

# How Well Woven is the Web?

## Measuring the IETF and W3C

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## Streamlining Social Decision Making for Improved Internet Standards

- Decision making in standards development organisations is a **complex, dynamic process**, with interaction and communication between people with **different interests and priorities**
- Much of the data about these decisions is publicly available



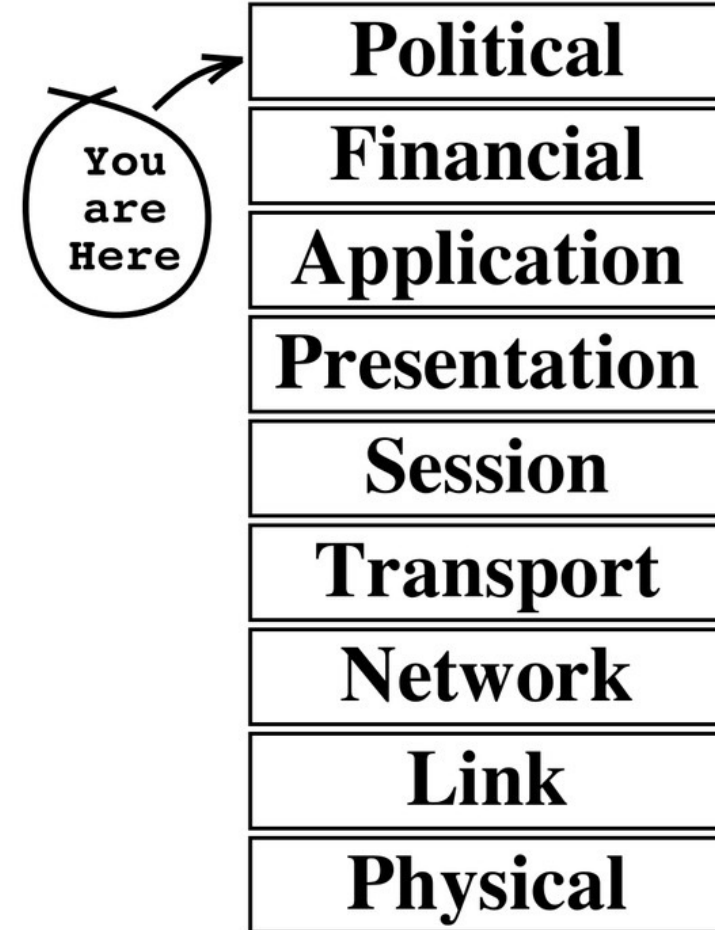
University of  
St Andrews



# Measuring the IETF and W3C

## Why does this matter?

- The Internet is part of global critical infrastructure, and so understanding how the standards that underpin are created is essential
- This understanding allows us to answer questions about
  - ... **resilience**
  - ... **influence**
  - ... **efficiency**
- Can we identify bottlenecks, and produce tools that help to **improve** decision making?



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# Measuring the IETF and W3C

## Overview

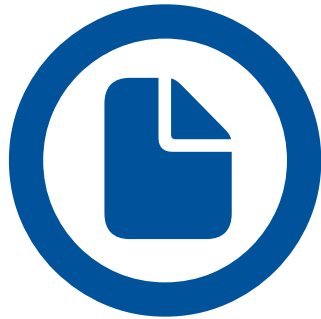
- Our previous work has largely focused on the IETF
- Expanding to include the W3C allows us to study the wider Internet standards development community, and identify interdependencies and bottlenecks
- We can begin to answer:
  - how is **participation** in Internet standards development changing over time?
  - how is **authorship** of Internet standards evolving?
  - what does the **overlap** between the IETF and W3C look like?
  - how dependent on **influential participants** is Internet standards development?

The logo for the World Wide Web Consortium (W3C). It features the letters 'W3C' in a stylized font. The 'W' and '3' are blue, while the 'C' is black. A registered trademark symbol (®) is located to the upper right of the 'C'.The logo for the Internet Engineering Task Force (IETF). It consists of a yellow zigzag line with black ends, set against a background of grey diamonds. Below the graphic, the letters 'I E T F' are written in a bold, black, sans-serif font, with a registered trademark symbol (®) to the right of the 'F'.

