

# Uncover the Missing Link

**Creating clear linkage between open source and standards**

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FOSDEM 2023

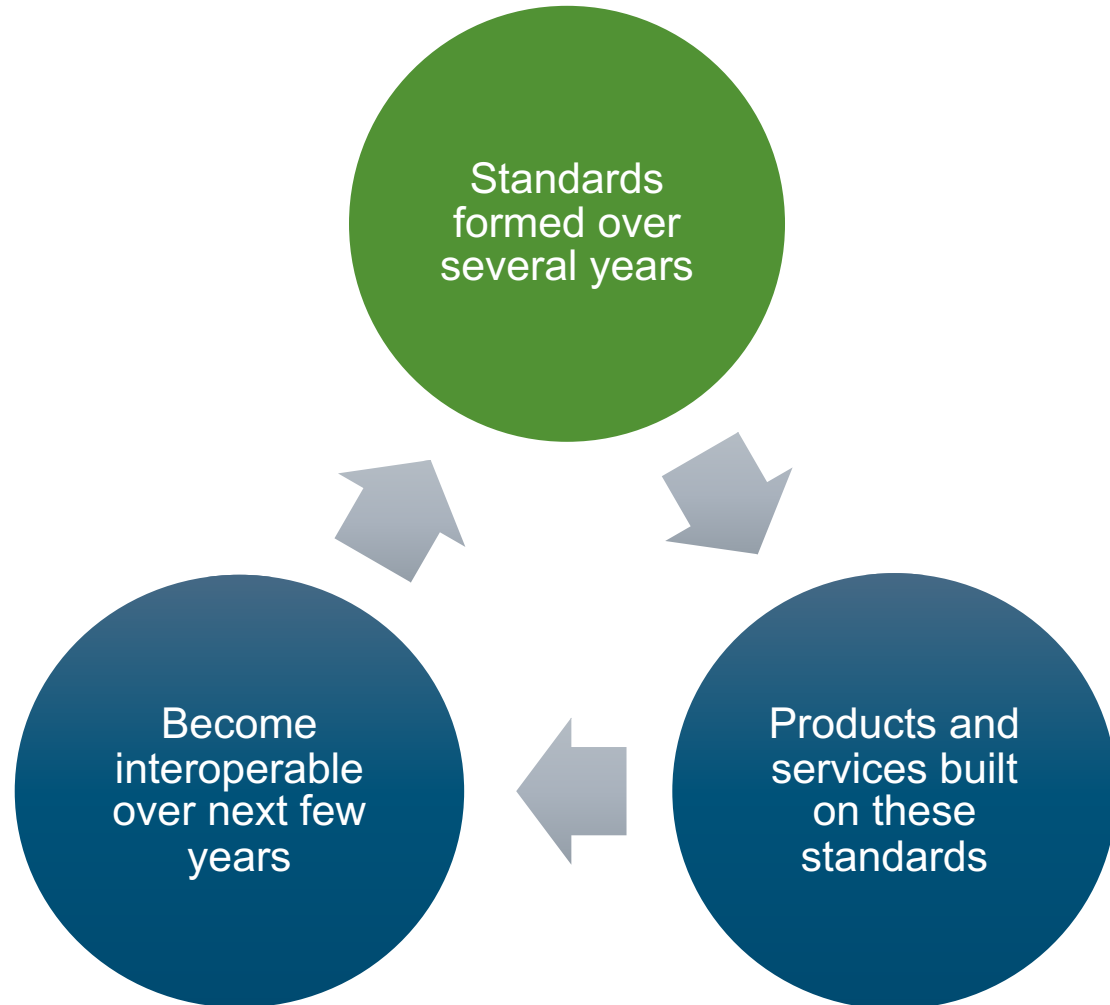


# Standards

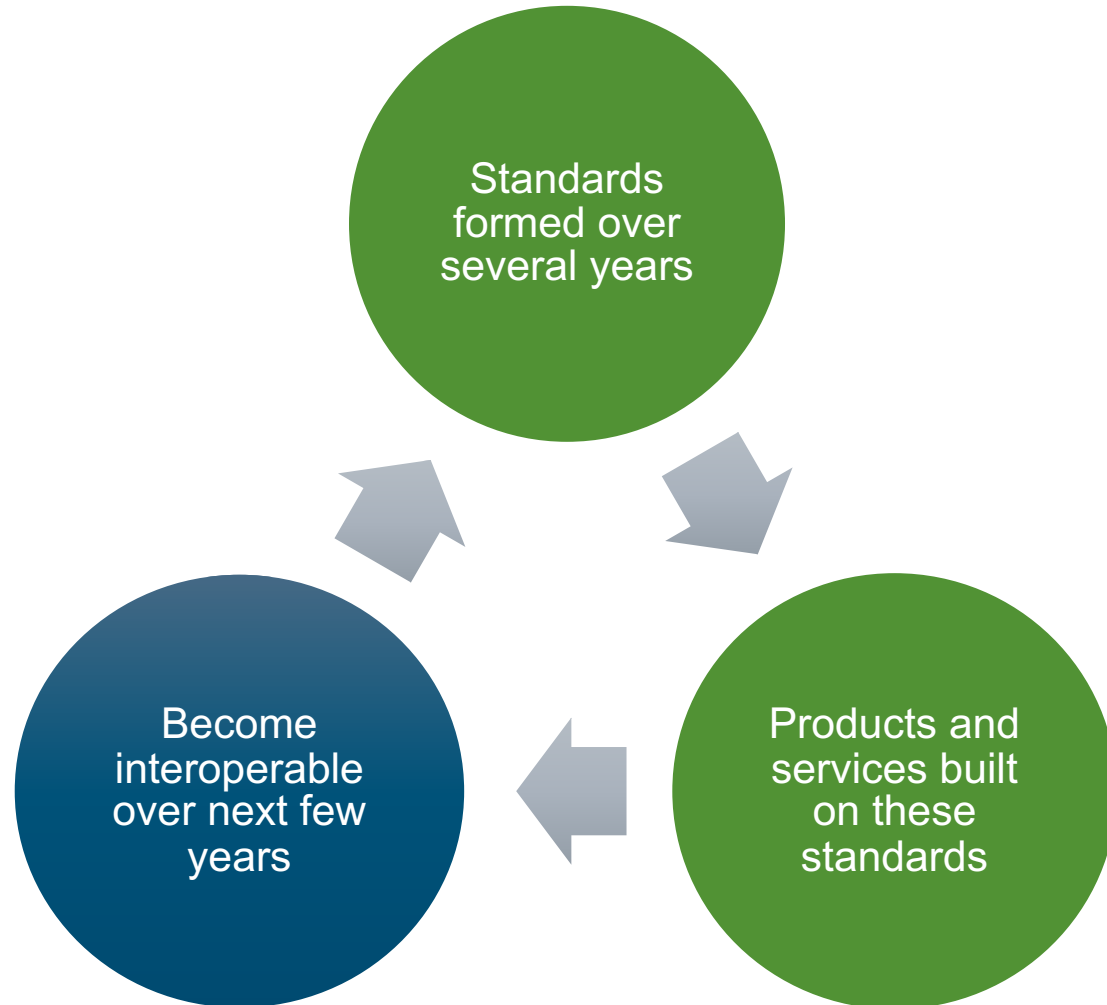
- Standards play key role in most major industries
  - E.g., communications, transportation, networking, ...
- Industry demand standards compliance from vendors
  - Ensure interoperability, avoid lock-in
- Vendors work together to define standards
  - Establish credibility for products
  - Ensure interoperability with partners and competitors



