Overview of the IETF

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Outline

- Introduction & Brief History of IETF
- IETF organization
- The product: RFCs, STDs, and BCPs
- The IETF Process
- References

Introduction

"The Internet is a work in progress.

There is no central authority.

There are many players independently making changes.

There are many forces of change -- e.g., new technologies, new applications, new commercial forces..."*

"The challenge is to keep a flexible and coherent global architecture"*

*Sally Floyd, "The Evolution of End-to-End Congestion Control", http://www.aciri.org/floyd/talks.html

The Internet Engineering Task Force (IETF)

"... is a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet.

It is open to any interested individual*".

*** From IETF Web page: http://www.ietf.org/**

IETF

Key words:

o Large

Meeting attendance ~ 2000, but email lists involve many more. There are ~115 Working Groups.

o Community

(As opposed to an organization).

IETF is not incorporated, has no officers or directors. IETF has no "official" standing as a standards body -- no charter from any government or treaty organization.

IETF

o Open

Both a populist anti-authoritarian philosophy, and a protection against law suits.

o International

Although the Internet and the IETF originated in the US, there is significant international participation.

o Architecture

The IETF sets technical standards for the Internet. These are published in the RFC document series.

IETF

- **Operation**

  The IETF cannot impose rules for Internet operation, of course. The IETF can only document "good practices". These are published as "Best Common Practices (BCP)" documents.

- **Individual**

  IETF 'Members' represent themselves, not company or country (at least in principle)

IETF Organization

- o Rules flexible, dynamic, pragmatic
- o Evolved, and still evolving, by trial and error.
  - -- On-going rule-making in POISSON WG
  - -- “Just enough” rules

    “The tricky part of describing the IETF process, certainly in the fast-changing world of the Internet, is that when you describe the process in too much detail, the IETF loses its flexibility, hence the name POISSON...”*
- o Strongly shaped by cultural imperatives

* Charter of POISSON Working Group:

http://www.ietf.org/html-charters/poisson-charter.html

Cultural Imperatives

- Open process
- No voting -- “Rough consensus”
- Prototypes before standardization

Summarized in IETF motto:

“Rough consensus and running code!”*

David D. Clark, MIT, in speech to IETF Plenary, ~1994.

Shared Technical Beliefs

1. **Heterogeneity is fundamental**

   Network built of many different technologies.

   This partly explains IETF hostility to ATM as THE E2E technology.

2. **Scaleability is crucial**

3. **Flexibility & adaptability are also vital.**

4. **Tight engineering optimizations are mostly a waste of time, and may be detrimental.**

5. **"End-to-End principal" => dumb network, smart end systems.**

6. **Prefer one general, adaptable mechanism to a set of point solutions.**

A Brief History of IETF

1981: ARPA (Vint Cerf) created board of researchers for technical advice on Internet program.

1984: Reorganized into Internet Advisory Board (IAB)

Initial IAB membership:

-- Dave Clark, Chair and *Internet Architect*

-- Jon Postel, RFC Editor & *Protocol Czar*

-- The chairs of research Task Forces

IAB Research Task Forces -- 1984

- Gateway Algorithms TF (---> IETF)
- New End-to-End Services TF
- Applications TF
- Privacy TF
- Security TF
- Interoperability TF
- Robustness & Survivability TF
- Autonomous Systems TF
- Tactical Internetting TF
- Testing & Evaluation TF

Evolution

o In Sept 1984 IAB meeting, Dave Mills reported:

"The Internet has grown into a very large system:
143 networks in the [host.txt] tables
900+ hosts
85 nets [in the gateway routing tables]"

o The DoD adopted TCP/IP officially, then backed off as the Great OSI War began.

o Task Forces evolved or died, and new ones arose; e.g.

