

Workshop Proposal for SIGCOMM 2016

1. Title of workshop

Global Access to the Internet for All (GAIA) Workshop

2. Organizers

Arjuna Sathiasseelan

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Dr Arjuna Sathiasseelan is a Senior Research Associate at the Computer Laboratory, University of Cambridge. He leads the Networking for Development (N4D Lab). The research group conducts research on novel Internet architectures for improving and reducing the cost of Internet access. He is the Chair of IRTF Global Access to the Internet for All (GAIA) research group and a member of the Internet Research Steering Group (IRSG). He is in the Access Advisory Panel guiding the UN Foundation's \$60 million Mobile Hub (funded by USAID, the Bill & Melinda Gates Foundation and Sida) to enable the digital ecosystem to deliver greater scale, efficiency and social impact as it creates more inclusive digital economies in emerging markets. He is a member of the Centre for Science and Policy (CSaP) and member of the Cambridge Big Data initiative. He has also co-authored and contributed to several Internet standards and drafts (IETF) and contributed to the DVB-RCS2 standardization at the ETSI TM-RCS. He graduated in Computer Science Engineering from NIT (India), gained an MSc in Computing and Internet Systems and a PhD both from Kings College London.

Jörg Ott

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Jörg Ott holds the Chair for Connected Mobility at Technische Universität München in the Faculty of Informatics since August 2015. He is also Adjunct Professor at Aalto University in the Department of Communications and Networking (Comnet). His research interests are in network architectures, protocol design, and networked systems, from modeling to implementation. His current research areas include communication in challenged networks, particularly delay-tolerant/mobile opportunistic networking; adaptive real-time communication, information-centric networking, and network measurements. He is co-chair of the DTN Research Group in the IRTF. In the IETF, was co-chair of the MMUSIC working group from 1997 through 2009 and co-chaired the SIP working group from its foundation in 1999 to October 2002. Jörg is treasurer of ACM SIGCOMM, vice chair of IEEE Comsoc TCCC, serves on the editorial board of Elsevier COMCOM, and is steering committee member of the ACM CHANTS workshop, the ACM ICN conference, and the IEEE Global Internet Symposium.

3. Rationale and Motivation

The Internet has crossed new frontiers with access getting faster and cheaper. New applications and services are being offered – and their impact omnipresent. Let us just refer to the recent activities in Massive Open Online Courses (with over 160 000 people from all over the world participating in a single university

course) and the potential of impact they might create for the whole education system. The Internet is now an all powerful medium - information has become pervasive, the entire digital economy relies on the Internet, new models for e-governance have emerged, and it runs the ever growing social networking platform which can even change governments.

On one end, we have the developed world where access is getting faster and services being developed to utilize faster access. On the other end, there are people who do not have access to the Internet at all. Some may not be able to get it due to lack of infrastructure support (which accounts to the notion of digital divide problem faced by most people in developed countries). There have been significant initiatives to solve the problem of affordable infrastructure. Crucially, most of these approaches address infrastructural barriers without addressing economic ones. This problem is also applicable to developed countries where many individuals find themselves unable to pass a necessary credit check, or living in circumstances that are too unstable to commit to lengthy broadband contracts. Indeed, Internet services are increasingly accessed on the move and so current models of “roaming” access provision drive this economic exclusion to a new level, not currently addressed by the push to deploy broadband. Digital inclusion is important for social equality to ensure access to the many benefits the Internet offers. These benefits include access to support services and information, cheaper goods, and online communities; and as novel services continue to become available (i.e. the Internet of Things), the consequences of exclusion will continue to grow. Leaving connectivity for all to be governed by market economics is a major impediment to achieving the full benefits of the Internet, and that basic Internet access should be made freely available to all due to its societal benefits, a sentiment recently expressed by Berners-Lee.

The current Internet access model, which is governed by market economics, makes it practically infeasible for enabling universal access especially for those with socio-economic barriers. The value chains do not reflect the technical development – as made obvious by recent debates between operators and content providers. Although there is no single magic bullet to remove socio-economic barriers, there are **infrastructural solutions** that could drastically reduce these barriers.

