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Network Infrastructure as Commons

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Executive summary

This deliverable summarizes the dissemination activities of the netCommons Consortium and their overall impact during the second year of the project's life, as well as outlining the impact that some actions will have in the near and far future. Notably, this year was marked by critical legal developments of the European legal frame of communications, including the European Electronic Communications Code (EECC), and the definitive enforcement of the General Data Protection Regulation (GDPR).

netCommons operated promptly on these developments both with its legal team and with its advocacy support group, and managed to play a key role in advocacy efforts, coordinating networking activities among Community Networks (CNs) in Europe and worldwide. In this context, that in some sense goes beyond the foreseen activity, we can list the following remarkable achievements:

- An Open Letter to European Union (EU) Policy-Makers: “Making Regulation Work for Community Networks”, in March 2017, and the corresponding press releases;
- Detailed notes on the individual amendments of the EECC before decisive votes in European Parliament in collaboration with La Quadrature Du Net (LQDN) and a second open letter;
- A focused workshop in the European Parliament coordinated by Member of the European Parliaments (MEPs) Miapetra Kumpula-Natri and Julia Reda and participated by other members including José Bové;
- Both social and technical comments and contributions to positively influence the development of the Radio Equipment Directive (RED), whose revision, currently under discussion, may severely hinder the growth and the sheer existence of CNs that exploit innovative open source resources;
- Initiation of the telecommons mailing list as a platform for communication exchanges across different CNs and coordination of joint actions such as the Open Letter to EU;
- Participation in the formation of a new Internet Society (ISOC) Special Interest Group on Community Networks.

In addition to these exceptional activities addressing policy makers and regulators, which are without a precedent in the brief history of CNs, netCommons extended its cooperation with several CNs and the communities they serve, achieving appreciated support and significant impact. This holds in particular for the CNs that maintain a close relationship with the project, namely ninux.org, guifi.net, Sarantaporo.gr and Federation French Data Network (FFDN). Activities in this direction have ranged from the organization of workshops and seminars to the diffusion of knowledge (funding and organizational models) and the help to attract competitive funding for assisting the CN growth.

netCommons partners have also engaged also in a wide variety of dissemination activities targeting the scientific community, local authorities and stakeholders, the Collective Awareness Platforms for Sustainability (CAPS) community, and the general public. In numbers, netCommons partners organized or co-organized 6 focused events, actively participated in 10 high-impact international and 2 Collective Awareness Platforms for Sustainability and Social Innovation (CAPSSI) specific events, attended 12 scientific workshops, and were invited to talk in 4 public events. In additions to these focused dissemination activities or partially overlap with them, netCommons researchers published more than 20 scientific papers, detailed in Chapter 8.

The structure of the deliverable is based on the type of activity, with an initial overall description and final conclusions:

Chapter 1 describes the rationale and strategy of dissemination we followed, with some highlights on specific items treated in more detail in the appropriate chapter;

Chapter 2 lists and presents one by one the events organized or attended by netCommons researchers;

Chapter 3 discusses the activities devoted to improve and support CNs advocacy initiatives;

Chapter 4 is devoted to the meetings and support with local communities in general and CNs in particular;

Chapter 5 presents the other dissemination activities that cannot be easily categorized;

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- Chapter 6** discusses the overall positive impact generated for CNs by netCommons, attempting an objective analysis as far as possible;
- Chapter 7** draws some final considerations on the success of dissemination and impact of netCommons after two years or project;
- Chapter 8** lists all the publications of netCommons during the second year of activity classified by publication type.

Contents

1	Overview of the activities	10
1.1	Community Networks	10
1.2	Local authorities and stakeholders	10
1.3	Policy makers, regulators, and politicians	11
1.4	Scientific communities	11
1.5	CAPS communities	11
1.6	General public	11
1.7	Internet Presence	12
2	Events	13
2.1	Organized events	13
2.1.1	GAIA Community Networks: Sustainability & Regulation Workshop	13
2.1.2	Universse 2017	14
2.1.3	Libremesh workshop	14
2.1.4	Participatory Design, beyond the local	16
2.1.5	4S panel on Citizen Science Politics and Practices	16
2.1.6	netCommons EP workshop	17
2.2	Participation in high-impact international events	19
2.2.1	RightsCon	19
2.2.2	IEEE Internet Inclusion, advanced solutions Workshop	19
2.2.3	re:publica 2017 - Digital Equality: how an open Web can contribute	21
2.2.4	Stockholm Internet Forum 2017	21
2.2.5	Battle of the Mesh 2017	23
2.2.6	IAMCR panel on the history and policy of Community Networks	23
2.2.7	The Internet of People Dagstuhl Seminar	24
2.2.8	Self-service connectivity: feasibility, business models and sustainability	25
2.2.9	Internet Governance Forum 2017	26
2.2.10	Organizing CNs advocacy capacities at the 34th Chaos Computer Congress	27
2.3	CAPS events	27
2.3.1	DSI Fair	27
2.3.2	DSI Manifesto Workshop	28
2.4	Scientific conferences and workshops	29
2.4.1	INW 2017	29
2.4.2	Wireless On-demand Network Systems and Services Conference, WONS 2017	30
2.4.3	Passive and Active Measurement Conference	30
2.4.4	International Conference on Computer Supported Cooperative Work in Design	31
2.4.5	International Symposium on Integrated Network Management	31
2.4.6	IV International Conference on Social and Complementary Currencies	32
2.4.7	International Symposium on Cluster, Cloud and Grid Computing	32
2.4.8	International Conference on Networking, Sensing and Control	33
2.4.9	IASC presentation on Laws for the commons: from nature to infrastructure commons	33
2.4.10	13th European Sociological Association Conference	34
2.4.11	Global Information Infrastructure and Networking Symposium	35

2.4.12	ECREA conference DCC	35
2.4.13	Conference on Computer Networks Histories	36
2.5	Local events	36
2.5.1	ninuxday 2017	36
2.6	Invited talks, public panels	38
2.6.1	Invited seminar at Madeira Interactive Technologies Institute (M-ITI)	38
2.6.2	Colloquium on the Commons (in French)	38
2.6.3	Wireless community mesh networks: fresh connectivity for 7 billion people	39
2.6.4	#SWAP: What about politics?	40
2.7	CN Oriented Workshops	41
2.7.1	Exercise about designing Business Model Canvas for CN in Delhi	41
3	Advocacy	43
3.1	European Electronic Communications Code	43
3.2	Radio Equipment Directive	43
4	Local meetings with CNs and beyond	44
4.1	Spain	44
4.2	Italy	44
4.3	Greece	45
4.4	Switzerland	45
4.5	France	46
5	Other dissemination activities	47
5.1	Social media	47
5.2	CAPS Networking	47
5.3	Interviews	47
5.4	Popular media	47
5.5	External blog entries	48
5.6	PhD theses	48
5.7	Awards	48
5.8	Testimonials	48
6	Impact on CNs	50
6.1	Visibility, Reliance, and Advocacy	50
6.2	Networking	50
6.3	Economic Initiatives and Funding Spawned by netCommons	51
6.4	Consolidation	52
6.4.1	Interactions with Ninux	52
6.4.2	Interactions with Sarantaporo.gr CN	53
6.4.3	Interactions with guifi.net CN	53
6.4.4	Interactions with other CN	53
6.5	Technical support	54
6.5.1	Interactions with OpenWISP	54
6.6	Other	54
7	Conclusions	55
8	List of Publications (2017)	56
	Bibliography	59

List of Figures

1.1	The access statistics of www.netcommons.eu	12
2.1	Public event on CNs at the cultural center Nosotros in Exarcheia neighbourhood	15
2.2	4S panel on Citizen Science Politics and Practices	17
2.3	netCommons partners and advisory board outside the EP before the netCommons workshop	18
2.4	The panel before the conference.	20
2.5	Digital Equality: how an open Web can contribute to a more Equal world?	22
2.6	The traditional Dagstuhl photo in front of the Castle Chapel with the seminar participants.	25
2.7	The presentation of Sarantaporo.gr CN as a success story of netCommons at DSI fair in Rome	28
2.8	Leonardo Maccari during his presentation of netCommons at the DSI Manifesto workshop in Rimini, Italy	29
2.9	The flier of the ninuxday 2017	38
2.10	Colloquium on the Commons, Paris	39
2.11	Invited talk by Leandro Navarro at the Computer Laboratory Wednesday Seminars, University of Cambridge	40
2.12	CNExchange workshop on business models	42

