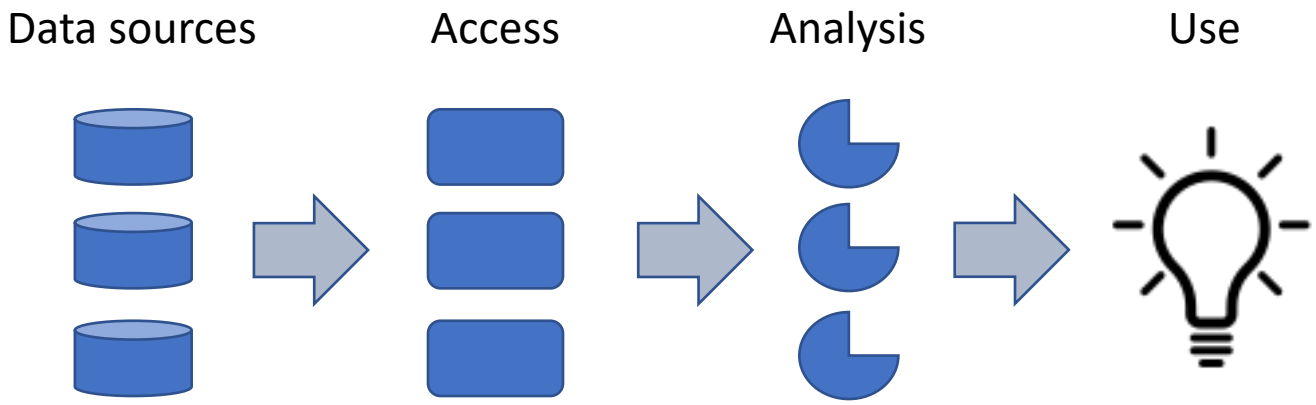
Session 1: Tools, data, methods

Chair: Jari Arkko

Presentations

- Datatracker interface (Sparks)
- BigBang (Benthall)
- SODESTREAM (McQuistin)
- IETF website analytics (Wood)



Relevant papers:

- Using Complex Systems Analysis to Identify Organizational Interventions (Sebastian Benthall)
- The ietfdata Library (Stephen McQuistin, Colin Perkins)
- The RFC Prolog Database (Marc Petit-Huguenin)
- Observations about IETF process measurements (Jari Arkko)
- And this, though not a paper: https://www.ietf.org/policies/web-analytics/ (IETF)

Accessing Datatracker Data

Robert Sparks

IAB AID Workshop

Session 1

What's available?

- Files (drafts, RFCs, agendas, minutes, photos)
  - Available over HTTPS and through rsync
- Metadata about People, Documents, Groups, Meetings, and more
  - Stored in SQL, structured as Django Models
- Archives of mailing lists
  - Managed by the mailarchive Django project rather than the datatracker

Details at https://notes.ietf.org/iab-aid-data-resources

Two ways to get to the datatracker data

- Set up a local development environment
  - Using docker (note that the first build will take 40-ish minutes)
  - Developer database dump refreshed daily
  - Django shell allows construction of arbitrary querysets
  - Instructions at https://notes.ietf.org/iab-aid-data-resources
- Use the v1 API
  - Built on Tastiepie
  - Can just be browsed (xml or json output)
  - Best accessed with curl and jq
  - Not as capable as the development environment
  - Some ordering care needed when retrieving a large number of records

Preview of what you can do

In [3]: Document.objects.filter(documentauthor__person__name= "Robert Sparks").count()

Out[3]: 258

In [4]: Counter(Document.objects.filter(documentauthor__person__name= "Robert Sparks").values_list('type_id',flat=True))

Out[4]: Counter({'draft': 67, 'review': 191})

Preview of what you can do

```
% curl "https://datatracker.ietf.org/api/v1/doc/document/?states__slug=lc&format=json" \
    | jq "[.objects[] | .name]"
[
  "draft-eastlake-rfc6931bis-xmlsec-uris",
  "draft-ietf-i2nsf-capability-data-model",
  "draft-ietf-i2nsf-nsf-monitoring-data-model",
  "draft-ietf-httpbis-priority",
  "draft-ietf-acme-dtnnodeid",
  "draft-ietf-httpbis-http2bis",
  "draft-ietf-lamps-samples"
]
```

What's in there?

- A lot – the datatracker is a large application, with complex data relationships
  - Over 100,000 documents
  - Nearly 20,000 people
  - Over 1000 meetings (including interims)
- Minimal PII for People
  - Names and email addresses
  - Sometimes Affiliation and Country
  - No addresses (though those can sometimes be mined from drafts)
  - No other explicitly captured demographics
- See https://notes.ietf.org/iab-aid-datatracker-database-overview

What's in there: History

- Most metadata is saved when a Document, Group, or Person object is modified
- Reasonably complete for recent (10 to 15 years) history
- Poor for older history – data is often incomplete, and is occasionally completely wrong
- The models were designed for tracking the current state of work. Mining the history records can be complicated.
  - It is very hard, for example, to determine when someone stopped being a chair of a given working group.