Privacy -> Privacy & Security
Gateway Alg's -> GADS -> INARCH + IETF

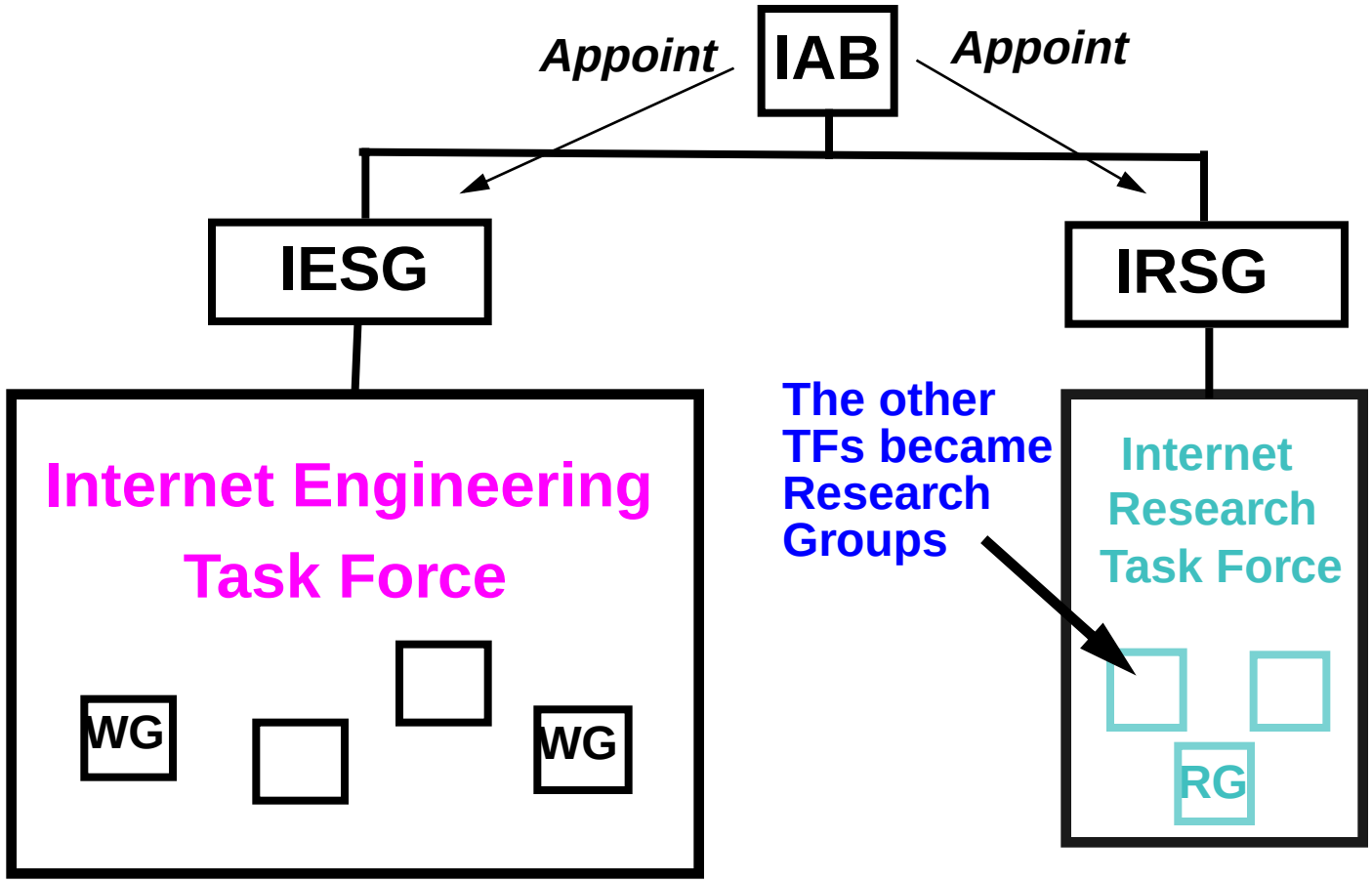
IAB Research Task Forces Jan 1989

- **Internet Engineering TF -- Phil Gross, CNRI**
- **Internet Architecture TF**
- **Autonomous Networks TF**
- **New End-to-End Services TF**
- **User Interface TF**
- **Privacy & Security TF**
- **Scientific Requirements TF**

Five Years Later (1989):

- o The NSFnet backbone had been built
- o The Internet had outgrown the DARPA research program that created it.
- o The IAB and its TFs continued to exist, trying to guide the technical evolution of TCP/IP.
- o The IAB tried to keep Floyd's "flexible & coherent architecture".
- o The IETF TF was clearly outgrowing the org chart, so the org chart was changed.