List of Acronyms

ACM	Association for Computing Machines
APC	Association for Progressive Communications
ARCI	Associazione Ricreativa Culturale Italiana
ARL	Ammbr Research Labs
CAPS	Collective Awareness Platforms for Sustainability
CAPSSI	Collective Awareness Platforms for Sustainability and Social Innovation
CCC	Chaos Computer Club
CdCE	Codice delle Comunicazioni Elettroniche
CHiC	Coordinating high impact for CAPS
CN	Community Network
DCC	Digital Culture and Communication
DoA	Description of Action
ECREA	European Communication Research and Education Association
EC	European Commission
EU	European Union
EECC	European Electronic Communications Code
eXO	exapansió de la Xarsa Oberta
FFDN	Federation French Data Network
FONN	Free Open & Neutral Network
FOSDEM	Free Open Source Developers' European Meeting
GAIA	Global Access to the Internet for All
GDPR	General Data Protection Regulation
GSoC	Google Summer of Code
IAMCR	International Association for Media and Communication Research
IEEE	International Electrical and Electronic Engineering
IETF	Internet Engineering Task Force
IFIP	International Federation for Information Processing
IGF	Internet Governance Forum
IGF-DC3	Internet Governance Forum–Dynamic Coalition on Community Connectivity
INW	Italian Networking Workshop
IRTF	Internet Research Task Force
ISOC	Internet Society
ISP	Internet Service Provider
LQDN	La Quadrature Du Net
MEP	Member of the European Parliament
NPO	Non-Profit Organization

OLSR	Optimized Link State Routing Protocol
OLSRv2	Optimized Link State Routing Protocol version 2
qMp	Quick Mesh Project
RED	Radio Equipment Directive
RFC	Request For Comment
WG	Working Group

1 Overview of the activities

Also the second year of the project has been very productive in terms of dissemination. netCommons team succeeded in reaching out to all the major target and stakeholders identified in the Description of Action (DoA), as summarized in remaining of this chapter separately dedicating a short section to every group of stakeholders. The other chapters of the document are structured around the various activities classified as detailed in the Executive Summary. Many of the activities addressed and reached multiple actors in the CNs play and different stakeholders too, hence the different organization of the detailed description and of this overview. Chapter 6 and Chapter 7 are dedicated to the analysis of the project dissemination activities and the impact they already had on CNs and other stakeholders.

1.1 Community Networks

netCommons partners contributed in many major events on Community Networks in 2017, and organized or cooperated in organizing several ones that introduced CNs to different audiences. Moreover netCommons researchers enabled CNs themselves to participate in forums otherwise not easily accessible to them, as for example the workshop with policy makers, politicians and regulators at the European Parliament (see Sec. 2.1.6 and Chapter 3).

The work of netCommons brought tangible benefits to specific CNs, like the technical work on Cloudy and OpenWISP already adopted by guifi.net and ninux.org respectively, or the close engagement with the Sarantaporo.gr area that has contributed to successful grant applications¹ and the FundAction's 'Rethink' grant of 5K EUR to support Sarantaporo.gr expertise sharing to Tzoumerka valley².

netCommons partners participated also in the formation of a new ISOC Special Interest Group on Community Networks³, a very important step toward the inclusion of CNs as important means for the reduction of the digital divide, and as fully recognized telecommunications infrastructures that must be actively and positively considered when telecommunication regulations are issued. Chapter 6 describes in detail all explicit and implicit impact that the overall work of netCommons had during its first two years.

1.2 Local authorities and stakeholders

In terms of approaching and engaging local authorities, Barcelona is still the more advanced case study with UPC playing a key role in the "Barcola" expert group on collaborative economies of the City Council of Barcelona (Ajuntament).

The Sarantaporo.gr success story has also opened some doors in Greece with local authorities in the Sarantaporo.gr area showing more and more interest and discussions having started with the municipality in Athens, about possible collaborations in the context of the refugee crisis, none of which have taken an official form yet. Other attempts in Italy and France, unfortunately, did not have meaningful follow-ups, showing a marginal interest by local authorities.

¹ISOC's Beyond the Net grant of 30K EUR for the expansion of the network and educational activities <https://www.internetsociety.org/beyond-the-net/grants/2017/sarantaporo-gr-community-network/>

²See <http://www.sarantaporo.gr/node/408>

³See <http://cnsig.info>

1.3 Policy makers, regulators, and politicians

Due to important developments in the area of EU legislation and more specifically the European Telecommunication Code, netCommons has been very active in 2017 in advocacy efforts (see Chapter 3), including:

- An Open Letter to EU Policy-Makers: Making Regulation Work for Community Networks, in March 2017, and the corresponding press release⁴;
- Detailed notes on the individual amendments of the EECC before decisive votes in European Parliament in collaboration with LQDN and a second open letter⁵, followed by a second press release, in October 2017⁶;
- A focused workshop in the European Parliament organized by MEPs Miapetra Kumpula-Natri and Julia Reda and participated by other MEPs including José Bové as discussants⁷;
- A contribution to the efforts around the Radio Directive⁸;
- The initiation of the telecommons mailing list⁹ which helped organizing the Open Letter initiative and is now used to exchange information among several CNs.

1.4 Scientific communities

In terms of scientific production and dissemination, netCommons continued to be very successful with 1 book chapter translated and re-published also in German, 8 journal articles, 9 conference papers, 3 presentations at open workshops or conferences, 3 PhD theses, and many master and bachelor theses spinning around netCommons arguments. Chapter 8 lists them all with short comments when necessary.

1.5 CAPS communities

netCommons partners further developed links and collaborations with CAPS projects, participating in several CAPS events (see Sec. 2.3) and initiating a working group on participatory design, which co-organized a workshop in the C&T conference, described in more detail in Sec. 2.1.4 and D3.3 [1].

1.6 General public

Reaching the general public and verify it is somewhat more tricky than other events, as press releases are not always reflected in newspapers, and journalists seek for news that make the headlines rather than complicated techno-legal concepts that are rarely grab the attention. In any case netCommons appeared in mass media and online press, including a 20 min. interview on a national TV¹⁰ and a second article on *The Conversation Global*¹¹.

⁴<https://netcommons.eu/?q=news/open-letter-eu-policy-makers-community-networks>

⁵<https://netcommons.eu/?q=content/notes-european-electronic-communications-code-decisive-votes-european-parliament>

⁶<https://netcommons.eu/?q=news/european-governments-seek-greater-oligopolization-telecom-infrastructures>

⁷<https://netcommons.eu/?q=content/eu-parliament-workshop-community-networks-and-telecom-regulation>

⁸<https://freifunk.net/blog/2017/12/das-problem-mit-der-eu-funkrichtlinie/>

⁹<https://lists.laquadrature.net/cgi-bin/mailman/listinfo/telecommons>

¹⁰The interview, in Greek, was included in a program of the national television ERT3 called “Antidrastirio”, broadcasted on May 25th and May 29th <http://webtv.ert.gr/ert3/25me2017-antidrastirio-kina-ke-kinoniki-allilengya-ikonomia> dedicated to alternative economies, the interview starts around minute 2.

¹¹Panayotis Antoniadiis. How to build an organic internet and stand up to corporations. *The Conversation Global*, 2017. URL <https://theconversation.com/how-to-build-a-more-organic-internet-and-stand-up-to-corporations-70815>

1.7 Internet Presence

netCommons web site in 2017 served 1,808,595 requests for 25,671 visitors (excluding robots) with an average of 72 visitors per day (with a 65% increase with respect to 2016). Fig. 1.1 reports the time graph of number of objects served (blu line, left hand axis) and the unique daily visitors (red line, right hand axis) for the reported period. It also shows how the website was highly visited especially corresponding to the events we participated or organized, such as the Stockholm Internet Forum 2017 Sec. 2.2.4.