# Measuring the IETF and W3C

## Data and methodology

Dataset covering 2 decades, from **2004 through 2023**



9,565 IETF RFCs  
413 W3C Recommendations



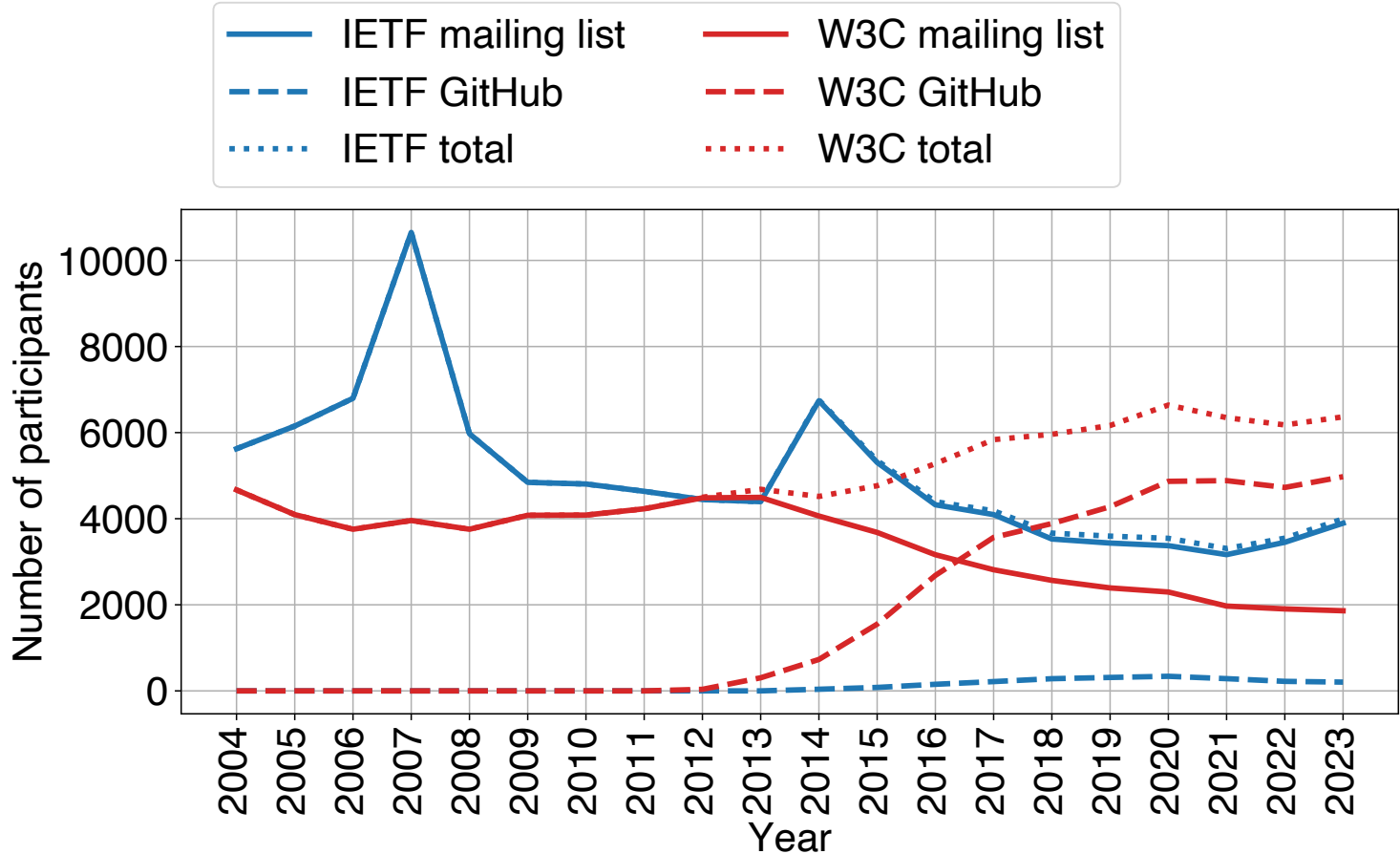
136,303 participants



4.3 million e-mails  
1,747 GitHub repositories

# Measuring the IETF and W3C

## How many people are participating?