Backup slides

What’s in there: Code

- Don’t ignore the codebase
- Many utilities exist to make data mining easier
  - Finding the current (or final) IESG ballot state for a document
  - Extracting authors from text Internet-Drafts
  - Finding the chain of all documents that ultimately normatively depend on a given document through dependencies on other documents.

Getting started

- Explore the development environment and the v1 API
- Ask questions:
  - I’m available at email:rjsparks@nostrum.com and on the IETF Slack
  - Consider subscribing to tools-discuss@ietf.org

BigBang Update
//
Using
Complex Systems Analysis
to Identify
Organizational Interventions

Sebastian Benthall, PhD
Information Law Institute
NYU School of Law

What is BigBang

- A scientific toolkit for studying collaborative communities
- Data sources: Email, Git repositories, IETF DataTracker, ListServ, …
- Data science tools: using Scientific Python stack
  - Entity resolution for names and organizations
  - Social network analysis
  - Natural language processing on message content
  - Time series analysis
  - Information extraction…

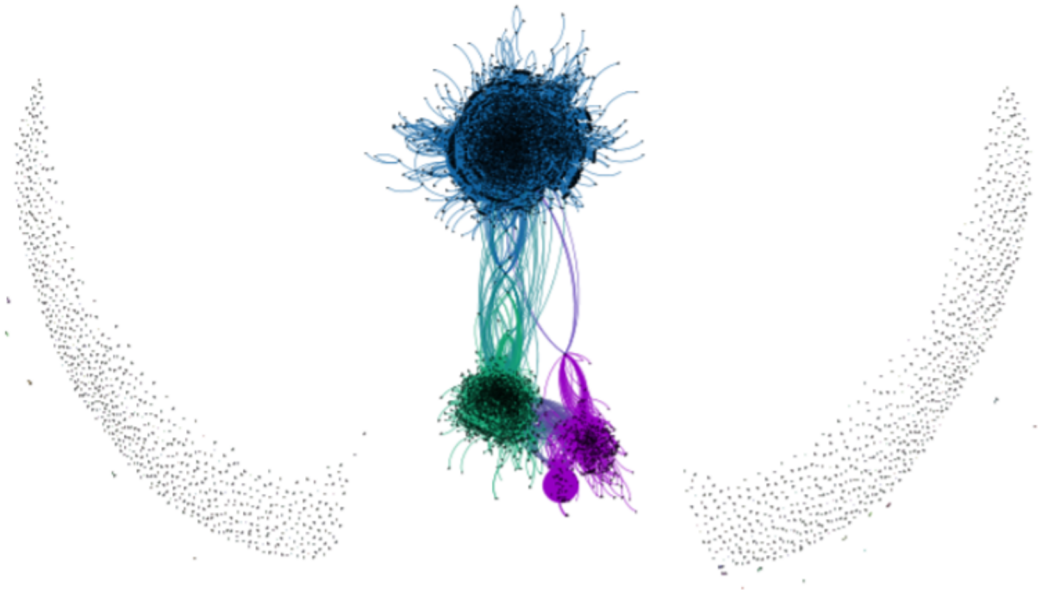
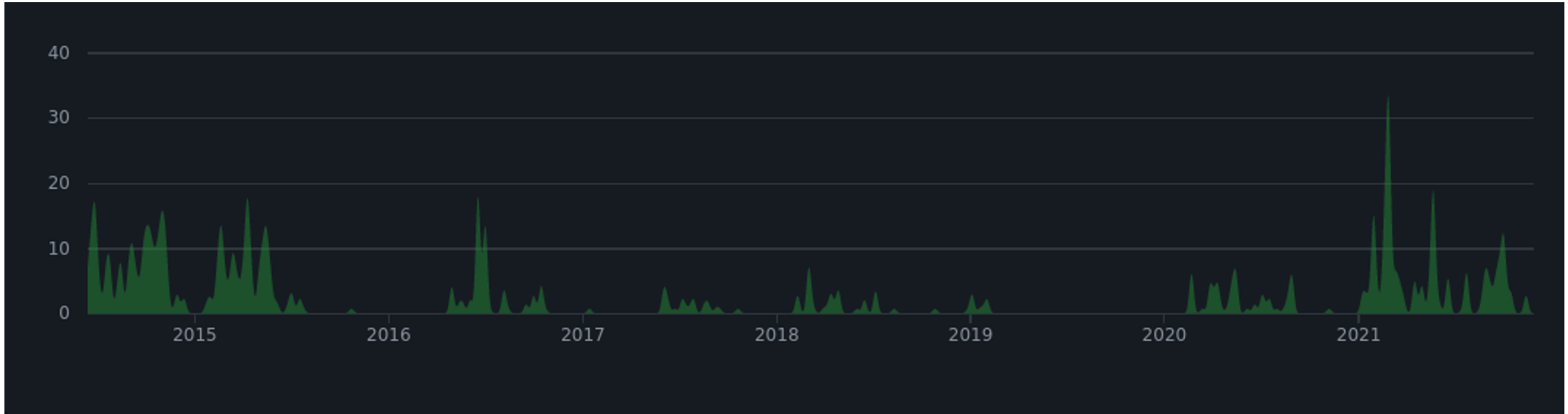