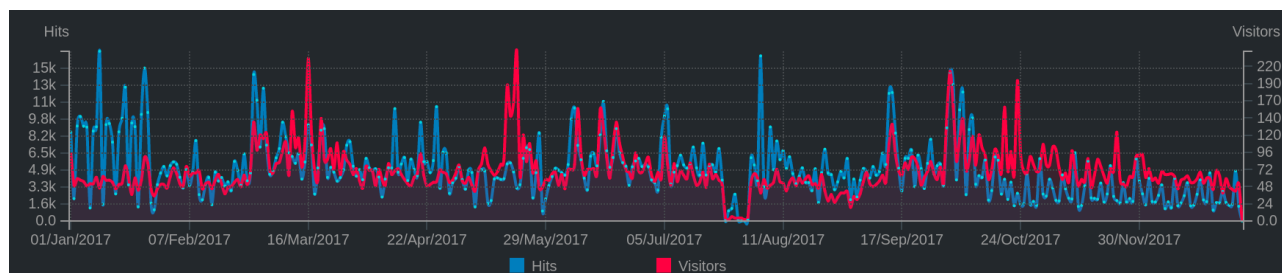


Figure 1.1: The access statistics of www.netcommons.eu.

2 Events

netCommons has organized numerous events and participated in well established events organized regularly by other stakeholders, being them communities, large scientific societies or other recognized actors. As done in the previous dissemination deliverable we divide events in categories: we first report on the events organized or co-organized by netCommons in Sec. 2.1, then on those where we participated in Sec. 2.2. These two Sections refer to general multi-cultural events. Sec. 2.4 is dedicated to specialist scientific venues where netCommons partners participated. Next, Sec. 2.5, Sec. 2.6 and Sec. 2.7 summarize on general public talks and other community building activities. Finally, in the chapter dedicated to other events, Sec. 5.2 reports instead on events organized specifically for CAPS or in general for H2020 projects,

2.1 Organized events

2.1.1 GAIA Community Networks: Sustainability & Regulation Workshop

Type: Workshop

Title: GAIA Community Networks: Sustainability & Regulation Workshop

Date: January 26-27, 2017

Place: Cambridge, UK

Organizers: Leandro Navarro, UPC

URL: https://www.cl.cam.ac.uk/~al773/gaiaworkshop/gaia_workshop17.html

Actors: Community networks, engineers, researchers, practitioners, international organizations

Audience: Around 80 participants

Dissemination Level: EU, US, Africa, Asia

Description: An Internet Research Task Force (IRTF) Global Access to the Internet for All (GAIA) workshop, co-organized with netCommons. The theme of the specific workshop was on the development of local networking infrastructures using cooperative & open-access management schemes considering two main approaches: 1) Open-access radio spectrum (and its availability, sharing, open access, etc.); 2) Community networks (with similar properties) providing open-access connectivity (and also IX-like infrastructures etc.).

Summary: It was half day event with very interesting presentations from all over the world, and a conspicuous participation from University of Cambridge members . netCommons researchers gave four presentations (about 50% of the total): Leandro Navarro (UPC) on network infrastructures as commons; Roger Baig (UPC) on the Net4all project; Renato Lo Cigno (UniTn) on spectrum usage and sharing; and Panayotis Antoniadis (NetHood) on the Sarantaporo.gr participatory design process.

Additional notes: The presentation by Panayotis Antoniadis on Sarantaporo.gr drew the attention of the 1worldconnected project, which led to the creation of a related case study¹, presented by Vassilis Chrysos at IGF2017².

¹See http://1worldconnected.org/wp-content/uploads/2017/12/053017_Sarantaporo_FB.pdf

²See https://twitter.com/1_WorldConnect/status/943784725910556674

2.1.2 Universe 2017

Type: Panel in Conference

Title: Digital infrastructure as commons

Date: 11 June 2017

Place: Athens

Organizers: Panayotis Antoniadis (NetHood)

URL: <https://universse2017.org/en/program/per-day/#k1214>

Actors: Activists, civil society, local authorities

Audience: 600 people in conference, 30 people in netCommons panel

Dissemination Level: Greece

Description (as published at the conference web site): This panel presents different examples of grassroots initiatives that treat network infrastructure as commons, and discusses issues of governance and sustainability with focus on the Greek case studies of Sarantaporo.gr and Exarcheia Net. More specifically presentations were given by

- Juergen Neumann, co-founder of Freifunk.net, Germany
- Vasilis Chrysos, co-founder of Sarantaporo.gr, Greece
- James Lewis, instigator & facilitator of Exarcheia Net, Greece
- Panayotis Antoniadis, co-founder of NetHood, Switzerland
- Guest speaker (not in the official programme): Nicolas Pace (Altermundi)

Summary: The panel introduced the concept of network infrastructure as commons to people active in other areas of commoning (housing, energy, urban commons) that came all around the world for this big event of high visibility and impact. The presentation of successful case studies from abroad (Freifunk.net and Altermundi.net) together with the local initiatives (Sarantaporo.gr and ExarcheiaNet) was very informative both for the audience but also helpful and inspiring for the local activists (e.g., the Exarcheia Net CN).

Additional notes: An article (in Greek) was published in the popular news site ThePressProject regarding this panel³.

2.1.3 Libremesh workshop

Type: Series of workshops

Title: Libremesh workshop

Date: 12-15 June 2017

Place: Athens, Greece

Organizers: Panayotis Antoniadis (NetHood)

URL: http://wiki.exarcheianet.gr/index.php?title=Libremesh_workshop_in_Athens_-_June_12-16th

Actors: Activists

Audience: 100 people

Dissemination Level: Greece

Description: In June 12-16th, experts in the field of Community Networks from all over the world, including Juergen Neumann (co-founder of Freifunk.net) and four core Libremesh developers also active in various com-

³See <https://www.thepressproject.gr/article/112431/Koinotika-Diktua-Apo-tin-prosbasi-sto-Diadiktuo-mexri-tin-organosis-tis-topikis-koinotitas>

munity networks around the world (Guifi.net, ninux.org, Altermundi.net), visited the Exarcheia Net initiative in Athens to share their experiences and knowledge.

In addition to self-organized hands-on workshops, a series of related events were organized:

- A public event at Exarcheia (with all guests present), June 12th⁴;
- A technical workshop at hackerspace.gr (with the libremesh team), June 13th⁵;
- The “regular” WiFi Wednesdays with the participation of the international guests, June 14th, h 14:00.

Summary: With the opportunity of the Battle of the Mesh conference in Vienna, the core team of the libremesh project was invited by NetHood to spend some days in Athens together with activists from the recently founded ExarcheiaNet CN. During the period a series of events were organized and were very successful. The most attended public event took place in the cultural space Nosotros and gathered around 80 people, including both activists and local residents interested in the topic.

Getting in close contact with such engaged activists leading one of the key software projects in CN technology was very informative and inspiring, leading to increased participation and interest in the ExarcheiaNet project. Also many long-terms contacts were established between local and international activists, with multiple positive effects.

For example, Nicolas Pace (Altermundi), visited later the Sarantaporo area during a local training workshop, was involved in it helping its success, and produced capturing and interesting video clips⁶ that are fostering the diffusion of the Sarantaporo.gr model. He also established a strong relationship with the Sarantaporo.gr team and contributed with consulting to a successful funding application for ISOC’s Beyond the Net grants,⁷, a success to be ascribed to netCommons mediation. A pilot libremesh access network deployed in the area was also a tangible outcome of this visit.



Figure 2.1: Public event on CNs at the cultural center Nosotros in Exarcheia neighbourhood

⁴See http://wiki.exarcheianet.gr/index.php?title=Nosotros.-_June.12

⁵See: https://www.hackerspace.gr/wiki/ExarcheiaNet_Libremesh_Workshop

⁶Available at <https://www.youtube.com/watch?v=ojiSXTThSCuk>, <https://www.youtube.com/watch?v=YSfOISxHQsQ>, <https://www.youtube.com/watch?v=WN5C98vxePY>

⁷Details on <https://www.internetsociety.org/beyond-the-net/grants/2017/sarantaporo-gr-community-network/>

2.1.4 Participatory Design, beyond the local

Type: Workshop

Date: June 27, 2017

Place: Troyes, France

URL: <https://capssi.eu/event/participatory-design-beyond-the-local/>

Dissemination Level: International

Actors: Academia, CAPS Communities

Audience: 15

Organizers Panayotis Antoniadis

Description (from the conference material): A focused workshop on participatory design based on experiences and lessons learned in different CAPS projects.