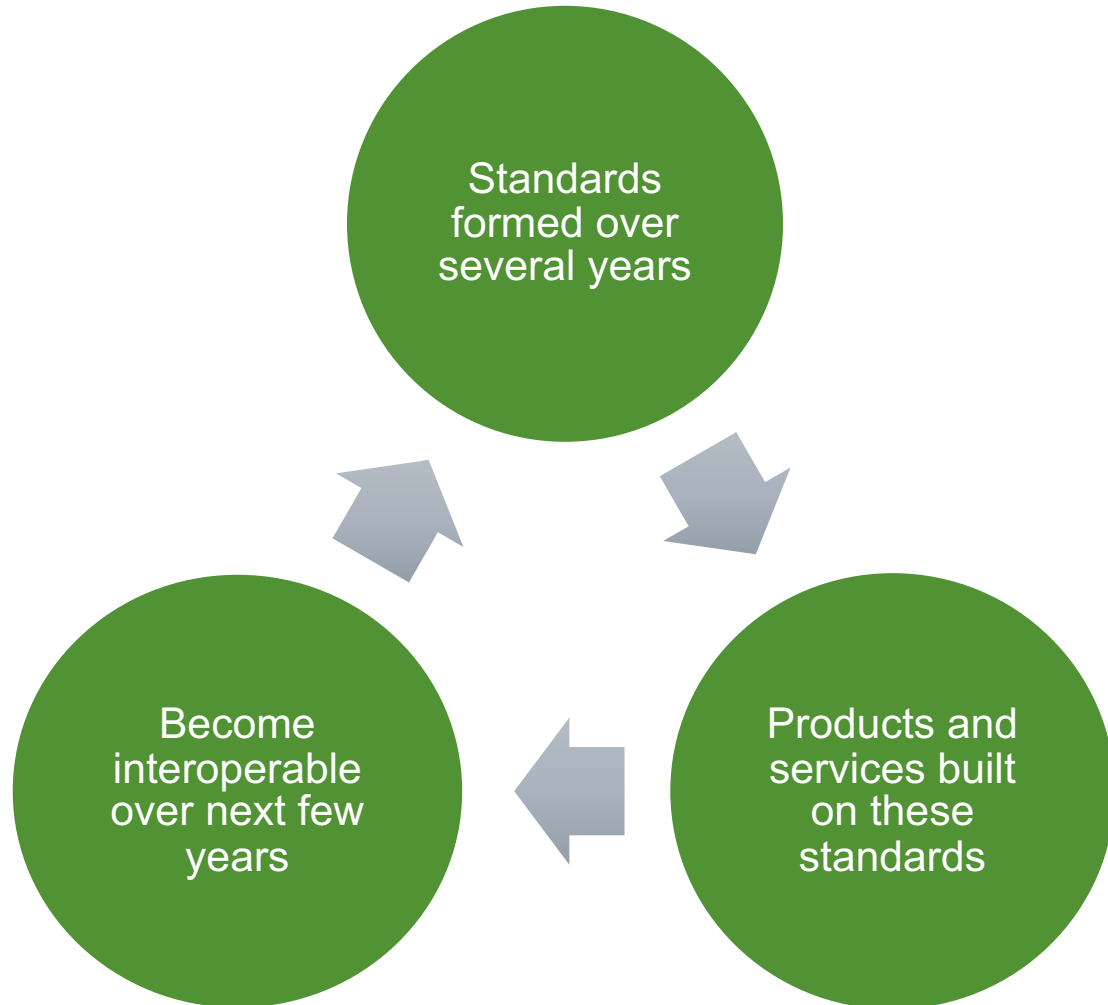
# Challenges with Standards



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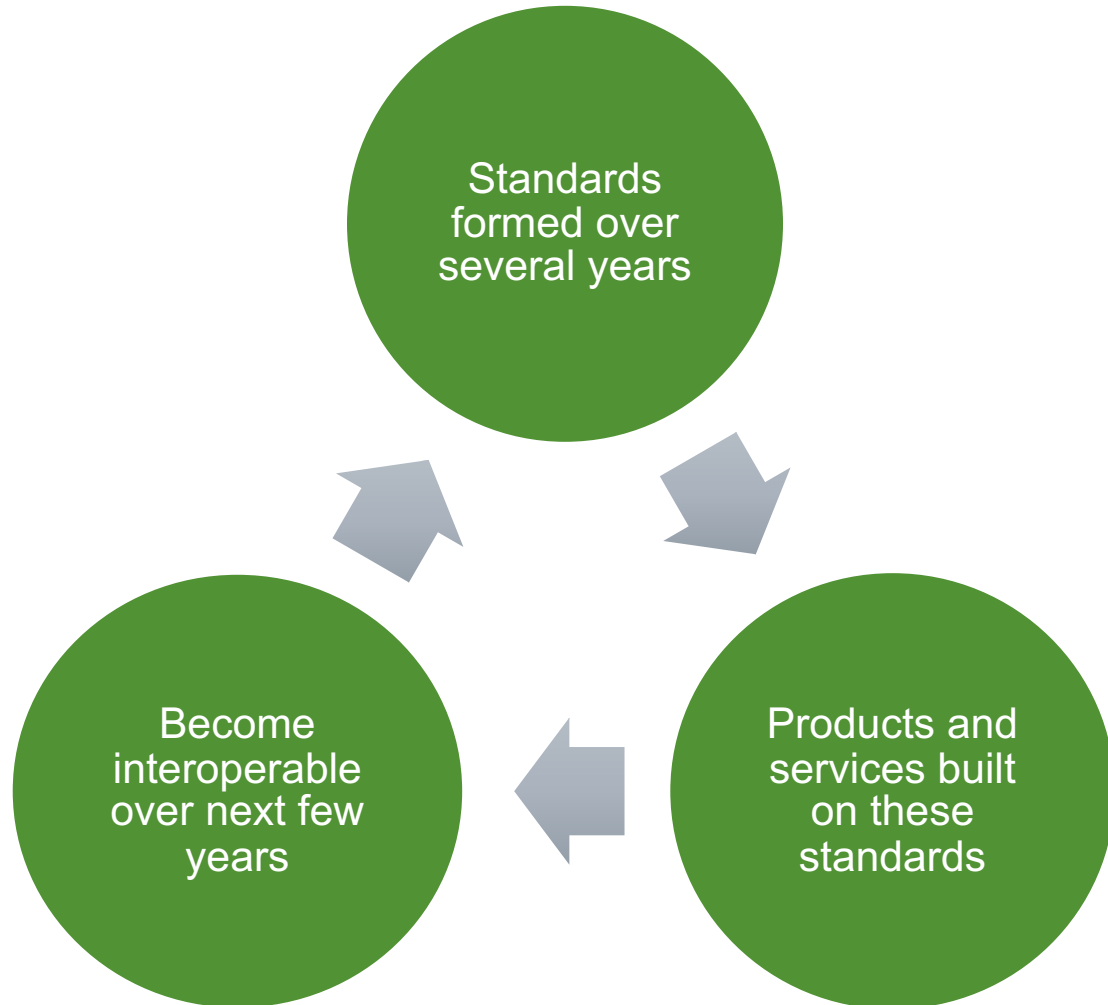


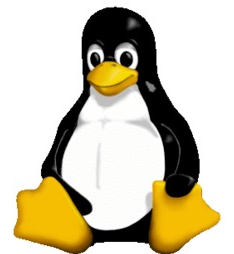
Photo credit:  
<https://play.google.com/store/apps/details?id=com.mobilerise.hourglass>

# Open Source

- Fuel industry transformation
- Engage a vast community
- Innovate at rapid pace
- Demanded by industry
- Result in de facto standard



**Apache**





# Challenges with open source

- Some assembly required
- Poor documentation
- Moving target
- Projects fade away
- Fragments



# Combine Open Source with Standards



Bring speed and collaborative spirit of open source to standards



Validate correctness and completeness of evolving specifications



Add support for key standards to open source projects



Speed adoption by providing usable code together with standards

# Network automation

## Open Source

## Standards



# IETF

- Internet Engineering Task Force
- Founded in 1986
- Goal – Make the Internet Work Better
- Definition of Internet Drafts (I-Ds) and RFCs
- Networking protocols, e.g., TCP/IP, DNS, DHCP, HTTP, TLS, QUIC, SIP, YANG, NETCONF, RESTCONF, ...

