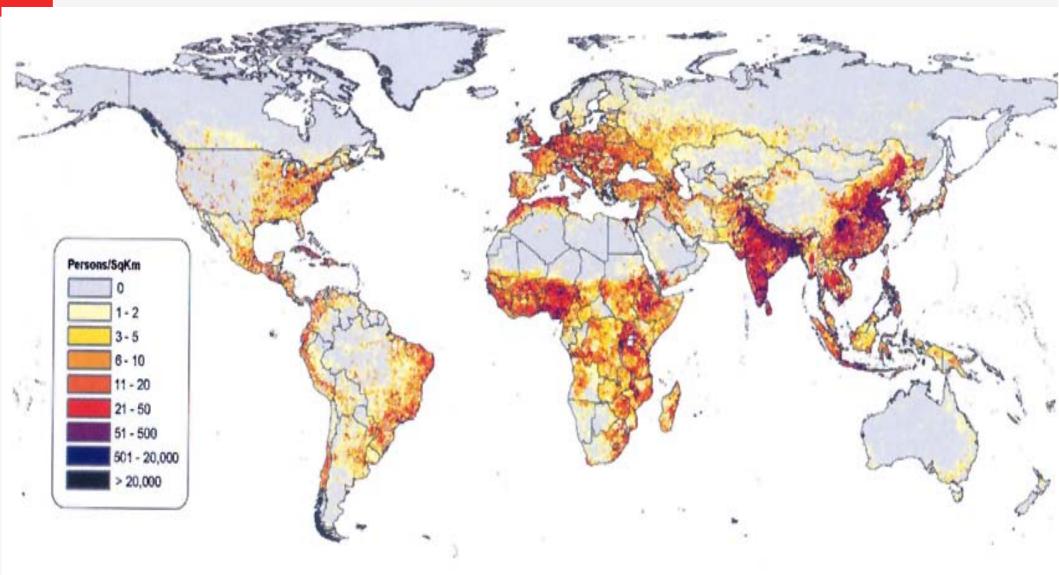
Go local: community networks

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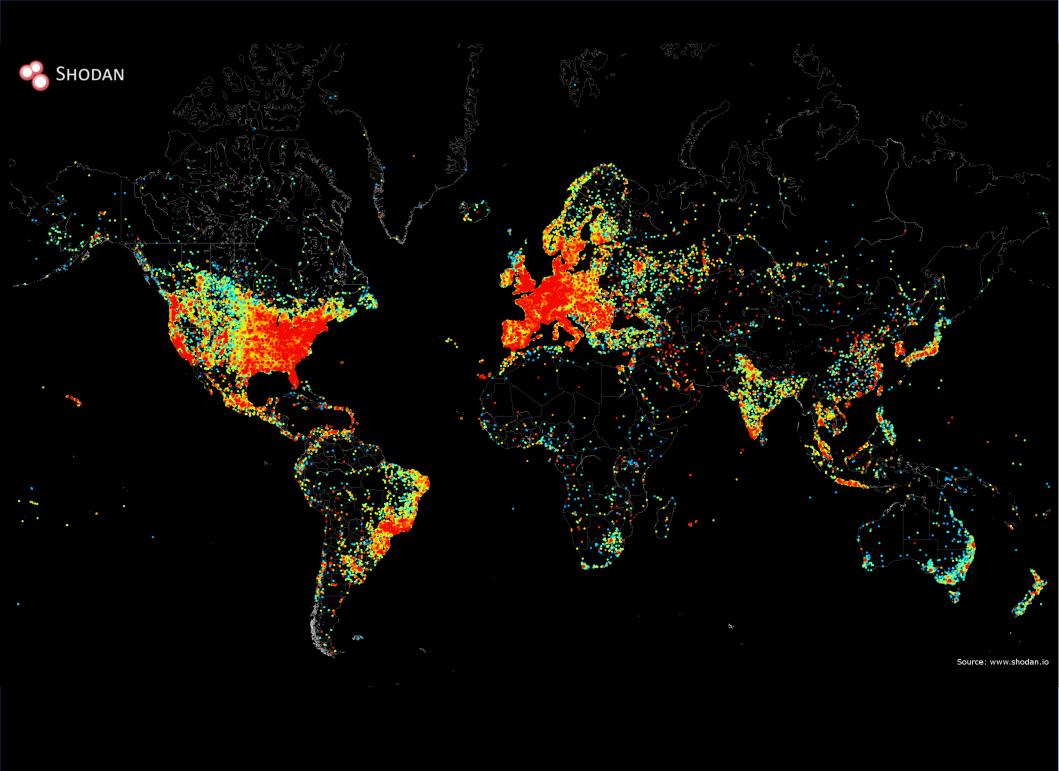
Supported by AmmbrTech, APC.org, Catalan gov, guifi.net, ISOC.org, netCommons.eu, Spanish gov