Summary: Four EU Horizon2020 CAPS projects, commonfare, empatia, MAZI, and netCommons, collaborated in the organization of a workshop titled “Participation Design, beyond the local”, which was hosted at the 8th conference on Community & Technologies, June 26-30, Troyes, France. The workshop aimed at stimulating and opening a debate around the capacity of Participatory Design (PD) and other co-design approaches to deliver outcomes and methodologies that can have an impact and value for reuse well beyond the local context in which they were originally developed.

Details on the discussions and outcome of this workshop are available in Deliverable 3.3 [1].

2.1.5 4S panel on Citizen Science Politics and Practices

Type: Workshop in Conference

Date: August 30–September 2, 2017

Place: Boston, MA, USA

URL: <https://convention2.allacademic.com/one/ssss/4s17/index.php>

Dissemination Level: International

Actors: Academia, Scientific Communities

Audience: 30

Organizers Melanie Dulong de Rosnay

Description (from the conference material): 4S is the conference of the Society for Social Study of Science gathering over 1000 STS scholars. This year’s theme was “STS (In)Sensibilities”. If sensibility is the ability to grasp and to respond, how might we articulate the (in)sensibilities of contemporary technoscience? How, similarly, can we reflect on the extent and limits of our own sensibilities as STS scholars, teachers, and activists? The conference theme invites an open reading and exploration of how the world is made differently sense-able through multiple discourses and practices of knowledge-making, as well as that which evades the sensoria of technoscience and STS. Our aim is that the sense of ‘sense’ be read broadly, from mediating technologies of perception and apprehension to the discursive and material practices that render worlds familiar and strange, real and imagined, actual and possible, politically (in)sensitive and ethically sensible.

Summary: Melanie Dulong de Rosnay co-organised 2 panels entitled ‘Citizen Science Politics and Practices’ with fellow STS (Science, Technology and Society) legal academics Shun-Ling Chen (Taipei) and Iris Eisenberger (Vienna) touching on the topic of Community Wireless Networks as Policy Makers/Makerspace.

After her presentation in one of these panels (Fig. 2.2), the discussion focused on the collaboration between citizens and researchers, which is sometimes inverted compared to traditional citizen science: researchers are also learning from practitioners, roles can change between both categories for the same actors, and knowledge

can take the form of policy evidenced by legal research, in addition to papers, licensing models and technology optimisation as more classical results.

Abstract of the presentation:

This communication explores the case of Community Wireless Networks as a case study of participation to public policy through the production of techno-legal knowledge. Community wireless networks (CNs) are local, commons-based alternatives to commercial internet service providers. They are producing and informing state-of-the-art knowledge in the field of computer science and engineering, economy, law, and political science. Members of CNs, through their practice and collaborations with peer users, hackers, digital rights activists, researchers and local authorities, develop and improve technologies, policies and practices. They devise new types of licensing, governance and socio-economic agreements, and as such contribute to research and scholarship on the commons. Based on sophisticated techno-legal analysis of liability, privacy or telecommunications legal framework, they may engage in advocacy to draft laws more protective of digital rights and privacy, more supportive of open hardware, or spectrum management. We claim that the communities are ‘making’ science and policy through these practices, rather than ‘only’ technology, by analysing problems and proposing creative solutions to improve access and sustainability. The method associates an ethnography of CNs in Greece, France, Germany and Spain with desk research on the definitions of citizen science, and theories on the relation between science and policy, in the view of informing both fields of the findings of this research, which is part of the H2020 netCommons research project supported by the European Commission.



Figure 2.2: 4S panel on Citizen Science Politics and Practices

2.1.6 netCommons EP workshop

Type: Closed Workshop at European Parliament

Title: Community Networks and Telecom Regulation

Date: 17 October 2017

Place: Brussels, Belgium

Organizers: netCommons

URL: <https://netcommons.eu/?q=content/eu-parliament-workshop-community-networks-and-telecom-regulation>

Actors: Politicians, policy makers, EU officials, researchers

Audience: 30 people

Dissemination Level: International

Description: Despite the stunning achievements of CNs, policy-makers at the national and European levels have so far mostly neglected their existence and specific regulatory needs. Worse, regulation is often hampering these initiatives, and the draft of the EECC risks worsening the situation. This workshop, co-sponsored by MEPs Miapetra Kumpula-Natri (S&D) and Julia Reda (Greens/EFA), gathered, policy-makers, netCommons researchers and Advisory Board members, and CNs' practitioners to discuss the way in which EU policy can help European CNs thrive. The workshop was actively organized by netCommons members, photographed at the entrance of the EP in Fig. 2.3, and without netCommons it would not have been held.



Figure 2.3: netCommons partners and advisory board outside the EP before the netCommons workshop

Summary: Details on the presentations, discussions and outcome of this important workshop organized by netCommons, are included in Deliverable 1.5. and the corresponding videos are available online⁸.

⁸See https://www.youtube.com/playlist?list=PLKXvzLAP_vSYkQpXmheK99AZkAtAoTaUv

This event is a clear achievement, and proof of impact, that netCommons research is having in what we called in the DoA the outer loop, i.e., the ability of netCommons to reach that part of society (and policy makers) that are utterly unaware, or even suspicious about, the phenomenon of CNs. Besides the two organizing MEPs, other MEPs attended, and they were all very interested in the CN phenomenon and impressed by the presentations done and by the accuracy and attention of netCommons work in following and trying to positively influence the evolution of regulations in telecommunications to avoid hampering bottom-up, democratic initiatives.

2.2 Participation in high-impact international events

2.2.1 RightsCon

Type: Conference

Date: March 29-31, 2017

Place: Bruxelles, Belgium

URL: <https://www.rightscon.org/past-events/>

Dissemination Level: International

Actors: Academia, General Public, Local Authorities, Local Stakeholders, Policy Makers, Scientific Communities

Audience: 80

Organizers: Federica Giovanella, Leonardo Maccari

Description (from the conference material): RightsCon is the world's leading conference on human rights in the digital age, we bring together business leaders, policy makers, general counsels, government representatives, technologists, and human rights defenders from around the world.

Summary: RightsCon is an international venue where practitioners, stakeholders, law makers and many more gather to trace the roadmap of digital rights for the years to come. It is attended by thousands of people and presents a set of parallel panels with invited speakers of high relevance.

Leonardo Maccari and Federica Giovanella were invited to the panel on "Sustainable Connectivity: Expanding Infrastructure and Empowering People". The panel was organized by Luca Belli, from the Center for Technology and Society at FGV Rio.

The panel was participated by around 80 people, among the speakers there were scientists, EU commission officers, and the central theme was how to bring connectivity to the unconnected, with a sustainable approach, a theme that is central in netCommons agenda. The panel was highly interactive and raised many questions, both about the technical and legal aspects that the two netCommons experts raised during their presentations.

2.2.2 IEEE Internet Inclusion, advanced solutions Workshop

Type: Workshop

Title: Internet Inclusion: Advancing Solutions

Date: April 24-25, 2017

Place: Washington, DC, USA

Organizers: IEEE Internet Inclusion WG

URL: <http://internetinitiative.ieee.org/events/conferences/internet-inclusion-advancing-solutions-washington-d-c-2017>

Actors: Engineers (IEEE), Governmental global institutions (International Telecommunications Union), UN, World Bank group, World Economic Forum), Internet global institutions (Internet Society, Network Startup



Figure 2.4: The panel before the conference.

Resource Center, APNIC), Community networks (guifi.net, Rhizomatica), Development agencies (USAID), companies (USA and global companies).