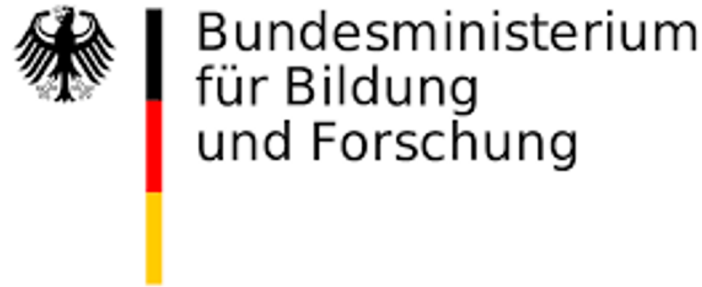
Fig. 1: *Interaction graph of all participants across all mailing lists explored in this study, rendered with [Gephi]. The large blue module is roughly the SciPy community. The green module is the Wikimedia community. The purple module is the OpenStreetMap community.*

Sebastian Benthall (2015) “Testing Generative Models of Online Collaboration with BigBang.” Proceedings of the 14th Python in Science Conference, 175 - 181, 2015, Eds.Kathryn Huff and James Bergstra, 10.25080/Majora-7b98e3ed-01b

History

- 2015 - Developed to study open collaborative communities.
- 2016 - adapted to study human rights advocacy in IETF and ICANN
- 2020 - Article 19 funds improvements to gender and affiliation detection, IETF datatracker and attendance ingest.
- 2021 - Article 19 sponsors BigBang Sprint at IETF 110.
- 2021 - BigBang awarded funding from Prototype Fund





Prototype
Fund

DATACTIVE

Individual vs. Organizations in IETF

“Participation in the IETF or of its WGs is not fee-based or organizationally defined, but is based upon self-identification and active participation by individuals.” - Tao of IETF

Are the participants in IETF acting as individuals, or as parts of organizations (like companies?)

Normative questions, like:

- Are individuals better stewards of the public interest than commercial organizations?

A related, *descriptive*, question:

- How to determine when individuals are acting independently vs. as part of an organizational action.

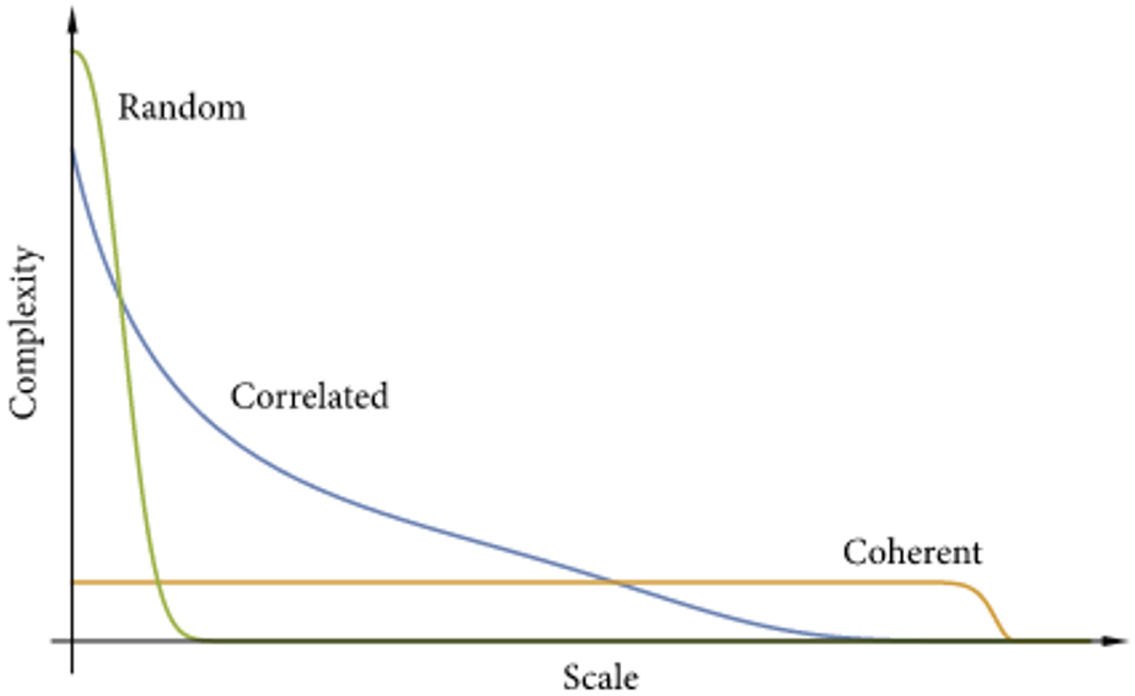
This is about how to do empirical work that spans *levels of abstraction*.

