FINISHED FILE

APRIGF 2026

OCTOBER 6, 2026
CLOSING THE LAST-MILE GAP: A CIVIL SOCIETY APPROACH TO INTERNET QUALITY MEASUREMENT IN RURAL INDONESIA
KANCHENJUNGA HALL
10:15 A.M. NPT

Services provided by:
Caption First, Inc.
P.O. Box 3066
Monument, CO 80132
719-941-9557
www.captionfirst.com

This text, document, or file is based on live transcription. Communication Access Realtime Translation (CART), captioning, and/or live transcription are provided in order to facilitate communication accessibility and may not be a totally verbatim record of the proceedings. This text, document, or file is not to be distributed or used in any way that may violate copyright law.

(Captioner standing by)

>> I think we can start. Okay.

>> UNGGUL SAGENA: Hello, everyone. Good morning, good afternoon. Welcome to this session. This session is Closing the Last-Mile Gap: A Civil Society Approach to Internet Quality Measurement in Rural Indonesia. My name is Unggul, I'm head of Internet Access Division at SAFEnet. I'm joining you online today. My colleague, Ramzy Muliawan is with you in the room. Also, we are waiting for another speaker from Internet Society Asia-Pacific. And we have Sohini Rajiyung is joining us, and Maria Xynou will share their response to this team. And after, Ramzy will present our findings.

Since 2025, SAFEnet has run 109 measurements on five big islands in Indonesia, Java, Sumatra, Kalimantan, Sulawesi, Sumbawa, pairing with also one day digital literacy Workshop in one location. We have found a sizable gap between Indonesia reported connectivity figures and what households experience. In the next eight minutes, Ramzy will walk us through the findings and what they mean for extending this work to West Papua. We have a Region that is large.

And then we will hear experience from Maria and Sohini,

each about five minutes for opening the floor for questions, and Ramzy has been involved in the field that we will see, from running it on the ground to facilitating the digital Workshops and website Manager as well.

So we don't further delay, let me hand it over to Ramzy in the room for about eight minutes. Ramzy the floor is yours.

>> RAMZY MULIAWAN: Thank you, Unggul. Good morning, my name is Ramzy. I'm part of the Internet access division at SAFEnet. So for the next nine minutes, we'll present the results of our research in the Indonesia districts and Regions. We'll have the slide decks, please.

So next slide ... so we have several approaches and efforts that have been run to measure the connectivity of Indonesia's Regions. The Internet Service Providers of Indonesia say 80% of Indonesians online, the measure by Unggul puts the median around 22.54 megabits per second. These figures don't really tell you what it looks like in the rural household of Indonesia. It is a country of 250 million people. Consists of thousands of islands. There are a lot of things that went unmeasured when you use the conventional methods of Internet measurement.

So we want to count whether you are online, we don't ask how fast or what price or how often the connection works. We have been utilizing the tools in our perusal to do so. Next slide, please.

So the method is knight simple on purpose.

We do Internet connectivity Workshop at each site. We have around 15 people a day being briefed on digital rights including access to the Internet as a human right. Then they go install the OONI tool. And after that they measure again from homes and residents and send us the figure with a screen shot. That home measurement is what we count as the method and result with the normalized value. Flag exclusions and publish the record set. This method because it is really quite simple, it needs no budget and no fixed probe. It costs one facilitator per day. We run that as a two-day Workshop for each site.

Next ... so we run six across Indonesia. We run one in West Sumatra. Serang and near the new capital zone of Indonesia in East Kalimantan. And we have Poole.

(Background noise)

The choice of the sites, it is spanned five islands and about five thousand kilomitres. We have around 109 submissions from the measurement.

So on the map you will see the grey is the National figure. And Orange is what our participants measure from the OONI probe. The box on the right is Papua where we have more, so we will come back to it. Next, we see that now, every district that we

measure lands at a third of the National claim of connectivity.

Mandar has the largest median. And BAJO has the lowest. The 19 and the National figure is three times that. 91% of our readings fall below it.

Next ... we see that the divide in Internet connectivity is no longer between the islands. It is between the neighbours.