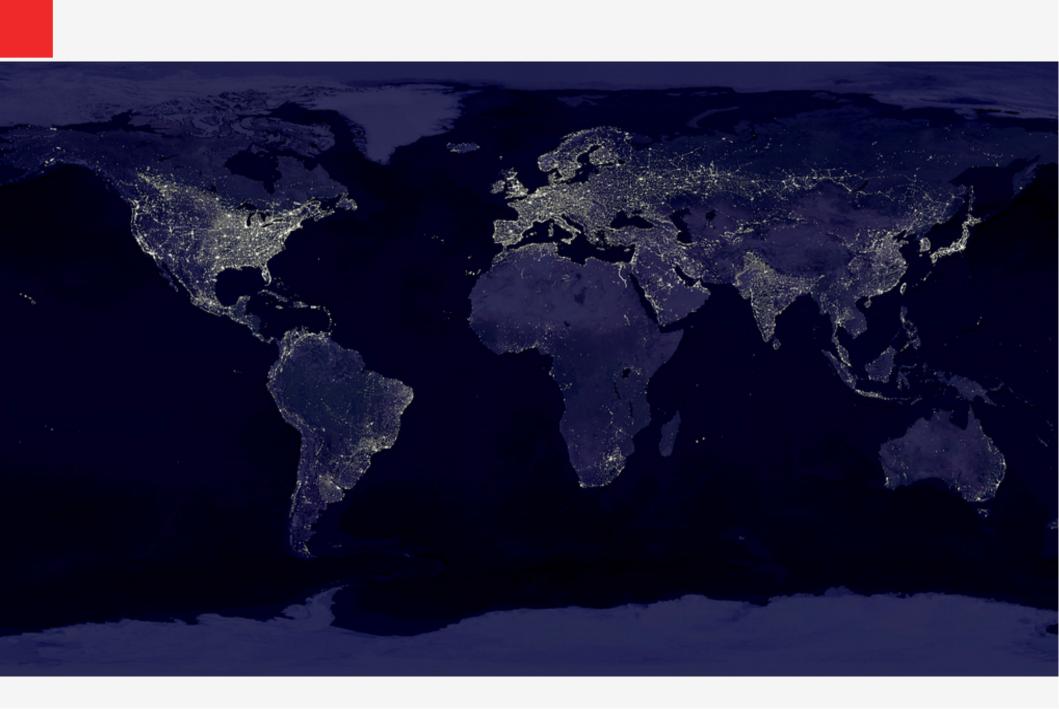
Internet is for everyone (RFC 3271) Vint Cerf 2002

- 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 <u>seek, receive and</u> <u>impart information and ideas through any media</u> and regardless of frontiers. (Universal Declaration of Human Rights)
- Not everyone has access, <u>not everyone can provide it</u>



Source: FAO.org, ORNL LandScan 2000





Connectivity in local communities

- Universal service (ECC)
 - Right to a <u>functional</u> internet connection ... that is <u>affordable</u> and allows <u>full engagement</u> 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



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\$ (PPP) 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

World Economy

Big enterprises, financial institutions and the State: serves global markets.

Local Market Economy

Small enterprises, self-employment: serves local needs.

The challenge

Subsistence Economy

Low market economic activity and informal activities: serves subsistence economy.