This workshop addresses the problem of digital exclusion through networking technology. It will address a range of research questions (feasibility, scalability, security, new privacy challenges, robustness, resource allocation, sustainability, performance etc.). It will create awareness on the technological solutions to digital exclusion and will help the research community to explore the above-mentioned challenges, understand requirements, the potential and the limits of solutions that have been proposed to address in this space. The workshop will overview the state of the art, detect gaps and determine a research roadmap to bridge these gaps.

The GAIA workshop has run repeatedly collocated with major international events (IETF 89 in London, UK, March 2014; ACM DEV 5 in San Jose, CA, USA, December 2014; upcoming ACM DEV 6 in London, UK, November 2015) as well as stand-alone (University of Cambridge, UK, October 2014). An emerging community is also fostered by an active GAIA Research Group in the Internet Research Task Force, co-chaired by Arjuna Sathiseelan.

After these mostly informal gatherings focusing on (invited) talks and demonstrations, this workshop intends to provide a forum for publishing novel research results via a typical peer review process. We particularly aim for the SIGCOMM in Salvador as this offers an excellent opportunity to reach out to local researchers and institutions in South America.

4. Potential participants and invited speakers

Besides the aforementioned instances of the GAIA workshop and GAIA RG related workshops that ran in the past and have contributed to building related (partly overlapping communities) include the LCDnet workshops (at MobiCom 2013) co-chaired by Arjuna, the Do-It-Yourself Networking workshop (at MobiSys 2015) co-chaired by Jörg as well as two Dagstuhl seminars, 14471 on “Towards an Affordable Internet Access for Everyone: The Quest for Enabling Universal Service Commitment” in 2014 (co-organized by Arjuna) and 14042 on “Do It Yourself networking: an interdisciplinary approach” (co-organized by Jörg). All these have contributed forming a notable community upon which the proposed workshop can draw to for submissions and participation as well as for recruiting PC members.

Potential Participants

1. Dirk Trossen, InterDigital Europe, UK
2. Jon Crowcroft, Computer Laboratory, Cambridge University, UK

3. Scott Burleigh, JPL, NASA, USA
4. Michael Welzl, Oslo University, Norway
5. Gareth Tyson, Queen Mary University, UK
6. Marco Zennaro, ICTP, Italy
7. Leandro Navarro, UPC Barcelona, Spain
8. Nabil Benemar, Morocco
9. Teemu Kärkkäinen, Technische Universität München
10. Nick Feamster, Princeton, USA
11. Jay Chen, NYU, UAE
12. Lakshmi Subramanian, NYU, USA
13. Adam Wolisz, TUB, Germany
14. Heikki Hämmäinen, University of Helsinki, Finland
15. Nishanth Sastry, KCL, UK
16. Saleem Bhatti, St. Andrews, UK
17. Kannan Govindan, Samsung Research, India
18. Ermanno Pietrosemoli, ICTP, Italy
19. Fernando Ramos, University of Lisbon, Portugal
20. Veljko Pejovic, University of Ljubljana, Slovenia
21. Aaditeswar Seth, IIT Delhi, India
22. Maneesha Sudheer, Amrita Institute, India
23. Barath Raghavan, ICSI, Berkeley, USA
24. Narseo Vallina Rodriguez, ICSI, Berkeley, USA
25. Marcelo Bagnulo, UC3M, Spain
26. Christian Esteve Rothenberg, University of Campinas, Brazil
27. Pan Hui, HUST, Hong Kong
28. Elizabeth Belding, UCSB, USA
29. Gorrry Fairhurst, University of Aberdeen, UK
30. David Johnson, CSIR, South Africa

Regional researchers from Brazil and other South-American countries we will reach out to.

Format of workshop

We propose the following format:

09:00-09:15 Chair's welcome
 09:15-10:00 Keynote
 10:00-10:30 Technical session 1
 1 talk
 10:30-11:00 Coffee Break
 11:00-12:30 Technical Session 2
 2 talks
 12:30-14:00 Lunch
 14:00-14:45 Short invited talks (from the region)
 3 talks @ 15min each
 14:45-15:45 Technical Session 3
 2 talks
 15:45-16:15 Coffee Break
 16:15-18:00 Technical Session 4
 up to 2 talks
 Open panel discussion

(breaks to be aligned with the SIGCOMM schedule)

We intend to go for 30min talk slots to have an interactive workshop with sufficient time for questions and discussions.