So when we go to Blitar, the measurements from one rural district is as low as 0.31 megabytes to 90 megabytes. That is a very interesting measurement results, which is a factor of nearly 300. If you go to BAJO, the line measured 0.16 and at the home in the same subdistrict, it measured 47 megabytes. It is very distinct and very divided result measurement right now. The gap now runs between the neighbours and the same district as much as between the islands. It hides the inequality of measurement that we're seeing.

Next ... mobile networks is one of the measurement that sets the ceiling for this observation.

All 11 (frozen) (audio skipping)

There is no fixed line or Wi-Fi line across the six Regions that went above 43 here. We just put two of the three fastest measurements came from ordinary residences in the highland of Solok in West Sumatra. While provision exists the distance from the capital city, it doesn't really stop household in rural areas to get into 100 megabytes.

Next? Yeah. Four institutions as I mentioned before, it produced the figures for Indonesia connectivity. One is Abjii, the association for Internet service providers for Indonesia. It counts whether people are online. OOKLA aggregates the test users run. Its figure leans towards urban users in the cities, on pretty good Internet lines.

The Indonesia Minister of Digital affairs. It reports that towers are built against the 100 megabytes target. But tower is not a working household connection.

As a Civil Society organization, SAFEnet provides the source. The example is small, but every measurement carries a village, real people, real community that experiences the Internet connectivity and we published the Microsoft data later as well.

So yeah. It really changes what people know about the Internet connectivity in Indonesia, because it works as a training. We use people to use the OOKLA and the OONI probes and the knowledge Index of the participants because we run a post and pretest after each Workshop to make sure that the participants are able to measure the problem of the Internet connectivity.

Next ... I said I want to talk about Papua as well. This is a dying spot of the Indonesia connectivity observations.

We have not hosted any of the Workshops in Papua, it has one of the lowest Internet penetration points in the country. That is where a single Internet cable path have been reported to fail. The break in that cable segment cut off 11 districts in Papua for many months. There is no adequate backup existed. The satellite did not keep the service running. The residents turned to Starlink for Internet access.

Our data shows the same exposure further West. It is also a question of the ISP, Group monopoly, where one operator Group carries 60 to 70% of the measured connections.

Next ... yeah. The finding summary here is that we have a convergence of the median speeds across the Indonesian archipelago. We have shown the difficult terrain fragments, for example, it fragments the connectivity. And our standing among our neighbours in the ASEAN Regions is measured from the numbers that are already flat for now.

Final slide, what we are proposing for the connectivity measurement experiment here is Indonesia needs a community measurement protocol, especially for the rural areas. The underdeveloped and outermost and frontier Regions.

We need a minimum common system where people can measure speed in both directions, looked into the lowest level of subdistricts. Where people can record all of the things for their Regions. Yeah. We are hoping to build this alongside Civil Society organizations as well. People in this room, this Forum, and support of anyone that would be aligned with this Mission. Next?

If you would like to replicate my model of measurement Workshops for your country or for your Region, this is basically a fairly simple of method of measurement. Any organisation with experience of running digital literacy Workshops can do this. Need one or two facilitators, one Day of Training, 15 to 20 people with their own phones, using the OONI probe. You have to get people measuring in their own homes, not on the Workshop venue. This is what we have been doing across Indonesia. If you would like to talk to us, feel free to find us after the session. And we'll be eager to share what we find with you as well.

With that, I think back to you Unggul. Thank you.

>> UNGGUL SAGENA: Thank you, Ramzy. That is a striking set of findings, especially the gap between the median and single district.

Now, bring Maria Xynou from OONI, who is behind all of the measurement. Maria, you are online with us. Over to you, about five minutes.

>> MARIA XYNOU: Thank you, Unggul and thank you, Ramzy for sharing the findings of your very important study. Thank you

for using OONI probe as part of it. We're happy to see that it was helpful in this way. The findings are so important. I think there is definitely a need to highlight more such cases where there are investigations examining what the quality of the Internet actually looks like from the perspective of users in rural districts.

And we have definitely seen a need for this in many countries around the world. For example, in 2018, there is no security lab on Ukraine carried out a similar study where they were violating how the blocking of websites varied across different Regions within Ukraine. And we're increasingly seeing more and more Groups investigating how blocks, Internet connectivity and various properties vary from network to network and more importantly, how they vary from Region to region within a country.

