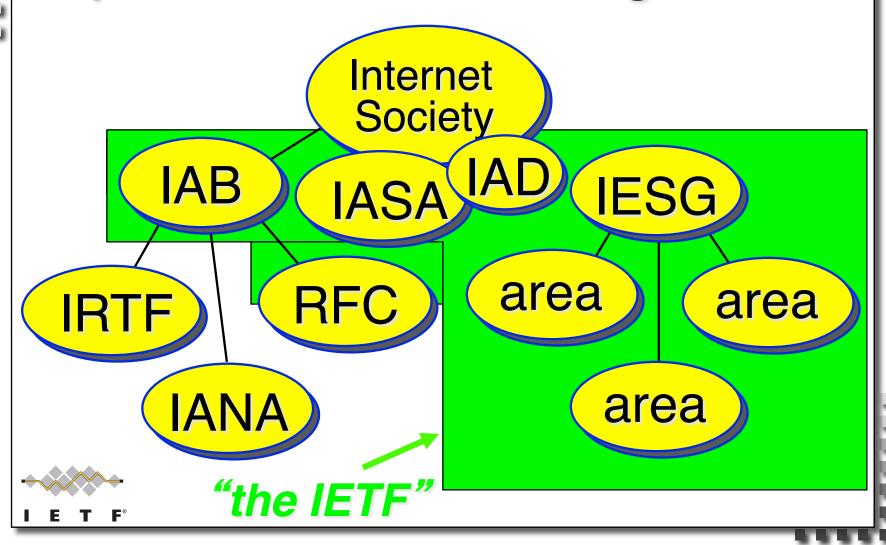
SDO (including IETF) assumption: each SDO modifies its own protocols --- but - see note to ITU-T

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





Top Level View of IETF Organization



The Internet Society (ISOC)

non-profit, non-governmental, independent & international, organization

more than 80 organizational members & more than 28,000 individual members in over 80 chapters around the world

organizational and administrative home for IETF

legal umbrella, insurance, IASA home, IAD employer, etc

ISOC Board of Trustees 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 Society

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)

Host Identity Protocol (HIP) Research Group

IP Mobility Optimizations (Mob Opts) Research Group

Internet Congestion Control Research Group

Network Management Research Group (NMRG)

Peer-to-Peer Research Group





IRTF, contd.

Public Key Next-Generation Research Group

Routing Research Group

Scalable Adaptive Multicast Research Group

Transport Modeling Research Group

Virtual Networks Research GROUP (VNRG)

chair appointed by IAB

most groups are open, some are by invitation only

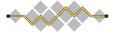
for more information see http://www.irtf.org





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 chartered by the ISOC



I E T F[®]

IAB Oversight Mechanisms

review BOFs provide input to IESG on WG formation & charters sponsor & organize IRTF convene topic-specific workshops mostly invitation only organize ad-hoc expert groups to adjudicate technical disputes write IDs/RFCs stating IAB opinion community & IESG review participate in WG discussions





Internet Assigned Number Authority (IANA)

assigns numbers and keeps them from colliding protocol numbers (ports, MIME types, etc)
IP addresses
mostly delegated to 5 regional IP Address registries

deals with top level domains (TLDs - e.g., .com, .ca, .us, ...) mostly delegated to DNS name registries

IANA predates IETF

domain names



IANA Contd.

functions sort of under IETF after IETF formed but paid for by US government

functions split from IETF with the creation of Internet Corporation for Assigned Names and Numbers (ICANN)

(semi) independent corp. took over IANA functions under contract with US government now IETF-IANA and non-IETF-IANA

separate US government contract with ICANN for IANA functions

to be reviewed soon





IETF-IANA

operates under MoU between ICANN and IETF RFC 2860

assigns protocol parameters for IETF protocols but not paid for by IETF

IP protocol numbers

well known TCP/UDP ports

PPP protocol ids

MIME types

etc.





