

# Open Measurement Gatherings (OMG)

Convening 1  
Public Report



Photo Credit: Kevin Beasley/Georgia Tech College of Computing

**MLAB**



**IODA**



**OONI**

**CS&S**

Code for  
Science &  
Society



**Censored Planet**



**Cloudflare Radar**

# Introduction

## Open Measurement Gatherings

The OMG project is funded by the [Open Technology Fund \(OTF\)](#) and is an opportunity for participating in open Internet and censorship measurement groups to coordinate more closely and become more knowledgeable about one another's work.

The goal of the OMG project is to increase trust and coordination between Internet measurement groups so that we can support the Internet Freedom community more sustainably and efficiently. With this motivation in mind, the events are organized with the following principles:

- 1. Better together:** Collaboration is essential to the Internet freedom community's goals. The convenings are designed with the belief that no group or individual can do it alone.
- 2. Collaborative learning environment:** To improve trust and coordination among Internet measurement groups, the OMG convenings foster a tone of humility and kindness.
- 3. Learning in the open:** To enhance trust with the wider Internet freedom community, the OMG convenings share work and solicit feedback openly.
- 4. Impact centered research:** To mitigate the decentering of the people most impacted by Internet disruption events, the convenings will consider how our research and capabilities could be useful to those "on-the-ground".

## OMG Participating Groups

[M-Lab](#), [IODA](#), [OONI](#) and [Censored Planet](#) will participate in all four convenings as these organizations' primary mission is to

provide open source tools and open data on Internet censorship events. In addition to these core groups, convening will include relevant experts from the Internet freedom and network research community, such as [Cloudflare Radar](#), who joined us as a guest for our first event.

Core participating groups:

- **M-Lab.** [Measurement Lab \(M-Lab\)](#) is an open, distributed server platform comprising hundreds of servers located in 70+ cities in 40+ countries globally. M-Lab's [Network Diagnostic Test \(NDT\)](#) speed test data is the most popular measurement service running on M-Lab, with ~3 million measurements each day globally. It tests a user's network connectivity by downloading and uploading an object and measuring the time it takes. In technical terms, it uses a WebSocket over TLS to measure how fast a user's device can send/receive data using a single TCP connection (bulk transport as defined in IETF's [RFC 3148](#)).
- **IODA.** [Internet Outage Detection and Analysis \(IODA\)](#) is a system that monitors the connectivity of the Internet infrastructure, in near-real time, to identify Internet outages affecting networks, nations, and subnational regions. It is run out of the [Internet Intelligence Lab](#) at Georgia Tech's College of Computing, in the School of Computer Science.
- **OONI.** The [Open Observatory of Network Interference \(OONI\)](#) is a nonprofit organization that builds free software (called [OONI Probe](#)) designed to [measure](#) various forms of Internet censorship, such as the blocking of websites, instant messaging apps, and circumvention tools. Since 2012, OONI Probe users have contributed [more than 2 billion network measurements](#)

collected from 27 thousand unique local networks in 241 countries and territories. OONI measurements collected from around the world are published as [open data in real-time](#).

- **Censored Planet.** [Censored Planet](#) is a censorship measurement platform that continuously measures reachability to over 2,000 websites from more than 95,000 vantage points in 221 countries. It uses remote measurement techniques that do not require users in Iran to run tests.

## OMG Convening 1 at Georgia Tech

From June 11th-13th, 2024, Measurement Lab (M-Lab) and the Internet Intelligence Lab hosted the first convening of the OMG on the sunny campus of Georgia Tech.

### Attendees

The convening brought together the following participants:

Affiliation	Name	Title
Censored Planet	Aaron Ortwein	PhD Student
Censored Planet	Anna Ablove	PhD Student
Censored Planet	Armin Huremagic	Lead Engineer & Researcher
Censored Planet	Wayne Wang	PhD Student
Cloudflare Radar	David Belson (industry guest)	Head of Data Insight
IODA	Alberto Dainotti	Associate Professor
IODA	Amanda Meng	Research Scientist
IODA	Shane Alcock	Software Developer
IODA	Zachary Bischof	Research Scientist
M-Lab	Lai Yi Ohlsen	Data and Research Lead
M-Lab	Melissa Newcomb	Senior Program Manager
OONI	Maria Xynou	Dir. of Strategic Engagement
OONI	Simone Basso	Senior Research Engineer
OONI	Jessie Bonisteel	Senior Project Manager
OONI	Maja Komel	Frontend Engineer

### Agenda

The convening agenda was designed collaboratively with input from each group, with an emphasis on flexibility and knowledge sharing.