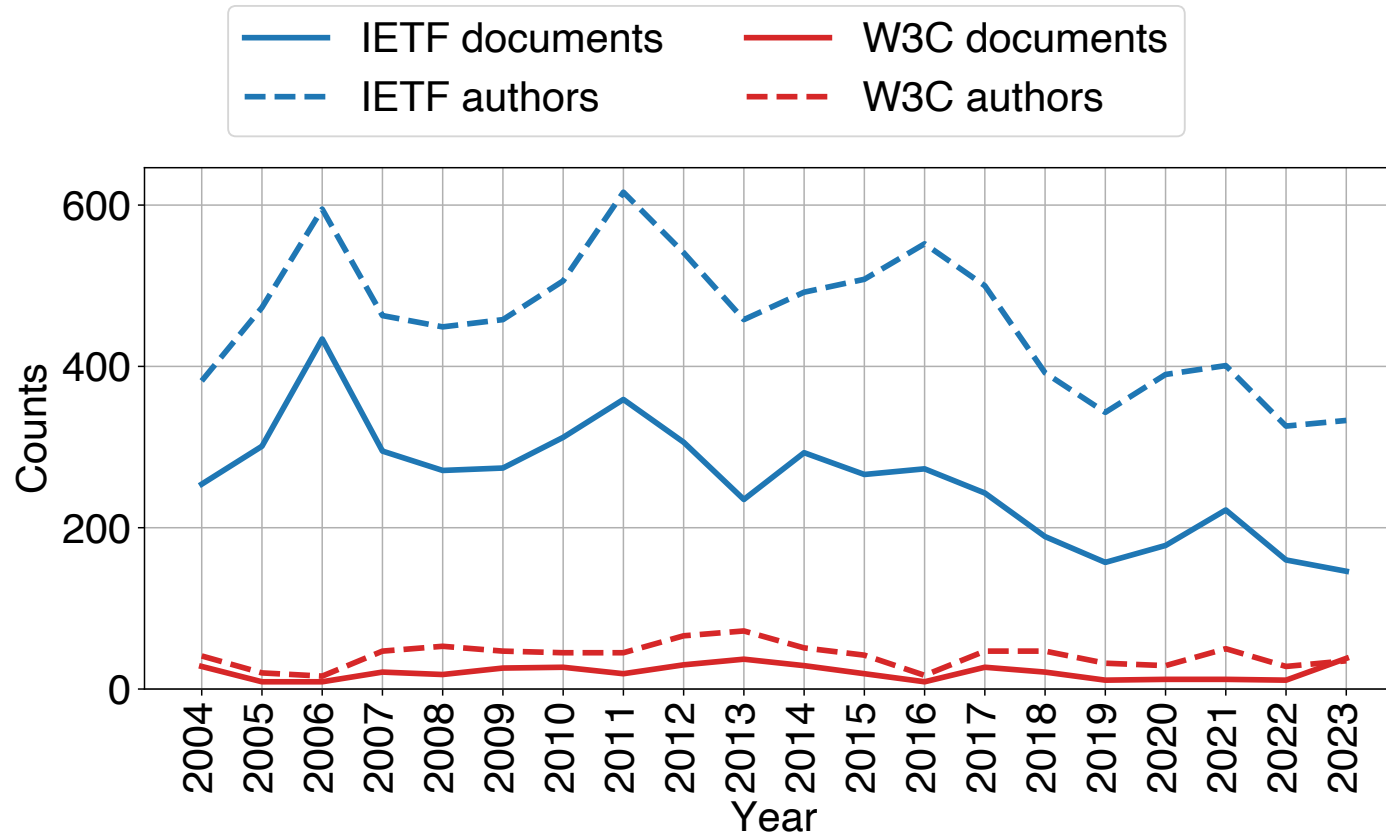






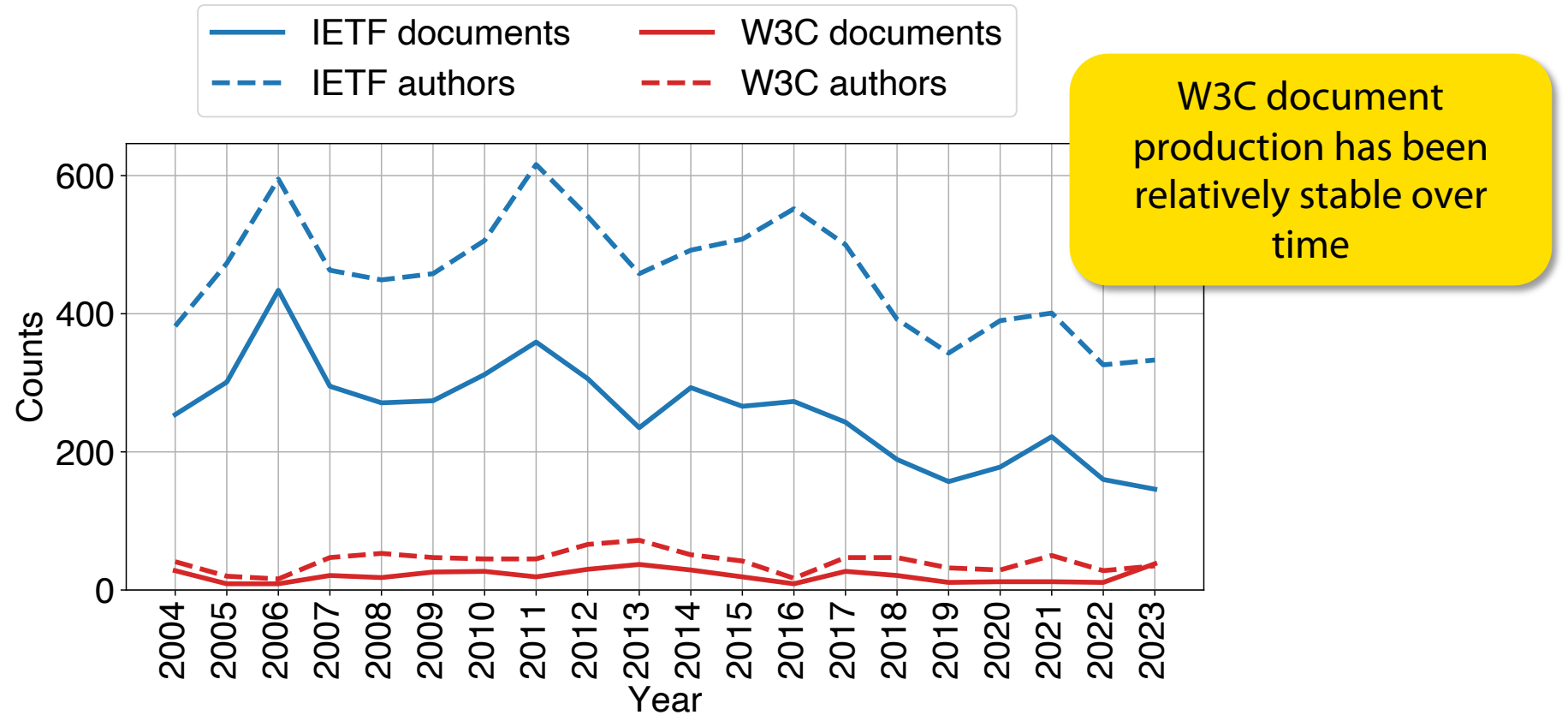
# Measuring the IETF and W3C

## Are more documents being written?



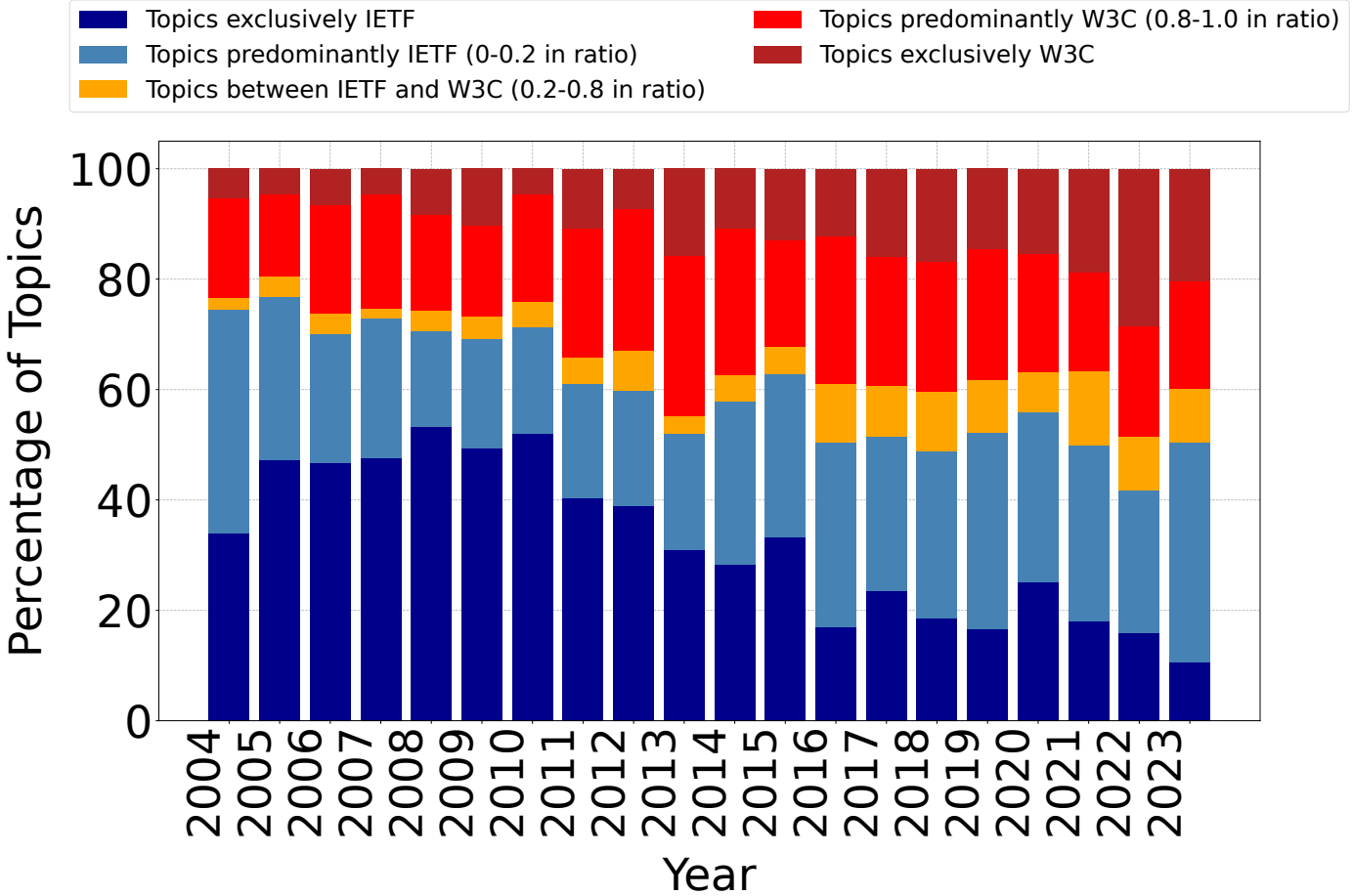
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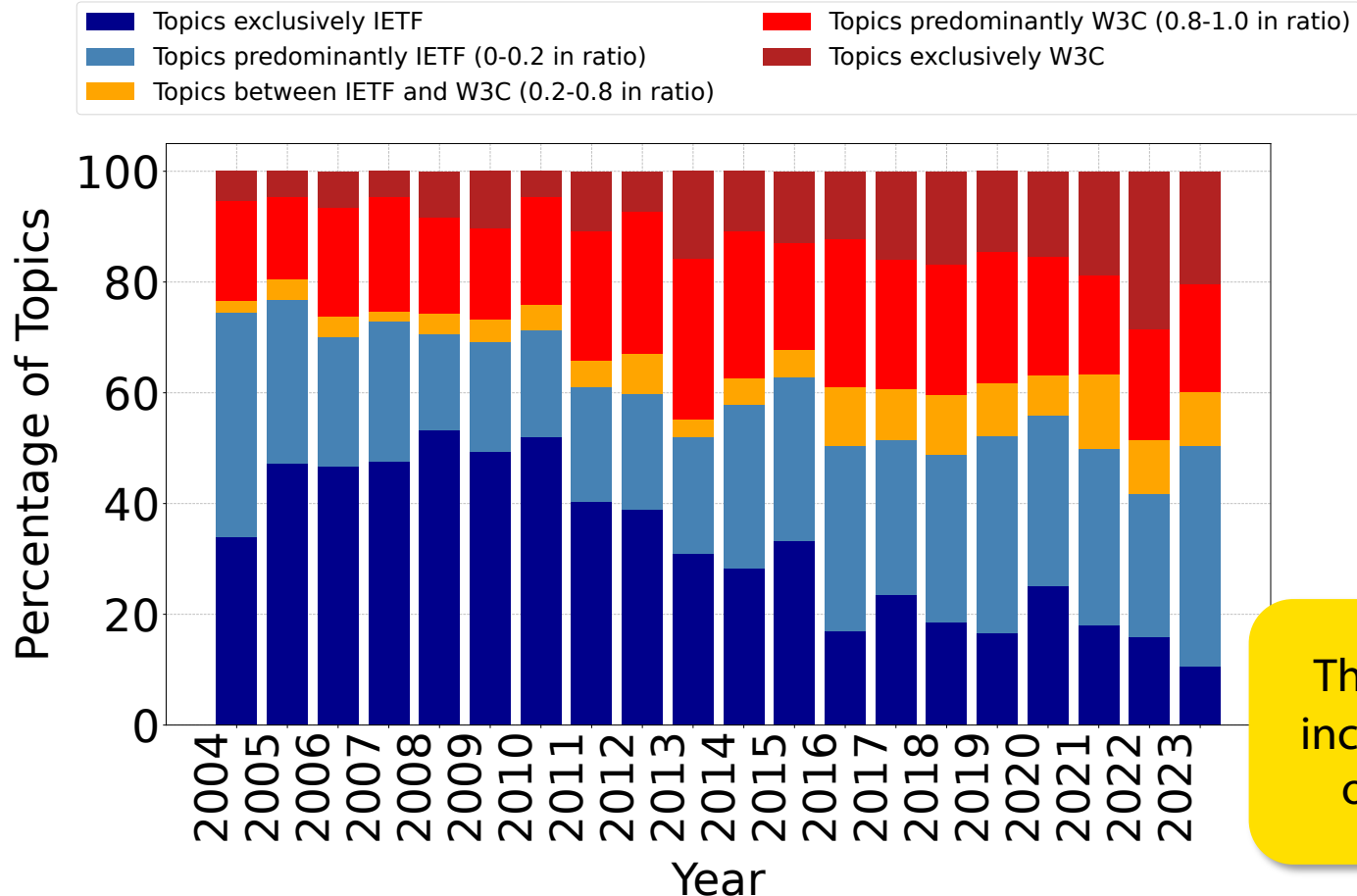
# Measuring the IETF and W3C

