GAIA WG IETF 101, minutes of the meeting

The agenda and Slides: https://datatracker.ietf.org/meeting/101/session/gaia. Thanks for the anonymous contributions to the notes during the session. A summary of the presentations with questions and answers:

Insights into RIFE field trial
Dirk Trossen, RIFE Project
A description of the RIFE field trial, as part of the guifi.net network, of an ICN, DTN network
Deployment flexibility; Service routing; Dual stack: IP, ICN
Deployments:
- Tarragona (Catalonia): WiFi based, 6 super-nodes, 15 AP
- laboratory (Barcelona): 3 super-nodes WiFi + Eth

Questions: not captured.

Connecting the edges. The UMOBILE project
Sotiris Diamantopoulos, Research Associate, Athena Research Center
Information centric & delay-tolerant networking, edge, new application models & services
Avoid centralization, move services close to the user, facilitate mobility
Routing: DABBER protocol, contextualization: social awareness,

PiCasso: Information-Centric Edge Computing Platform for Community Mesh Networks
Mesh Networking Experience: qMp case
Adisorn Lertsinsrubtavee & Mennan Selimi, Cambridge University
QMP mesh network in Barcelona, a 80 node mesh of about 200 nodes
Focus: is it possible to run a lot of services in the network?
network went from 30 to 80 nodes within 2 years
discovered highly skewed bandwidth distribution, reason: some users are changing transmission power and other parameters of their devices.
Solution: deploy additional devices in strategic places.
Distribute services to the edge with lightweight virtualization (Docker based) with the Picasso service. Automated decision about service location, monitoring system, smart forwarding.
Results: reduction in latency of service delivery.

Questions:
Q ??: how did you measure the bandwidth capacities?
A: we measured with a linux command? It's a production network so we were careful not to cause overhead
Q: ??, univ of Essex: not captured
Q V. Chryssos: what kind of services did you deploy & why these
A: first was TahoeLAFS, second was videostream (peerstreamer)

Vassilis Chryssos, Administrator, Sarantaporo.gr
"Empowering local communities to build, maintain and expand their community network"
Social aspects of the Sarantaporo.gr community network.
Sarantaporo: isolated area, no telcos present
villagers started building community mesh network, soon 15 neighbor villages joined
Vision: eradicate digital divide, give young ppl a motvation to stay in their region (by giving them opportunities)
Network: 24 backbones connecting 11 villages, 3 farms & 1 camp; 95 access points in the villages; >50 active community members (the villagers building & maintaining their network)
Q Juliusz Chroboczek: scale of the map on the picture? A: ~60 km range.
The organization provides training for villagers to empower them to DIY their network.
Example: Workshop in Sarantaporo (for farmers, elderly ppl etc, mots >50 yrs old) on how to make an ethernet cable, what is a p2p link, how to troubleshoot their own network.
=> Why do they do this? If they don't have internet, their grandchildren won't come!
Do planning in paper maps from sat images.
Good practices: Support via Instant Messaging app. Celebration, Support, update on progress
WiFi and Internet connectivity quality very important.
Important: what services can people use, what do they need? (don't just deploy ~something~).
Participants gained awareness on privacy, personal data, surveillance possibilities by learning how the internet works.
The magic? Local riding club expanded the network on their own; older community members support new members, autonomously organize workshops, women participate, farmers use it for their work, collectively buy fertilizer; doctors use it for prescriptions, etc.
What to do next: more workshops, expand.

Questions:
Q Luis Martinez: How are costs of the network covered (Internet connection, maintenance)?
A: through EU funding, ISOC's grant to Sarantaporo.gr, local people (node owners) contributing 60 €/year. Also voluntary work (everybody's volunteering).
A: Hybrid model: volunteers from Athens cooperate with locals when there's a problem. Internet: Local university provides their internet.
Q Adisorn: sustainability of the network as people join or leave.
A: As the community grows, more contributions are expected (individual contributions, fests), but they haven't solved the sustainability problem.
Q Richard ??: RE: workshops, What do ppl have difficulties with, has your model been replicated?
A: things they can't visualized, they can't comprehend. => visualize backbone using maps, don't overcomplicate things.
A: But! 90% of problems can be solved with basic knowledge on how to make cables, alogn links, position nodes
A: Regarding "export" of the idea: Hasn't happened yet. This summer we're visiting a village in Epirus region to transfer know-how and set up together their first CN node.
A: Don't make the participants feel like they're on their own when you leave.
Q Gareth Tyson: Are there many participants or does the system rely on a few very engaged ppl? What do you do if these people leave?
A: We've worked w many ppl who have come & gone; we see that in each village there's 1-2 ppl championing the project and inspire others to join. If somebody leaves, someone else will usually take over, but it takes a lot of community building effort.

