

IPv6下一代互联网技术创新与 国际标准研讨会

主办单位：中国通信标准化协会
中国互联网协会

协办单位：清华大学
华为技术有限公司

2021年9月29日

研讨会日程安排

时间	事项	主讲人
14:00-14:10	开场介绍来宾	崔勇
14:10-14:40	IETF 介绍	Lars Eggert (IETF 主席)
14:40-15:10	互联网技术演进, 回顾和思考	李星 (清华大学)
15:10-15:40	Internet Area 综述	段晓东 (中国移动)
15:40-16:10	茶歇、合影	
16:10-16:40	Routing Area 综述	李振斌 (华为)
16:40-17:10	OPS Area 综述	姚健康 (CNNIC)
17:10-17:40	Transport Area 综述	石航 (清华大学)
17:40-18:00	开放研讨、总结	崔勇

Lars Eggert 介绍

- 分布式系统, 网络架构与协议设计专家
- 现任: IETF主席,
NetApp Technical Director
- 曾任
 - IRTF主席, IAB member (2011-2017)
 - Transport Area Director (2006-2009)
 - DCCP, RMCAT, QUIC 工作组主席 (2005-2021)
 - Nokia首席科学家



目录

CONTENT

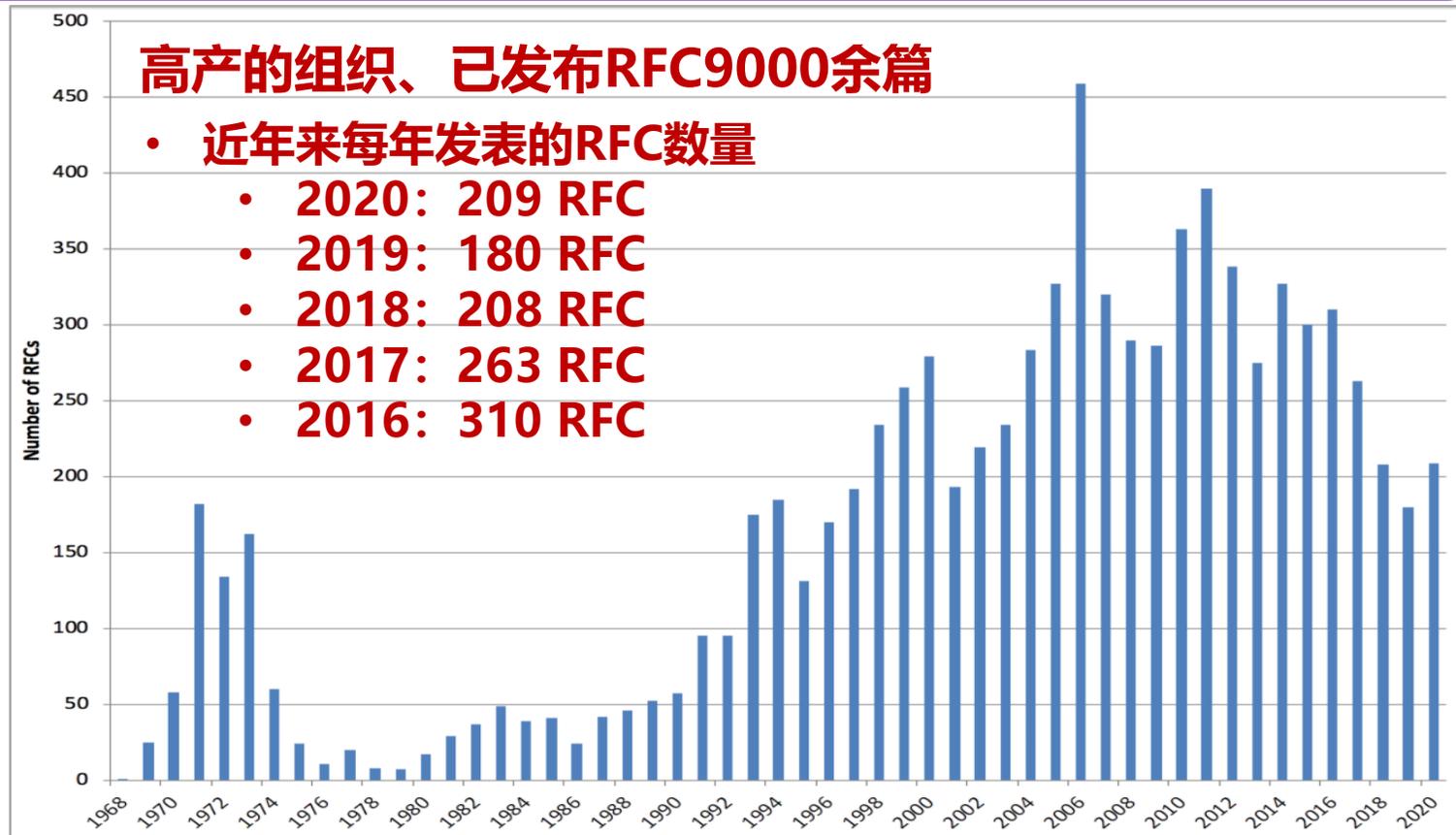
1 总结

2 如何参与

IETF是一个年轻而高产的标准组织

国际互联网标准制定组织IETF，制定技术规范RFC，获得全球设备商、运营商和互联网企业的广泛使用，成为全球互联网的事实标准

	
I E T F ®	
简称	IETF ^[1]
成立时间	1986年1月16日，35年前
类型	非营利组织 标准组织
目标	创建自愿性标准，以保持和提高互联网的易用性和互操作性。
服务地区	全球
上级组织	互联网协会
网站	ietf.org



技术主导、过程公开与大致共识

-from the *TAO (道) of IETF*

No formal membership

“我们没有会员的概念，所有人都可以参与，都可以报名参加会议。只要加入[邮件列表](#)，你就可以把自己看做是一个IETF成员 (There is no membership in the IETF. Anyone may register for and attend any meeting. The closest thing there is to being an IETF member is being on the IETF or Working Group mailing lists) --the TAO of IETF

技术主导、过程公开

“某个领域的负责人AD (area director) 是选出来协助大家思考，而不是接管整个思考过程。

(ADs are selected to think, not to just run the process.) " --the TAO of IETF

对某个问题自由表达意见。这个原则包含尽可能让文件、电子邮件讨论组、参与者名单和会议记录在互联网上公开

大部分的工作是通过邮件列表中完成的
(Most work done on mailing lists)

