Introduction to the
Internet Engineering Task Force
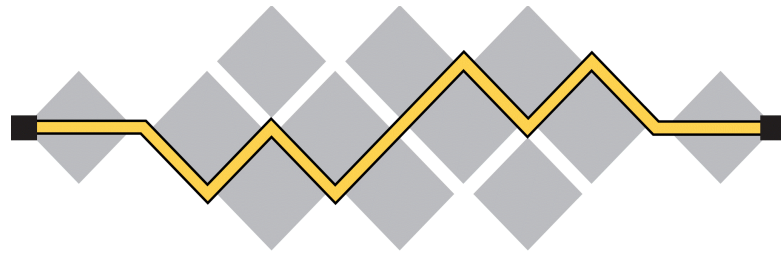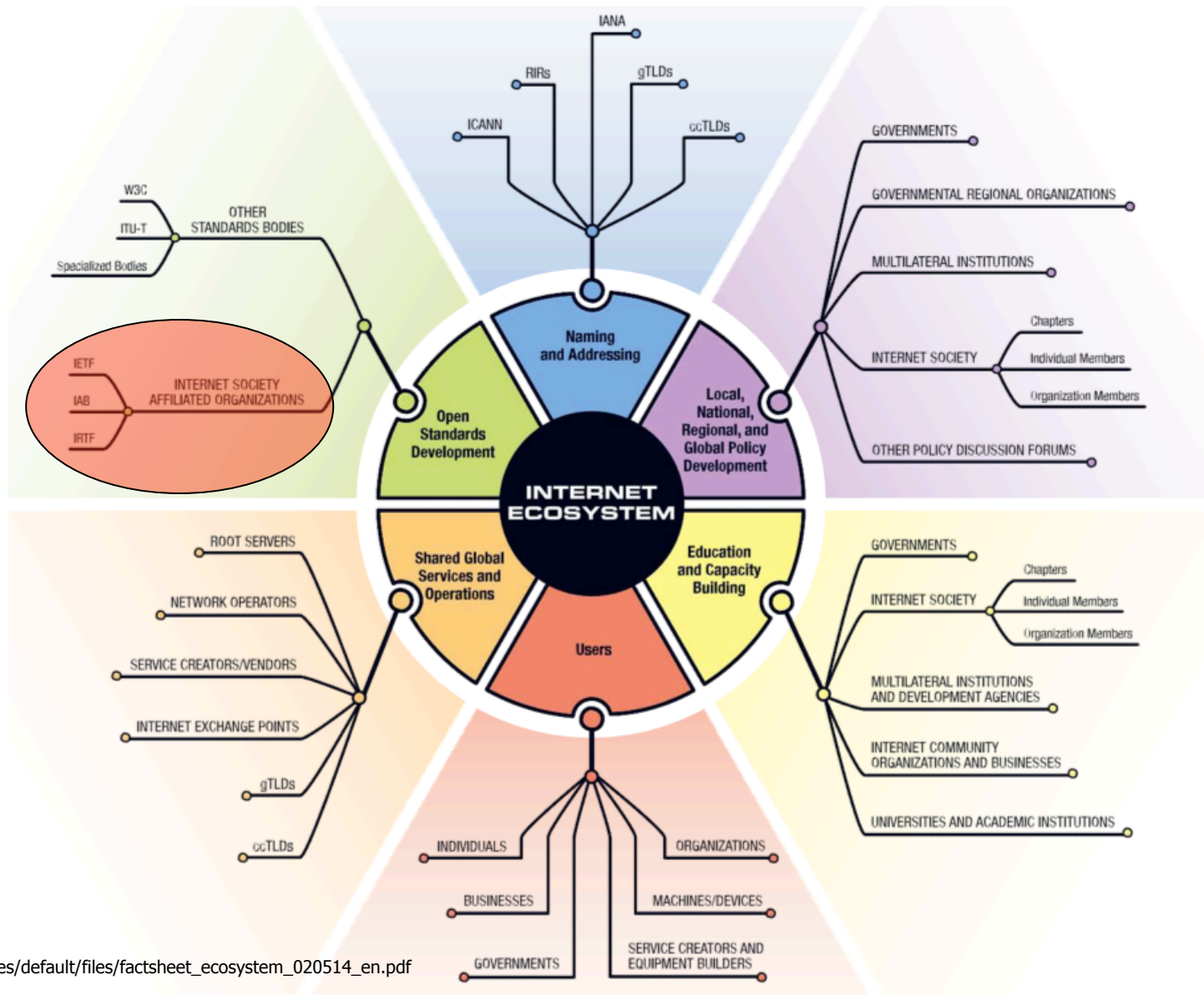
I E T F®