## What topics are being discussed?



# Measuring the IETF and W3C

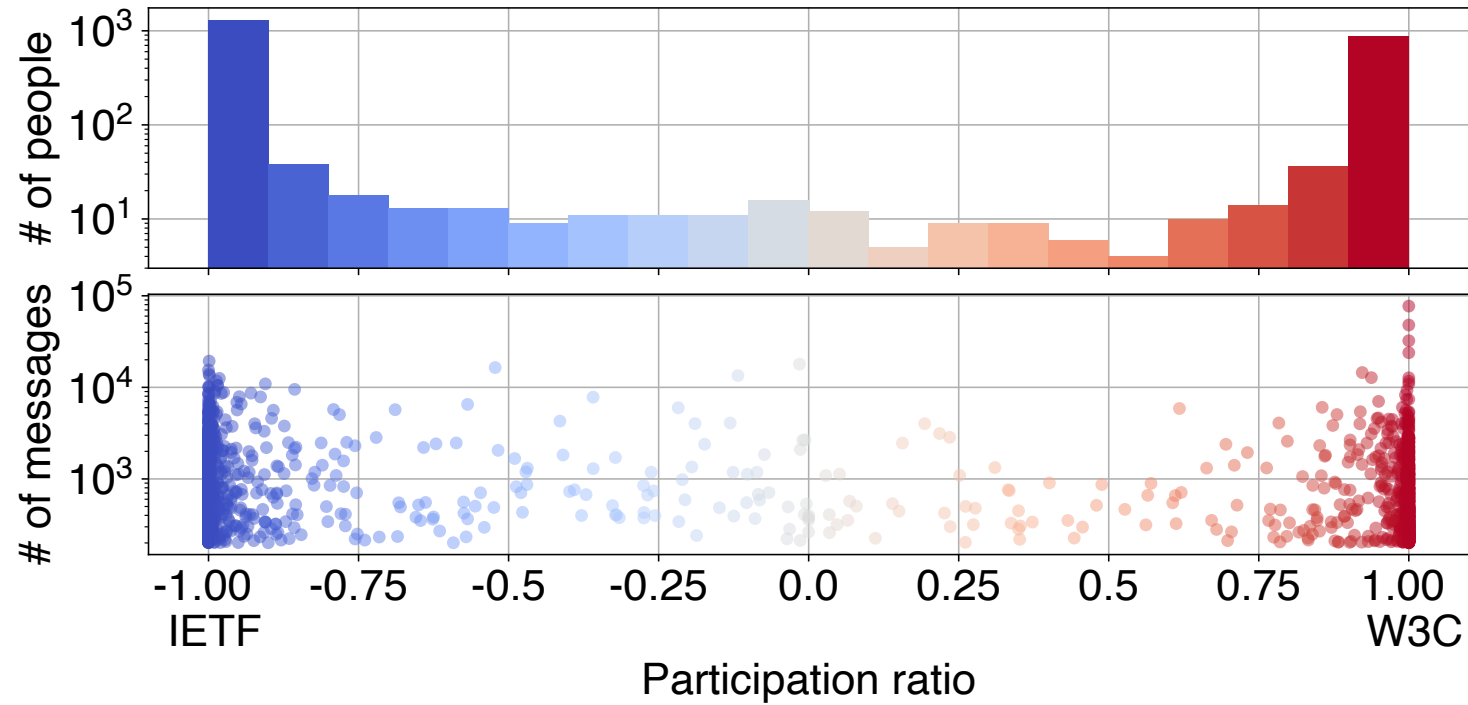
## What topics are being discussed?