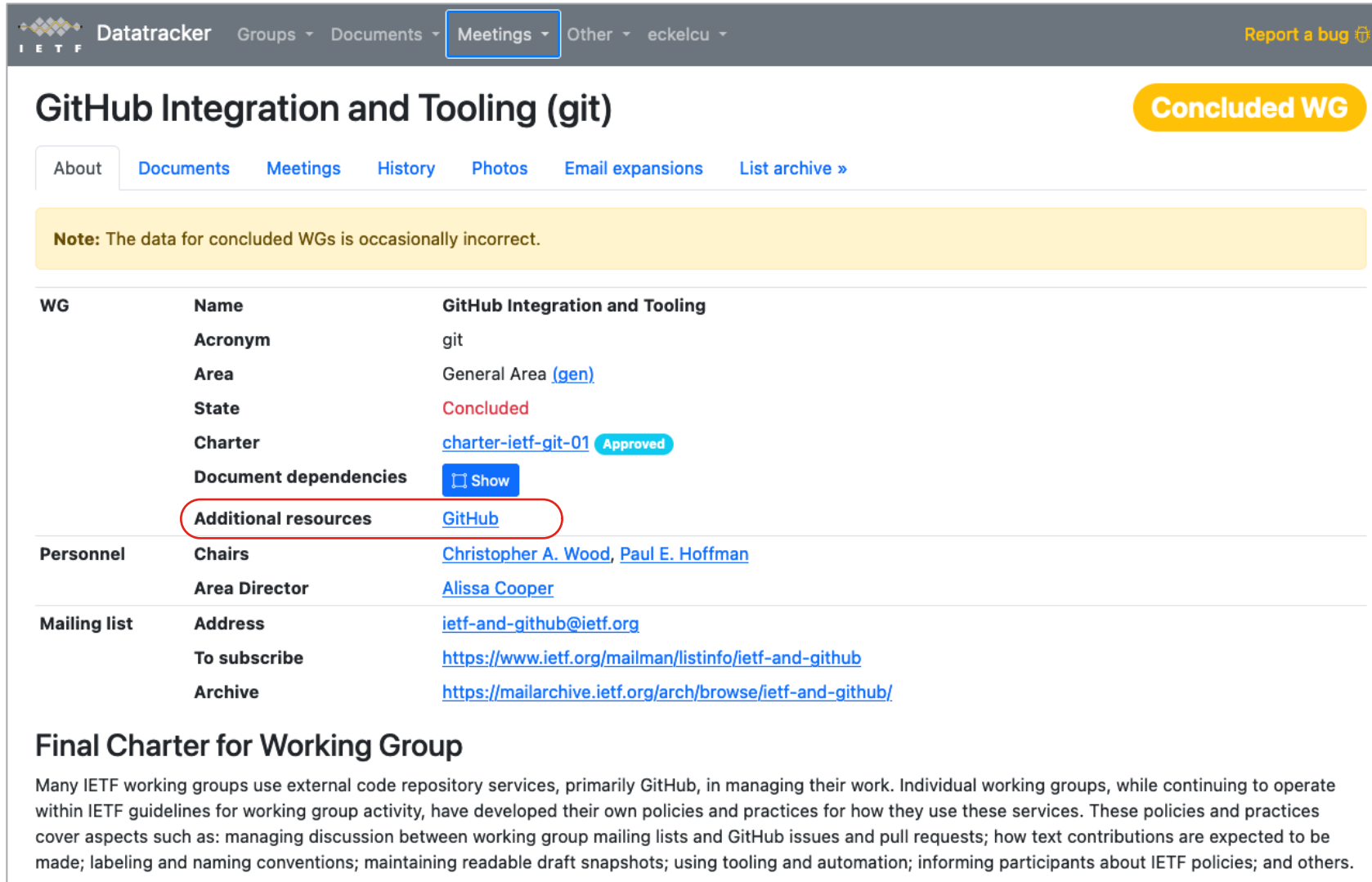


*We reject kings,  
presidents and voting.  
We believe in rough  
consensus and  
running code.*

- David Clark, Tao of the IETF

# Developer friendly standards process

<https://datatracker.ietf.org/wg/git/about/>



The screenshot shows the IETF Datatracker interface for the 'GitHub Integration and Tooling (git)' working group. The page is titled 'GitHub Integration and Tooling (git)' and is marked as 'Concluded WG'. A note states: 'Note: The data for concluded WGs is occasionally incorrect.' The main content is organized into sections: 'WG' (Name, Acronym, Area, State, Charter, Document dependencies, Additional resources), 'Personnel' (Chairs, Area Director), and 'Mailing list' (Address, To subscribe, Archive). The 'Additional resources' link is circled in red.