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October 2015

The Internet Ecosystem

http://www.isoc.org/sites/default/files/factsheet_ecosystem_020514_en.pdf

Internet Engineering Task Force

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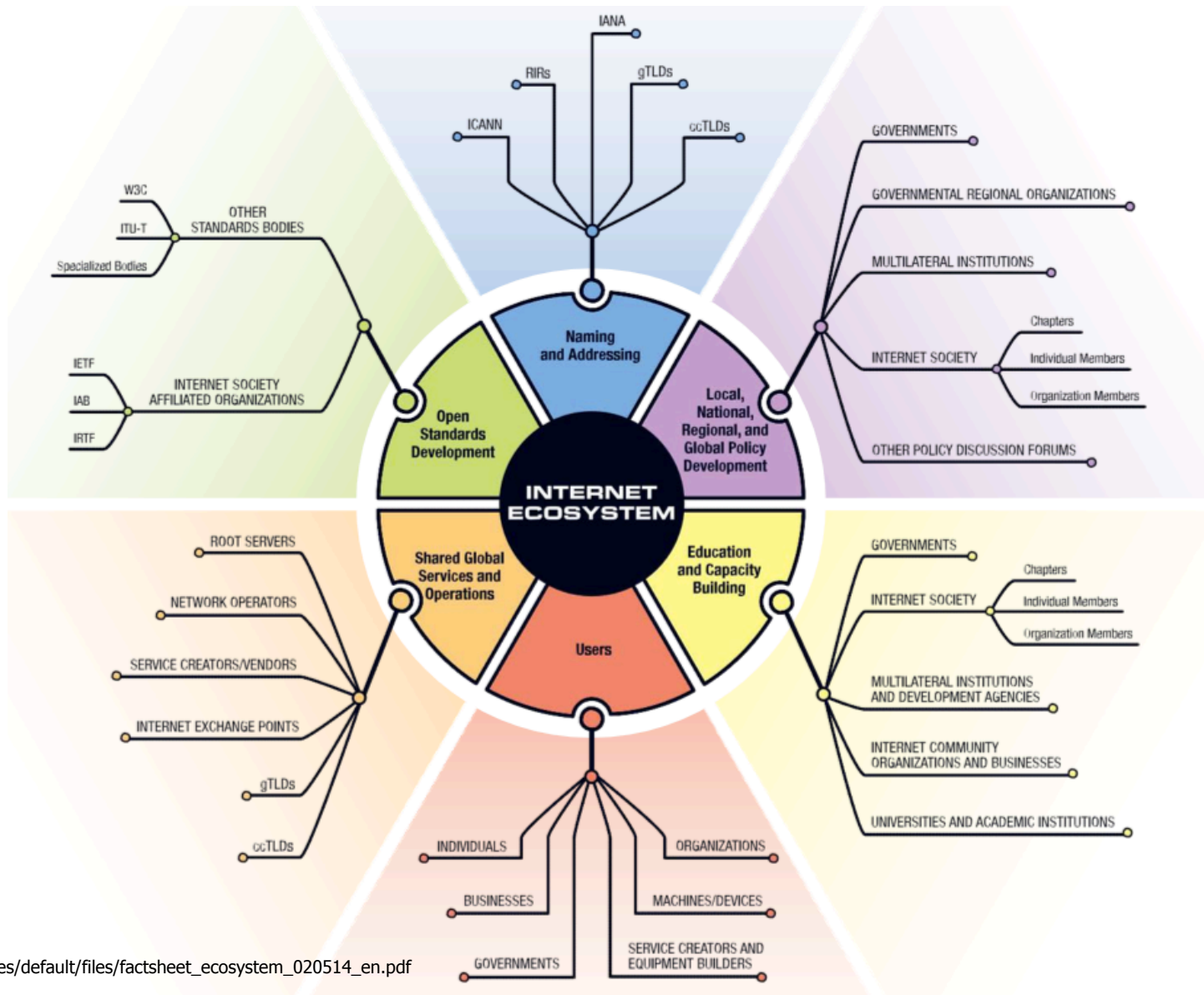
Internet Engineering Task Force

- "We make the net work"
- RFC 3935: The mission of the IETF is to produce high quality, relevant technical and engineering documents that influence the way people design, use, and manage the Internet in such a way as to make the Internet work better. These documents include protocol standards, best current practices, and informational documents of various kinds.

IETF Motto

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

Dave Clark, MIT

IETF Participants

RFC 4677: The Internet Engineering Task Force is a loosely self-organized group of people who contribute to the engineering and evolution of Internet technologies. It is the principal body engaged in the development of new Internet standard specifications.

- Everyone is invited to participate
- An open and international community
- Interested individuals, not companies
- Goal: rough consensus – no voting
- Remote participation is common

Rough Consensus

- No defined IETF membership; just participants

    We believe in rough consensus and running code

- Does not require unanimity
- Because there is no constituency, there is no formal voting
    - Sense of room often gauged by hum
- Disputes are resolved by discussion
- Decisions verified on mail list
    - Ensures that people that are not present at a face-to-face meeting have their say
- RFC 7282: On Consensus and Humming in the IETF