IETF Management

IETF Chair

AD for General Area, chief spokesperson

Area Directors (ADs)

manage individual areas (two per area)

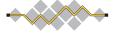
Internet Engineering Steering Group (IESG)

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 Management, contd.

all volunteers

AD job: half to 3/4 time

IAB job: 1/3 time

IETF Chair job: full time

IETF does not pay ADs, IAB members, IAOC members, WG chairs or IETF Chair a salary or expenses

company or self-supported secretariat personnel, RSE, ISE & IAD are paid



IETF Chair

```
Russ Housley <chair@ietf.org>
also chair of the IESG
also AD of the General Area
also ex officio member of the IAB
nominated by IETF community - this now includes you
selected by nomcom
IETF's "CTO" - "Chief Talking (& Traveling) Officer"
```



Area Directors (ADs)

Areas have 2 ADs
except 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
review working group documents
prior to IESG review



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





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 gets list of jobs to fill from IETF chair IETF Chair, IESG, IAB & IAOC members nominate one person for each job IAOC approved by IESG, IESG & IETF Chair approved by IAB, IAB approved by ISOC BoT



IETF Areas

IETF Chair & AD for General Area (gen) - 0 WGs

Applications (app) - 15 WGs

Internet (int) - 28 WGs

Operations & Management (ops) - 15 WGs

Real-time Applications and Infrastructure (rai) - 19 WGs

Routing (rtg) - 16 WGs

Security (sec) - 17 WGs

Transport Services (tsv) - 14 WGs





IETF Secretariat

Association Management Solutions, LLC - Fremont, CA, USA

managed by IETF Administrative Support Activity (IASA)

runs

plenary meetings, mailing lists,

Internet-Draft & directory, RFC production, publication & 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: see RFCs 4071 & 4371

has no authority over the standards process

housed within the Internet Society creates budget for IETF



money from meeting fees & from ISOC

responsible for IETF finances

contracts for IETF support functions

Secretariat functions, RFC Editor & IETF-IANA

deals with IETF IPR





IASA, contd.

```
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 president (ex offico)
plus
members selected by nomcom (2), IAB, IESG & ISOC
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IETF Trust