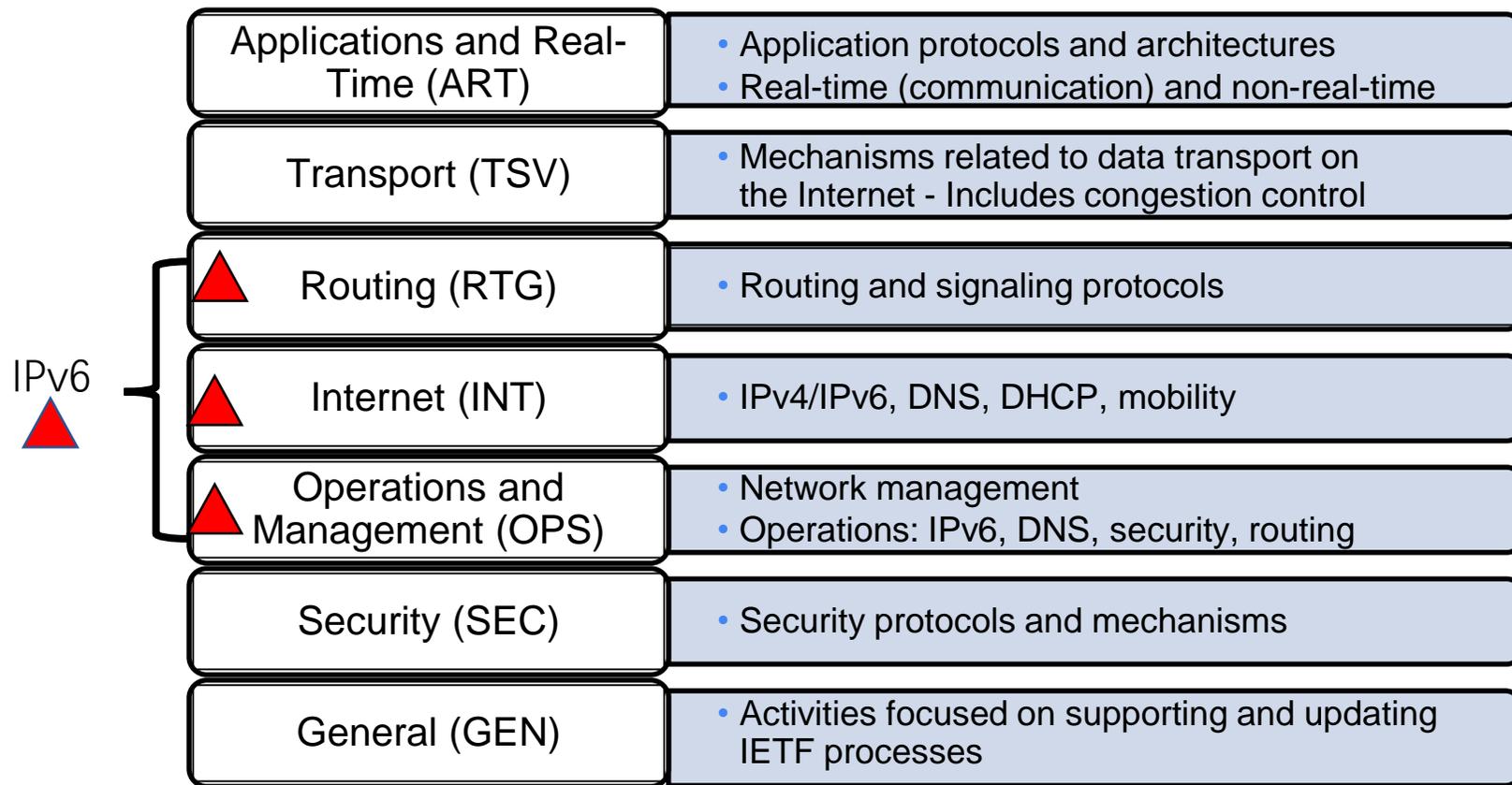
只相信大致共识和可以运行的代码

“我们拒绝国王、主席和投票。我们相信共识和运行的代码 (“ We reject kings, presidents and voting. We believe in rough consensus and running code ") --from David Clark, the TAO of IETF

