Measuring Internet Resilience in Africa (MIRA)

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What is Africa's Internet Resilience?

- Internet interruptions or service degradations occur frequently for many in the African region which results in a disjointed Internet experience.

- A <u>survey</u> carried out by AFRINIC in 2019 showed that Internet measurement is not a common practice in the African region

- Lack of sufficient measurements in African countries, therefore, makes it very challenging to accurately determine the problem areas that need to be addressed in order to improve the reliability and resilience of the Internet in Africa.

Sustained Internet Resilience Measurements

AFRINIC & ISOC are working to Measure Internet Resilience in Africa (MIRA in short). The main goals are:

1. To determine levels of Internet Resilience in African countries
   - by analyzing data and increasing Internet measurement vantage points in Africa where sustained Internet measurements can be carried out.

2. To present the data for users at all levels
   - Policy makers
   - Tech engineers
   - Internet users

Work done so far?

- Signed MoU– July 2020
- Several webinars to engage and update the community
- Ongoing work to identify & refine metrics and methodology (Whitepaper)
- Identified measurement tools & countries
  - *Will rely initially on RIPE and M-Lab for quantitative data*
- Deployed prototype measurement infrastructure managed over a cloud platform (Balena OS)
- Draft visualization of the data

Why Measure Internet Resilience in Africa

- Provide up to date information on the quality of Internet connectivity in different African countries
- Provide an easy to use platform for Internet users to determine Internet reliability
- Provide insights into policies that contribute to more resilient Internet connectivity
- *Allow users at all levels to make informed decisions*

What we hope to find out with MIRA

- What are the different Internet experiences on the African continent?
  - ➢ How do statistics measured using tools match user experience?
  - ➢ How does ISP A compare with ISP B?
- How does Internet reliability in countries with multiple Internet providers compare to countries without such infrastructures?
- What impact do unreliable underlying infrastructures have on Internet Resilience? (Unstable power, Fiber cuts, shutdowns, sabotage etc)
- What policies are beneficial or have positive impact in improving Internet Resilience?

Countries to be studied at the initial stage

Country		RIPE Atlas Anchor	M-Lab Server
Benin	🇧🇯		
Burkina Faso	🇧🇫		Now present!
DRC Congo	🇨🇩		
Ethiopia	🇪🇹		
Kenya	🇰🇪		
Madagascar	🇲🇬		
Mauritius	🇲🇺		
Nigeria	🇳🇬		
South Africa	🇿🇦		
Tunisia	🇹🇳		

- Carry out qualitative and quantitative measurements
- Maximum of 5 ISPs per country to be included in a phased approach
- Qualitative: mainly using measurement tools
- Quantitative: mainly using surveys & forms
- Measure against local (in-country) vantage points against vantage points outside the country

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Measurement infrastructure in the project

- RIPE & M-Lab software clients/servers to be used in the 10 countries (where not available)

- Use of Raspberry PIs as hosts to run the RIPE Atlas & M-Lab clients on Balena OS

- Measurements will be done in a phased manner and more data sources can be incorporated moving forward

| App name ⬍	Device type ⬍	Created on ⬍	Total devices ⬍	App type ⬍
Amreesh-Mauritius-RPI	🍓 Raspberry Pi 4	Nov 13th 2020, 11:52 am	1	Starter
Nairobi-RPI-1	🍓 Raspberry Pi 4	Oct 23rd 2020, 9:26 am	3	Starter

Quantitative Data

- RIPE measurements
  - Uptime
  - DNS measurements
- M-Lab measurements
  - Throughput
  - Latency
  - Round Trip Time