```
created in Dec 2005 to hold IETF IPR
  copyrights (on RFCs etc)
  domain names (e.g., ietf.org)
  trademarks
  software paid for by IETF
  databases
  etc
IPR created during secretariat contract goes to Trust
not a patent pool
```

Dots

- IAB member (red)
- IESG member (yellow)
- Working Group chair (blue)
- nomcom (orange)
- Local host (green)
- IAOC member (purple)



I E T F°

Standards Procedure

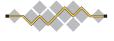
proposals published as Internet Drafts (ID)
worked on in a Working Group
WG sends IESG request to publish an ID 'when ready'
proposal reviewed by AD

can be sent back to working group for more work

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

IESG review

last call comments + own technical review can be sent back to Working Group for more work publication as RFC





Birds of a Feather Sessions (BOF)

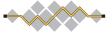
often precedes the formation of a Working Group group of people interested in a topic

convince an AD that they have a good idea - one worth exploring & there are enough interested people to do the work

need description and agenda before a BOF can be scheduled

and sometimes a draft charter

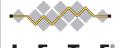
BOFs generally only meet once can lead to a WG or can be a one time thing



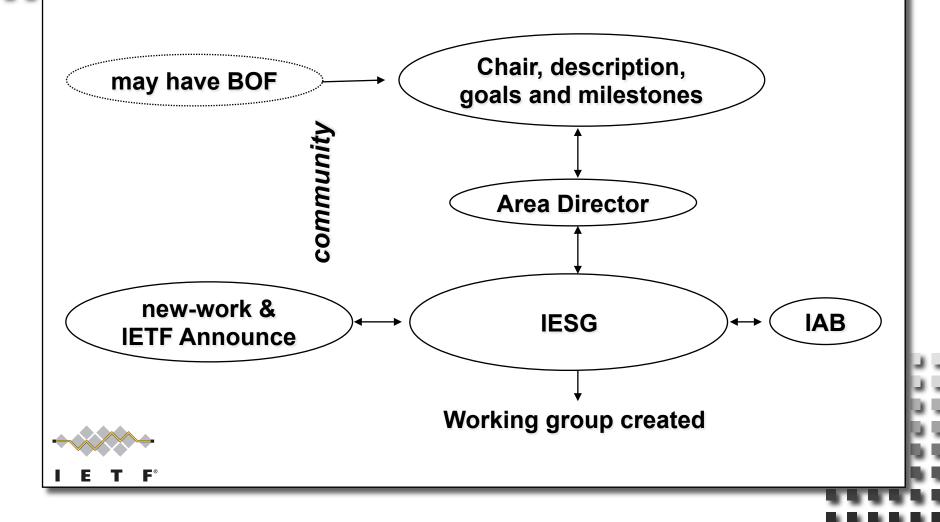
I E T F°

Working Groups

this is where the IETF primarily get its work done most discussions on WG mailing list face-to-face meetings focused on key issues (ideally) note: face-to-face meetings generally quite short Working Groups are focused by charters agreed between WG chair(s) and area director restrictive charters with milestones working groups are 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 not define constituency can do show of hands or hum - but no count

does not require unanimity

chair determines if there is consensus

disputes resolved by discussion

mailing list and face-to-face meetings

final decisions must be verified on mailing list

to ensure those not present are included

but taking into account face-to-face discussion

IETF Document Format

English is the official language of the IETF

but blanket permission is given to translate any IETF document into any language

ASCII is the mailing list and document format

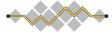
constant discussion of alternate formats

IETF seen as "behind the times" - e.g., (almost) no drawings

but no consensus on alternative format

note that the current format is still readable after 40 years (see RFC 20 for an example)

how many other formats can claim that?





IETF Documents

all IETF documents are open

i.e., anyone can download and make copies (in full)

Internet Draft

IETF working documents

some I-Ds are working group documents

RFC

archival publications (never changed once published)
update or correction gets new RFC number
many different types of RFCs



IETF Working Documents

Internet-Draft random or non-random thoughts input to the process no admissions control other than boilerplate (see IPR) in theory, removed from **IETF** ID directory after 6 months unless under IESG consideration but many mirrors exist, including in IETF Tools all RFCs must pre-exist as IDs to deal with IPR handoff (other than some IANA or RFC Editor created ones)



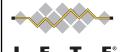


What is a RFC?

RFC used to stand for "Request for Comments"
now just a (brand) name
now tend to be more formal documents than early RFCs
IETF document publication series
RFC 1 Host Software - Apr 7 1969
now over 5000 RFCs

not all RFCs are standards!

see RFC 1796
though some vendors imply otherwise
many types of RFCs



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 ...

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
was one person, then one function
now multiple parts
   oversight (RFC Series Editor - RSE)
      interim RSE appointed by IAB
   editing (RFC Production) - done by Secretariat
   publishing (RFC Publisher) - done by Secretariat
   independent submissions (Independent Stream
     Editor - ISE)
      ISE appointed by IAB
```



I E T F

RFC Production & Publishing

```
receives requests to publish IDs from multiple streams
IETF (via IESG)
IRTF
IAB
Independent Stream (via ISE)
edits IDs for publication
publishes RFCs
```