Open Standards

The mission of the IETF is to make the Internet work better. However, no one is "in charge" of the Internet. Instead, many people cooperate to make it work. Each person brings a unique perspective of the Internet, and this diversity sometimes makes it difficult to reach consensus. Yet, when consensus is achieved, the outcome is better, clearer, and more strongly supported than the initial position of any participant.
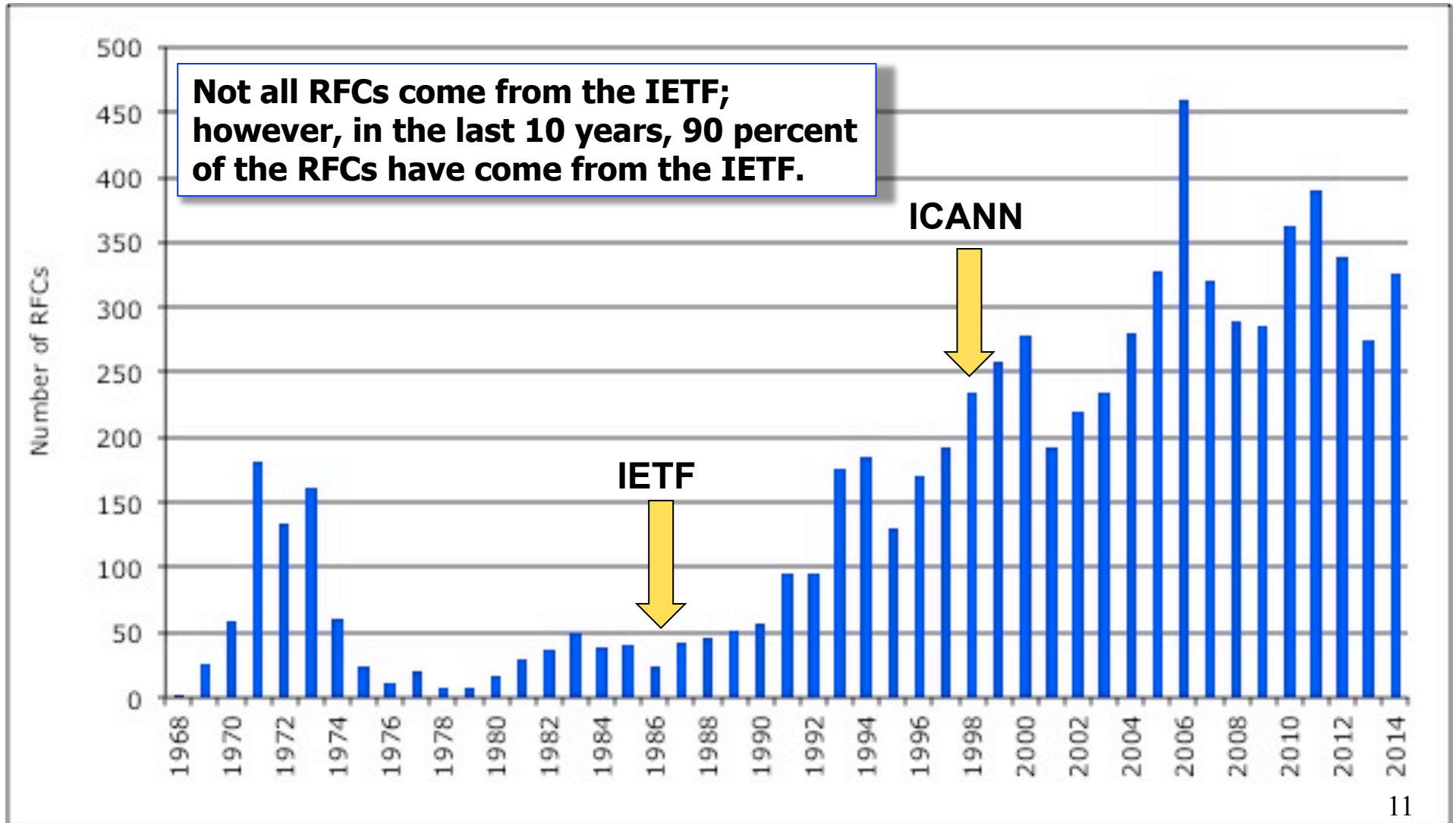
Internet-Drafts

- Proposals in the IETF start out as Internet-Drafts (also called "IDs" or just "drafts")

- Anyone can write drafts, even those who don't go to meetings

- After a draft is accepted in the IETF, it goes through the RFC publication process and then becomes an RFC

IETF Document Format

- English is the official language of the IETF
  - Blanket permission is given to translate any IETF document to other languages
- ASCII is used today
- Moving to XML for authoritative format soon
  - Produce plain text, HTML, and PDF
- After 44 years, everyone can still read the RFCs
  - See RFC 20

RFCs Published

Not all RFCs come from the IETF; however, in the last 10 years, 90 percent of the RFCs have come from the IETF.

Some IAB and IETF RFCs

RFC 1034-1035: Domain names

RFC 1591: DNS Structure and Delegation

RFC 2826: IAB calls for a unique DNS Root

RFC 3912: WHOIS Protocol Specification

RFCs 4034-4035: DNSSEC

RFCs 5890-5895: Internationalized Domain Names

RFCs 7480-7485: Registration Data Access Protocol

**RFC 7500**: Principles for Operation of IANA Registries

RFC 7540: HTTP/2

…

Ethos of the IETF

- IETF uses an open standards process
  - All interested people are invited to participate
  - Even if unable to attend the face-to-face meetings, participants can join mail list discussions
  - All documents are online, available to everyone
  - Online consensus calls; no barriers for participation
- One Internet
  - Open standards for a global Internet
  - Maximum interoperability and scalability
  - Avoid specialized protocols in different places
- Contributions are judged on merits:
  rough consensus and running code