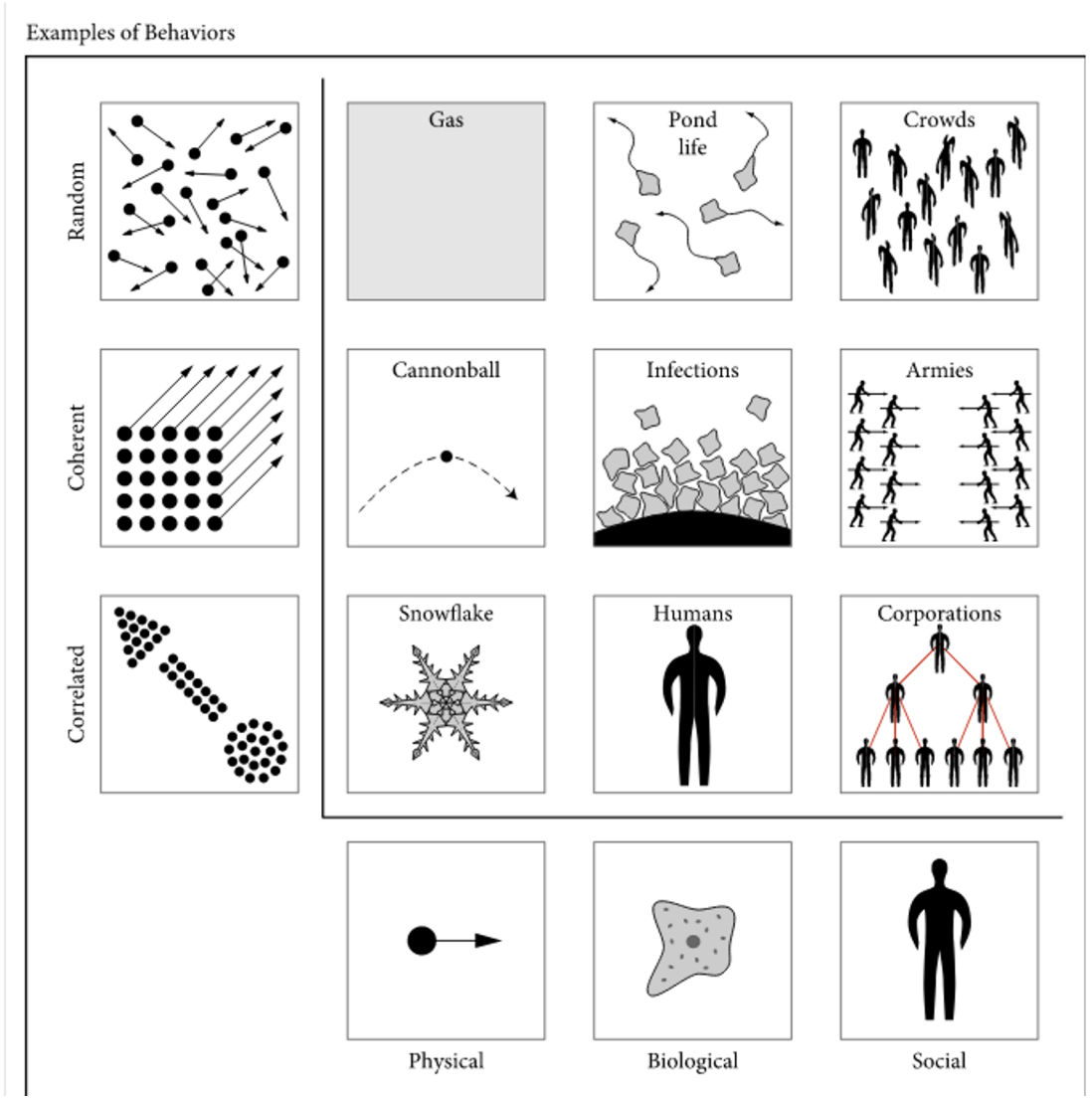
Tools, data, and methods

- Using BigBang for mailing list analysis
  - Getting participation in discussion outside of drafting

- This data is organized along multiple levels of abstraction.