WG	Name	GitHub Integration and Tooling
	Acronym	git
	Area	General Area ( <a href="#">gen</a> )
	State	Concluded
	Charter	<a href="#">charter-ietf-git-01</a> <span>Approved</span>
	Document dependencies	<a href="#">Show</a>
	Additional resources	<a href="#">GitHub</a>
Personnel	Chairs	<a href="#">Christopher A. Wood</a> , <a href="#">Paul E. Hoffman</a>
	Area Director	<a href="#">Alissa Cooper</a>
Mailing list	Address	<a href="mailto:ietf-and-github@ietf.org">ietf-and-github@ietf.org</a>
	To subscribe	<a href="https://www.ietf.org/mailman/listinfo/ietf-and-github">https://www.ietf.org/mailman/listinfo/ietf-and-github</a>
	Archive	<a href="https://mailarchive.ietf.org/arch/browse/ietf-and-github/">https://mailarchive.ietf.org/arch/browse/ietf-and-github/</a>

## Final Charter for Working Group

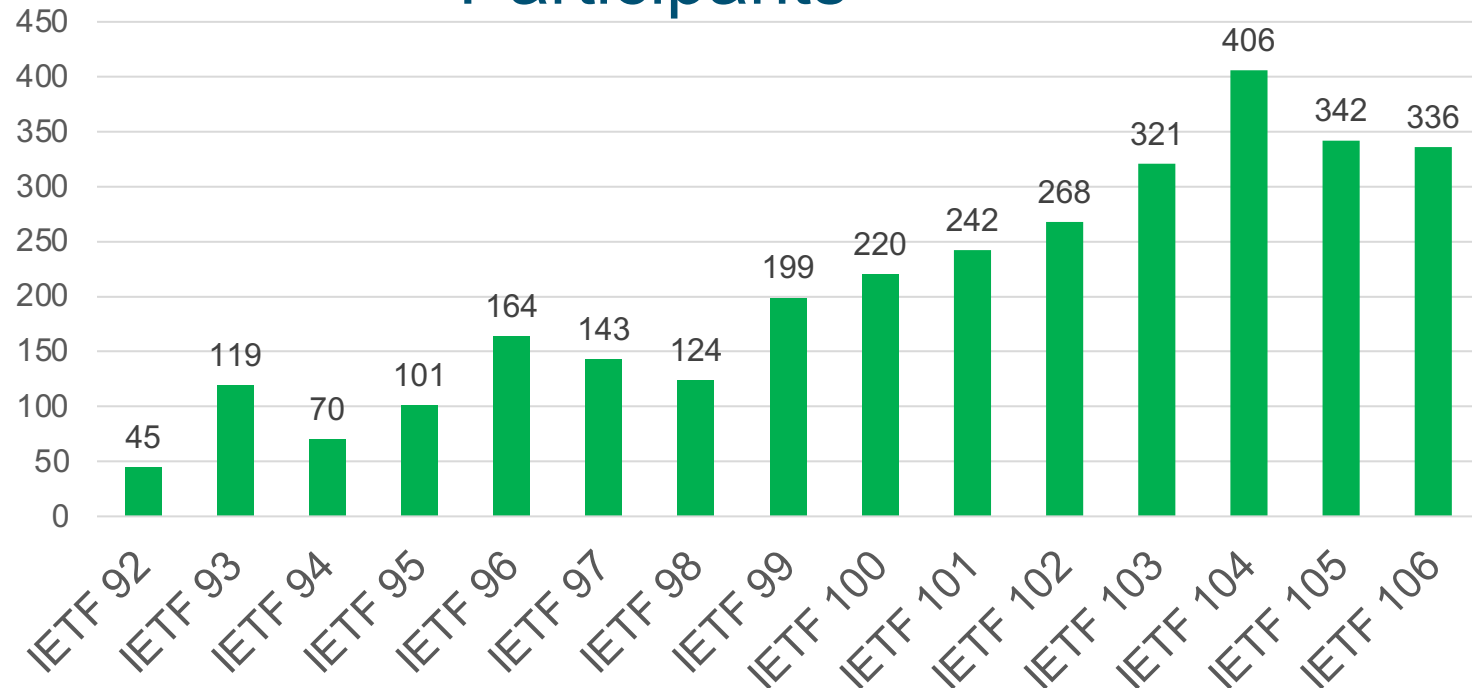
Many IETF working groups use external code repository services, primarily GitHub, in managing their work. Individual working groups, while continuing to operate within IETF guidelines for working group activity, have developed their own policies and practices for how they use these services. These policies and practices cover aspects such as: managing discussion between working group mailing lists and GitHub issues and pull requests; how text contributions are expected to be made; labeling and naming conventions; maintaining readable draft snapshots; using tooling and automation; informing participants about IETF policies; and others.