The W3C and IETF are increasingly discussing overlapping topics

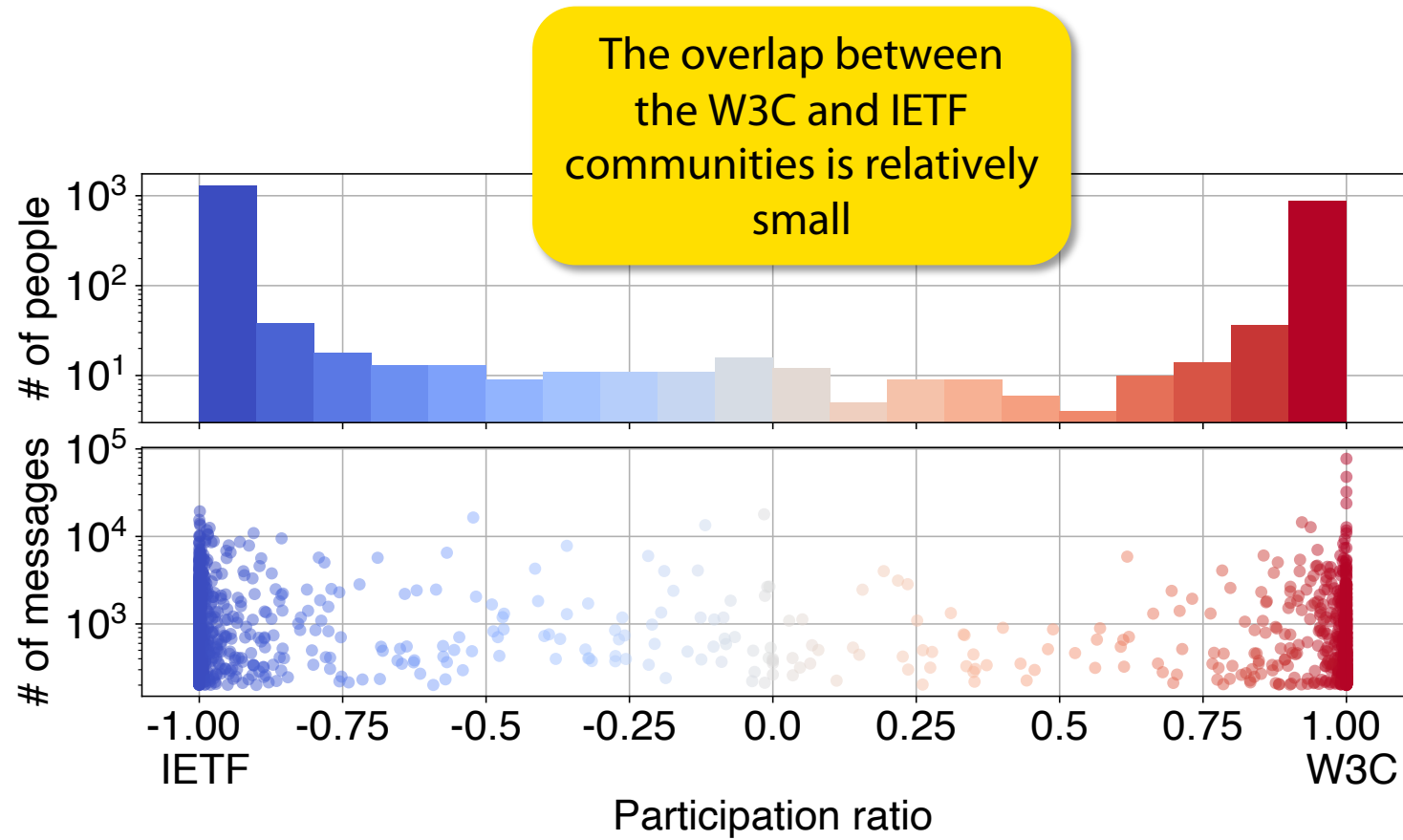
# Measuring the IETF and W3C

## Is there an overlap in participation?



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# Measuring the IETF and W3C

What impact do influential participants have on communication?

0 0.33 0.66 1

Proportion of people in overlap removed (ranked by betweenness centrality)