Email Addresses		Working Group 1	Working Group 2
prefix_a	@domain_x.com	250	10
prefix_b		1	50
prefix_c	@domain_y.org	150	20
prefix_d		100	30





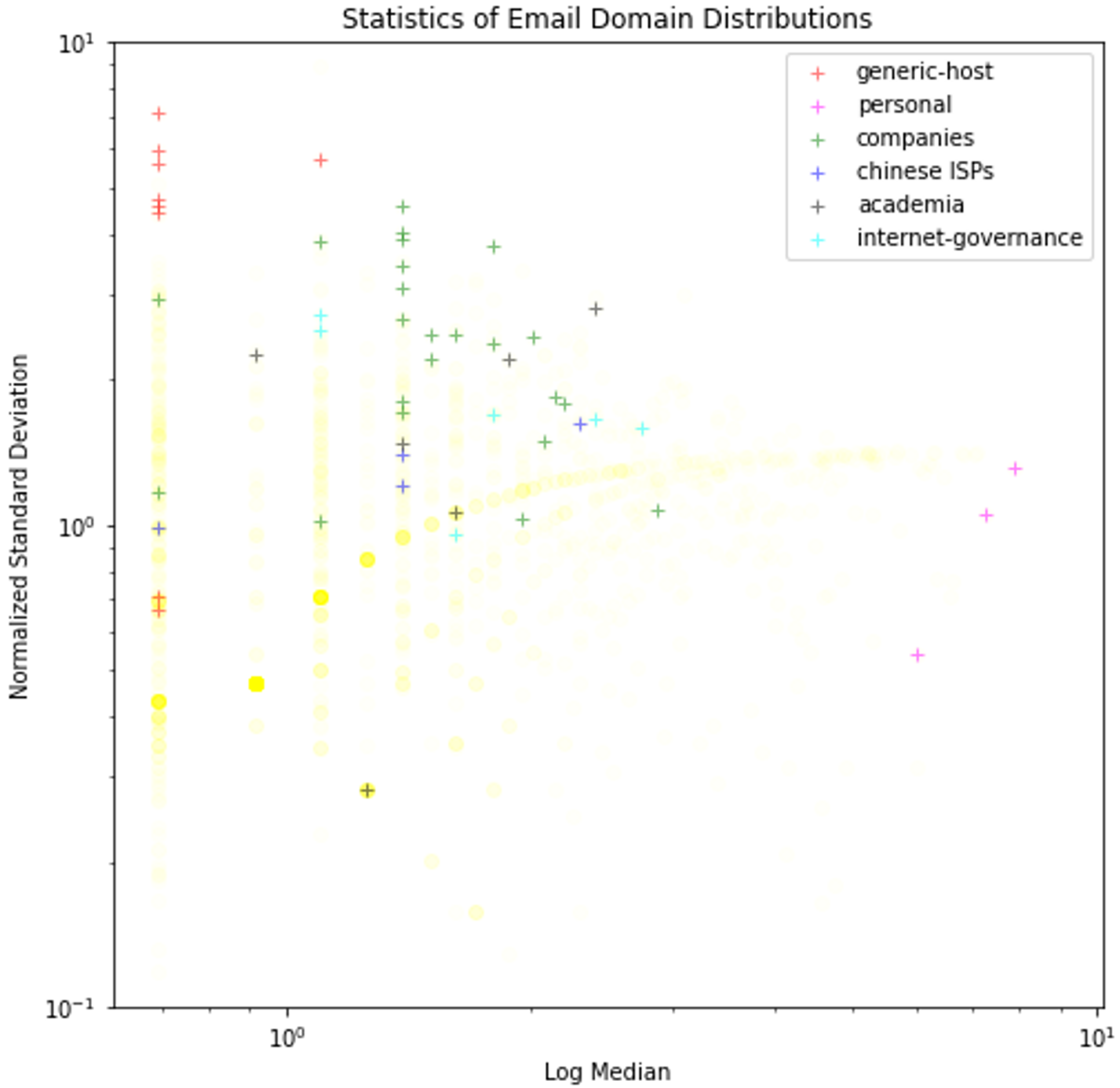
Use the *complexity profile* of a phenomenon to determine if it is acting randomly or else with a higher organizing principle. (Figures from Siegenfeld and Bar-Yam, *Complexity*, 2020)

Preliminary results on distributions over prefixes:

- *Generic email domains:*
  - e.g. `gmail.com`
  - *high standard deviation*
  - *low median*
  - R*andom* organization.

- *Organizational* email domains
  - E.g. `apple.com`
  - *higher median*
  - C*orrelated* organization

- *Personal* email addresses
  - E.g. `csperkins.org`
  - *low standard deviation*
  - *high median*
  - Coherent organization



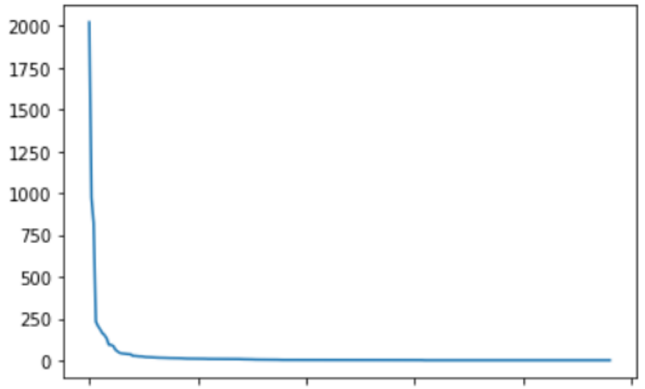
Next steps

- Consider organization within working groups
  - At individual level
  - At domain level
- Are the working groups random, correlated, or coherent organizations?
- Are they a mixture of activities of different types of organizations?