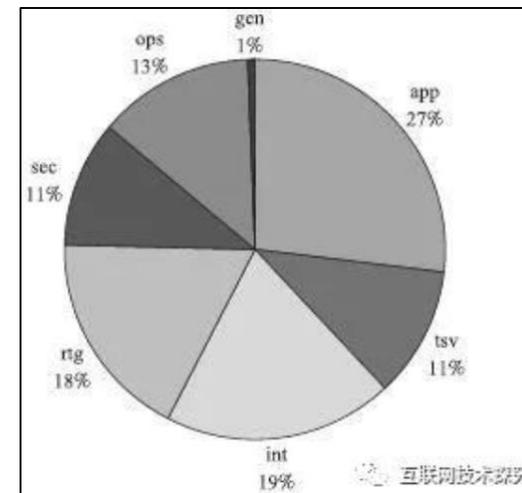
No formal government role

IETF: 制定标准，但并不硬性推广标准，更不谋求控制互联网

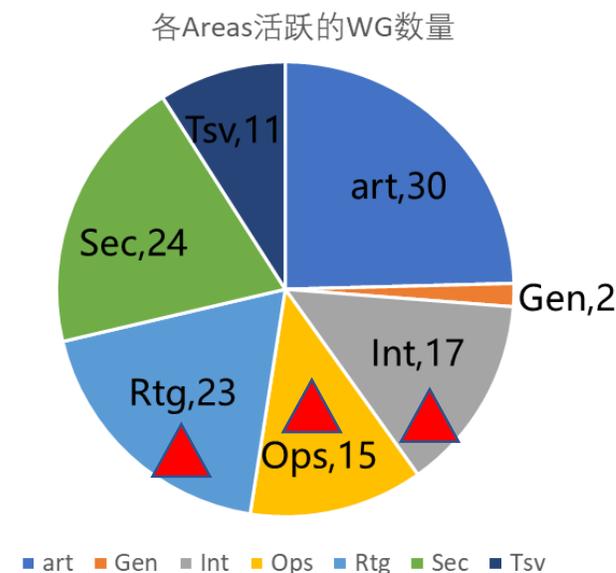
七大领域、120+工作组



7各研究领域 (Area) , 有122各工作组 (WG)



已发布RFC所属领域分布图 (~2017年)



IETF主要玩家

设备商



互联网ICP



网络运营商/ISP

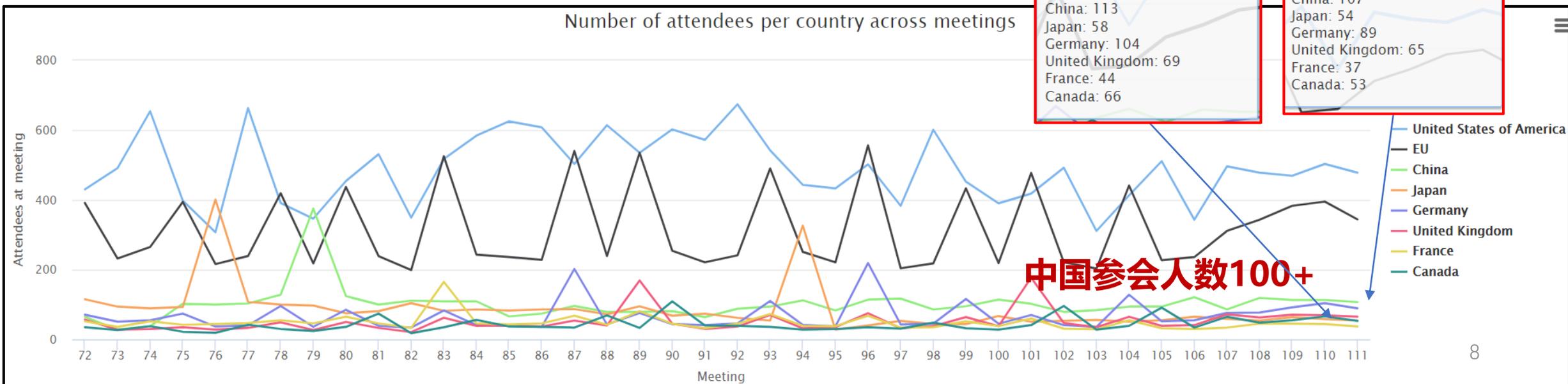
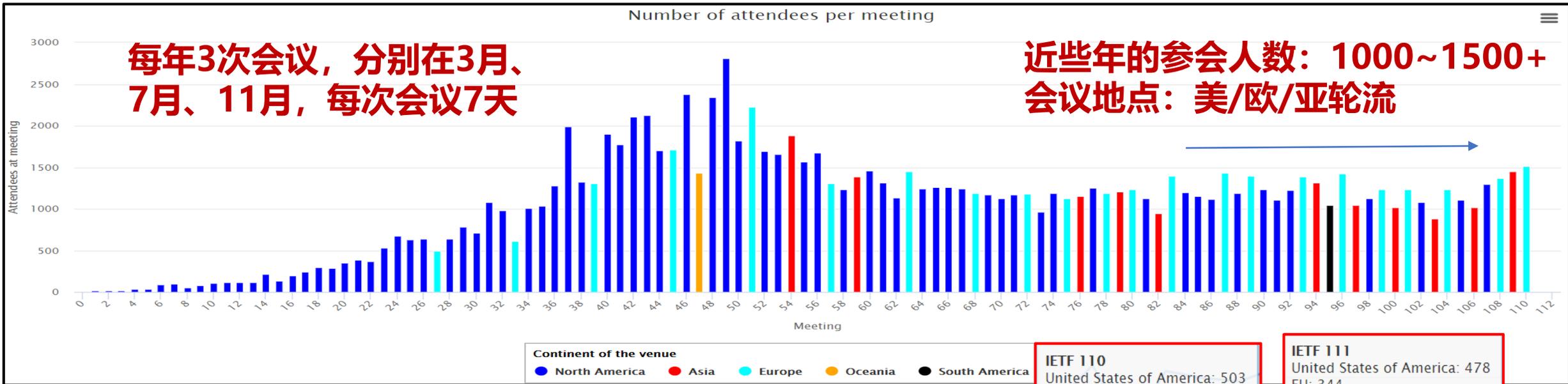


