

Title: Internet measurement Initiatives in Africa

8.30 Registration

9.00-9.15 **Opening Remarks (KENET - Prof. Kashorda)**

Session 1

9.15-9.35 Measuring the complexity of the Internet: indexes and indicators (RIA - Enrico Calandro)

Abstract: Measuring internet development in order to achieve better connectivity and resulting socio-economic development goals is a challenge and a necessity to ascertain progress made in terms of ICT sector development and socio-economic growth. Many intergovernmental, governments, non-profit and private organisations have sought to tackle the challenge through setting targets, defining indicators, and applying research methods to measure progress. Nevertheless, ambitious goals and targets relate mostly to the achievement or improvement of physical connectivity to ICT, while as more and more people get connected to the internet, the attainment of users' digital rights including capabilities and liberties will need to be measured as well and will need to be included in policy objectives on ICT development.

Speaker: Enrico Calandro (PhD) is a senior researcher at Research ICT Africa. He previously worked as a technical advisor for the ICT programme of the SADC Parliamentary Forum in Namibia, and also has experience in the ICT private sector as a business developer. He holds a PhD in Business Administration specialising in telecommunications policy, from the Graduate School of Business, University of Cape Town.

9.40-10.00 State of Internet measurement Infrastructure/tools in Africa (AFRINIC - Amreesh Phokeer)

Abstract: The presentation will aim to highlight the state of the measurements infrastructure in Africa, with the view of devising strategies for increasing the availability and capabilities of the available tools and vantage points. Topics such as how tackle the question of how to increase the footprint and diversity of vantage points (probes and measurement anchors), as well as how to leverage mobile devices for Internet measurements will be discussed.

Speaker: Amreesh is the Research and Innovation Manager at AFRINIC. He heads the newly created AFRINIC Labs whose main focus areas are Internet performance measurements and Internet security in Africa. He previously served as Software Engineer and Applications Unit Manager since 2011. Prior to joining AFRINIC, he was a Guest Research at the National Institute of Standards

and Technology (NIST). He is currently reading for a PhD in Computer Science at the University of Cape Town.

10.05-10.25 Measuring quality of Internet links in NRENs (KENET - Kennedy Aseda)

Abstract: This talk focuses on the deployment of perfSONAR at KENET as well as bottlenecks to watch out for when specifying hardware for Internet measurements. In addition, the presentation also delves into ways in which the infrastructure at KENET is utilized for end-to-end network performance measurements for collaborating researchers and faculty in Kenya and other collaborating institutions in other countries

Speaker: Kennedy Aseda is a Lead Network Operations Engineer at KENET and has been working at KENET since 2008. He holds a BSc. in Electrical & Electronic Engineering from the University of Nairobi and is a member of Kenya's National IPv6 Task Force as well as National CIRT/CC. He primarily works on KENET's core network and focuses on routing, switching and configuration backup of network devices, security and virtualization. He also has a passion in process automation of network tasks and notification.

10.30-11.00 Break

Session 2

11.00-11.20 ARDA - Measuring peering and Interdomain routing topology (ISOC - Michuki Mwangi)

Abstract: The African Route-collectors Data Analyzer (ARDA) system aims to present data collected at African IXPs in ways that can be easily extrapolated into practical business, policy, developmental, technical, or research opportunities for everyone involved in the peering and interconnection ecosystem.

Speaker: Michuki Mwangi joined ISOC in April 2008 as Senior Education Manager working with the Education team to promote Internet growth and sustainability in the developing world. Michuki has long been active in the African and global Internet communities, having been centrally involved in key infrastructure developments, technical coordination activities, and policy-making forums.

11.25-11.45 Quantifying WACREN performance gains with perfSONAR (WACREN - Omo Oaiya)

Abstract: The presentation will describe perfSONAR uptake in African NRENs and WACREN plans for a regional deployment in its ongoing network rollout for measurements and to compare the performance improvement of NRENs vs Commercial Internet.

Speaker: Omo Oaiya is CTO of the West and Central African Research and Education Network (WACREN).

11.50-12.10 TraceMON - a new RIPE Atlas tool (RIPE NCC - Jasper den Hertog)

Abstract: The RIPE Atlas team released a new online tool that helps to make sense of trace routes that are generated by RIPE Atlas. Use this tool to optimize your routing and debug network problems.

Speaker: Jasper den Hertog is working for the RIPE NCC in the R&D department as a developer on the team that produces RIPE Atlas. Before joining the RIPE NCC he worked as a freelance 3D and web developer as well as a sysadmin for over 15 years. He holds a degree in engineering from the Delft Technical University.

12.15-12.30 Isolario - A real-time Internet Observatory (IIT CNR - Alessandro Improta)

Abstract: The incompleteness of data collected from BGP route collecting projects is a well-known issue. Recent works explained that one of the possible solution is to increase the contribution in terms of routing data collected from ASes located in the Internet periphery, in order to reveal the peering connectivity of their upstream providers. Our contribution is Isolario, a route collecting project based on the do-ut-des principle which aims to increase the appeal of BGP route collecting for persuading network administrators in small-medium organizations to share their routing information by offering services in return, ranging from real-time analyses of the incoming BGP session(s) to historic analyses of routing reachability.