Questions and feedback: spb413@nyu.edu. Thanks!

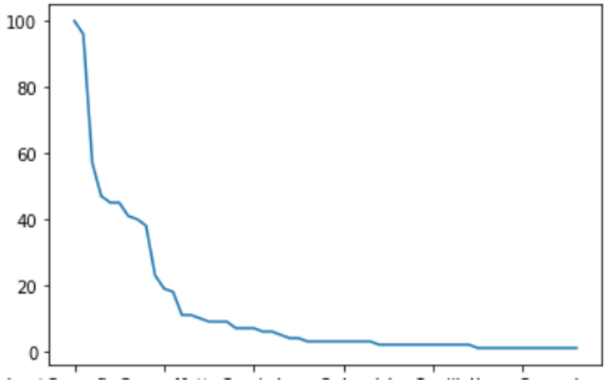
Messages to `httpbisa`

Messages per email - gmail.com



Many differently affiliated individuals at major differences in scale - random.

Messages per email - google.com



Area under curve indicating corporate strategy.

University of Glasgow

The ietfdata Library

Stephen McQuistin
Colin Perkins

IAB Workshop on Analyzing IETF Data (AID)
November 29th 2021

UKRI Engineering and Physical Sciences Research Council

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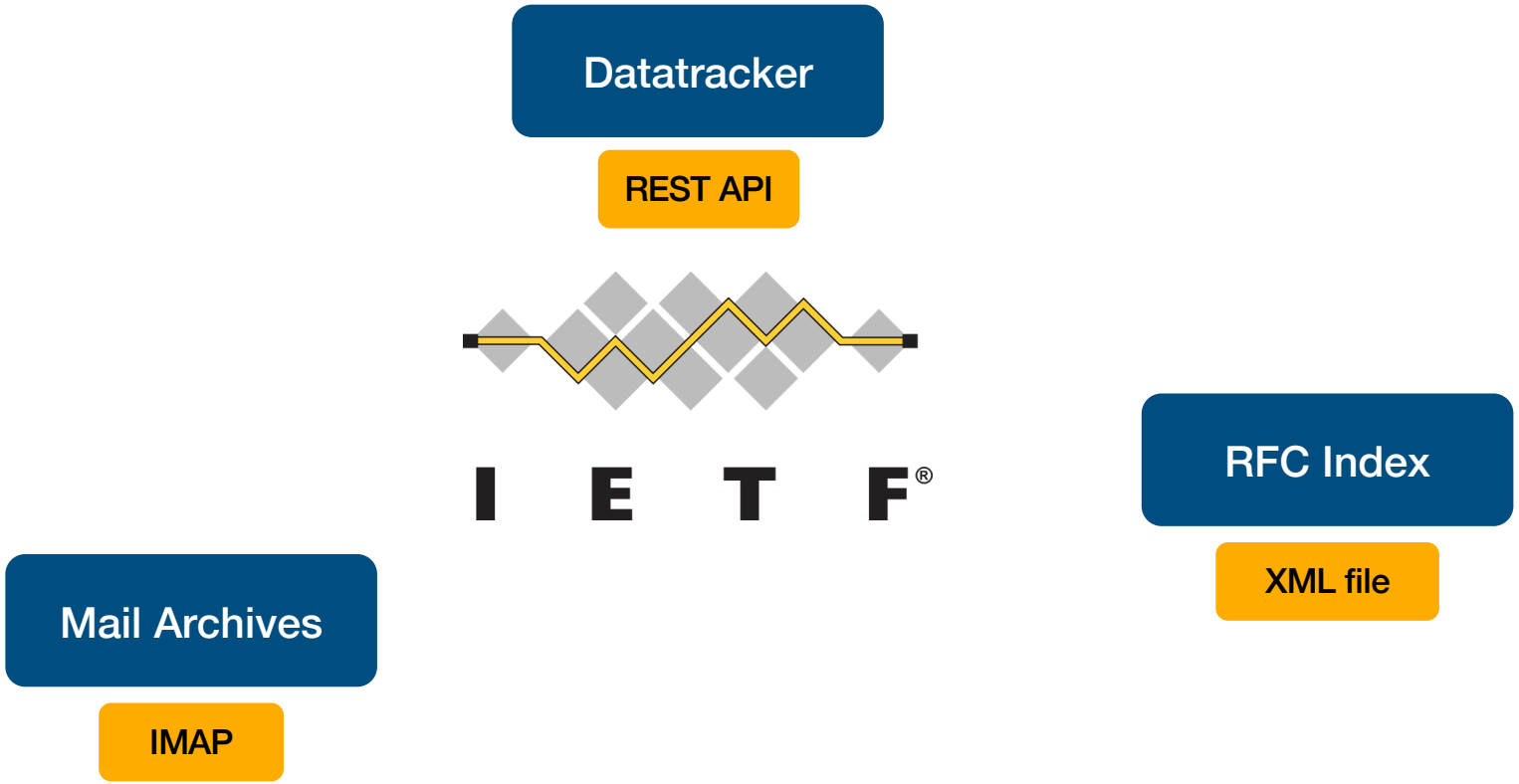
IETF Data