5. Publicity and promotion plan

In addition to the channels the SIGCOMM publicity chairs may use to publicize the workshops at SIGCOMM at large (which we will use ourselves if there won't be common advertising). We will also use mailing lists

mainly the GAIA and TIER mailing lists to advertise the CfP to the ICTD audience and attract relevant papers.

6. Call for papers

The Internet has crossed new frontiers with access getting faster and cheaper. New applications and services are being offered – and their impact omnipresent. Let us just refer to the recent activities in Massive Open Online Courses (with over 160 000 people from all over the world participating in a single university course) and the potential of impact they might create for the whole education system. The Internet is now an all powerful medium - information has become pervasive, the entire digital economy relies on the Internet, new models for e-governance have emerged, and it runs the ever growing social networking platform which can even change governments.

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Topics

Topics of particular interest include, but are not limited to:

1. “Global access to the Internet for all” (GAIA) using networking technologies
2. Do-it-yourself (DIY) networking (such as community networks) for the developing world
3. Cost-efficient networked systems appropriate for use in underdeveloped areas
4. Fault-tolerant resilient networking technologies for the developing world
5. Rural/remote area wireless solutions (that can work efficiently with resource constraints such as intermittent and unreliable access to power/ networking service)
6. Simplified network management techniques (including support for heterogeneous service delivery through multiple solutions)
7. Using cognitive radio technology and 5G standards (with possible native integration of satellites) for GAIA
8. Techno-economic issues related to development (including development of flexible pricing and incentive structures as well as new spectrum access models for wireless)
9. Techno-political and cultural issues related to using communications for development

10. Using emerging networking architectures and future Internet architectures [e.g., cloud computing, fog computing, network functions virtualization (NFV), information-centric networking (ICN), software-defined networking (SDN), and delay-tolerant networking (DTN)] for development.
11. Using wireless access/ distribution technologies (such as the following) for development: TV white spaces (TVWS); satellite communications using advances in geostationary orbit (GEO) and low-earth orbit (LEO) satellites; low-cost community networks; cellular technologies (such as CDMA 450, the open-source OpenBTS, etc.); wireless mesh and sensor networks; Wi-Fi-Based Long-distance (WiLD) networks; and wireless based wireless regional access networks (WRANs).
12. Measurements of infrastructures in developing regions.
13. Understanding Internet censorship and solutions to circumvent censorship.

Workshop Co-Chairs

Arjuna Sathiaselvan, Computer Laboratory, Cambridge University, UK
 Jörg Ott, TUM, Germany

Technical Program Committee [Agreed to be part of the TPC]

1. Dirk Trossen, InterDigital Europe, UK
2. Jon Crowcroft, Computer Laboratory, Cambridge University, UK
3. Scott Burleigh, JPL, NASA, USA
4. Michael Welzl, Oslo University, Norway
5. Gareth Tyson, Queen Mary University, UK
6. Marco Zennaro, ICTP, Italy
7. Leandro Navarro, UPC Barcelona, Spain
8. Nabil Benemar, Morocco
9. Teemu Kärkkäinen, Technische Universität München
10. Nick Feamster, Princeton, USA
11. Jay Chen, NYU, UAE
12. Lakshmi Subramanian, NYU, USA
13. Adam Wolisz, TUB, Germany
14. Heikki Hämmäinen, University of Helsinki, Finland
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19. Fernando Ramos, University of Lisbon, Portugal
20. Veljko Pejovic, University of Ljubljana, Slovenia
21. Aaditheshwar Seth, IIT Delhi, India
22. Maneesha Sudheer, Amrita Institute, India
23. Barath Raghavan, ICSI, Berkeley, USA
24. Narseo Vallina Rodriguez, ICSI, Berkeley, USA
25. Anders Lindgren, SICS, Sweden
26. Pan Hui, HUST, Hong Kong
27. Christian Esteve Rothenberg, University of Campinas, Brazil
28. Lisandro Zambenedetti Granville, UFRGS, Brazil

TPC Members (Contacted but not yet responded)

1. Marcelo Bagnulo, UC3M, Spain
2. Elizabeth Belding, UCSB, USA
3. Gorrry Fairhurst, University of Aberdeen, UK
4. David Johnson, CSIR, South Africa
5. Antonio Alfredo Ferreira Loureiro, UFMG, Brazil
6. Virgilio Almeida, UFMG, Brazil