# IETF Hackathons

- Advance pace and relevance of IETF standards
  - Flush out ideas, feed back into working groups
- Attract developers, universities
  - Team newcomers with veterans
  - Reduce time to meaningful contribution
- Free, open to everyone
- Collaborative



## Participants



# Code in Hands of Developers

<https://github.com/ietf-hackathon>

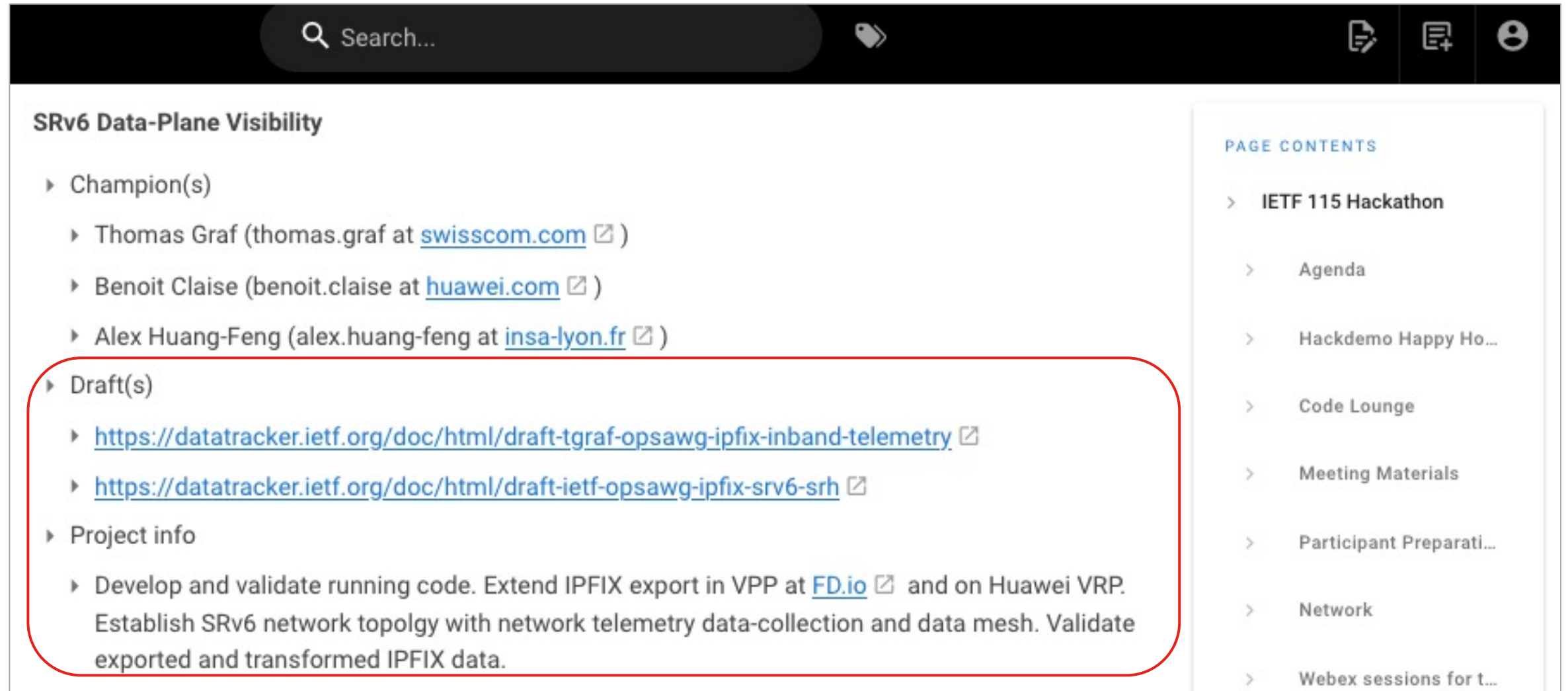
The screenshot shows the GitHub profile page for 'IETF-Hackathon'. At the top, there is a search bar and navigation links for Pull requests, Issues, Codespaces, Marketplace, and Explore. The profile header includes the repository name 'IETF-Hackathon', a description 'Repository for sharing code, presentations, and other artifacts at IETF hackathons', 18 followers, and an email address 'hackathon@ietf.org'. A 'Follow' button is visible on the right. Below the header is a navigation menu with 'Overview' selected, and other options for Repositories (33), Projects, Packages, Teams, People (181), and Settings. The 'Pinned' section displays six repositories in a grid:

- mDNSResponder** (Public): C, 49 stars, 9 forks.
- delaydns** (Public): C, 6 stars.
- linux-user-space-ipv6-mcast** (Public): C, 3 stars, 2 forks.
- pqc-certificates** (Public): Shell, 9 stars, 9 forks.
- p4-ipv6-switch-ml** (Public): P4, 5 stars, 3 forks.
- NSDCatZ** (Public): Python, 3 stars, 1 fork.

On the right side, there is a 'View as: Public' dropdown, a note about viewing the README and repositories as a public user, and a link to 'Get started with tasks'. Below that is a 'Discussions' section with a 'Turn on discussions' link. At the bottom right, there is a 'People' section showing a row of profile pictures.

# Links to standards and code in wikis

<https://wiki.ietf.org/en/meeting/115/hackathon>



**SRv6 Data-Plane Visibility**

- ▶ Champion(s)
  - ▶ Thomas Graf (thomas.graf at [swisscom.com](mailto:thomas.graf@swisscom.com) )
  - ▶ Benoit Claise (benoit.claise at [huawei.com](mailto:benoit.claise@huawei.com) )
  - ▶ Alex Huang-Feng (alex.huang-feng at [insa-lyon.fr](mailto:alex.huang-feng@insa-lyon.fr) )
- ▶ Draft(s)
  - ▶ <https://datatracker.ietf.org/doc/html/draft-tgraf-opsawg-ipfix-inband-telemetry>
  - ▶ <https://datatracker.ietf.org/doc/html/draft-ietf-opsawg-ipfix-srv6-srh>
- ▶ Project info
  - ▶ Develop and validate running code. Extend IPFIX export in VPP at [FD.io](https://fd.io) and on Huawei VRP. Establish SRv6 network topology with network telemetry data-collection and data mesh. Validate exported and transformed IPFIX data.