#### Day 1

Knowledge sharing and improving an understanding of each other's datasets.

#### Day 2

Current cross-cutting efforts to improve techniques related to throttling, censorship event detection, and collaboration during rapid response to a censorship event.

#### Day 3

"Unconference", allowing for salient topics that emerged during Day 1 and 2 to be further explored.

## Summary

### June 11th - Day 1

To start off the convening we shared as individuals our goals for the convening. Nearly everyone stated the goal of wanting to learn more about each other's data as well as get to know our fellow colleagues working in measurement of network interference. We spent the rest of the day with presentations from each group going into detail on measurement techniques and datasets, accompanied by hands-on sessions using dashboards and notebooks. These hands-on sessions were continued on Day 3 when we collectively observed one Internet interference event in each of our datasets.

### June 12th - Day 2

On Day 2 the IODA team shared new research on outage detection methodologies and Censored Planet discussed how they use Google trend data as early warning signs of censorship. Additionally, IODA and OONI shared their current work on the detection of throttling, a notoriously difficult form of censorship to measure. In the afternoon, we shared, compared, and discussed each team's approach to rapid response when censorship events occur to identify where we might improve our coordination. We closed the day by planning which topics and conversations we wanted to cover on Day 3 for our unconference.

### June 13th - Day 3

On Day 3 we explored salient topics that were touched on during Day 1 and 2 but merited further discussion and time including:

- A cohesive review and documentation of what resources are used across groups to identify both dependencies and opportunities to share resources

- A more detailed discussion of the definition of throttling and techniques for its measurement, building on the session from Day 2
- An evaluation of our rapid response efforts and the users they primarily benefit.
- A review of our Internet "blind spots" or the dynamics and behaviors that no group currently measures
- A continued data dive session where we observed Internet interference events from each dataset

## Key Takeaways

Across our three days together we identified several key findings and top takeaways.

### Shared Challenges

Throughout Day 2 and Day 3 we were able to identify similar challenges faced across groups that we can better understand through conversation with each other. These challenges included: share points of dependency, blind spots in measuring network interference, needing to identify effective yet responsible rapid response methods.

- **Common dependencies.** Each of our projects rely upon a specific scale and configuration of infrastructure to facilitate the collection and publication of our measurements. While our means of acquiring these infrastructures is individual to each project and their business model, we often rely upon similar models. For example, more than one project relies upon donated credits from a cloud provider to publish their data for open access by researchers.



These donations often rely upon internal individual sponsors and personal relationships, and though highly valued and carefully maintained, they are relatively vulnerable and susceptible to shifts in dynamics outside of our control. Similarly, all of our projects rely upon other datasets to provide additional context to our own, such as MaxMind's GeoLite2 database for IP address geolocation and University of Oregon RouteViews Project for global routing data.

- **Blind spots.** While each project predictably focuses day to day on what we do measure, we are each acutely aware of the dynamics and behaviors of the Internet that we do not measure. There is an ongoing tension between measuring what is currently relevant and measuring in a longitudinally consistent manner. Though complete measurement is an impracticable and unattainable goal, there was a shared acknowledgement that being aware of our blind spots is important for not only ourselves but for our users.
- **Communications and Rapid Response.** Censorship measurement is nuanced work that often requires deep technical and sociopolitical expertise to comprehend in its entirety. At the same time, core to the mission of our work is the accessibility of our data and its insights. Balancing these realities often requires a significant amount of time and labor from each of our teams, particularly when it comes to rapid response for advocates and journalists. Additionally, while we each do our best to enable others to use our data to reach their own conclusions, it was also observed that due to our subject matter expertise, members of the community often request our validation of their conclusions.

## Existing Complementary Efforts

Much of the work that the groups are already doing is complementary and supportive of one another's goals and objectives. During the gathering groups identified existing collaborative efforts that are working well and considered how these initiatives could be best sustained and scaled.