Organization 1989-1994



Internet Commercialization Began...

and with it, a growing need for some institutional grounding of IETF

199?: Internet Society (ISOC) formed

-- An international professional society, a legal entity, concerned with promoting the Internet.

-- Internet standards process run by IAB became an ISOC activity.

1993-1994: Popular Revolution

Until 1994:

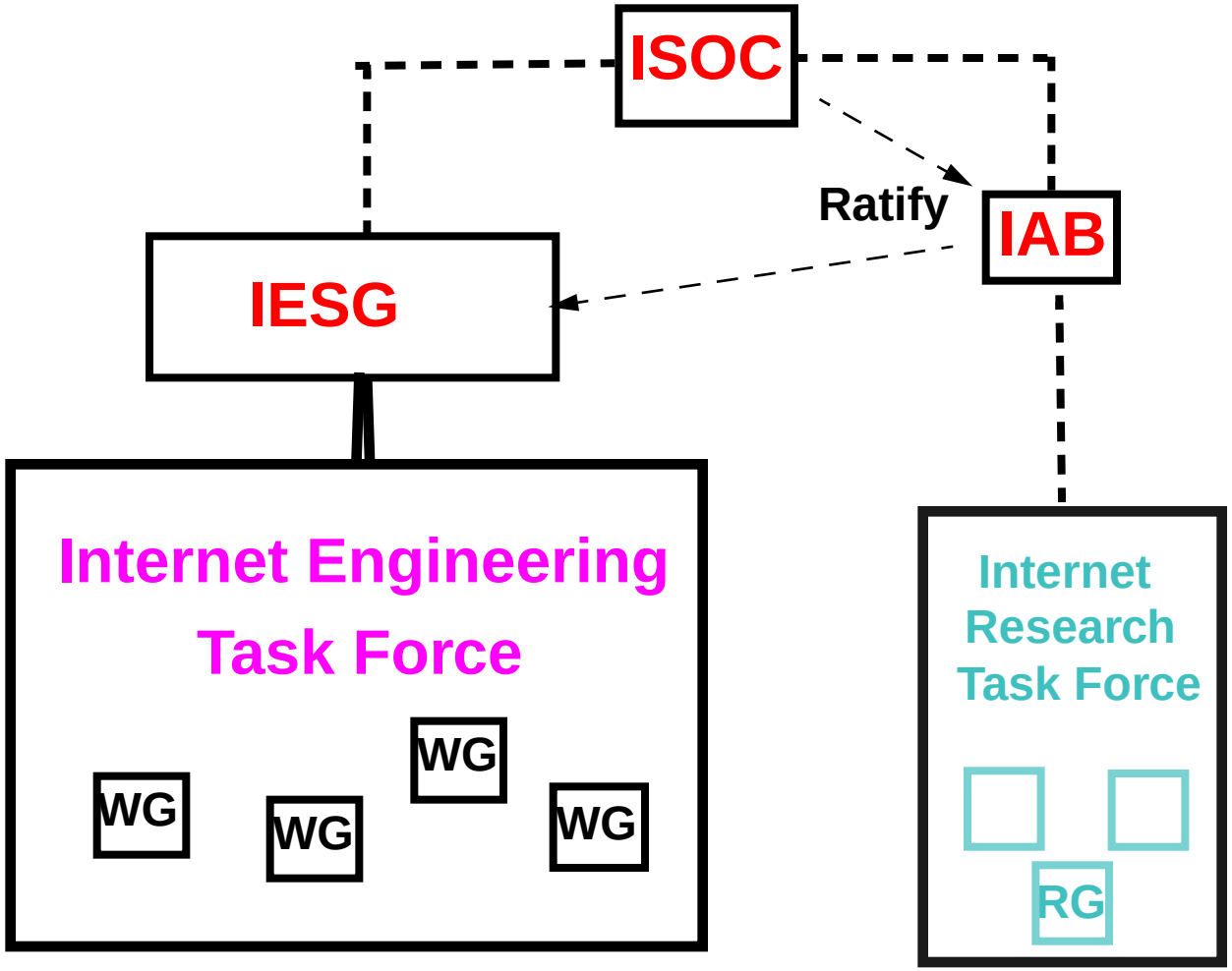
The IAB was the final authority for choosing IESG members and setting Internet standards.
The IESG (Internet Engineering Steering Group) managed IETF activities.