研究机构



参会人数中，设备商思科/华为、互联网服务商谷歌参会人数最多

美、欧、亚三足鼎立，美国最强



国内IETF参会情况对比

110次会议 (线上) (2021.3)

	单位	CN	单位	全球
设备商	华为	37	华为	73
	中兴	6	CISCO	62
	思科	1	JUNIPER	33
互联网服务商	阿里	1	google	36
	腾讯	2	facebook	6
电信运营商	中国移动	12	apple	10
	中国电信	11	阿里	2
	中国联通	4	腾讯	6
	CAICT	7		
研究机构	CNNIC	4		
	国内高校 清华/同济/川大/厦大/武大	15		
	个人	18		
		112		

106次会议 (新加坡) (2019.11)

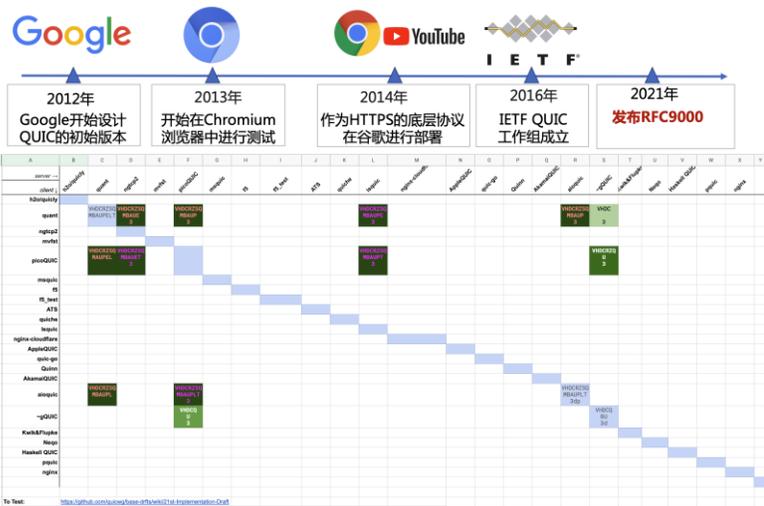
	单位	CN	单位	全球
	华为	36	华为	72
	中兴	5	CISCO	57
	H3C	10	JUNIPER	26
	思科	1	中兴	10
	阿里	1	google	36
	中国移动	3	facebook	9
	中国电信	3	apple	11
	中国联通	1	阿里	2
	CAICT	9	腾讯	2
	CNNIC	3	ATT	4
	清华大学	9	DT	7
	声学所	3		
	无组织	32		
		112		1008

我国主要参会情况 (近两次现场会议与在线会议)