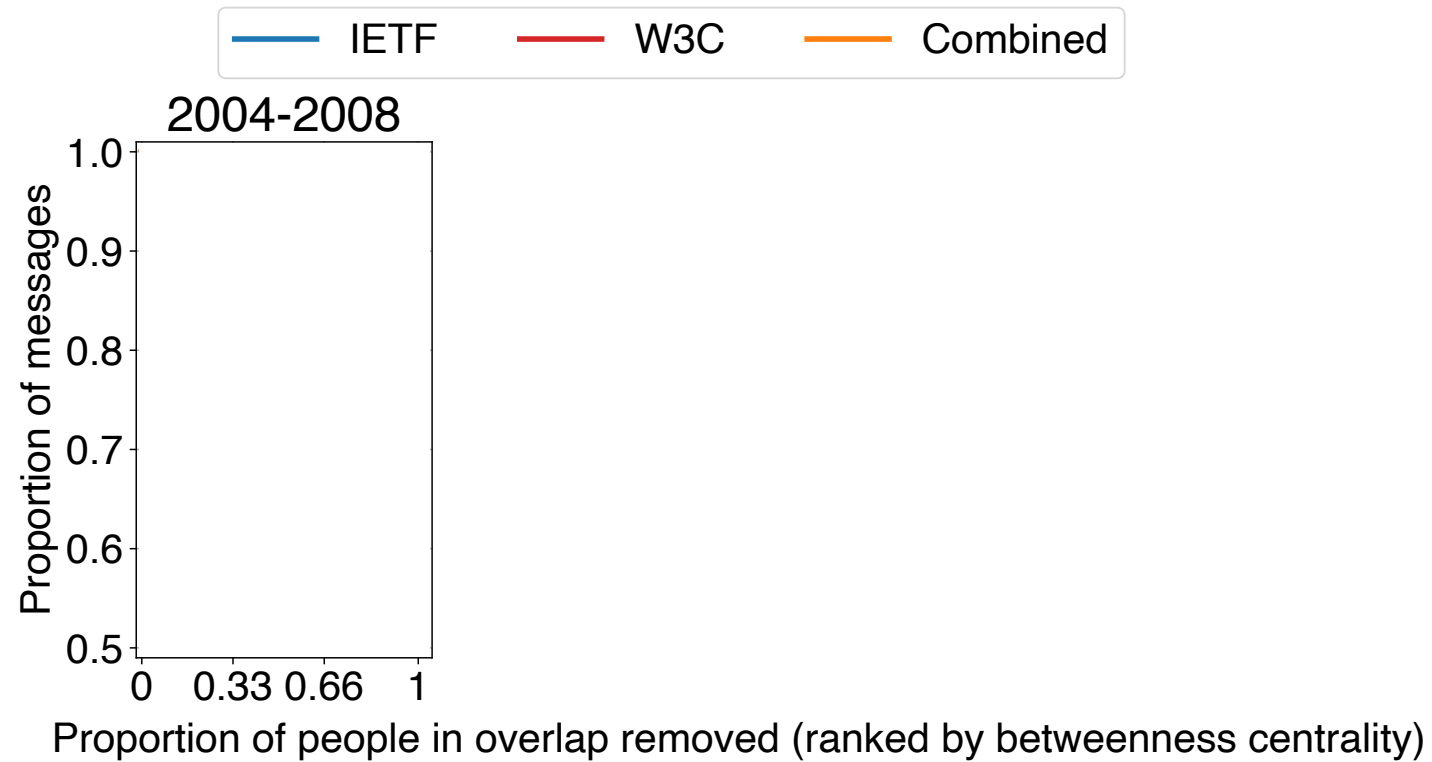
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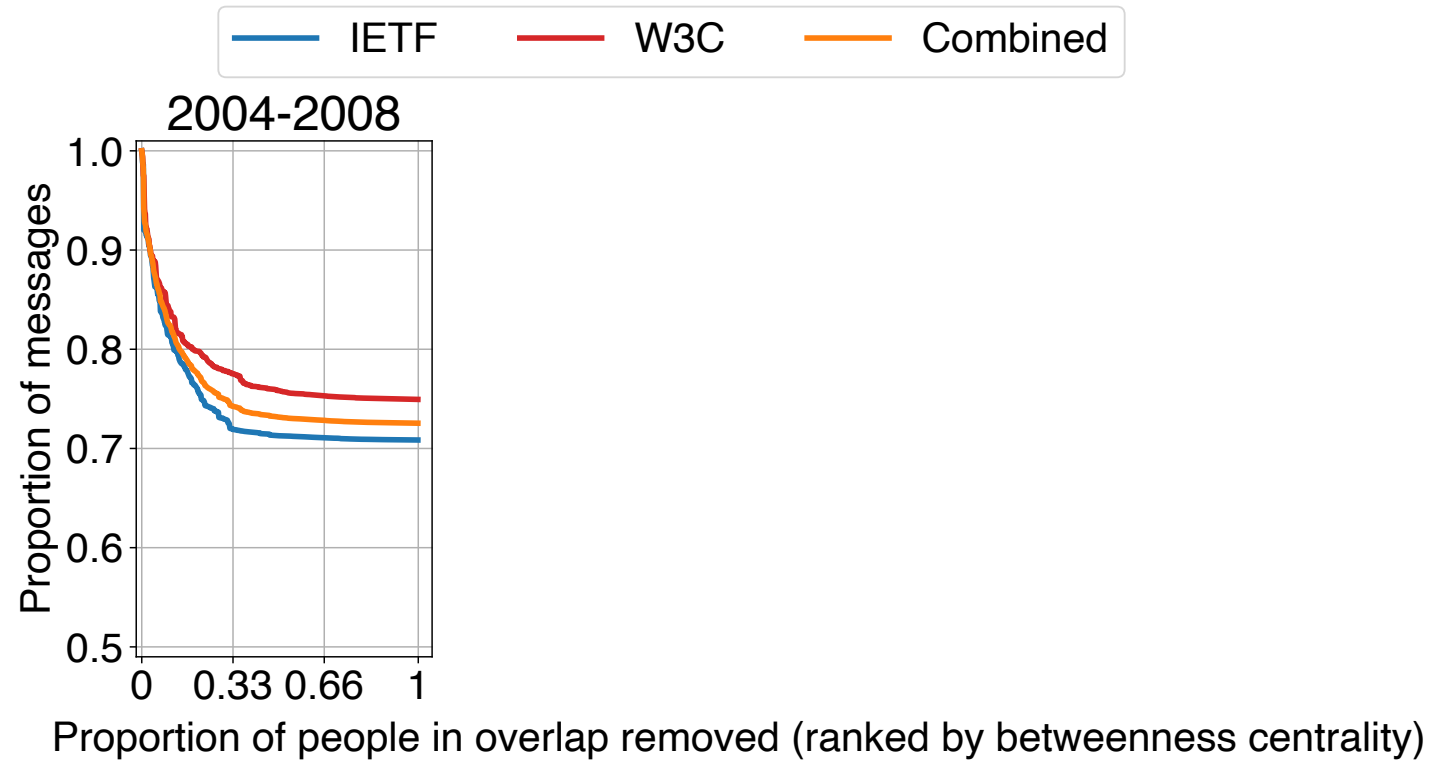
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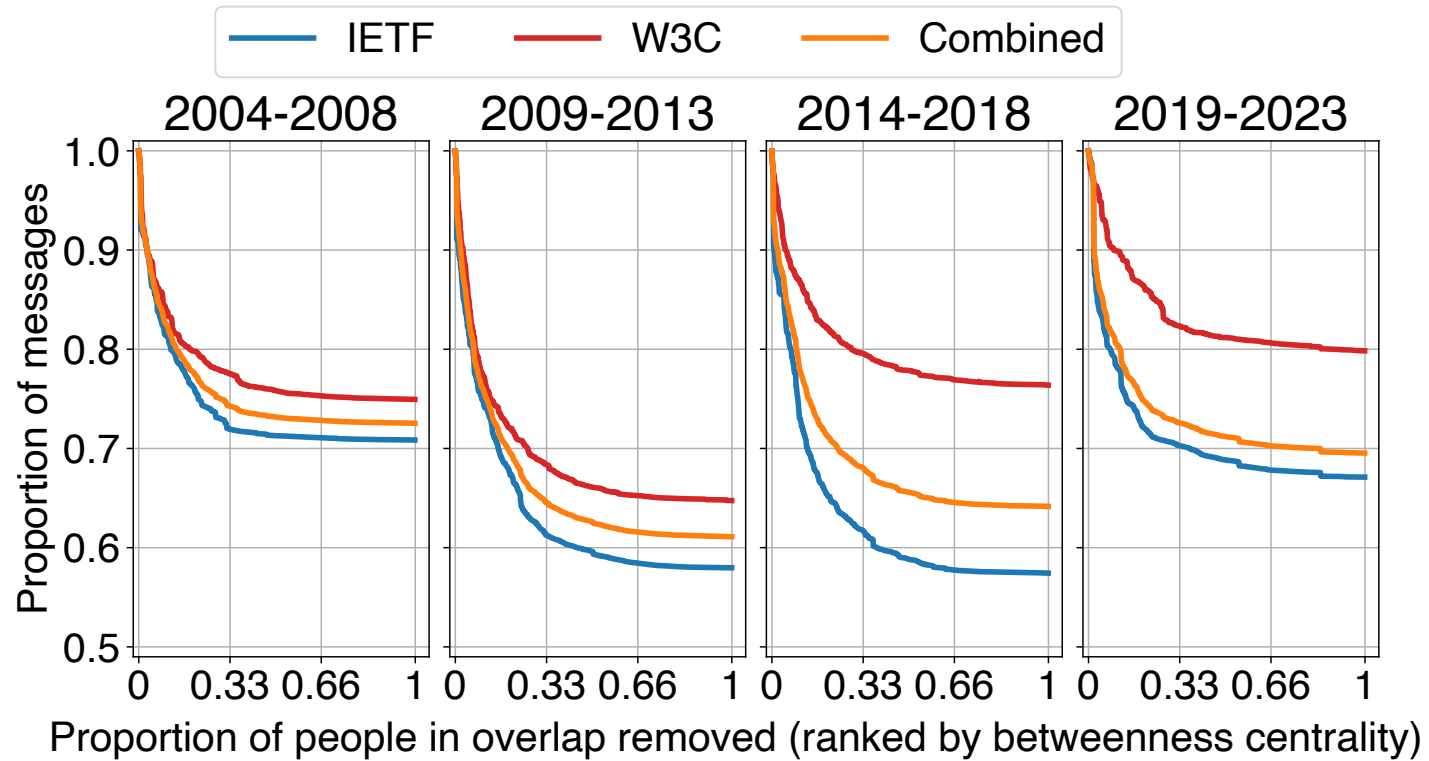
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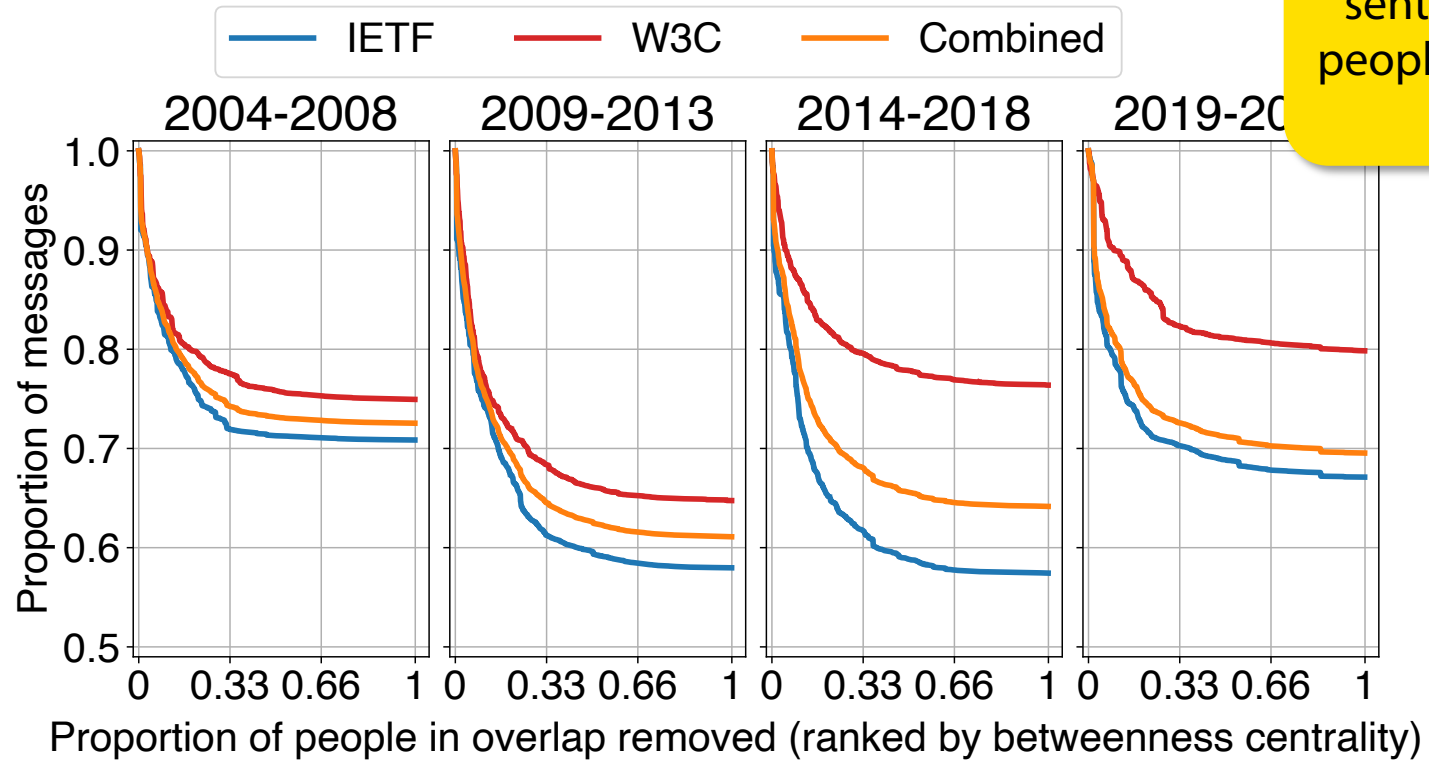
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Around 20% of messages sent in the W3C come from people that also participate in the IETF