Audience: Around 150 participants

Dissemination Level: International

Description: An International Electrical and Electronic Engineering (IEEE) organized workshop. guifi.net and netCommons actively participated in setting up the event. The theme of the specific workshop was Internet Inclusion: finding solutions for about half of the global population that still has no access to connectivity. The main collaborating partners for the event included: Network Startup Resource Center, Guifi.net, netCommons, Internet Society, ITU, 1 World Connected, Partnership for Public Access, People Centered Internet, USAID, World Bank Group, World Economic Forum and gold-level sponsor Venture Smarter.

Sessions were built on previous internet inclusion events organized by IEEE, as well as other programs dedicated to internet access, development and inclusion. These collaborative, multistakeholder events have outlined definitive opportunities to accelerate progress in meaningfully connecting the estimated 60 percent of the global population that remains unconnected around the world.

Summary: A high level discussion with many global representatives and USA participants, with a clear aim at finding ways to deliver connectivity to the remaining global population, for diverse reasons and with diverse methods. Institutions like the World Bank see a great opportunity for socio-economic development and they are willing to support “bankable projects”.

The Community Networks Working Group was led by Roger Baig (guifi.net and UPC) with participation also from Roger Pueyo (guifi.net and UPC) and Leandro Navarro (UPC), co-organized by guifi.net, netCommons, Internet Society, Internet Governance Forum–Dynamic Coalition on Community Connectivity (IGF-DC3).

Community Networks were acknowledged drivers for a truly empowering Internet inclusion, as they imply the involvement of the communities in the design, construction, maintenance and operation of their own telecommunications infrastructure. Fostering their adoption poses an excellent opportunity for contributing to connect the next billion(s). The WG focused on identifying ways to address the key challenges for this adoption.

Roger Pueyo, Roger Baig and Leandro Navarro participated in many weekly preparatory online conferences to organize the event. Roger Baig as chair and Leandro Navarro as co-chair organized a parallel discussion session

for the Community Networks WG. Roger Baig participated in the preparation of the post-event document⁹.

2.2.3 re:publica 2017 - Digital Equality: how an open Web can contribute to a more Equal world?

Type: Conference

Date: May 8-10, 2017

Place: Berlin, Germany

URL: <https://re-publica.com/en/17/session/digital-equality-how-open-web-can-contribute-more-equal-world>

Dissemination Level: International

Actors: Academia, General Public, Local Stakeholders

Audience: 70

Participants: Melanie Dulong de Rosnay

Description (from the conference material): Panel on Digital Equality: how an open Web can contribute to a more Equal world?

Summary: Melanie Dulong de Rosnay participated to a panel of the large conference re:publica. Its audience was composed of open web policy activists, academics and practitioners. Community networks and the results of netCommons were presented as an alternative to commercial Internet Service Providers (ISPs), enabling community empowerment.

The discussion following the presentation started with policy and regulation issues, which threaten CNs and were not addressed during the net neutrality debate. Thomas Lohninger noted that the project WiFi4EU¹⁰ is mainly targeting big telcos doing local WiFi than these more sustainable forms of investment, which need more funding. He explained that the highest number of cables were to be found in Bulgaria, because that's the way Internet access started, with geeks hooking up their friends and family with wires. Unlike Germany, where regulation prevents the installation of wires above the street, and where copyright liability rules resulted in routing the traffic through Sweden. Kathleen Berger described CNs projects supported by the Mozilla Foundation to provide access in affordable ways in rural areas of India, Brazil and Africa, as Renata Avila was questioning whether this model would be viable outside Europe. Melanie Dulong de Rosnay explained that while netCommons was a European project, CN infrastructure had been successfully deployed and studied in ICT4D. Finally, features of resilience to censorship and surveillance were underlined as a real progress, favoured by the control of the infrastructure and the absence of monitoring, despite the dependence on backbones. Another challenge, common to other areas of internet & society studies, is the inclusion of non-geeks and non-male audiences.

A blog post by Cathleen Berger: Digital equality and the complexities of inclusion - #LoveOutLoud, 19 May 2017¹¹.

Additional notes: The video of the entire panel is available on the webpage of the panel¹².

2.2.4 Stockholm Internet Forum 2017

Type: conference

Title: Stockholm Internet Forum

⁹See https://internetinitiative.ieee.org/images/files/events/iias_washington_april2017_report.pdf

¹⁰WiFi4EU <https://ec.europa.eu/digital-single-market/en/policies/wifi4eu-free-wi-fi-europeans> is a boost initiative targeting public bodies (municipalities in particular) to help them offer free WiFi access to residents and visitors. Funding is minimal (15 kEU per institution maximum), its goals and specifications are unfortunately fuzzy and in any case devoted (only?) to provide a global, centralized authentication system. Indeed, it is foreseen that the first calls will be either delayed or canceled.

¹¹See https://medium.com/@_cberger/digital-equality-and-the-complexities-of-inclusion-or-why-we-need-an-open-an-free-web-29646ab46c96

¹²See <https://youtu.be/nVcay3ZEPSg?t=17m13s>



Figure 2.5: Digital Equality: how an open Web can contribute to a more Equal world?

Date: 17-18 May 2017

Place: Stockholm, Sweden

Organizers: Swedish International Development Agency (SIDA)

URL: <http://www.stockholminternetforum.se/>

Actors: Development actors (international organizations, NGOs, Internet organizations).

Audience: Interested in the role of Internet in Development.

Dissemination Level: International, with special focus on development and developing countries.

Description: An international forum for in-depth dialogue and discussions on how a free, open and secure Internet promotes human rights and development worldwide. Organized in two parts: preparatory meetings (Pre-SIF or side events), and the main event, with plenary sessions and parallel workshops.

Summary: Two main activities with the participation of Leandro Navarro (UPC).

One side event: *Developing Internet universality indicators with UNESCO and the APC Internet indicators consortium.* This is related to UNESCO that in 2015 put the concept of ‘Internet Universality’ at the heart of its work to promote an Internet that works for all. Internet universality points to four ‘*fundamental norms that have been embodied in the broad evolution of the Internet to date, and which provide a comprehensive way to understand how multiple different aspects are part of a wider whole.*’ These norms – known for short as the ROAM principles, are concerned with: Rights (R), Openness (O), Accessibility (A) and Multistakeholder Participation (M). Leandro mentioned the work that netCommons is doing, and in the second half of June we will be able to provide written inputs about how to measure Internet universality from the perspective of CN.

A main session *A positive outlook: Leave no one offline Community access – Helping the last 4 billion get connected.* A very interesting panel about the potential for small-scale locally based communications infrastructure to help address the digital divide. The presenters described how the emergence of low cost networking equipment has stimulated a growing number of community based networks all over the world, from Barcelona to Bogota, from rural Eastern Cape in South Africa to rural Thailand. This has inspired some to say “just let the unconnected connect themselves.” The discussion covered aspects about sustainability, key constrains such as policy and regulation, the gender gap and gender perspective.

2.2.5 Battle of the Mesh 2017

Type: Assembly

Date: June 4, 2017 to June 10, 2017

Place: Wien, Austria

URL: <http://battlemesh.org/>

Dissemination Level: International

Actors: Existing Community Networks, General Public, Practitioners

Audience: 80

Participants: Leonardo Maccari

Description: The annual meeting of the European CNs, and the meeting of the developers of routing protocols that are used in CNs.

Summary: The Wireless Battle of the Mesh is an yearly event that brings together people from across the world to test and compare the performance of different routing protocols for ad-hoc and mesh networks, like Babel, B.A.T.M.A.N., BMX6, OLSR, 802.11s. Every year the community gathers and set-up a testbed on which the protocols are run, developed, debugged and tested, and some performance measures are extracted. While the initial spirit of the event was to set-up a competition between the protocols (as the name suggests), with time it changed into a moment of exchange of experience, collective development of innovations in the field of mesh networks and wireless open source networking software. The participants of the BM today are activists, developers, practitioners, and curious people involved in the world of CNs.

BM is a key event for CNs, because the developers that meet at the BM share the knowledge about the innovation they are introducing in their protocols, which shape the future of CNs. It is a key event also because it collects all the people that run and manage CNs, and they are the ones who keep their fingers on the pulse of CNs. netCommons was listed among the endorsers of the meeting, for having contributed to publicize the event and for having contributed with hardware for the testbed that was set-up during the event.