呼唤更多中国人的声音

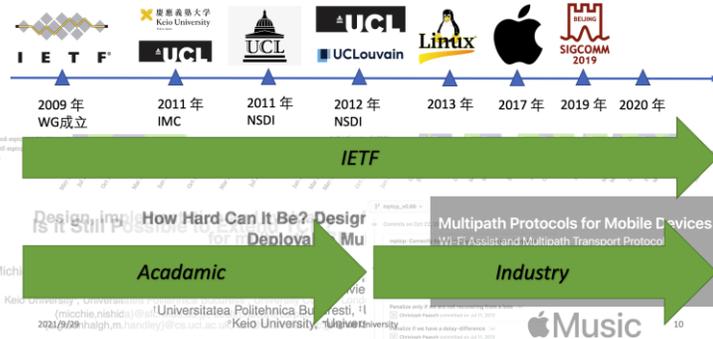
企业

- 满足自己的业务需求
- gQUIC 影响iQUIC的设计
- 开源生态的力量
- PR以及招人



研究机构

- 做真正有价值的研究
- 大牛的审稿意见



学生

- 一流的技术论坛
- 直接与技术大牛交流
- 职业发展

How Hard Can It Be? Designing and Implementing a Deployable Multipath TCP

Costin Raiciu[†], **Christoph Paasch**[‡], Sebastien Barre[‡], Alan Ford, Michio Honda[°], Fabien Duchene[‡], Olivier Bonaventure[‡] and Mark Handley^{*}

[†]Universitatea Politehnica Bucuresti, [‡]Universite Catholique de Louvain
[°]Keio University, ^{*}University College London

TCP Extensions for Multipath Operation with Multiple Addresses

Multipath Protocols for Mobile Devices Wi-Fi Assist and Multipath Transport Protocols

Christoph Paasch, Apple Core Networking Engineer

Was draft-ietf-mptcp-rfc6824bis (mptcp WG)

Authors Alan Ford, Costin Raiciu, Mark Handley, Olivier Bonaventure, **Christoph Paasch**

Last updated 2021-06-15

Follow or lead?

目录

CONTENT

1 总结

2 如何参与

如何参与

➤ 找到感兴趣的领域，从邮件列表入手

www.ietf.org Mailing Lists

Welcome!

Below is a listing of all the public mailing lists on www.ietf.org. Click on a list name to get more information about the change the preferences on your subscription. To visit the general information page for an unadvertised list, open a URL name appended.

List administrators, you can visit [the list admin overview page](#) to find the management interface for your list.

If you are having trouble using the lists, please contact mailman@ietf.org.

List	Description
111all	Official communication about IETF 111
112-newcomers	Mailing list for newcomers
112all	Official communication about IETF 112
112attendees	Mailing list for IETF 112 attendees
16NG	16ng working group discussion list
3gpp-ietf-coord	3GPP IETF COORDINATION
3gv6	This mailing list is intended for discussions relating to the use of IPv6 in cellular networks.
6band	6lo Bootstrapping, Access for Networked Devices
6gip	IP Issues in 6th Generation Mobile Network System (6gip)
6lo	Mailing list for the 6lo WG for Internet Area issues in IPv6 over constrained node networks.
6lo-fragmentation-dt	6lo Fragmentation Design Team
6tisch	Discuss link layer model for Deterministic IPv6 over the TSCH mode of IEEE 802.15.4e, and resource allocation
AAA-DOCTORS	AAA Doctors E-mail List
abfab	Application Bridging, Federated Authentication Beyond (the web)
abnf-discuss	General discussion about tools, activities and capabilities involving the ABNF meta-language
Accord	Alternatives to Content Classification for Operator Resource Deployment
Ace	Authentication and Authorization for Constrained Environments (ace)
Acme	Automated Certificate Management Environment
acvp	Automated Cryptographic Validation Protocol
Add	Applications Doing DNS

The screenshot shows the IETF website's navigation bar with links for Datatracker, Groups, Documents, Meetings, Other, and User. The main content area is titled 'QUIC (quic)' and features a navigation menu with 'List archive »' highlighted in red. Below the menu, the 'WG' section lists details for the QUIC working group, including its name, acronym, area, state, charter, status update, and dependencies. The 'Personnel' section lists chairs and an area director. The 'Mailing list' section, also highlighted in red, provides the address (quic@ietf.org), subscription URL (https://www.ietf.org/mailman/listinfo/quic), and archive URL (https://mailarchive.ietf.org/arch/browse/quic/). The 'Jabber chat' section provides a room address and a logs URL.