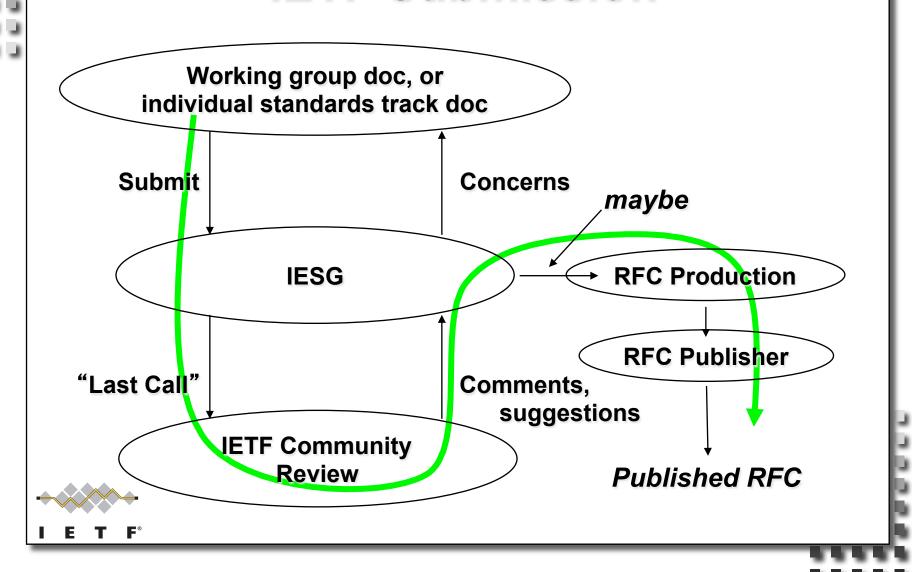
Independent Stream Editor

ISE gets requests to publish IDs can publish informational or experimental **RFCs** asks IESG for advice but can exercise own discretion to publish or not presumption is to publish technically competent and useful IDs

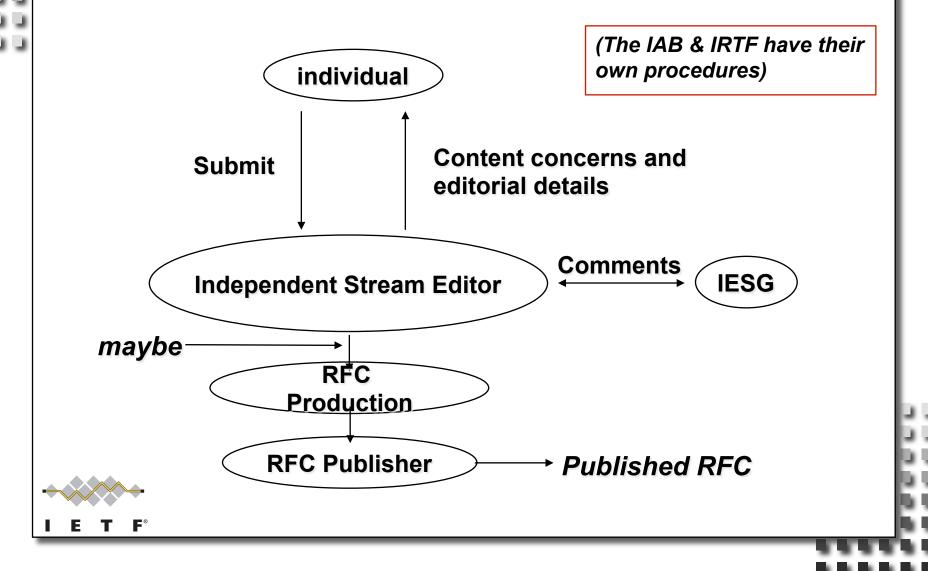
which sometimes is a conflict with IESG



IETF Submission



Non-IETF Submissions



Standards Track RFCs:

```
Best Current Practices (BCP)
   policies or procedures (best way we know how)
3-stage standards track (not all that well followed)
   Proposed Standard (PS)
     good idea, no known problems
   Draft Standard (DS)
     PS + stable
     multiple interoperable implementations
     note: interoperability not conformance
   Internet Standard (STD)
     DS + wide use
```

Other RFC Types

Informational

Experimental

Historical

"The Internet runs on proposed standards" – perhaps first said by Fred Baker, IETF Chair 1996-2001 always check the current status of an RFC before relying on it. A new RFC may obsolete an old one

you can find out by looking at the RFC index



Appeals Process

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 itself is broken, (not that the process was not followed)

then an appeal can be made to the ISOC Board (after the above is complete)

it is OK to appeal decisions – people do (& succeed) but appeals are not quick

starting "low" is the right thing to do

I E T F°

Working Group Session

WGs only meet for a few hours at an IETF meeting most working group work must be done on mailing lists often only specific unresolved issues discussed at meeting so read the IDs before the session advice: listen (and read) before speaking

sessions are being streamed & recorded
so speak directly into the mike (don't look at the questioner)
say your name - every time you get to the mike
for the people in audio-land & for the scribe

sign the blue sheets

record of who is in the room - required for openness

retained but not published



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?