Speaker: Alessandro Improta received his BSc and MSc in Computer Engineering from the University of Pisa, Italy, in 2006 and 2009, respectively. He then went on to receive his PhD in Information Engineering from the University of Pisa, in 2013. Since 2009 Alessandro has held a research position with the Institute of Informatics and Telematics (IIT) at the Italian National Research Council (CNR) in Pisa. His research interests include Internet AS-level measurement and analysis, and the discovery of Internet path characteristics.

12.30-13.30 Lunch Break

Session 3

13.30-14.00 Assessing Internet Freedom and the Digital Resilience (SmallMedia UK/CIPIT - Mahmood Enayat/Moses Karanja)

Abstract: Since December 2016, CIPIT, a research centre at Strathmore Law School in partnership with Small Media, a research and advocacy organization based in London, UK, has been running network measurements to investigate the relationship between physical internet infrastructure ownership and internet

freedom in Burundi, Rwanda, Uganda and Tanzania. Physical internet infrastructure is used here to mean the networking layer of the internet connecting end users to the global ecosystem from national gateways, exchange points and service providers.

Speaker: Mahmood Enayat is the founder and executive director of Small Media Foundation, a London-based action lab, providing digital research, training and advocacy solutions to support the work of civil society actors that provides assistance to at-risk communities globally. Moses Karanja is an information controls researcher at Strathmore University, a Nairobi-based research centre working on how digital technologies interface with the practice of human rights.

14.05-14.20 Tampering With the Open Internet: Experiences From Africa (CIPESA - Dr. Wairagala Wakabi)

Abstract: The talk explores the ways, explicit and covert, in which states and private operators hinder the free flow of internet traffic. The security and privacy implications of such tampering numerous, but could intermediaries in Africa play a more proactive role to minimise threats to an open internet? This talk also notes how practices such as surveillance and censorship affect civic engagement, and, as food for thought, poses the question of how the economic and social impacts of internet traffic tampering in Africa countries should be accurately measured.

Speaker: Wakabi is the Executive Director at CIPESA, he leads policy research for cohesive approaches in advocating for online rights and for the use of ICT in democratic processes and civic participation. He holds a PhD in informatics with a specialisation in e-Government at Örebro University. Wakabi has also been involved in various collaborative researches with African, Asian and North American think tanks and NGOs.

Session 4

14.25-14.40 Understanding affordability and user strategies: challenges in significant measures (RIA - Chenai Chair)

Abstract: Affordability is cited as one of the biggest challenges to Internet uptake and use. Some service providers and users of over-the-top (OTT) platforms and applications have devised strategies that allow the OTT services to be used as communication substitutes for traditional voice and SMS services over mobile devices. However, the question becomes how can we measure affordability and do these measurements truly reflect the way in which end users manage their data costs? This presentation will outline the supply and demand side methodology to understanding affordability from the market perspective and user perspective based on Research ICT Africa data.

Speaker: Chenai Chair is a researcher at Research ICT Africa and holds an MSocSci specialising in Global Studies from the University of Cape Town. She

previously worked as a student researcher at the Center for Information Technology and National Development in Africa (CITANDA) focusing on the use of mobile phones for purposes of effective water service delivery in rural areas.

14.45-15.00 Beyond access: measuring digital inequalities (RIA - Enrico Calandro)

Abstract: Through the RIA ICT Household and Individual Access and Use Surveys, the digital divide is analysed not only by using narrow supply-side indicators, or at the level of purely descriptive quantitative data, but also through the impact of gender, location (i.e. urban/rural), and age on social and economic outcomes in relation to areas other than ICT. RIA's studies on ICT access and use move beyond the issue of physical access to the infrastructure to the increasingly critical issue of ICT use as well as the factors that enable and or constrain use. The factors that determine individuals' abilities to optimally use such potentially enabling technologies are also studied.

Speaker: Enrico Calandro (PhD) is a senior researcher at Research ICT Africa. He previously worked as a technical advisor for the ICT programme of the SADC Parliamentary Forum in Namibia, and also has experience in the ICT private sector as a business developer. He holds a PhD in Business Administration specialising in telecommunications policy, from the Graduate School of Business, University of Cape Town.

15.05-15.25 Measuring Internet rights (RIA - Alison Gillwald)

Speaker: Alison Gillwald (PhD) is the Executive Director of Research ICT Africa (RIA) and holds an adjunct professorship at the University of Cape Town Graduate School of Development, Policy and Practice where she supervises PhD candidates focusing on ICT policy and regulation. She served on multiple councils and boards including SATRA, the SA National Broadband Advisory Council, TENET and the Western Cape Digital Foundation.

15:30-16.00 Break

Session 5

16.00-16.30 Panel Discussion on Internet measurements and Internet freedom (CIPESA, CIPIT, Small Media-UK)

16.30-17.00 Panel Discussion on Intersection of Internet measurements, Internet development and policy formulation, state of Internet measurement infrastructure/tools in Africa (RIA, AFRINIC, ISOC, RIPE)

17.00-17.10 Way forward/Open Mic

17.10-17.15 Closing remarks