- **Rapid response.** Many of the groups coordinate quite frequently in response to network interference events, in particular, OONI, IODA and Cloudflare Radar, in collaboration with others in the community such as Access Now's [#KeepItOn](#) coalition and Kentik. These coordinated responses have ensured that groups are keeping in close, consistent contact with one another and provide more exposure to one another's tools and techniques.
- **Documentation of censorship events.** In addition to rapid response, many projects collaborate on the documentation of censorship events, which is often used to corroborate anecdotal evidence. These collaborations enable deeper dives into our datasets than is often allowed for during rapid response. Participants expressed pride in these endeavors and a desire for the funds and resources to pursue more like them.
- **Complementary datasets.** Due to the complementary nature of the measurements and data collection methodologies, projects are often able to work together to more fully document a censorship event and confirm activity through unique techniques. For example, OONI and Censored Planet can both confirm instances of website blocking while IODA

and Cloudflare Radar are able to confirm network outages. When we do these confirmations with separate techniques, we provide more evidence that the behavior we are seeing is reflective of the user experience on the ground.

each project has a specific set of user groups that we design for. Projects shared their techniques for making their tools as accessible as possible for users, that they have learned over time, and gave insight into how those improvements were made.

## Evolution of Projects

Collectively the groups have decades of experience and lessons learned about open Internet measurement.

Throughout the convening, groups highlighted different lessons learned and describe different iterations of their projects that can only be appreciated reflectively.

- **Technical infrastructure innovations.** The OONI project shared that the release of the [fifth version of their data processing pipeline](#) is upcoming, which will help automate the detection and characterization of more forms of Internet censorship. IODA also shared their new work on automatic detection of outages, which is made possible by the evolution of their monitoring and analysis infrastructure.
- **Funding maturity.** The participating measurement projects have received funding from private philanthropy, government grants, corporate donations and more. Each model takes time to learn how to become a part of and effectively manage a relationship. Groups shared their experience with different donor ecosystems and processes, which will ultimately strengthen the awareness and maturity of the open Internet measurement space as a whole.
- **Evolution of usability.** Though our goals and focuses are certainly overlapping,

## Opportunities for Collaboration

We can approach shared challenges together. In instances where our dependencies or resource constraints overlap, we can collaborate and more effectively overcome shared challenges. Examples include collaboration on censorship reporting, possible sharing infrastructure, developing shared rapid response protocol, or writing a shared theory for change for open measurement groups.

- **Shared measurement expertise.** We are all experts, but not in one another's tools. The 101s, data dives, and hands-on sessions on Day 1 & Day 3 were key in developing a shared knowledge of each other's datasets. This shared knowledge is so important because it enables us to (1) point digital rights researchers to the right dataset, depending on their research question (2) understand how our data fits together to collaboratively report on network interference. Moving forward, through the OMG convenings and more, we can continue to increase our measurement expertise by using one another's datasets in our research, giving one another tutorials on our tools and methodologies and fostering an ongoing environment of open collaborative and open learning. Ideally, we can scale our outreach and communications by becoming champions and experts in one another's work.

- **Shared resources.** As outlined above in the shared challenges section, many of our projects depend on similar if not identical resources such as Google Cloud, bare metal servers, etc. Additionally, there are many mutual responsibilities such as fundraising, rapid response, data analysis support, and infrastructure maintenance that could potentially benefit from a collective effort. Internet measurement, as a discipline, is built on many fragile ecosystems and there is a pragmatic need to work together to ensure that we can continue to support our user communities and document censorship. While each of our projects are distinct and have many needs specific to our architecture and techniques, there is an interest in doing technical and strategic discovery around what a more integrated way of working could look like.
- **Shared theory of change.** By publishing our data, each group is tasked with making strategic decisions about how we can have the most impact with our data and tools. For example, should we focus on getting our data used in academic papers? Legal processes? Journalism? International organizations? While these approaches and ecosystems are not conclusive or mutually exclusive, they each require a vast amount of attention and are associated with a specific form of impact. Aligning on a common vision for how we engage with these theories of change could enable us to have a wider reach and give a common context and purpose to the work that we do. This can allow us to voice and recognize our assumptions, understand who our agents of change are, and identify the most strategic modes and opportunities of

intervention, understanding that there are many stakeholders that will bring us to desired impact.