Leonardo Maccari attended the meeting. He made a presentation about the state of advance of netCommons and the topics that are most interesting for CNs, he also helped to set-up the testbed to do protocol testing, which is the core activity of the meeting. The testbed is a key activity in the BM, but in the latest years, it has been a cause of conflict for not being able to produce sufficient results for the routing protocol developers. This year Leonardo Maccari contributed to its organization and to the documentation of the results. The results were documented in a report that is available at the Battle Mesh website and the whole process was very much appreciated by the community.

The take-away for netCommons is very important, because we were able to share the material produced by the project that was very well received by the communities (the technical and the legal products, specifically) and we gained credibility in the organization of the testbed. This opened the way to propose, in the next BM, the applied results of netCommons, which is one of the goals of the third year of netCommons.

2.2.6 IAMCR panel on the history and policy of Community Networks

Type: Conference

Date: July 16-20, 2017

Place: Cartagena, Colombia

URL: <http://cartagena2017.iamcr.org/>

Dissemination Level: International

Actors: Academia, Scientific Communities

Audience: 3000 the entire conference, 15 participants to the panel discussion

Participants: Melanie Dulong de Rosnay, Maria Michalis, Félix Tréguer, Dominique Trudel

Description (from the conference material): The 2017 conference of the International Association for Media and Communication Research (IAMCR) is one of the biggest conferences for social science scholars working on communication and media. This year, it gathered around 3000 participants in Colombia.

Summary: During our panel entitled “Drawing Policy Lessons From the History of Alternative Media and Networks”, the netCommons team was able to present the elaboration and revisiting on the history and policy of alternative networks and reflect on contemporary stakes for Community Networks.

Additional notes: The netCommons panel was extremely well received by participants from the Communication Policy & Technology section of the IAMCR, which awarded Félix Tréguer the Emerging Scholar Best Paper Award for his paper on the history of alternative Internet networks¹³.

2.2.7 The Internet of People Dagstuhl Seminar

Type: Working Conference

Date: October 8–11, 2017

Place: Dagstuhl Schloss, Germany

URL: <https://www.dagstuhl.de/17412>

Dissemination Level: International

Actors: Academia, Policy Makers, Scientific Communities

Audience: 35

Participants Leonardo Maccari, Panayotis Antoniadis

Description: A Dagstuhl seminar organized on the theme “Internet of People”. Dagstuhl Seminars are international meetings for researchers and scientists that meet in an informal way to share their vision on a specific research theme, and open the way to new research fields. As the Schloss Dagstuhl website reports

“A seminar is organized by at most four organizers, established leaders in their field, representing the different communities invited to the Seminar, preferably from different institutions. Dagstuhl invites on their behalf about 35 to 45 researchers of international standing from academia and industry, among them promising young researchers. Most seminars discuss an established field within computer science. However, Dagstuhl Seminars are also known for establishing new directions by bringing together separate fields or even scientific disciplines.”

Summary: The seminar on the Internet of People came after the workshop realized in Vienna during the International Federation for Information Processing (IFIP) Networking conference in 2016, and was meant to be the place where to discuss how the Internet should change from a network of devices and IP addresses to a network of people, in which human beings play a central role. Three researchers from the netCommons project were invited to this seminar, Leonardo Maccari and Renato Lo Cigno (UniTn) and Panayotis Antoniadis (NetHood), thanks to their visibility in the field. Unfortunately Renato Lo Cigno could not participate due to institutional chores.

The workshop was extremely productive, it alternated several themes, from the most technical ones to some social ones, and it was the chance to describe the work done in the netCommons project. The concept of Internet of People can be specialized in many flavours, one interpretation is about having a “digital twin”, an AI-driven copy of self that interacts with digital artifacts on behalf of us, when direct interaction is not possible. Another interpretation that we gave, is that the network infrastructure should be representative of people, and managed by them. The idea that a community network is already an example of Internet of People is central in the netCommons project and was well received by the seminar participants.

¹³Read more on this achievement on netCommons website <https://netcommons.eu/?q=news/iamcr2017-delving-history-and-policy-community-networks>

Among the participants were not only top scientists from all over the world, but also professionals and representatives of the European Commission. This kind of seminar is a key place to shape the future of Computer Science research and it was essential that the netCommons themes were represented and contaminated the on-going discussion.



Figure 2.6: The traditional Dagstuhl photo in front of the Castle Chapel with the seminar participants.

2.2.8 Self-service connectivity: feasibility, business models and sustainability

Type: Workshop at IETF Standardization Meeting

Date: November 15, 2017

Place: Singapore

URL: <https://www.ietf.org/how/meetings/100/>

Sessions are recorded by MeetEcho, the GAIA workshop is available at

<http://www.meetecho.com/ietf100/Recordings#GAIA>

Dissemination Level: International

Actors: Academia, Existing Community Networks, Local Authorities, Local Stakeholders, Policy Makers, Scientific Communities

Audience: 100

Participants: Leandro Navarro

Description: The GAIA Working Group (WG) meeting at IETF-100. Internet Engineering Task Force (IETF) meeting are large, complex venues, where Working Groups push and discuss future Request For Comments (RFCs). GAIA is part of IRTF, thus still more on the research than on the standardization side.

Summary: A presentation about self-service connectivity covering three aspects: feasibility, business models and sustainability. The work is related to WP1 results mainly. Self-service connectivity makes sense since “standard connectivity” (restaurant like) cannot reach the majority of population, self-provided connectivity seems a way (homemade like). Both can combine in the retail, wholesale and backhaul.

Feasibility (inception) is critical. There are different models to develop critical networking infrastructures. Costs vary since there are different models (e.g. right of pass for a private operator more expensive than a for an open access network done locally; costs: Fibre deployed from farms quite cost effective when done by farmers, compared to deployments by incumbents). A key issue is the initial and ongoing investment: typically done by a mix of local involvement and external help, which raises the requirement for crowdfunding and ways to facilitate that.

Regarding business models: depending on who does it (large operator, WISP, CN) result in different costs and ownership. Technology tends to come bundled with business models (e.g. GSM implies operator and license) where WiFi, mesh, bitcoin are clearly decentralized. Infrastructure sharing is a key ingredient too: sharing with other utilities like roads, pipes, electricity, but also other networks: the case of Open Access networks or Internet eXchanges. Regarding sustainability: compensating the cost is important (experience from guifi.net). Compensation of OPEX and CAPEX. Compensation can be cost-oriented (cooperative development of a resource) or profit-oriented (competition and profit to mitigate risk and reward investors). There are diverse stakeholders involved: consumers (citizens, orgs, gov), producers (volunteers, professionals), and necessary facilitators (gov, regulation, rights of pass). Some ideas to remember: Commons can develop from cooperation or competition, especially for the development of infrastructure and services in the stakeholders we need to work to combine the efficiencies, and avoid the inefficiencies. Sustainability comes from crowdsourcing and crowdfunding, that leads to digital infra sovereignty, and ultimate local socio-economic development. Unbundling is key: open and separate choices for hardware, software, network, coord, service, apps.

2.2.9 Internet Governance Forum 2017

Type: Workshop

Title: DC3 workshop

Date: December, 19, 2017

Place: Geneva, Switzerland

Organizers: United Nations

URL: <https://igf2017.swiss/>

Actors: All stakeholders

Audience: All stakeholders (global)

Dissemination Level: International

Description: The 12th annual meeting of the Internet Governance Forum (IGF) took place between 18 and 21 December 2017 at the United Nations Office at Geneva (Palais des Nations, Avenue de la Paix 14, CH-1211 Geneva 10, Switzerland).

The IGF is a global multistakeholder forum that promotes discussions and dialogue about public policy issues related to the Internet. It was convened in 2006 by the United Nations Secretary-General.

Summary: netCommons, through Leandro Navarro (UPC) and Panayotis Antoniadis (NetHood) and Vassilis Chrysos wearing two hats (Sarantaporo.gr, AUEB-RC) participated in various panels and workshops, including the “DC on Community Connectivity”, the panel on “Financing and Building Sustainable community networks”, the APC event on GISWATCH 2017 including announcement of GISWATCH 2018, and the presentation of the Librerouter project.