This is especially important for countries like Indonesia where you have such a vast country with so much diversity of districts. Where it is important to have the sort of measurements. I hope it is possible to expand the study also to Papua, as I think it would be interesting to see what the quality of the Internet looks like there from the perspective of households.

It is definitely very concerning to see this big discrepancy between the OOKLA National median download versus what was in households. The sample size is relatively small, it still provides a strong signal that there is an important discrepancy and need for further investigation.

I think a helpful thing with a tool like OONI probe which is a free software app provided by my organisation as which anyone can use for their own studies, for free. It is basically built to support these reference studies and use cases. It is for community red and community led measurements on local networks around the world.

One of the great things is by default, the measurements are published as open data in real-time. A limitation to our tool is that while we do collect country-level information, unfortunately, we're not able to pinpoint a specific Region within a country. Over privacy concerns we don't collect that level of geographical detail. There is increasing research need. I know the character of annotating a measurement to a specific district is quite a difficult process. I imagine that SAFEnet must have had to manually collect a lot of the measurements and put in time and effort to annotate and categorize them per districts.

We're hoping to enable these efforts in a privacy preserving way, so future studies can be easier to conduct in this way.

Actually, we have a new experiment, there is going to be released in the next months. Which aims to collect information that could help with characterizing also the specific Region that a measurement is collected from. We will publish a survey through which we are aiming to collect Agency feedback for how they want to submit this information and hope tell help support such studies going forward to make them easier and to collect many more measurements that will provide even greater confidence in the findings.

Congratulations SAFEnet for the very important and interesting study. I hope to see it expanded also to more Regions going forward. Thank you.

>> UNGGUL SAGENA: Thank you, Maria. Let's hear from Sohini Rajiyung from the Internet Society joining us in the room. Sohini we would love your perspective. Feel free to connect this to whatever you think is most useful. We are interested in the meaningful and useful connectivity framework. Or you can speak on something else entirely that you want to say about the Internet in Asia-Pacific or specifically on our study. Over to you Sohini.

>> SOHINI RAJIYUNG: (No English translation) thank you both for having me here.

I think I want to start with the point that Ramzy raised about how measurement doesn't have to be complicated. And it should be replicable and accessible to the community.

That is an important point. I think we at Internet Society are learning more about that as we go through our own redesign of how we measure resilience.

We have a platform called Pulse that does Internet-centred measurement and also measures resiliency. If you go to the website right now, you can see countrywide support it is where a country stays on the Index. On day 0, when bee had a decision on the topic, Nepal sits about 50 out of 100. We have realized the measuring shutdowns and more and looking at the data is not enough. We need to know how to use it for advocacy and creating digital equity and identifying gaps and how to work on that. And I think SAFEnet is doing a great job. And we would love to know more and learn more about you and about this project and what your plans are for the future.

And looking at the study, I would say that resiliency and measuring resilience should truly rely on this kind of refined data you're looking at, not just measuring how accessible the Internet is in a country. But the inequity that exists from neighbour to neighbour, and what we see in the Internet in terms of data might become the misleading point when it is something that we also rely on. I think that is something very important that you're doing.

Another interesting thing in your study is the point how when fiber cables went down. It was very difficult to set up quickly again.

So I wanted to share that we have been talking to our community who have been facing connectivity issues due to natural disasters. Like in Venezuela when the earthquake happened and fiber cables went down. What worked for them? And also with our Huawei, and the other chapters how they responded when disasters hit? And was the country really resilient? It was not. Because it was definitely very highly dependent on fiber cables. It was very difficult to bring it back up once it went down. So what worked for them was shared was older tech and extensive use of ham radio. I think that kind of tech is ignored as we move really fast in this space. I'm really glad you're looking at similar things and the problems with exposure. We have open data on where the fiber cables connect and the IXP sit. Have we looked at where they're concentrated where if a disaster strikes, it will go down. Where our ISP towers sit. Are we looking at that data? It is something we're looking at with the Internet Society and we're happy to work with you on that. The other point the community raised because you mentioned Starlink I want to mention as well that their message, the chapter's message to us was do not assume that a country will have the license to operate a Starlink device. Even if you get a temporary permit to get access to a Starlink device, who is going to maintain it and pay the ongoing cost? The Venezuela department had temporary licenses to use. But now because it is expiring and country cannot pay, they will take back the devices. Those things we learn when we talk to each other. When we share information. With each other.