IETF Meeting Attendance
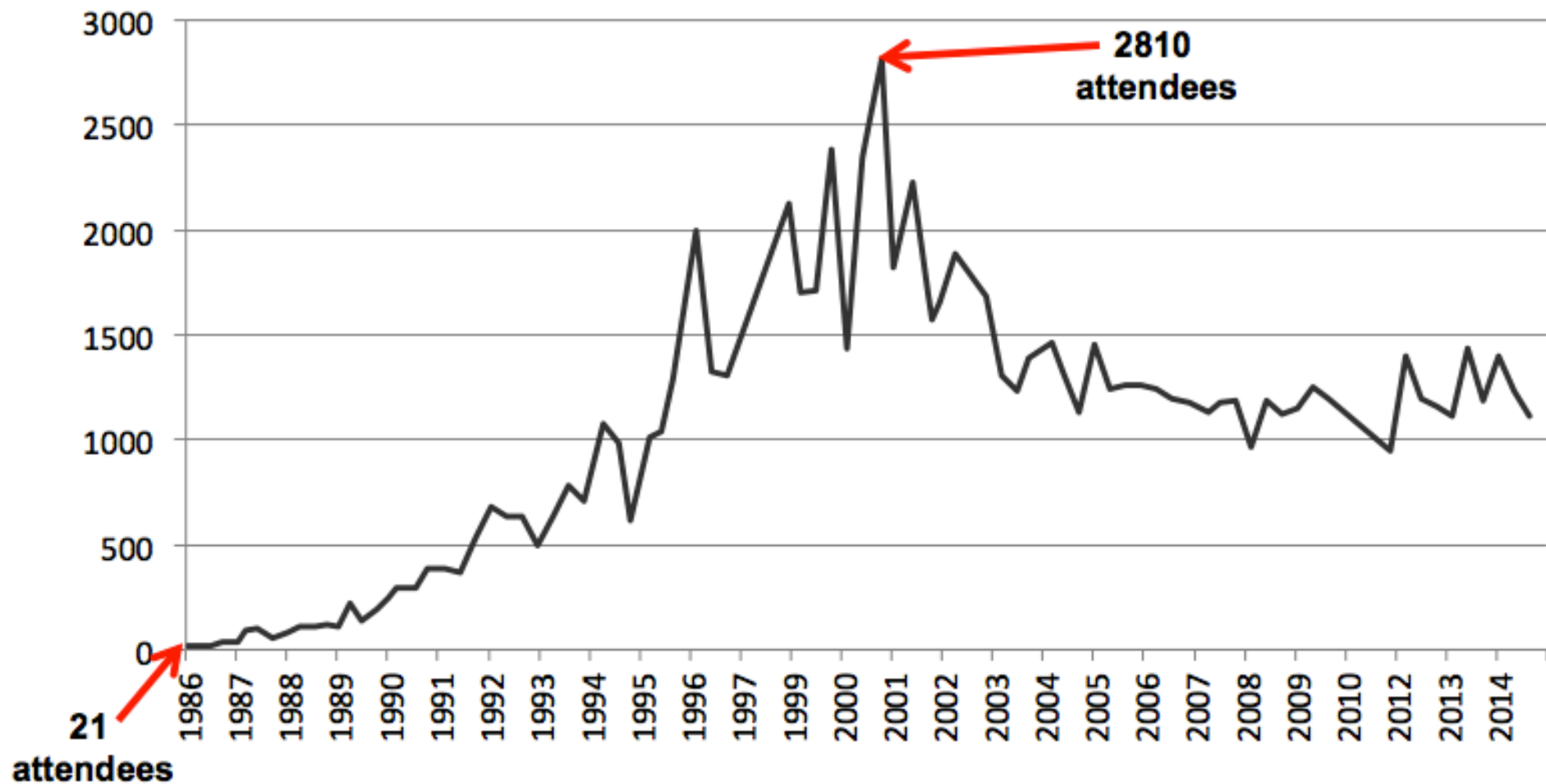
IETF Takes on Work When…

- The problem needs to be solved
    - Avoid specialized protocols in different places
    - Research complete; engineering work needed
- The scope is well defined and understood
- Agreement on specific deliverables
- Reasonable probability of timely completion
- People willing to do the work

IETF is Most Successful When…

- Participants care about solving the problem
- Participants exhibit open minds and consider multiple points of view

However, there have been bad experiences with problems that span Standards Development Organizations (SDOs)

- Must be vitally important topic to do it again
- Note: WEBrtc and RTCweb seem to be working very well between IETF and W3C

IETF Structure Overview

- The IETF is not a legal entity – no members
- 1000 to 1200 people at three meetings each year
  - Many more people on mail lists
- About 120 Working Groups (WGs)
  - Where the real work gets done
- Currently there are seven Areas
  - Each Area lead by two or three Area Directors
  - Except General Area, which is lead by IETF Chair
- IESG: Area management, standards approval
- IAB: Architectural guidance, liaison, oversight
- IAOC: Oversee budget, contracts, and IPR