**PAGE CONTENTS**

- > IETF 115 Hackathon
  - > Agenda
  - > Hackdemo Happy Ho...
  - > Code Lounge
  - > Meeting Materials
  - > Participant Preparati...
  - > Network
  - > Webex sessions for t...





# Find Code Related to an Internet-Draft or RFC

<https://datatracker.ietf.org/doc/draft-eckel-edm-find-code/>

Workgroup: edm  
Internet-Draft: draft-eckel-edm-find-code-02  
Published: 10 January 2023  
Intended Status: Best Current Practice  
Expires: 14 July 2023  
Author: C. Eckel  
*Cisco Systems*

## Table of Contents

1. Introduction
  2. Existing IETF Processes and Procedures
    - 2.1. Implementation Status
    - 2.2. GitHub
    - 2.3. Hackathon
  3. Proposal
    - 3.1. GitHub Repository
    - 3.2. README
    - 3.3. Datatracker
    - 3.4. Implementation Status
    - 3.5. Inline Errata
    - 3.6. Known Limitations
  4. Implementation Status
  5. Security Considerations
  6. IANA Considerations
  7. Informative References
- Acknowledgments
- Author's Address

## Find Code Related to an Internet-Draft or RFC

### Abstract

Code related to existing IETF standards and ongoing standardization efforts may exist and be publicly accessible in many places. This document provides a set of practices to make it easier to identify and find such code.

The RFC Editor will remove this note

### Discussion Venues

This note is to be removed before publishing as an RFC.

Discussion of this document takes place on the Evolvability, Deployability, & Maintainability mailing list (edm@iab.org), which is archived at <https://mailarchive.ietf.org/arch/browse/edm/>.

Source for this draft and an issue tracker can be found at <https://github.com/eckelcu/draft-eckel-edm-find-code>.

# related-implementations

- For individual drafts, authors can add code as “Additional resources”
- For working group drafts and RFCs, working group chairs can edit

**Datatracker**

## Find Code Related to an Internet-Draft or RFC

draft-eckel-edm-find-code-02

Status: IESG evaluation record | IESG writeups | Email expansions

History

**Versions:**

00 01 02

draft-eckel-edm-find-code

00 Jul 2021 | 01 Jan 2022 | 02 Jan 2023

<b>Document Type</b>	Active Internet-Draft (individual)
<b>Author</b>	<a href="#">Charles Eckel</a> ✉
<b>Last updated</b>	2023-01-10
<b>RFC stream</b>	(None)
<b>Intended RFC status</b>	(None)
<b>Formats</b>	<a href="#">txt</a> <a href="#">html</a> <a href="#">xml</a> <a href="#">htmlized</a> <a href="#">pdf</a> <a href="#">bibtex</a>
<b>Additional resources</b>	<a href="#">Edit</a> <a href="#">Example implementation in RFC 9311 GitHub repository to collaborate on draft</a>

# related-implementations

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## Additional Resources

```
github_repo https://github.com/eckelcu/draft-eckel-edm-find-code  
(GitHub repository to collaborate on draft)  
related_implementations https://datatracker.ietf.org/doc/rfc9311/  
(Example implementation in RFC 9311)
```

Format: 'tag value (Optional description)'. Separate multiple entries with newline. When the value is a URL, use https:// where possible.

**IETF Datatracker**

### Find Code Related to an Internet-Draft or RFC

#### draft-eckel-edm-find-code-02

Status: IESG evaluation record | IESG writeups | Email expansions

History

**Versions:**

00 01 02

draft-eckel-edm-find-code

Jul 2021 | Jan 2022 | Jan 2023

Document Type	Active Internet-Draft (individual)
Author	<a href="#">Charles Eckel</a> ✉
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# Links to standards and code in wikis

<https://wiki.ietf.org/en/meeting/115/hackathon>

The screenshot shows a wiki page titled "SRv6 Data-Plane Visibility". The page has a dark header with a search bar and navigation icons. The main content is organized into sections: "Champion(s)", "Draft(s)", and "Project info". Under "Champion(s)", there are three entries: Thomas Graf (thomas.graf at swisscom.com), Benoit Claise (benoit.claise at huawei.com), and Alex Huang-Feng (alex.huang-feng at insa-lyon.fr). Under "Draft(s)", there are two links: <https://datatracker.ietf.org/doc/html/draft-tgraf-opsawg-ipfix-inband-telemetry> and <https://datatracker.ietf.org/doc/html/draft-ietf-opsawg-ipfix-srv6-srh>. The second link is highlighted with a red box. Under "Project info", there is a paragraph: "Develop and validate running code. Extend IPFIX export in VPP at FD.io and on Huawei VRP. Establish SRv6 network topology with network telemetry data-collection and data mesh. Validate exported and transformed IPFIX data." On the right side, there is a "PAGE CONTENTS" section with a list of items: "IETF 115 Hackathon", "Agenda", "Hackdemo Happy Ho...", "Code Lounge", "Meeting Materials", "Participant Preparati...", "Network", and "Webex sessions for t...".