Datatracker

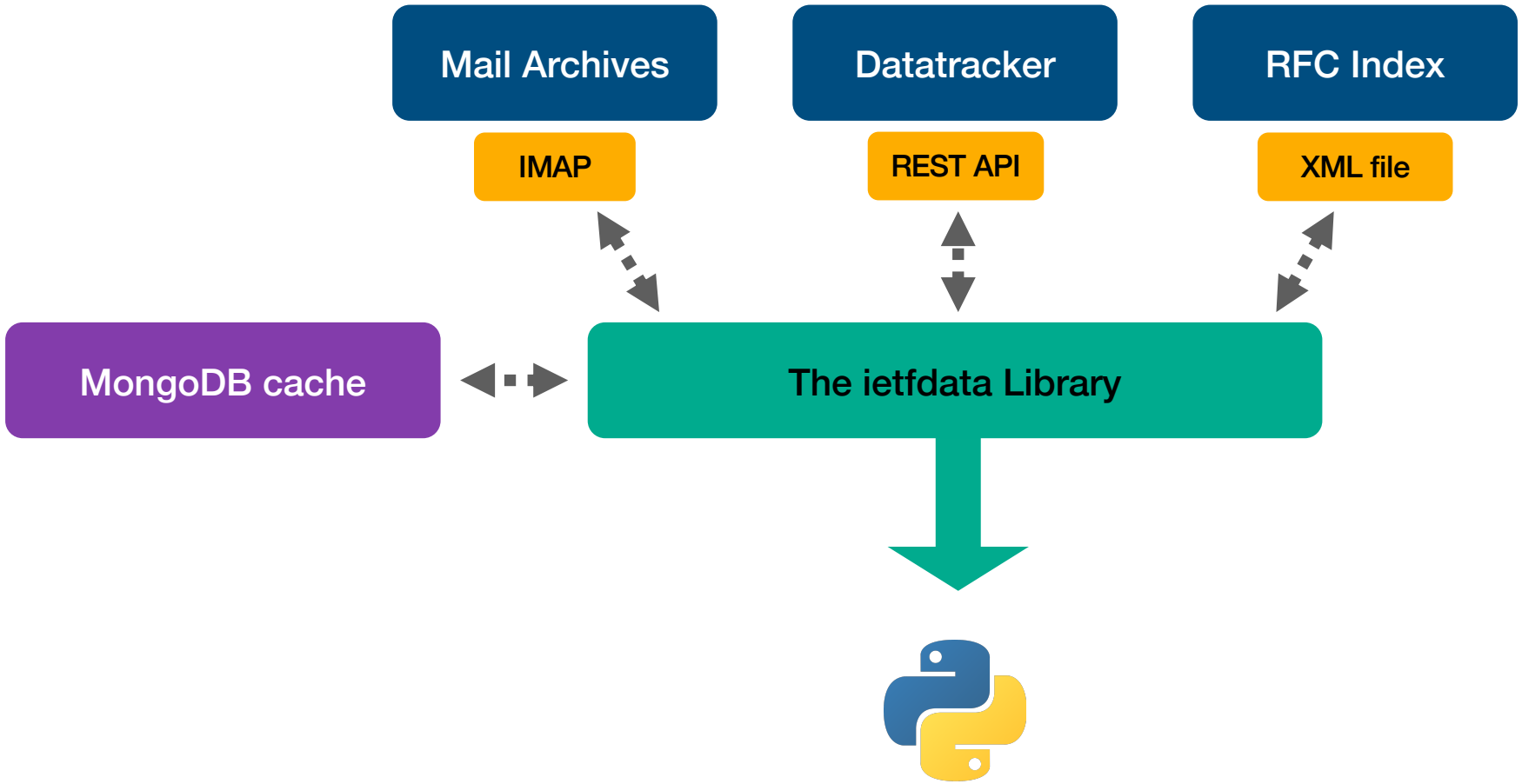
RFC Index

Mail Archives

IETF Data


Datatracker
REST API
I E T F®
RFC Index
XML file
Mail Archives
IMAP

The ietfdata Library



What data is available?

- Author list
- Stream
- IETF working group and area information, if appropriate
- Status (at publication, and current)
- Updates/obsoletes relationships between RFCs

RFC Index

Mail Archives

Datatracker

What data is available?