IETF Organizational Overview
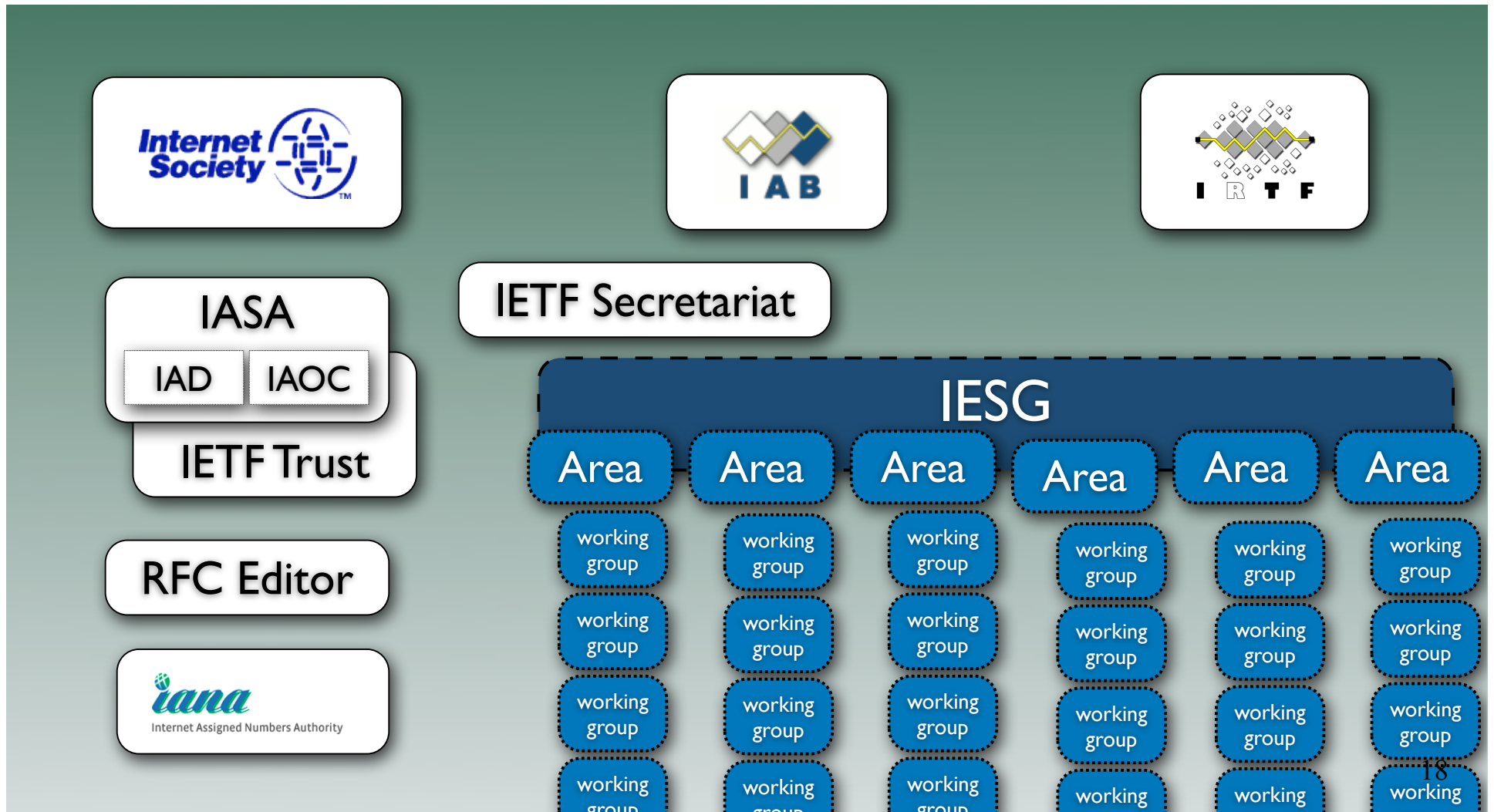
Internet Society (ISOC)

- Administrative "home" for the IETF and the IAB
  - Neither the IETF nor the IAB are legal entities
  - ISOC was formed when the US National Science Foundation stopped funding the IETF Secretariat
  - IETF Administrative Director (IAD) is an ISOC employee and manages all of the contracts that support the IETF
    - The only person that "works for" the IETF
- President of ISOC appoints the IETF Nominations Committee Chair, kicking off the process to select IETF leaders

Internet Architecture Board (IAB)

- Provides overall Internet architecture *advice*
- Provides technical advice to the Internet Society
- Manages external liaison relationships for IETF
- Appoints the RFC Editor and oversees RFC series
- Selects IANA registry operator for protocol parameters and oversees their operation
- Confirming body for the IESG membership
- Appeals
  - IAB is the final step for all technical appeals
  - ISOC Board is the final step for process appeals

IETF Areas

- **Areas** are led by Area Directors (ADs)
    - Applications and Real Time – ART –three ADs
    - Internet – INT –two ADs
    - Operations & Management – OPS –two ADs
    - Routing – RTG –three ADs
    - Security – SEC –two ADs
    - Transport and Services – TSV –two Ads
    - General – GEN – led by IETF Chair

Area Directors (ADs)