Qualitative Data

- Where do you connect to most of the time? *(home/work/school)*
- What technology do you use to connect to the Internet at the above selected venue? *(3/4G, fibre, ADSL)*
- What do you use the Internet for most of the time?
- Did you experience a downtime?
- Did you experience a degraded service?
- Did you experience a power outage?
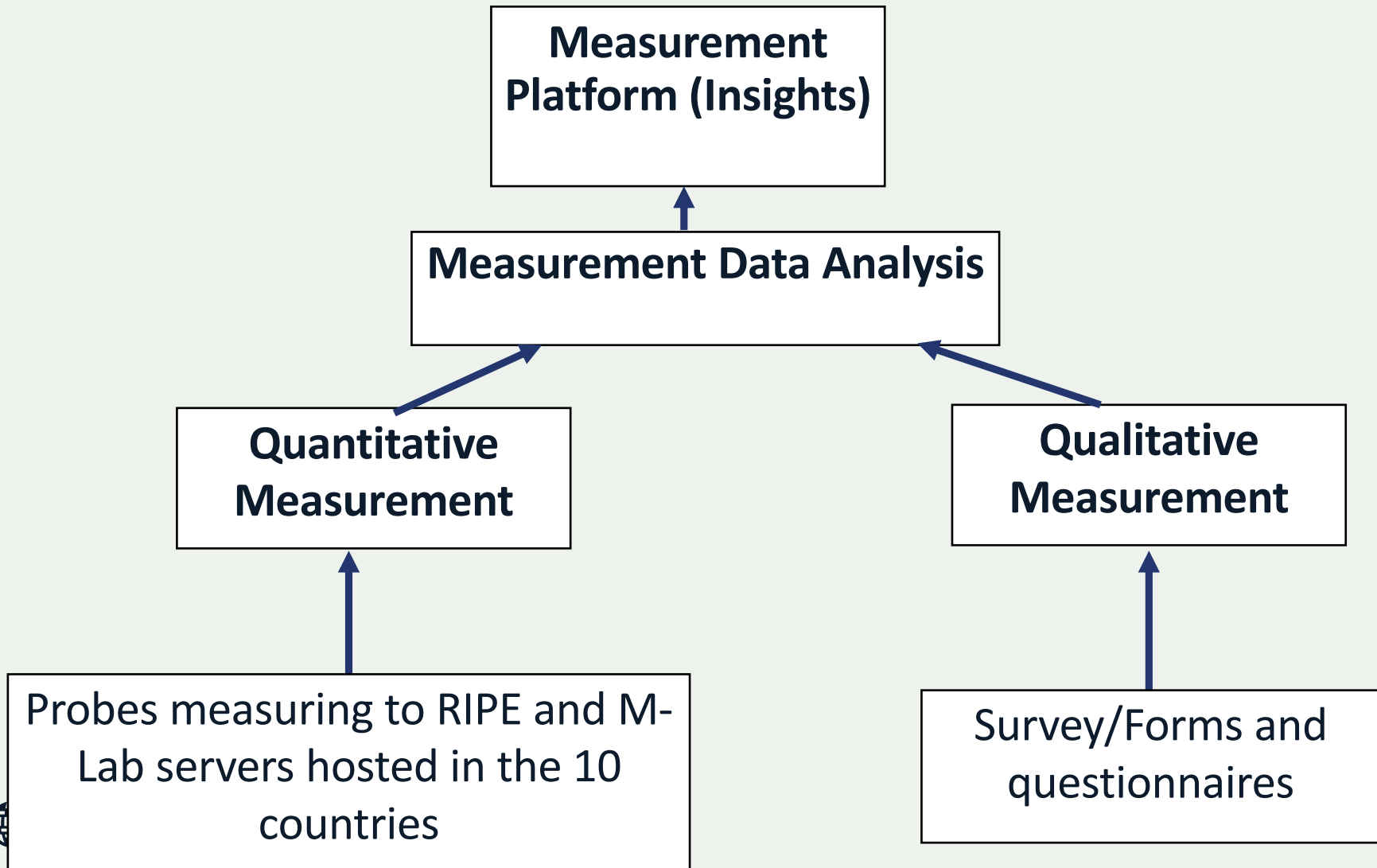
The Insights Platform

- ISOC is consolidating trusted third-party Internet measurement data from various sources into a single platform:

  ## insights.internetsociety.org

- We'll examine trends, publish reports, and tell data-driven stories and encourage everyone to do the same.

- *Insights* will be available to everyone including policymakers, researchers, journalists, network operators, civil society groups.

Photo by Markus Spiske on Unsplash

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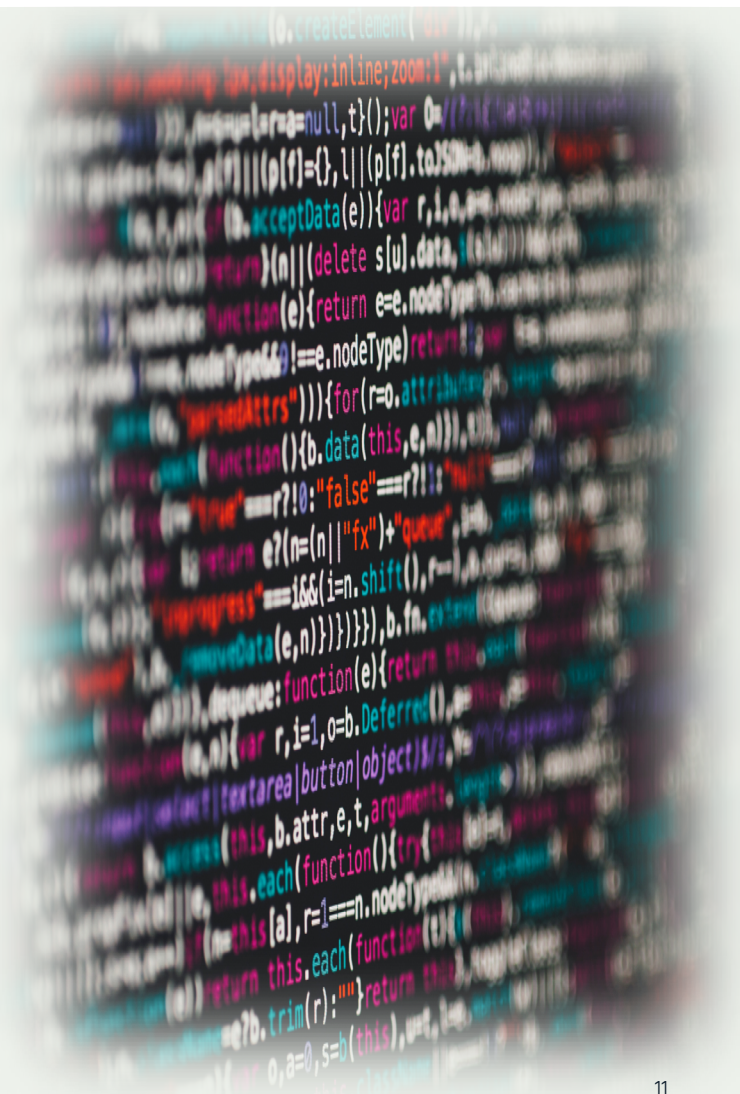
Timelines & More information

- 2020 timelines:
  - August 2020: Definition and draft framework document
  - September 2020: Country selection (done) of prototype measurement setup (done)
  - October 2020: Measurement campaign (started)
  - November 2020: Measurement campaign & Data gathering and analysis (ongoing)
  - December 2020: Initial Reports & planning for 2021

- More information & updates will be available via
  http://bit.ly/measurement-wg <- Mailing list hosted by AFRINIC

Thank You

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