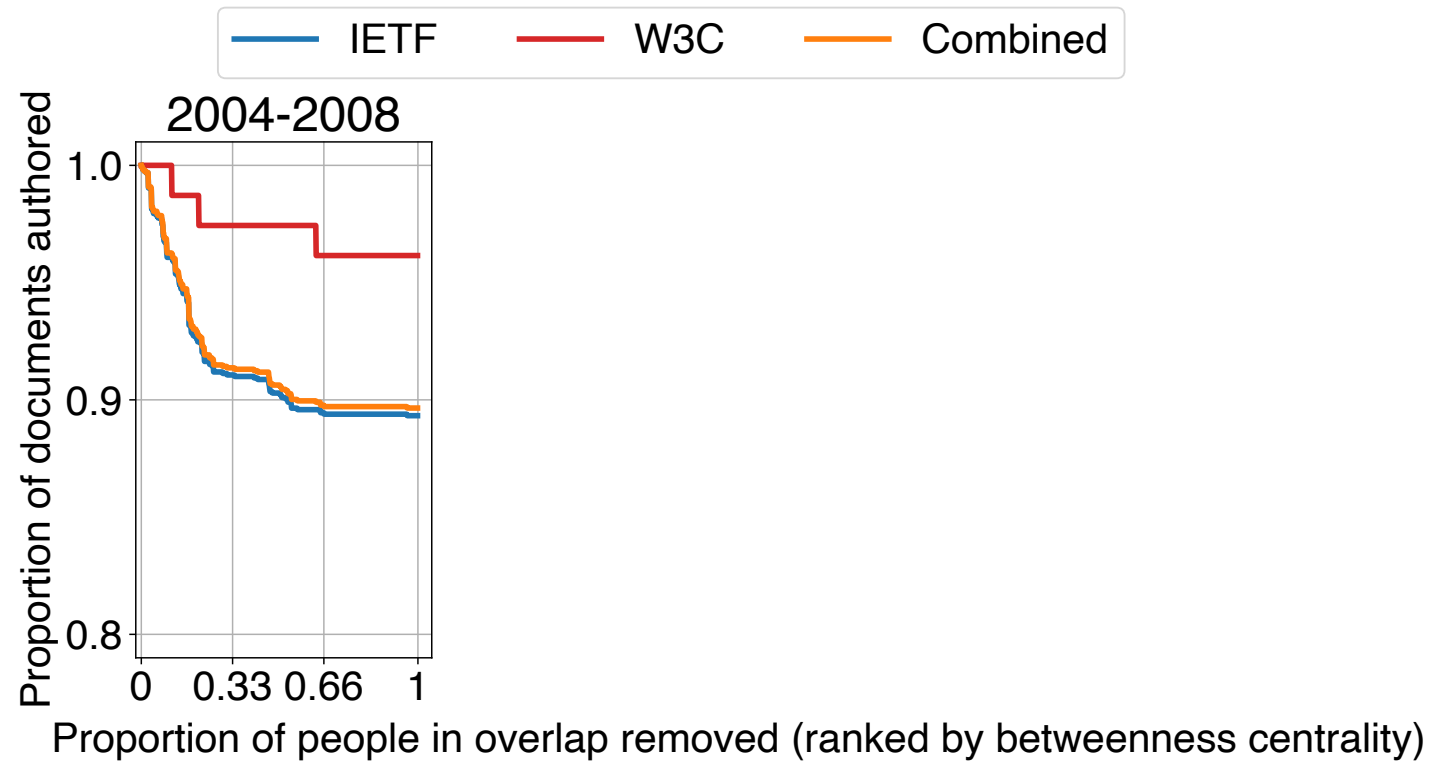
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What impact do influential participants have on authorship?