And I'm really, really grateful that you invited me and gave me the space to talk about what we're doing at Internet Society. And because you mentioned ECC where we work with the community where we design and deploy our own community networks, we have a champion from Philippines here, Benji. You should talk to him. He's done it on the ground. Not only have they done it from a technical point to deploy community networks, but over 10 years they created an enabling environment in the Philippines for community network to be licensed and, yes, please. Sorry for pointing you out like that.

He's somebody you could definitely connect with if you want to talk about community centred connectivity. I had five minutes. Sorry for going over time. Connect with us and let's stay connected as well.

(Overlapping conversations)

>> UNGGUL SAGENA: Open for questions. I see some online as well.

>> RAMZY MULIAWAN: There are questions in the chat. I think just one or two minutes, I want to answer a little bit because it is kind of very technical. We can connect after this. We will have another session before we go to the floor.

I think what I will say is that, yeah, from -- yeah, Papua. Thank you. I think I can say that is a fair question. No ID and the participation is also voluntary. So we try to manage this. It is independently by following the end user. Visibility can be protection. So that's why we don't collect many other things, other than the screen shot up there. And for Papua, this is also what we don't measure yet. I think for the first question like that.

Next question we can discuss later. I want to discuss to Ramzy because only about three minutes from the floor. Ramzy you can check if there are questions and answer?

>> RAMZY MULIAWAN: Any questions from it the floor? Yes, one.

>> ATTENDEE: My name is frac everybody. Access is political. I know at SAFEnet you are doing a great job. How are measurement and data being used to account for transparency? In Papua, there is no Government data or proof they're doing that? And talking about Internet shut down. What are the things we're trying to push it here and have the greater impact. The data is there, but what happens after that? That is my question.

Also related to the grounding of the measurement tools. There is a Government surveillance because you are accessing their ISP and we talk about it many years. There is a voluntary base. The risk is the person running the tool on the mobile phone connecting to ISP. Of course, VPN doesn't help. We don't know where they're accessing from. Claud doesn't help. Is there a proper safety measure, if they are prosecuted whether the ability to advocate for freedom?

>> RAMZY MULIAWAN: I can take it directly. We only have a couple of minutes. With COVID, we had the case of the shutdown there with the protests happening in the western part of the island. We challenged the block to the Jakarta administrative court and won, actually. Declaring the block was illegal. It was against existing Indonesia law. We agree that there is a lot of political and legal things that need to go to resolve the problems we identify in this report.

One thing we observe as a result of the dataset here is that there is an economic competitive aspect to this. We see a lot of the ISPs operating in different parts of Indonesia.

Where one ISP or monopolize the Internet connectivity services, it is usually not going well for the communities that serve. Maybe there is an economic collaborative approach to

explore for the legal and political solutions to the problems and advocating for a better and more inclusive Internet Governance has been part of the issue many years.

And looking at the criminalization case from Yogi, that are using the license to provide Internet for his community with Starlink in his community. We don't think the criminalization is right. We think it should be addressed by better policymaking and better Governance in the Ministry level.

Yes. There is a lot of solutions that can be formalized through policymaking. Safety is advocating for a rights based perspective as a human right in Indonesia and so does Asia.

>> UNGGUL SAGENA: Thank you, Ramzy and to all of the speakers. It is also all you guys who ask question. We don't have enough time. Yeah, it is four minutes late. And we finish in four minutes. So thank you again. I think it is the end of our session. Thank you to the APrIGF for hosting us. You can always go to Ramzy and we'll still be there until the APrIGF ends in the next few days. Thank you for coming. That brings this session to a close. Thank you very much.

(Concluded)

This text, document or file is based on live transcription. Communication Access Realtime Translation (CART), captioning, and/or live transcription are provided in order to facilitate communication accessibility and may not be a totally verbatim record of the proceedings. This text, document, or file is not to be distributed or used in any way that may violate copyright law.