- Each Area has two or three ADs, except General Area
- Responsible for guiding direction in Area
- Responsible for managing process in Area
  - Appoint Working Group (WG) Chairs
  - Close WGs when work is complete or focus is lost
- Review WG documents for sound technical solution as well as proper process
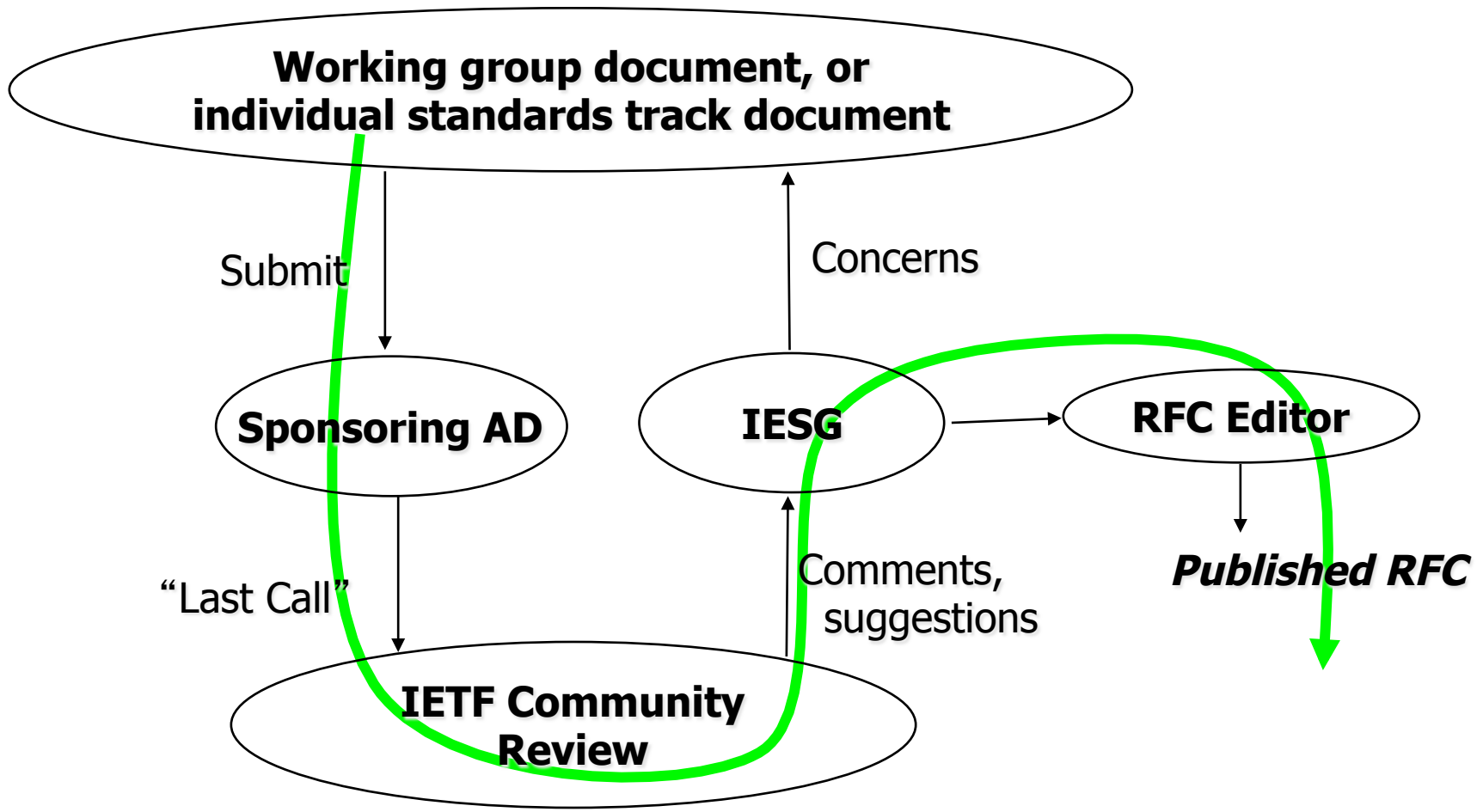
Internet Engineering Steering Group (IESG)

- **15 ADs**, includes IETF Chair for General Area
- Process management and IETF RFC approval body
- Approves Working Group creation and charter
- Reviews technical solution and process
  - Multi-disciplinary technical review
- Approves publication of all IETF documents
  - Ensures that non-IETF RFCs are not an "end run" around Internet standards process

Working Groups

- WGs are primary mechanism for development of specifications and guidelines

- IESG approves WG charters with IAB input
  - Generally short lived
  - Address a specific problem or produce specific deliverables

- No formal membership; participation open to all
  - Every WG has a mail list

- WG Chair
  - Sets agenda for meetings
  - Appoints document editors and optional WG secretary
  - Determines when rough consensus has been reached

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IETF Standards Approval

Working group document, or individual standards track document

Submit

Concerns

Sponsoring AD

IESG

RFC Editor

"Last Call"

Comments, suggestions

Published RFC

IETF Community Review

IETF Standards Process

- **Identify Need**
  - Birds of a Feather (BOF) Session often used to demonstrate the need, show there are people interested in using the proposed outcome, and identify people willing to do the work
  - Compose a draft charter for the Working Group
- **Organize Working Group**
  - Working Group charter approved by the IESG
  - Open mail list discussions and open meetings
- **Develop Draft**
  - Internet-Draft documents are public
  - Small Design Team often tackles a technical issue

IETF Standards Process (2 of 2)

- **Formal Review**
  - Working Group Last Call is optional
  - Area Director review
  - IETF-wide Last Call
- **Approve Standard**
  - IESG evaluates and approves document
- **Publish Approved Standard**
  - RFC available for free download
  - IETF Trust and the authors hold copyright

Nominations Committee

- IETF Chair, ADs, IAB and 2 of the IAOC members are picked by Nominations Committee (NomCom)
  - NomCom Chair appointed by ISOC President
- Volunteers serve as NomCom voting members
  - Volunteers must attend 3 of last 5 IETF meetings
  - Ten voting members are randomly selected from the volunteer pool
- NomCom picks one person for a two year term
- Confirmation before names are announced
  - IETF Chair and ADs confirmed by IAB
  - IAB confirmed by ISOC Board of Trustees
  - IAOC confirmed by IESG

IANA Protocol Parameter Registries

- Registries of parameter values used in Internet protocols are stored and maintained by the IANA, subject to policy in RFCs

- For 15 years, this IANA function has been provided by ICANN, formalized through MoU signed 2000 [RFC 2860]

- Over time, processes and role definitions have evolved, and have been documented in supplemental agreements, often called the Service Level Agreement (SLA).