## Looking Forward

For OMG Convening #2, the groups have tentatively decided to focus thematically on:

1. **Data Analysis Workflows.** In this convening we began to share new research regarding alert systems and censorship detection workflows, but we were not able to cover all organizations or do deep dives. We will use case study events to further describe and understand each other's data analysis workflows.
2. **Managing a Data Collection and Publication Platform and Pipeline.** Many of the groups are working to improve their data pipelines. For example, OONI has just completed a significant update to their data pipeline. In addition to learning more about this update our goal will be to understand each other's data collection to data usage pipeline.
3. **Priorities and Plans for the Year Ahead.** In this convening, measurement of throttling was an important discussion topic because many groups had this as a priority. We want to make sure we are sharing our priorities and plans so that we can identify opportunities for collaboration and learning.

We find these themes to build on topics from Convening 1 while bringing the potential for new insights and shared knowledge. We are excited for OMG Convening 2!

# Appendix A: OMG

## Convening 1 Agenda

### June 11th- Day 1

Time	Session/ Description
9:00 - 10:00 AM	Welcome/ Orientation/ Logistics/ Intros
10:00 AM - 12:00 PM	20-Minute Measurement 101s: IODA, M-Lab, OONI, Censored Planet, Cloudflare Radar
12:00 PM - 1:30 PM	Lunch
1:30 PM - 2:30 PM	30-Minute Data Dives: IODA, M-Lab
2:30 PM - 2:45 PM	Break
2:45 PM - 3:15 PM	30-Minute Data Dive: Cloudflare
3:15 PM - 3:30 PM	Break
3:40 PM - 4:40 PM	30-Minute Data Dives: Censored Planet, OONI
4:30 PM - 5:00 PM	Close of Day
6:00 PM - 8:00 PM	Social Event

### June 12th- Day 2

Time	Session/ Description
9:00 - 9:15 AM	Welcome/ Orientation/ Logistics/ Intros
9:15 AM - 10:45 AM	New approaches in modeling and detecting censorship events
10:45 AM - 11:00 AM	Break
11:00 AM - 12:00 PM	Existing and new methods for measuring throttling / open brainstorm
12:00 PM - 2:00 PM	Lunch
2:00 PM - 3:30 PM	Identifying priorities for collaboration and coordination in response to censorship events
3:30 PM - 3:45 PM	Break
3:45 PM - 5:00 PM	Planning for Next Day Unconference and Close of Day
6:30 PM	Dinner



<b>Time</b>	<b>Session/ Description</b>
9:00 - 9:10 AM	Welcome/ Orientation/ Logistics/ Intros
9:10 AM - 10:10 AM	Shared resources and funding
10:10 AM - 10:25 AM	Break
10:25 - 11:15 AM	Towards Defining Throttling   Key User Groups
11:15 - 12:00 PM	Internet Blind Spots
12:00 PM - 1:30 PM	Lunch
1:30 PM - 3:00 PM	Hands-On Session - Hands-on workshop based on a case study that combines outages and blocks: Which dataset answers which questions? How can we access and interpret each other's data?
3:30 PM - 3:45 PM	Break
3:45 PM - 4:00 PM	Feedback Survey
4:00 PM - 5:00 PM	Review of Convening 1; Future Plans

## June 13th- Day 3

Time	Session/ Description
9:00 - 9:10 AM	Welcome/ Orientation/ Logistics/ Intros
9:10 AM - 10:10 AM	Shared resources and funding
10:10 AM - 10:25 AM	Break
10:25 - 11:15 AM	Towards Defining Throttling   Key User Groups
11:15 - 12:00 PM	Internet Blind Spots
12:00 PM - 1:30 PM	Lunch
1:30 PM - 3:00 PM	Hands-On Session - Hands-on workshop based on a case study that combines outages and blocks: Which dataset answers which questions? How can we access and interpret each other's data?
3:30 PM - 3:45 PM	Break
3:45 PM - 4:00 PM	Feedback Survey
4:00 PM - 5:00 PM	Review of Convening 1; Future Plans



Photo Credit: Kevin Beasley/Georgia Tech College of Computing

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