- 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 <u>shared network infrastructure</u>

- 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)

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VicJordiP

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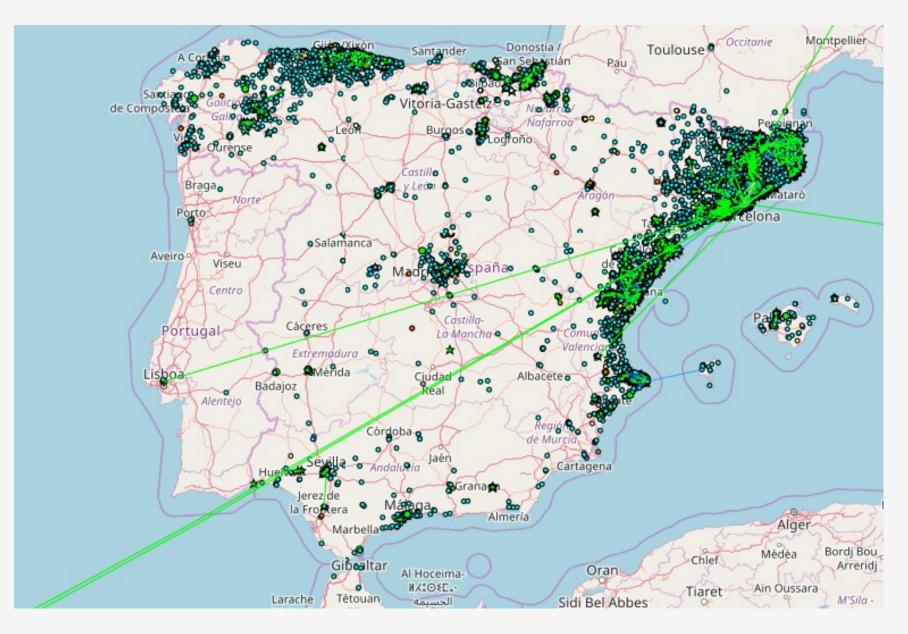
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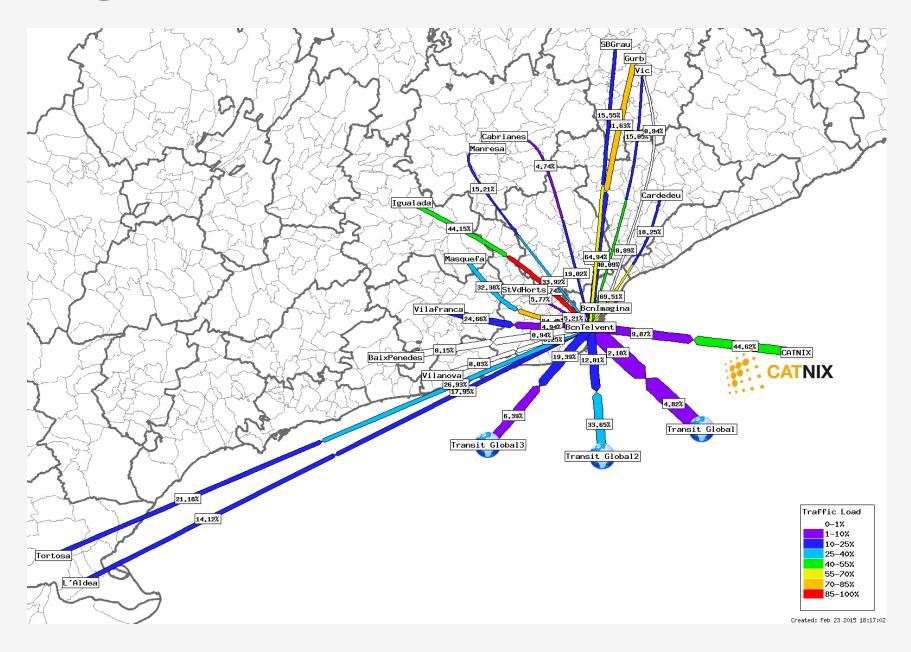
guifi.net: many communities



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 "<u>homemade</u> model" (small operators, WiFi)

Regional backbone & Internet



Governance

- Based on principles for governance of <u>commons</u> as <u>common property</u> (E. Ostrom)
- Aim: preserve local connectivity as a key resource for the community, avoid the "tragedy of the commons"
- Ensure right of access, participation, <u>provision</u>, 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, <u>self-provision</u>
- Small providers, need to <u>cooperate</u> to be effective in regional coverage, services
- <u>Community networks</u>: 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