Go local: community networks

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Internet is for everyone (RFC 3271) Vint Cerf 2002

- Everyone has the right to communicate, access to information

- Article 19. Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers. (Universal Declaration of Human Rights)

- Not everyone has access, not everyone can provide it
Connectivity in local communities

- Universal service (ECC)
  - Right to a **functional** internet connection ... that is **affordable** and allows **full engagement** with the digital economy and society
- Urban: high population density and infrastructure
- Rural: not urban, not centres
- How to sustain connectivity and net services?
  - Business models & technology
Internet for everyone
Distribution of offline population

- Developing World 94%
- LDCs 21%

Absolute distribution of 3.9 Billion OFFLINE
- Africa: 716 million
- Arab States: 229 million
- Asia & Pacific: 2.4 billion
- CIS: 93 million
- Europe: 131 million
- The Americas: 349 million

Proportion of offline population by regional population
- Africa: 75%
- Arab States: 58%
- Asia-Pacific: 58%
- CIS: 33%
- Europe: 21%
- The Americas: 35%
- Developed: 22%
- Least Developed: 85%

Source: ITU.int, International Telecommunications Union 2017
Internet for everyone

Offline population

The Gender Gap is most pronounced in Africa, the Arab States and Asia-Pacific

58% 42%

Half have a GNI/capita of < US$6,500, a large proportion of which are located in Africa and Asia-Pacific

60% live in rural areas, of which a large proportion is located in Africa and Asia-Pacific

The elderly have much lower Internet penetration levels than the overall population across all regions

Individuals with low educational attainment often remain unconnected across all regions

Source: ITU.int, International Telecommunications Union 2017
The challenge

• Not only availability (offer), but also
• a dramatic reduction of cost (affordability),
• Provision:
• ... (by & for) local or “extractive” economy?
• Farms, fields, less or not profitable?
• Not only offering, but also local development: local provision = Self-provision
Community networks

Crowdsourced networks built by citizens, that contribute and coordinate their own network devices to create a shared network infrastructure

- What technology? wireless, fibre commodity, mixed (standards, interop)
- What governance? of a shared infrastructure (cooperative, open to anyone, local Internets)
- Decentralized investment, management by everyone: volunteers, professionals, ...
- Openness (participation, operation, services)
guifi.net: many communities
Self-service connectivity

- Connectivity (local+global) not everywhere
- Connectivity expensive to have (bring)
- Sometimes not feasible in commercial terms: the (licensed) “restaurant model” (large operators)
- Self-provided connectivity: the “homemade model” (small operators, WiFi)
Regional backbone & Internet
Governance

• Based on principles for governance of *commons* as *common property* (E. Ostrom)
• Aim: preserve local connectivity as a key resource for the community, avoid the “*tragedy of the commons*”
• Ensure right of access, participation, *provision*, benefits for all
• All: *individual citizens, professionals, private or public orgs* ...
Business models

• Who does it?
  - One for all: a large operator (with license)
  - Wireless ISP (WISP): a local operator
  - Community networks: anyone in a community

• Differences in costs (e.g. right of way, deployment, maintenance, local staff) & ownership

• Technology comes bundled with business models: Ethernet, ATM, GSM, 5G, WiFi, mesh, bitcoin ...

• Infrastructure sharing: + complex, - expensive: Open Access Networks, Internet eXchanges
Ingredients in Community nets

- Diverse, small Internets, experimentation:
  - Multiple AS, IPv6, routing protocols (BGP, OSPF, BMX6), unlicensed spectrum, diverse technology, (WiFi AP, WiFi P2P links, wireless mesh, fibre, anything ...)
  - Infrastructure sharing: Regional IX, decentralized net management, backhaul sharing, virtualization => software & services
  - Decentralized economic model: compensation, incentives, blockchain, cryptocoins
Internet for everyone by everyone

- Need for an open Internet, **self-provision**
- Small providers, need to **cooperate** to be effective in regional coverage, services
- **Community networks**: Local development, local connectivity, local business, local resilience
- Diversity, standards, interop, commodity components, incremental upgrade, decentralised
- **Connectivity for the next 50% will develop bottom-up**
- **The topic of the IRTF GAIA WG**