- IETF mailing lists, and mirrors, from around 1995
- Messages grouped by mailing list
- Library provides a thread abstraction

What data is available?

- Documents
  I-Ds, agendas, bluesheets, charters, minutes, recordings, …
- Groups
  Events, milestones, roles (chairs and ADs), URLs …
- Intellectual property disclosures
- Mailing list subscriptions
- Meetings
  Registrations, schedule, session details, …
- People
  Names, e-mail addresses, biographies, …
- Reviews
  Requests, reviews, assignments, review teams/directorates, …

RFC Index

Mail Archives

Datatracker

Example: Meeting registrations

```
from ietfdata.datatracker import *

dt = DataTracker()

p = dt.person_from_email("sm@smcquistin.uk")
print("Name: {}".format(p.name))

for reg in dt.meeting_registrations(person=p):
    meeting = dt.meeting(reg.meeting)
    if dt.meeting_type(meeting.type) == dt.meeting_type_from_slug("ietf"):
        print(F"Registered for IETF {meeting.number} in {meeting.city}")
        print(F"  Name: {reg.first_name} {reg.last_name}")
        print(F"  Affiliation: {reg.affiliation}")
        print(F"  Email: {reg.email}")
```

Example: Meeting registrations

```
Name: Stephen McQuistin
Registered for IETF 94 in Yokohama
  Name: Stephen McQuistin
  Affiliation: University of Glasgow
  Email: sm@smcquistin.uk
Registered for IETF 96 in Berlin
  Name: Stephen McQuistin
  Affiliation: University of Glasgow
  Email: sm@smcquistin.uk
Registered for IETF 101 in London
  Name: Stephen McQuistin
  Affiliation: University of Glasgow
  Email: sm@smcquistin.uk
Registered for IETF 103 in Bangkok
  Name: Stephen McQuistin
  Affiliation: University of Glasgow
  Email: stephen.mcquistin@glasgow.ac.uk
Registered for IETF 105 in Montreal
  Name: Stephen McQuistin
  Affiliation: University of Glasgow
  Email: sm@smcquistin.uk
...
```

Example: Meeting registrations

```
Name: Stephen McQuistin
Registered for IETF 94 in Yokohama
  Name: Stephen McQuistin
  Affiliation: University of Glasgow
  Email: sm@smcquistin.uk
Registered for IETF 96 in Berlin
  Name: Stephen McQuistin
  Affiliation: University of Glasgow
  Email: sm@smcquistin.uk
Registered for IETF 101 in London
  Name: Stephen McQuistin
  Affiliation: University of Glasg
  Email: sm@smcquistin.uk
Registered for IETF 103 in Bangkok
  Name: Stephen McQuistin
  Affiliati
  Email: stephen.mcquistin@glasgow.ac.uk
Registered
  Name: Stephen McQuistin
  Affiliation: University of Glasgow
  Email: sm@smcquistin.uk
...
```

Finds registrations by person, even if a different e-mail address was used

Summary

- The ietfdata library provides a Python API for accessing email archives, the Datatracker, and the RFC Index
- Support for caching, to improve performance and reduce load on the IETF's infrastructure
- Available via PyPI, with code and examples on GitHub

Installation via PyPI:
`pip install ietfdata`

Code and examples:
https://github.com/glasgow-ipl/ietfdata

Examples

More at github.com/glasgow-ipl/ietfdata/tree/master/examples

Example: Bluesheets

```
from ietfdata.datatracker import *

dt = DataTracker()

bluesheets = dt.document_type_from_slug("bluesheets")
quic = dt.group_from_acronym("quic")

for doc in dt.documents(doctype = bluesheets, group = quic):
    print(doc.title)
    print(doc.url())
    print("")
```

Example: Organisational chart

```
from ietfdata.datatracker import *

dt = DataTracker()

def print_group(group : Group, level : int):
    for i in range(0, level):
        print("  ", end="")
    print(group.name)
    for g in dt.groups(parent = group, state = dt.group_state_from_slug("active")):
        print_group(g, level + 1)

print_group(dt.group_from_acronym("ietf"), 0)
print_group(dt.group_from_acronym("irtf"), 0)
```

Example: Group roles

```
from ietfdata.datatracker import *

dt = DataTracker()

def group_roles(group: Group):
    print(F"Group: {group.name}")
    for gr in dt.group_roles(group = group):
        e  = dt.email(gr.email)
        p  = dt.person(gr.person)
        rn = dt.role_name(gr.name)
        print(F"  {rn.name}: {p.name} <{e.address}>")
    print("")


for g in [dt.group_from_acronym("ietf"),
          dt.group_from_acronym("irtf"),
          dt.group_from_acronym("iesg"),
          dt.group_from_acronym("irsg"),
          dt.group_from_acronym("quic")]:
    group_roles(g)
```