Working Group vs. BOF

Working Group

- IETF 主要工作开展的的地方
- 包含Charter 和 milestones

Charter for Working Group

The QUIC WG originated the specifications describing version 1 of QUIC, a UDP-based, stream-multiplexing, encryption-based transport protocol. The WG acts as the focal point for any QUIC-related work in the IETF. It is chartered to pursue work in the areas

1. The first area of work is maintenance and evolution of the existing QUIC specifications:

* Maintenance and evolution of the QUIC base specifications that describe its invariants, core transport mechanisms, and versions of QUIC.

* Maintenance and evolution of the existing QUIC extensions specified by the WG.

WG adoption of work items falling into this first area of work needs to be strongly motivated by existing or ongoing protocols* in the rest of this charter) that have adopted QUIC as a transport.

2. The second area of work is supporting the deployability of QUIC, which includes specifications and documents that describe how to deploy QUIC in various environments.

3. The third area of work is the specification of new extensions to QUIC. The WG will primarily focus on extending publicly document deployed proprietary extensions or to enable wider experimentation with proposed new protocols. Specifications describing how new or existing application protocols use the QUIC transport layer, called application protocols that intend to use QUIC. New application protocol mappings might require QUIC extension support of those protocols, are strongly requested to consult with the QUIC WG and seek early and ongoing review. The QUIC WG originated HTTP/3, the mapping of HTTP to QUIC, and the QPACK header compression scheme. T Defining new congestion control schemes is explicitly out of scope for the WG. However, new QUIC extensions t

Milestones

Date	✦ Milestone
Jun 2021	Datagram Extension to IESG draft-ietf-quic-datagram
May 2021	QUIC Applicability and Manageability Statement to IESG draft-ietf-quic-applicability draft-ietf-quic-manageability
Sep 2021	QUIC-LB: Generating Routable QUIC Connection IDs to IESG draft-ietf-quic-load-balancers
Sep 2021	Version Negotiation Extension to IESG draft-ietf-quic-version-negotiation

Bird of a Feather(BOF)

- 围绕一个topic的讨论组
- 通常是为了组建新的WG
- 自下而上申请， AD批准召开

Further Information

[RFC 5434](#), Considerations for Having a Successful Birds-of-a-Feather (BOF) Session

[RFC 6771](#) provides guidelines on how to best form a community to work on a proposal for new work.

Request a Birds of a Feather session for the next IETF Meeting

Request a BoF in the Datatracker

YOU MIGHT BE INTERESTED IN

[Learn more about IETF 112](#)

<https://www.ietf.org/how/bofs/>

IETF 参与文化



热情，聪明，乐于讨论
不要害羞提问



注重技术性贡献

做好功课
参与讨论



着装不必太正式



紧密协作

Datatracker and Tools Page

IETF Datatracker

<https://datatracker.ietf.org/>



I E T F®

Datatracker

The IETF Datatracker is the day-to-day front-end to the IETF database for people who work on IETF standards. It contains data about the documents, working groups, meetings, agendas, minutes, presentations, and more, of the IETF.

The primary public face of the IETF is at www.ietf.org.

IETF Document Search

[Search page for www.ietf.org website](#) | [Search page for IETF mail list archives](#)

▼ Additional search criteria

Tools Page

<https://tools.ietf.org/>



IETF Tools

*IETF-related tools, standalone or hosted on tools.ietf.org.
(Tools hosted by the secretariat are listed at <http://www.ietf.org/tools>).*

Which license? See [Preferred License](#)



Prepare documents

[RFC dependency checker](#)

Joe Touch

A [script](#) to check the references in Internet Drafts for dependencies and updates.