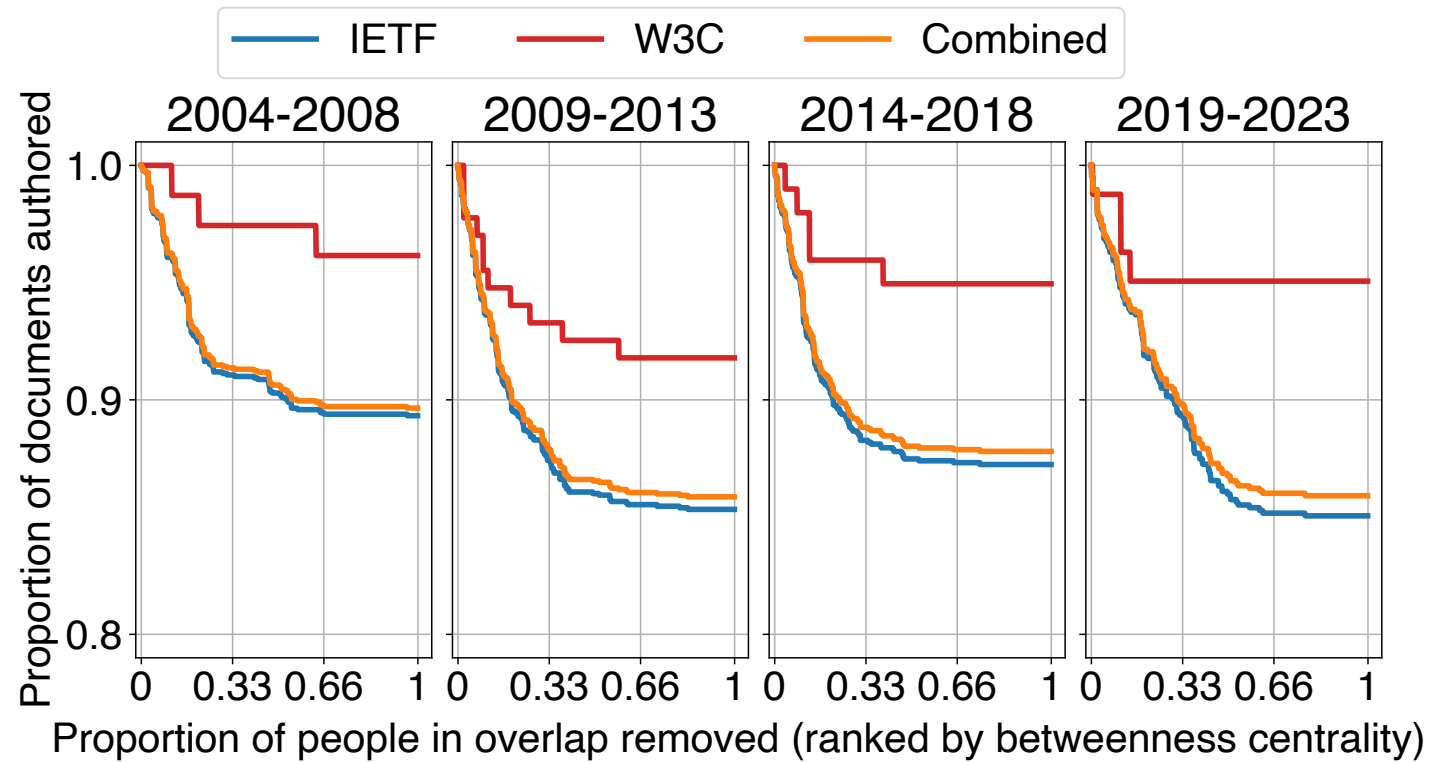
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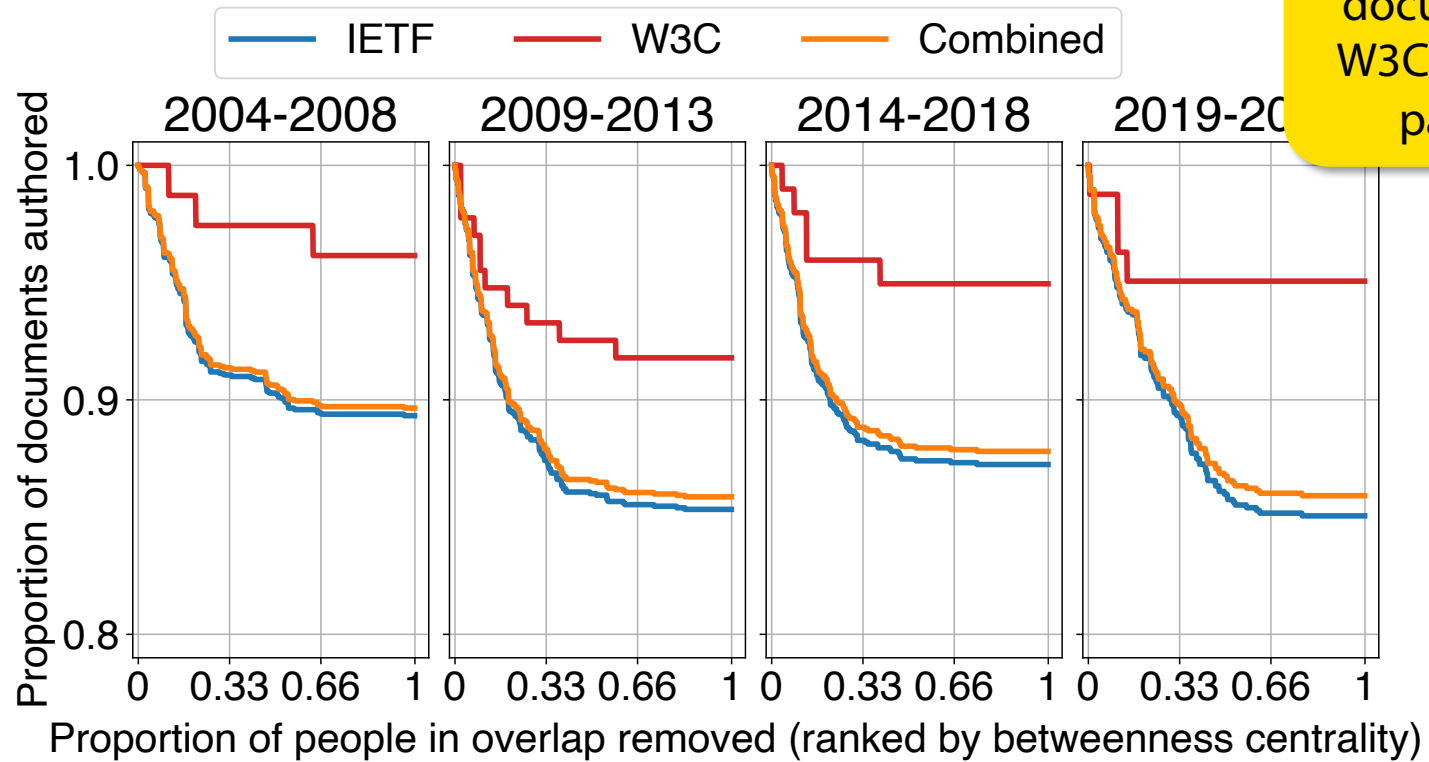
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Only around 5% of documents authored in the W3C are by people that also participate in the IETF

# Measuring the IETF and W3C

## Conclusion and discussion

- The Internet standards development community is evolving, broadly **becoming smaller, and producing fewer documents**
- People that participate in both the IETF and W3C have an **outsized impact** in the number of messages sent, but not on the number of documents authored
- What are the interesting questions that the data and analysis can answer about the IETF, W3C, and wider Internet standards community?
- More details available from <https://sodestream.github.io>