Talks were given by Panayotis Antoniadis in the panel on open source technologies, “Defending Freedoms in the Digital Future”¹⁴, and by Vassilis Chrysos in the panel “DC on Connecting the Unconnected”¹⁵.

Additional notes: Discussions with several organizations (global: APC.org, ISOC.org, ITU.int, IEEE.org) and many local community initiatives about the work in netCommons.

Participation in the formation of a new ISOC SIG on CNs, announced at the closing ceremony by Matthew Rantanen¹⁶.

2.2.10 Organizing CNs advocacy capacities at the 34th Chaos Computer Congress

Type: Assembly

Date: December 27-30, 2017

Place: Leipzig, Germany

Organizers: Chaos Computer Club (CCC), a German based, registered hacker association with international outreach

URL: <https://events.ccc.de/tag/34c3/>

Dissemination Level: International

Actors: Academia, CAPS Communities, Existing Community Networks, General Public

Audience: 50

Participants Félix Tréguer

Description (from the conference material): The Chaos Computer Congress is one of the oldest and biggest yearly hacker conference in the world.

Summary: Félix Tréguer from the netCommons team attended the Congress and took part in various activities with representatives of CNs in Europe, especially FFDN and Freifunk communities, in particular regarding legal issues surrounding CNs that are currently being debated at the level of the European Union, but also organizational aspects and the need for greater European coordination on policy issues. He also liaised with people working on Radio Spectrum policy and Volker Grassmuck, who made a presentation on network commons that built on the work of the netCommons project¹⁷.

2.3 CAPS events

2.3.1 DSI Fair

Type: Workshop

Date: February 1-2, 2017

Place: Rome, Italy

Organizers: Coordinating high impact for CAPS (CHiC) Coordination and Support Action under the CAPSSI umbrella

URL: <https://capssi.eu/event/digital-social-innovation-fair-2017/>

Dissemination Level: International

¹⁴Information and video available at <https://igf2017.sched.com/event/CTsM/open-source-defending-freedoms-in-the-digital-future-ws8> and <https://www.youtube.com/watch?v=wkORW3HeBFs>

¹⁵Information and video available at <https://igf2017.sched.com/event/CTsm/dc-on-connecting-the-unconnected> and See <https://www.youtube.com/watch?v=kb9iPuwbWpo&feature=youtu.be&t=6396>

¹⁶See <http://cnsig.info>

¹⁷See <https://media.freifunk.net/v/infrastructure-from-public-welfare-to-commons>

Actors: Academia, CAPS Communities, General Public, Local Authorities, Local Stakeholders, Policy Makers, Scientific Communities

Audience: 200+

Participants: Renato Lo Cigno, Panayotis Antoniadis, Merkouris Karaliopoulos, Iordanis Koutsopoulos

Description (from the conference material): The DSI Fair 2017 offered a rich program featuring an international conference, focused workshops, networking and hands-on sessions. The line-up of speakers includes experts and practitioners, as well as policy makers and civil society players from all over the world.

Summary: Renato Lo Cigno and Panayotis Antoniadis presented the netCommons work with Sarantaporo.gr as one of the CAPS success stories.



Figure 2.7: The presentation of Sarantaporo.gr CN as a success story of netCommons at DSI fair in Rome

2.3.2 DSI Manifesto Workshop

Type: Workshop

Date: May 23, 2017

Place: Rimini, Italy

Organizers: CHiC Coordination and Support Action under the CAPSSI umbrella

URL: <https://www.dsimanifesto.eu/workshop>

Dissemination Level: International

Actors: Academia, CAPS Communities, General Public, Local Authorities, Local Stakeholders, Policy Makers, Scientific Communities

Audience: 50

Participants Leonardo Maccari, Panayotis Antoniadis

Description: The workshop for the official launch of the Digital Social Innovator Manifesto. As mentioned in the Manifesto's home page, "*The Manifesto for Digital Social Innovation (DSI) is an initiative promoted by the EU project ChiC with the collaboration of the DSI4EU project and several other European innovators.*"

Summary: The workshop was organized in order to gather feedback on the DSI Manifesto, that is under construction. It involved many CAPS projects and several other stakeholders, especially among Public Administration.

The participation was good, though limited in number, with lively discussions. Panayotis Antoniadis presented netCommons and MAZI under the analogy of "the organic Internet" and Leonardo Maccari got deeper in the netCommons themes.



Figure 2.8: Leonardo Maccari during his presentation of netCommons at the DSI Manifesto workshop in Rimini, Italy

2.4 Scientific conferences and workshops

2.4.1 INW 2017

Type: Workshop

Title: Italian Networking Workshop

Date: January 11-213, 2017

Place: Falcade, BL, Italy

Participants: Renato Lo Cigno, UniTN

URL: <https://www.>

Actors: Italian scientific community on communication networks with some international participants

Audience: Around 70 participants

Dissemination Level: Italy

Description: Italian Networking Workshop (INW) is an informal annual meeting of the Italian research community (mostly from academia) on communication networks. Albeit informal, it is a lively forum for discussion and where the community exchange the recent work done and organizes work ahead.

Summary: Renato Lo Cigno gave a presentation on netCommons work titled “*Community Networks: An Interdisciplinary Approach to Alternative Internets*” discussion the main technical challenges posed by CNs. A lively discussion followed the presentation.

2.4.2 Wireless On-demand Network Systems and Services Conference, WONS 2017

Type: International Conference

Title: IFIP/IEEE Wireless On-demand Network Systems and Services Conference

Date: February 21-24, 2017

Place: Jackson Hole, Wyoming, USA

URL: <http://2017.wons-conference.org/>

Actors: Academia, industry

Audience: 50 people

Dissemination Level: International

Description (from the conference website): Wireless on-demand network systems and services have become pivotal in shaping our future networked world. Starting as a niche application over Wi-Fi, they can now be found in mainstream technologies like Bluetooth LE, LTE Direct and Wireless LANs, and have become the cornerstone of upcoming networking paradigms including mesh and sensor networks, the Internet of Things, cloud networks, vehicular networks, disruption tolerant and opportunistic networks, underwater and intra-body networks.

The challenges of this exciting research field are numerous. Examples include how to make smart use of these novel technologies when multiple technologies or a mix of permanent services and on-demand networking opportunities are available to a network node, how to provide robust services in highly dynamic environments, how to efficiently employ and operate heavily resource-constrained devices, and how to develop robust and lightweight algorithms for self-organization and adaptation. Finally, there are many application-specific challenges.

WONS, now in its thirteenth edition, is a high quality forum to address these challenges. WONS aims to provide a global platform for rich interactions between experts in their fields, discussing innovative contributions in a stimulating environment.

Summary: Renato Lo Cigno presented the paper *On the Feasibility of Collision Detection in Full-Duplex 802.11 Radio* by Michele Segata and Renato Lo Cigno.

Francesco Gringoli, a researcher from the University of Brescia collaborating with UniTN team, presented the paper *A Dynamic and Autonomous Channel Selection Strategy for Interference Avoidance in 802.11* by Francesco Maturi, Francesco Gringoli and Renato Lo Cigno.

2.4.3 Passive and Active Measurement Conference

Type: International Conference

Title: Passive and Active Measurement Conference (PAM)

Date: March 30-31, 2017

Place: Sydney, Australia

Organizers: University of Sydney, Australia

URL: <https://research.csiro.au/pam2017/>

Actors: Academia, industry

Audience: 100 people

Dissemination Level: International

Description (from the conference website): 18th edition of this international conference on network measurements.

PAM brings together both the network research and operations communities to discuss novel network measurement and analysis techniques, with a particular focus on early stage research.

PAM has traditionally focused on research and practical applications of specific network measurements. However, over the last years, PAM has broadened its scope to encompass measurements of networked applications and systems, content distribution networks, online social networks, overlay networks, and more. Indeed, measurement technology is needed at all layers of the stack, e.g., for power profiling of hardware components, at the MAC/network/transport layers, as well as up the stack for application profiling and even to collect user feedback. Measurement technologies are being designed for the digital home, residential access networks, wireless and mobile access, enterprise, ISP, and data-center networks.