**SRv6 Data-Plane Visibility**

- ▶ Champion(s)
  - ▶ Thomas Graf (thomas.graf at [swisscom.com](http://swisscom.com) )
  - ▶ Benoit Claise (benoit.claise at [huawei.com](http://huawei.com) )
  - ▶ Alex Huang-Feng (alex.huang-feng at [insa-lyon.fr](http://insa-lyon.fr) )
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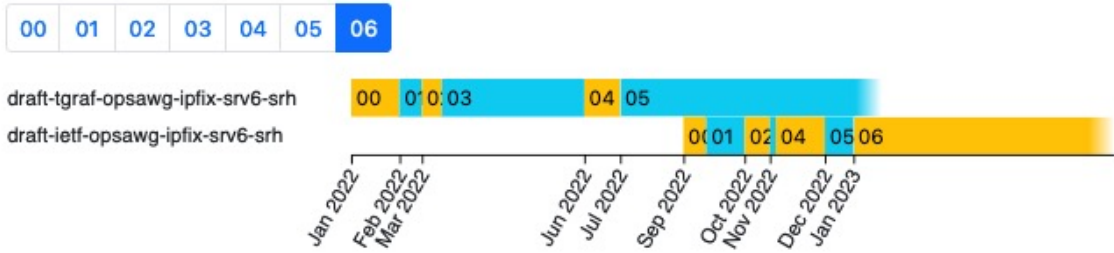


# Export of Segment Routing over IPv6 Information in IP Flow Information Export (IPFIX)

## draft-ietf-opsawg-ipfix-srv6-srh-06

Status IESG evaluation record IESG writeups Email expansions History

Versions:



<b>Document Type</b>	Active Internet-Draft ( <a href="#">opsawg WG</a> )
<b>Authors</b>	<a href="#">Thomas Graf</a> ✉, <a href="#">Benoît Claise</a> ✉, <a href="#">Pierre Francois</a> ✉
<b>Last updated</b>	2023-01-06 (Latest revision 2023-01-05)
<b>Replaces</b>	<a href="#">draft-tgraf-opsawg-ipfix-srv6-srh</a>
<b>RFC stream</b>	Internet Engineering Task Force (IETF)
<b>Intended RFC status</b>	Proposed Standard
<b>Formats</b>	<a href="#">txt</a> <a href="#">html</a> <a href="#">xml</a> <a href="#">htmlized</a> <a href="#">pdf</a> <a href="#">bibtex</a>
<b>Additional resources</b>	<a href="#">Related Implementations</a> <a href="#">Mailing list discussion</a>
<b>Stream</b>	<a href="#">WG state</a> Submitted to IESG for Publication

**Datatracker** IETF

# Export of Segment Routing over IPv6 Information in IP Flow Information Export (IPFIX)

## draft-ietf-opsawg-ipfix-srv6-srh-06

Status IESG evaluation record IESG writeups Email expansions History

**Versions:**

00 01 02 03 04 05 06

draft-tgraf-opsawg-ipfix-srv6-srh 00 01 03 04 05

draft-ietf-opsawg-ipfix-srv6-srh 01 02 04 05 06

Jan 2022 Feb 2022 Mar 2022 Jun 2022 Jul 2022 Sep 2022 Oct 2022 Nov 2022 Dec 2022 Jan 2023

**Document Type** Active Internet-Draft ([opsawg WG](#))

**Authors** [Thomas Graf](#) ✉, [Benoît Claise](#) ✉, [Pierre Francois](#) ✉

**Last updated** 2023-01-06 (Latest revision 2023-01-05)

**Replaces** [draft-tgraf-opsawg-ipfix-srv6-srh](#)

**RFC stream** Internet Engineering Task Force (IETF)

**Intended RFC status** Proposed Standard

**Formats** [txt](#) [html](#) [xml](#) [htmlized](#) [pdf](#) [bibtex](#)

**Additional resources** [Related Implementations](#) [Mailing list discussion](#)

**Stream** [WG state](#) Submitted to IESG for Publication

[insa-unyte / vpp-srh-onpath-telemetry](#) Public

SRH and On-path telemetry export in IPFIX for VPP

Apache-2.0 license

4 stars 1 fork

★ Starred Watch

<> Code Issues Pull requests 1 Actions Projects

🔑 master

[ahuangfeng](#) feat: update ioam patch reference ... 20 hours ago ⌚ 48

[View code](#)

☰ README.md

## VPP topologies

This repository have the vpp configurations for the following POCs in VPP:

- [draft-tgraf-opsawg-ipfix-srv6-srh](#)
- [draft-tgraf-opsawg-ipfix-on-path-telemetry](#)

## Dependencies

- VPP fork repository: [INSA-unyte-vpp](#)
- Tested in `ubuntu/focal64` using [Vagrantfile](#)

# CALL TO ACTION!

Make it easy to find and use code related to standards

Create links  
between open  
source and  
standards

Make standards  
consumable by  
developers

Make open  
source  
consumable by  
industry



Thank you!