[Bibtex Citation Converter](#)

Yaron Sheffer

This tool converts bibtex-formatted citations into the bibxml format used in xml2rfc. Many (if not most) academic papers have bibtex citations available online, and the tool makes it easier to reference them in Internet Drafts.

[Templates for xml2rfc work](#)

Elwyn Davies

Elwyn Davies has produced a template as a starting point for writing drafts using xml2rfc. You can find a copy of the schema v3 version of the [XML template at tools.ietf.org](#).

[Draft Submission API](#)

Henrik Levkowetz

A simplified draft submission interface, intended for automation, is available at <https://datatracker.ietf.org/api/submit>.

The interface accepts only xml uploads which can be processed on the server, and requires the user to have a datatracker account. A successful submit still requires the same email confirmation roundtrip as submissions done through the regular submission tool.

[BibXML to Markdown Converter](#)

Yaron Sheffer

This simple script, bibxml2md, converts bibxml references extracted from xml2rfc files into markdown, for use in kramdown-rfc2629 Internet Drafts.

[License File for Open Source Repositories](#)

IESG

Many working groups work with open source repositories, even for their work on specifications. The IESG has made a boilerplate text available for inclusion in repositories, available at the URL



Search, show and print documents

[Download the latest documents](#)

Rsync access to various document archives:

- Unpurged IETF drafts repository:

To list the content, do:

```
rsync rsync.tools.ietf.org::tools.id
```

To sync the content, do:

```
rsync -avz rsync.tools.ietf.org::tools.id ./id
```

- Currently available htmlized drafts and RFCs:

To list the content, do:

```
rsync rsync.tools.ietf.org::tools.html
```

To sync the content, do:

```
rsync -avz rsync.tools.ietf.org::tools.html ./html
```

- For a full list of the various rsync sources at tools.ietf.org, do:

```
rsync rsync.tools.ietf.org::
```

[Access IETF-related files from the command line](#)

Paul Hoffman

The "ietf" program lets you access IETF-related files from the command line. It creates a local copy of these files on your computer using rsync, and gives a friendly way to access them. You can give commands from your normal shell, or you can run an interactive shell that is part of the program.

[Chrome: Rewrite IETF ID URLs to the Tools or Datatracker versions](#)

Warren Kumari

This will rewrite the "official" IETF Internet Draft URLs (<https://www.ietf.org/id/foo-42.txt>) to the Tools (<https://tools.ietf.org/html/foo-42>) or Datatracker (<https://datatracker.ietf.org/docs/foo>) versions instead.

[Retrieve IETF Documents from the search bar](#)

Sean Leonard

This adds an IETF document retrieval search provider to the Firefox (v2+) or IE (v7+)

[Print an Internet Draft \(ID\) or RFC as PDF.](#)

[IETF Home](#)

[About Tools](#)

[Tools:](#)

[diffs](#) [spell](#)

[xml2rfc](#) [idnits](#)

[id2xml](#)

[tracker_src](#)

[News](#)

[Get Passwd](#)

NET-112:

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[Agenda](#)

[iCal maker](#)

[Documents](#)

[RFCs](#)

[Doc fetch:](#)

[Wikis:](#)

[IESG](#) [IRTF](#)

[Dev](#) [RSOC](#)

[Chairs](#) [Edu](#)

[Tools](#) [BOFs](#)

[NomCom](#)

[Areas](#)

[WGs:](#)

[concluded...](#)

[6lo](#)

[6man](#)

[6tisch](#)

[Ace](#)

[Acme](#)

[Add](#)

[Alto](#)

[Anima](#)

[Asap](#)

[Asdf](#)

[Avtcore](#)

[Babel](#)

[Bess](#)

Open Mic: 后续工作

- 明确目标
 - IPv6下一代互联网技术创新与国际标准
- 领域综述
 - 安全域、应用域
- 新技术研讨
- Running Code与实验演示
-

谢谢!