Global Access to the Internet for All (GAIA)

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Internet Penetration Map



Motivation 1: Health





Influenza – 250,000-500,000 deaths annually [Ref: WHO]

Cholera, Malaria, Flu, Dengue Fever, Small pox and many more....

0.6 doctors for every 1000 people in India!

Reduction of Mortality Rates



Evidence on link between health literacy and mortality rates suggests that access to internet has the potential to save ~2.5 million lives



Extending Internet access has the potential to increase life expectancy for >2.5 million people affected by HIV/AIDS

Reduction of Child Mortality

Improved health information to expecting mothers and health workers could lead to a reduction of child mortality, saving 250000 children who may otherwise have died during their first year of life



Motivation 2: Education







Motivation 3: Economic Impact



The Internet

Internet access as an enabler for human rights

Internet is an important (potentially life saving) enabler Communication, Health, Knowledge, Economy, Governance

.. and the human right argument

ISOC 2012 survey with 10,000 users in 20 countries
83% agreed or agreed strongly that access to Internet is a human right
2/3 agreed or agreed strongly that the Internet would play a Significant role in solving global problems:
Reducing child mortality (63%)
Improving maternal health (65%)
Eliminating extreme poverty and hunger (61%)
Preventing trafficking of women and children (69%)

Internet access is challenged

Geographic

Conventional Internet access has physical limitations Not economically feasible for a network operator to provide coverage

Economic

Access to fixed broadband in some developing countries costs almost 40x-100x the national average income In developed countries, affordability limits broadband access in impoverished communities

Regulatory, Social & Capacity building challenges

How big is Africa?



Connecting Africa



Affordability

Some questions..

Why has 3+ decades of progressive Internet research failed to solve these challenges to make the Internet universally accessible to all?

What have we overlooked? And why have we overlooked?

And now how do we solve it?

IRTF Global Access to the Internet for All (GAIA) Research Group

Need increased visibility among the wider community and foster collaboration Workshops, projects, papers, IRTF drafts

Understand what are the costs and how do we reduce costs (10x reduction in access costs especially in geographies and populations with low Internet penetration)

Report deployment experiences to better understand what technologies/protocols work what are the challenges in terms of adoption

Longer term: Input to standards \rightarrow stacks \rightarrow adoption

IRTF Global Access to the Internet for All (GAIA) Research Group

Chaired by Arjuna Sathiaseelan (UCAM) & Mat Ford (ISOC)

Plan is to meet twice a year (minimum)

GAIA meetings IETF London 2014 Cambridge 2014 ACM DEV 2014, San Jose IETF Prague 2015 ACM DEV 2015, London ACM SIGCOMM 2016, Brazil

Community has grown to 350+ members

Official page: https://irtf.org/gaia Mailing list: https://irtf.org/mailman/listinfo/gaia

Key Topics

Measurements and deployment experiences Understand the challenges Research opportunities: better measurement tools, incentives for tech adoption → infrastructural solutions → usecases for new architectures, regulation and socioeconomic models

Alternative network deployments Wireless Internet Service Providers (reach) Shared infrastructure (reach, costs to an extent) Decentralised networks/services (Community-led): nonprofit (costs + reach) Research opportunities: access tech, localised comms (ICN, NFV), management (SDN), socio-economic models, regulation

Key Topics

Protocol and architectural fixes There are many: which/what works? What should we change (for e.g free aps → ads → multiple TCP conns, HTTP/2, large initial windows etc) Opportunities for new protocols/mechanisms to emerge or to co-exist)

Capacity building & Impact Wider dissemination of the results is important Organisations like the ICTP, NSRC, A4AI..

The longer term vision

ITU study group for GAIA?

We need a Center for GAIA (hub & spoke model)

R&D, training and deployment

Several opportunities for development (5G, IoT and big data)

Momentum within the EU (>8 million of funding raised on GAIA related projects in 2014-2015)

More opportunities -Decentralised networks 5G for rural/remote EU-Africa/SE Asian initiatives