Protocol Parameters

- Some IETF standards need a registry of port numbers or other similar values
- Similar to the manner that the IEEE registers values for their standards
- Example: HTTP error codes

- Registries and (some) values are specified in RFCs

- Thousands of registries

- No direct operational Internet impact; all effects take place through vendors and implementors

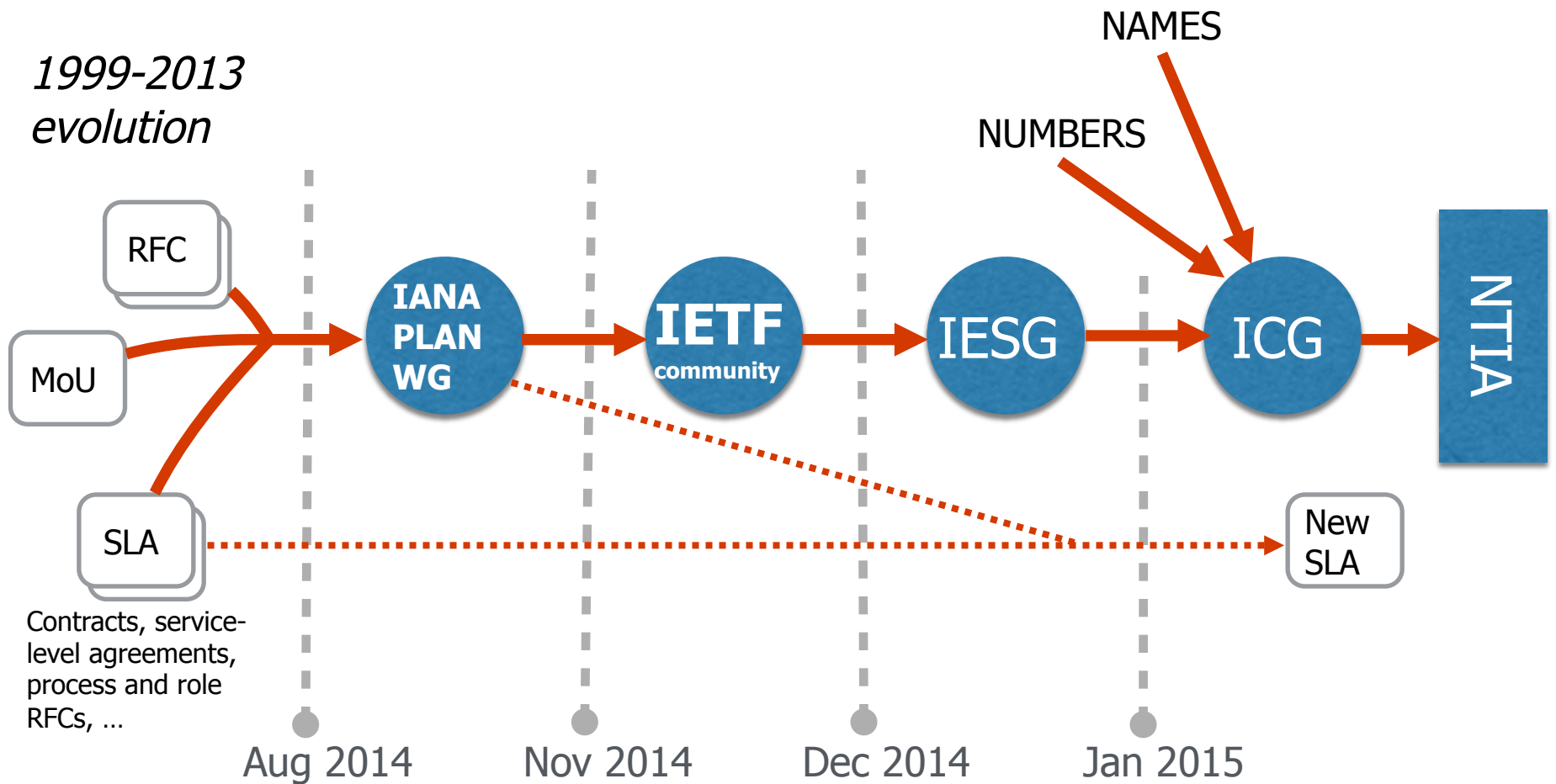| Value	Description	Reference
400	Bad Request	RFC 7231
401	Unauthorized	RFC 7235
402	Payment Required	RFC 7231
403	Forbidden	RFC 7231
404	Not Found	RFC 7231

IETF and IANA Division of Labor

- IETF makes **policy** decisions for protocol parameter allocations

- IAB provides **oversight**

- IETF contracts with the IANA service operator for **implementation** of the protocol parameter registries

- Arrangements have matured over time

- 35+ years of good experience with this structure

IAB
Oversight

IETF
Policy

IANA
Implementation

OBJ
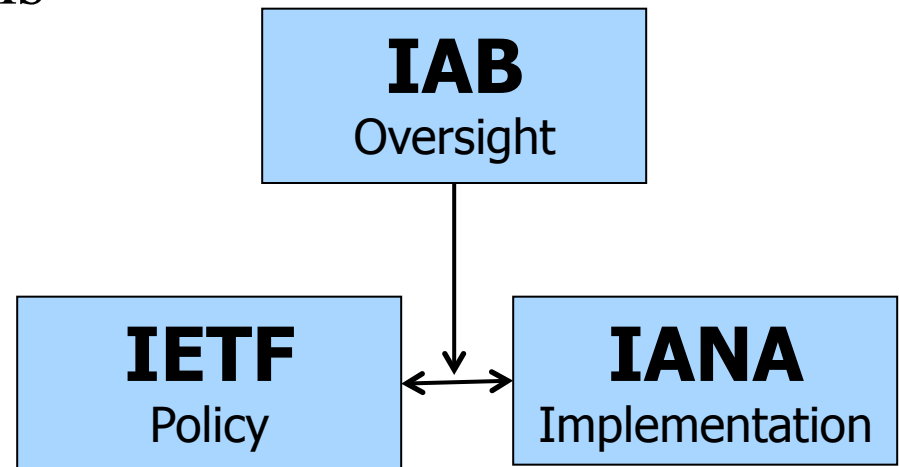
IANA Stewardship Transition

- ICANN has contract with the U.S. NTIA
- In March 2014, NTIA announced intention to transition out of IANA stewardship role
- NTIA requested a transition proposal and provided evaluation criteria