Community Cellular Network: Towards 5G
Mohamed Kassem, University of Edinburgh, Scotland
>40% of world population is living in rural areas, often unconnected (52% of world population)
reason: infrastructure costs (for minimum revenue bc not densely populated or low-income area), non-affordability
but! universal internet is not just a problem of developing countries: rural areas in UK (for example) are often affected too
one objective of 5G: close this gap. other ideas: google balloons, leveraging low frequencies (700 mHz), etc.
New deployment model for the cellular net in rural areas simplicity, scalability, applicability to new emerged services, cost efficient, adaptability
Three main components: access nets (LTE small cells), TVWS backhaul (8 MHz channel), Core in the cloud
TVWS usability:
Selected area in Scotland (60 Km) to assess whether TV Whitespace can be used to build low-cost middle mile infrastructure
usually, availability is used as metric whether TVWS is usable. But this is often inaccurate/overly optimistic! => look at TVWS *usability* instead. Usability is a metric that denotes quality, not quantity
Problem: TVWS spectrum is fragmented. For high capacity, the possible 6/8 mHz channels aren't sufficient. Solution: aggregate too-small channels into usable ones
Idea was deployed recently in Balquhidder. Focus not so much on distance (1 Km), but on high-quality link.

Questions:
Q Andres, Cambridge: In DBs, models usually overestimate ??; how ...
A: In our analysis, we focus on the receiver side. it might be that channel is very interfered with on receiver.
Q Andres, Cambridge: Have you got any experience with transport protocols
A: No, main focus is on PHY performance
Q Adisorn, Cambridge: relationship with 5G?
A: we are trying to resolve the bottleneck
A: work with any regulator? No
Q ?? Richard: The high bandwidth that you need, is that p2p?

IoT Networks and TTN Community IoT
Jon Brewer, NSRC
IoT protocols are designed with device & network constraints in mind: low poer/cpu/size; radio propagation issues, etc
Unfortunately, wifi is still the most popular IoT protocol. wifi devices are cheap, but problematic in terms of security, battery consumption...
Enter IEEE 802.15.4(n): star/tree/mesh topologies, power saving, 128-bit encryption keys, PAN/LAN solution w/out mobility, can be set up by anyone. But! not low-cost because no economics of scale.
Bad Stuff:

- Lo-Fi, Motenio etc-- cheap toys run unencrypted serial across 433, 868, 915 MHz
- Sigfox-- low power, proprietary, limited to 140 12-byte msgs/day, optional encryption, mobility possible (when channel persistent), only sigfox can run sigfox network!
- Weightless/nbIoT ("5G")-- open standard, low power, public key encrypted, mobility scaling, only mobile operators can operate it.
- LTE-M ("5G")-- uses LTE base stations, possibly periodic transmissions, can only be run by mobile operators
- LoRa/LoRaWAN-- bidirectional comms, star-only, multiple levels of encryption, anyone can run a LoRaWAN network. The Thing network builds cmmunity IoT networks all over the world

Questions:
Q Jon, Cambridge: There's a cool measurement of IoT homes, alarming in terms of data (??)... If you run a LoRaWAN network you'll find you're not alone. we found 12 in London last year, but there's an issue with networks coexisting.
Q J. Ignacio, QMUL: Openness: LoRa one chipset company, IP issues, SigFox: closed
Security of the infrastructure.

Discussion of informational best practices document and next steps for GAIARG -Chairs/All
No time left, further comments in the mailing list.

Related events:

* **The IETF 101 plenary: The Future of Internet Access** https://www.ietf.org/live/ietf101-techplenary/
A panel of experts in community networks, the use of spectrum, and satellite access networks discussed recent developments in these areas and their implications for the Internet's future development. Moderated by Jane Coffin, responsible for development strategy at the Internet Society.

The slides:
Go local: community networks (Leandro Navarro)
How To Connect Everyone (Steve Song)
The Future is Up in the Sky (Jonathan Brewer)

* **Call for topics to discuss in the next GAIA WG meeting** at IETF 102 Montreal (14 Jul 2018 - 20 Jul 2018) https://www.ietf.org/how/meetings/102/
Tell us (can be off-list) about topics/presentations/documents you'd like to share/discuss by mid may (Friday 18).

A reminder for upcoming calls for papers and participation:

* The **ANRW '18** takes place in Montreal, Quebec, Canada, the venue of the IETF-102 meeting , on Monday, July 16, 2018.
Paper submission deadline (extended) April 23, 2018
https://irtf.org/anrw/2018/

* **14th Asian Internet Engineering Conference** (AINTEC), Thailand, 12-14 November 2018, (after IETF 103 https://www.ietf.org/how/meetings/103/ also there)
Abstract registration 18 August 2018
Full paper submission 2 September 2018
Conference 12-14 November 2018
https://interlab.ait.ac.th/aintec2018/