Patents - Issues

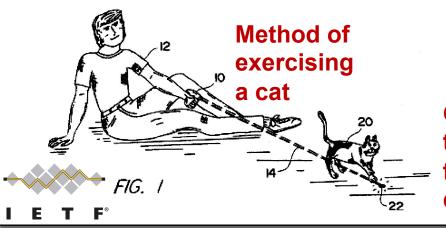
lots of patents in the world some very good, some not so good

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)



Circular transportation facilitation device

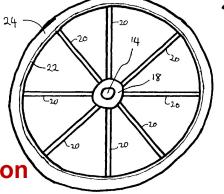


FIGURE 2

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
by requiring multiple implementations based on multiple
licenses to progress to Draft Standard or Internet
Standard

but a worry about "submarine patents"
patent rules part of RFC 2026 replaced by RFC 3979 &
RFC 4879
mostly clarifications





IPR, contd.

IETF IPR (patent) rules (in RFC 3979)

require timely disclosure of your own IPR in your own submissions & submissions of others disclosures published on IETF web site

"reasonably and personally" known to the WG participant

i.e., no patent search required

WG may take 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

E T F or assumed IPR-free

Patents, Cases

"your IPR" = a issued patent or a patent application that is owned directly or indirectly, by you or your employer or sponsor (if any) or that you otherwise have the right to license or assert

example cases:

A/ you want to submit an ID, some part of which covered by your IPR

B/ you see that someone from your company submitted an ID, some part of which covered by your IPR

C/ you discover your IPR that covers some part of a published ID or RFC from you or someone at your company

in these cases you or your company MUST make an IPR disclosure as soon as reasonably possible



Many companies insist that company lawyers do this.

| E T F°

Patents, Cases, contd.

example case:

D/ you find an ID or RFC submitted by someone else, some part of which covered by your IPR

two situations:

1/ you or someone from your employer or sponsor participates in any WG where the ID or RFC is discussed or otherwise participates in any discussion of the ID or RFC

in this situation you or your company MUST make an IPR disclosure as soon as reasonably possible

2/ situation #1 is not the case

in this situation, you SHOULD make an IPR disclosure as soon as reasonably possible



Patents, Cases, contd.

example case:

E/ you know of IPR, other than your own IPR, which covers some part of an ID or RFC

in this case you MAY make an IPR disclosure

the IETF Secretariat will attempt to contact the IPR holder and ask for an IPR disclosure

remember – by participating in the IETF, you are agreeing to abide by its IPR rules

if you are in any doubt, consult the WG chair and your employer's legal experts

the IETF will not give legal advice



I E T F°

IPR (Copyright)

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

also (normally) the right to make derivative works required for standards track documents

author(s) retain all other rights

updated by RFC 5378

expanded rights granted to IETF Trust issue with text copied from older IDs and RFCs

TETF Trust released a FAQ on IETF copyright





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

continued ...





Note Well (3)

All IETF Contributions are subject to the rules of RFC 5378 and RFC 3979 (updated by RFC 4879).

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 5378 and RFC 3979 for details.

continued ...





Note Well (4)

A participant in any IETF activity is deemed to accept all IETF rules of process, as documented in Best Current Practices RFCs and IESG Statements.

A participant in any IETF activity acknowledges that written, audio and video records of meetings may be made and may be available to the public."



Other IETF Training/Tutorials

1300 - 1450 Newcomer's Training (you are here)

1300 - 1450 Security Tutorial (you are not here)

1500 - 1650 Docuent Lifecycle

1500 - 1650 NAT and NAT Traversal Tutorial

1700 - 1900 Welcome Reception

(talking to IETF people is often quite an education!)



What next?

this is where the work happens
read (and understand) before writing
read the drafts
don't be shy
talk to people
look for common ground
help people
don't settle for second-rate



Questions?