IETF Proposal Development Overview

1999-2013 evolution

RFC

MoU

SLA

Contracts, service-level agreements, process and role RFCs, …

IANA PLAN WG

IETF community

IESG

ICG

NTIA

NAMES

NUMBERS

New SLA

Aug 2014   Nov 2014   Dec 2014   Jan 2015

These dates will likely change this week

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IETF IANAPLAN WG

- The IANAPLAN WG is in the General Area
- Produced an IETF consensus on expected interaction between the IETF and the operator of protocol parameter registries
- Addressed the implications of NTIA moving out of its current role with respect to the protocol parameter registries
- Focused on continuation of current arrangements
- Most work finished earlier this year

# Protocol Parameter Registry Transition Proposal

- IANA WG proposal was delivered to the IANA Stewardship Transition Coordination Group (ICG) in January 2015

- The U.S. Government has little to no role with the protocol parameter registries, so the IETF has put forward a transition proposal that is evolutionary

- https://www.ietf.org/id/ draft-ietf-ianaplan-icg-response-09.txt

IETF Summary

- **The Internet works on IETF standards!**
- IETF uses an open standards process
    - Everyone is invited to participate
    - All documents available to public for free
    - Join mail list discussions, and face-to-face meetings if able
- One Internet
    - Open standards for a global Internet
    - Maximum interoperability and scalability
    - Avoid specialized protocols in different places

IETF Summary – IETF Movie

http://www.youtube.com/watch?v=tqc8vd_jPpg
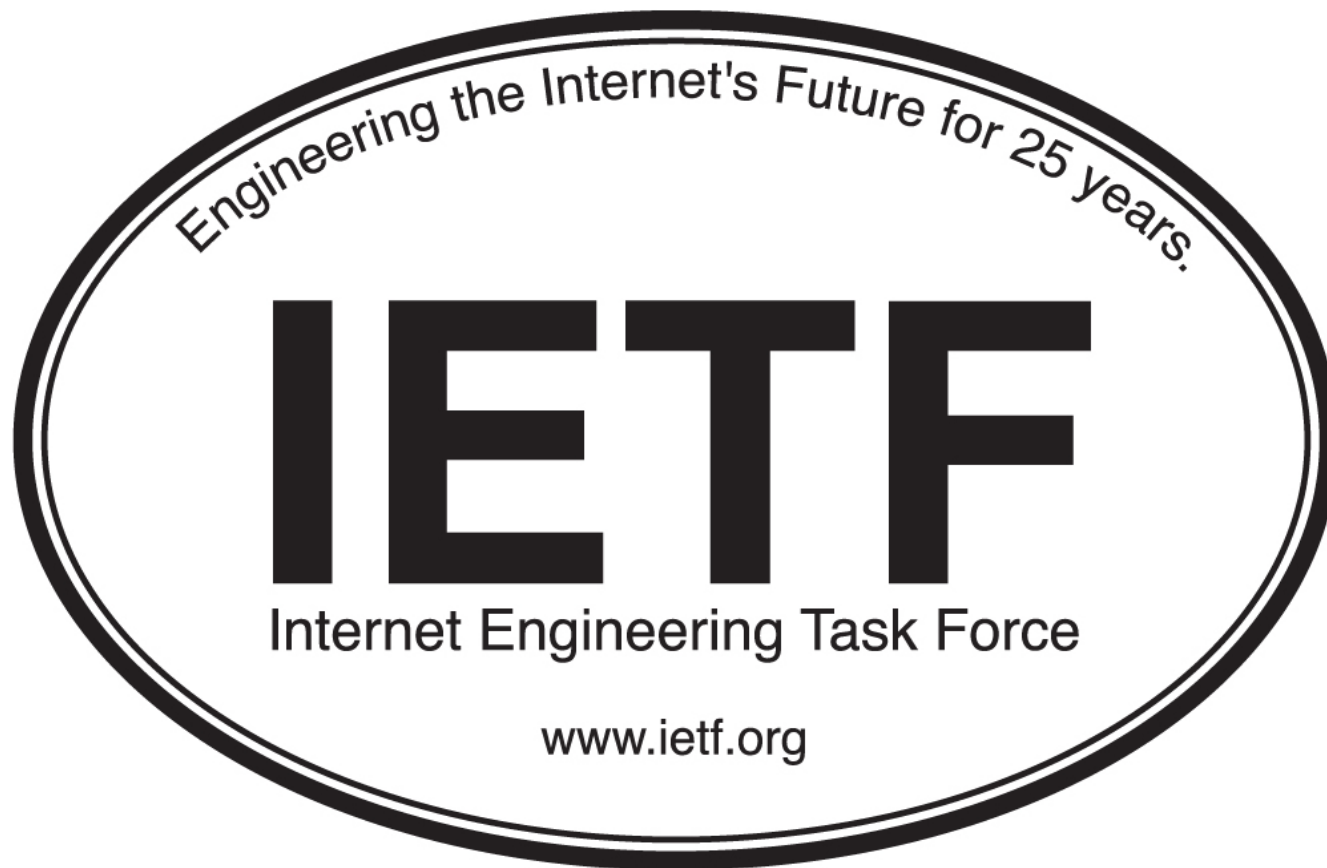
Questions?

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