Increasing IETF dissatisfaction with IAB's rule led to popular revolt in IETF.

IESG became final authority for all standards decisions, setting and managing IETF process.

The current organizational rules were established.

Current Organization



Glossary

ISOC = Internet Society

IAB = Internet Architecture Board

IETF = Internet Engineering Task Force

IRTF = Internet Research Task Force

RFC = “Request for Comments” document series

BCP = “Best Common Practices” sub-series.

Working Groups Divided into Areas

- Applications Area -- 35 WGs
- General Area - 2 WGs
- Internet Area - 20 WGs
- Routing Area - 18 WGs
- Security Area - 14 WGs
- Transport Area - 23 WGs
- User Services Area - 3 WGs

There are one or two Area Directors for each area.
These are the key people who do their best to make rational things happen.

Choosing its Leaders

o IESG Members: Area Directors (ADs) plus IETF chair plus a few ex-officio members.

o Chosen by annual quasi-democratic process.

- Members of a Nominating Committee ("NomCom") randomly drawn from a pool of volunteers.

- The Nominating Committee finds & picks nominees for open IESG (and IAB) positions.

- IAB ratifies nominees for IESG (and ISOC board ratifies nominees for IAB).

See RFC 2027.

Other Important Organizations

- **The RFC Editor**

  Publishes the "Request for Comments" archival document series.

  - **Standards-track documents**

    Proposed Standard, Draft Standard, Internet Standard

  - **Experimental**

  - **Informational**

- **The IANA (Internet Assigned Number Authority)**

  Assigns protocol parameters

  Related to ICANN (please don't ask ... !)

IETF Meetings

- o One week (Mon - Friday AM), 3 times per year.
- o Organized by the IETF secretariat
- o Announcements sent to the ietf-announce mailing list (see IETF Web page for subscription).
- o Many WGs meet at once. Despite heroic attempt to minimize conflicts, there will be some.
- o Many people meet/work from 7AM to 10PM.
- o Good terminal room facilities.

Web Pages

IETF: http://www.ietf.org

IAB: http://www.iab.org

IRTF: http://www.irtf.org

RFC-Editor: http://www.rfc-editor.org

IANA: http://www.iana.org

References

- RFC 2026 -- Internet Standards Process
- RFC 2027 -- IAB, IESG Selection
- RFC 2028 -- IETF Organization
- RFC 2223 -- Instructions to RFC Authors
- RFC 1613 -- Working Group Guidelines and Procedures

VoIP and the IETF

A major challenge to the IETF and the Internet

- TBD: Does (large-scale) VoIP make economic and technical sense?
- Telephony: New technical sub-community in IETF,

  with their own cultural imperatives and technical principles.

  Used to tightly optimizing/engineering their networks.

VoIP and the IETF...

o IETF management problems will be increased

-- Economic pressure to get any solution standardized yesterday, without overall plan.

-- It is hard for the IETF management (or members) to block mediocre or bad ideas.

o The pace of technological change will not decrease anytime soon.

We live in interesting times.