Summary: Leandro Navarro from UPC presented the paper *Internet Access for All: Assessing a Crowdsourced Web Proxy Service in a Community Network* authored by E. Dimogerontakis, R. Meseguer, and L. Navarro.

2.4.4 International Conference on Computer Supported Cooperative Work in Design

Type: International Conference

Title: IEEE 21st International Conference on Computer Supported Cooperative Work in Design (CSCWD)

Date: 26-28 April 2017

Place: Wellington, New Zealand

URL: <http://cscwd17.sim.vuw.ac.nz/>

Actors: Academia, industry

Audience: 150 people

Dissemination Level: International

Description (from the conference website): CSCW is one of the oldest conferences on the topic of human-computer interaction.

Design of complex artifacts and systems requires the cooperation of multidisciplinary design teams. The 2017 IEEE 21st International Conference on Computer Supported Cooperative Work in Design (CSCWD 2017) provides a forum for researchers and practitioners involved in different but related domains to confront research results and discuss key problems. The scope of CSCWD 2017 includes the research and development of collaboration technologies and their applications to the design of processes, products, systems, and services in industries and societies. Collaboration technologies include theories, methods, mechanisms, protocols, software tools, platforms, and services that support communication, coordination and collaboration among people, software and hardware systems. Related fields of research include human-computer interaction, business process management, collaborative virtual environments, enterprise modeling, security and privacy, as well as social aspects and human factors related to collaboration and design.

Summary: Sergio Ochoa presented the paper *Design Trade-offs of Crowdsourced Web Access in Community Networks* authored by E. Dimogerontakis, R. Meseguer, L. Navarro, S.F. Ochoa, and L. Veiga.

2.4.5 International Symposium on Integrated Network Management

Type: International Conference

Title: IFIP/IEEE International Symposium on Integrated Network Management (IM)

Date: 8-12 May 2017

Place: Lisbon, Portugal

URL: <http://im2017.ieee-im.org/>

Actors: Academia, industry

Audience: 250 people

Dissemination Level: International

Description: IM is a prestigious conference on network management.

Summary: E. Dimogerontakis from UPC presented the paper *Client-Side Routing-Agnostic Gateway Selection for heterogeneous Wireless Mesh Networks* authored by E. Dimogerontakis, I. Neto, R. Meseguer, L. Navarro, and L. Veiga.

2.4.6 IV International Conference on Social and Complementary Currencies: Money, Consciousness and Values for Social Change

Type: Paper presentation(s) and workshop

Title: IV International Conference on Social and Complementary Currencies

Date: May 10-14, 2017

Place: Barcelona, Spain

Organizers: Susana Martín

URL: <https://ijccr.net/2016/08/27/iv-international-conference-on-social-and-complementary-currencies-10-14-may-2017/>

Actors: Researchers, civil society, activists

Audience: 330 people at the event, 30 at the netCommons panel, and 20 at the district currency game workshop

Dissemination Level: International

Description (from the conference material): The 4th Conference's goal is to reflect on social and complementary currencies as tools which, on being implemented by people themselves, nurture the social change in favor of a completely sustainable development. Self-management, trust, closeness, respect and benevolence, among others are quite determining elements in the future of such sort of initiatives.

Summary: The netCommons team presented two papers summarizing the work in D2.6, which were well received adding a new type of common resource in the discussion that many participants of the conference were not really aware of. The two papers in the panel "Commons oriented currencies: What makes the difference?":

- *Community currencies for community networks*, by Panayotis Antoniadis (presenter), Jens Martignoni, David Franquesa, Roger Baig (presenter), Leandro Navarro
- *The District Currency – a new currency design for managing the commons*, by Jens Martignoni

The 2 hour district currency game workshop was also very well received and having as participants true experts in the field made the feedback particularly interesting and to the point. More details about the lessons learned from the currency game are included in D2.6.

Additional notes: Roger Baig introduced the guifi.net network in the alternative currencies community in Barcelona.

2.4.7 International Symposium on Cluster, Cloud and Grid Computing

Type: International Conference

Title: 17th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGrid 2017)

Date: May 14-17, 2017

Place: Madrid, Spain

URL: <https://www.arcos.inf.uc3m.es/ccgrid2017/>

Actors: Academia, industry

Audience: 300 people

Dissemination Level: International

Description: One of the major international conferences on Cloud and Grid computing, sponsored both by IEEE and Association for Computing Machines (ACM).

Summary: Mennan Selimi from UPC presented the paper *Practical Service Placement Approach for Microservices Architecture* authored by M. Selimi, L. Cerdà-Alabern, M. Sánchez-Artigas, F. Freitag, and L. Veiga

Additional notes: The authors received an invitation to submit an extended version of the paper to a Special Issue of a prestigious journal.

2.4.8 International Conference on Networking, Sensing and Control

Type: International Conference

Title: 14th IEEE International Conference on Networking, Sensing and Control (ICNSC)

Date: 16-18 May 2017

Place: Calabria, Italy

URL: <http://icnsc2017.dimes.unical.it/>

<https://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=7990365>

Actors: Academia, industry

Audience: 100 people

Dissemination Level: International

Description: ICNSC is a conference on the intersection of computer networks and sensor devices.

Summary: N. Apolónia from UPC presented the paper *Gossip-based Service Monitoring Platform for Wireless Edge Cloud Computing* authored by N. Apolónia, F. Freitag, and L. Navarro.

E. Dimogerontakis from UPC presented the paper *Community Sharing of Spare Network Capacity* by E. Dimogerontakis, R. Meseguer, L. Navarro, S.F. Ochoa, and L. Veiga

2.4.9 IASC presentation on Laws for the commons: from nature to infrastructure commons

Type: Conference

Title: Laws for the commons: from nature to infrastructure commons

Date: July 10-14, 2017

Place: Utrecht, the Netherlands

URL: <https://www.iasc2017.org/sessions/>

Dissemination Level: International

Actors: Academia, Local Stakeholders, Scientific Communities

Audience: 40

Participants Melanie Dulong de Rosnay (CNRS)

Description (from the conference material): The IASC is the world's leading professional organization for the interdisciplinary study of commons, common-pool resources, and other resources that are (or could be) held or used collectively by communities, both in developing and developed countries. The association is devoted to understanding and improving institutions for the management and governance of such resources. The IASC is open to both academic scholars as well as expert practitioners, and hence has become the (non-profit) association par excellence for the mutual exchange between scholars and practitioners on commons' issues. The 2017 Biennial IASC-Conference will be an excellent opportunity for scholars and practitioners from all over the world to meet each other, to learn from each other's research and experiences, to exchange ideas, and to learn from successful examples of management and governance of common-pool resources.

Summary: Melanie Dulong de Rosnay explained how the law is being affected by alternative infrastructures, and how law and technology are co-shaping each other, especially in the context of the commons. The well-attended panel received 4 questions, including on the opportunity to define legal models for the commons, since the theoretical framework of the commons has been designed in a bottom-up manner, without any possibility to draw a common unified theory from a multitude of case studies. Another question addressed the fact that legal jurisdictions have a hard time enforcing judgments at the national level for cross-borders matters.

2.4.10 13th European Sociological Association Conference

Type: International Conference

Title: 13th European Sociological Association Conference: (Un)Making Europe: Capitalism, Solidarities, Subjectivities

Date: August 19 – September 1, 2017

Place: Athens, Greece

Organizers: European Sociological Association

URL: <https://www.europeansociology.org/conferences/past-esa-conferences/13th-conference-2017-athens>

Dissemination Level: EU, US, Africa, Asia

Actors: Academics, researchers, international organisations

Audience: Around 3000 participants for the whole conference, 50 for the netCommons panel

Participants Dimitris Boucas (UoW)

Description: The Biannual international conference of the European Sociological Association which regularly attracts high number of participants and accommodates a variety of papers and themes. The general analytical framework of the conference has been based on 1) Capitalism and its contradictions, including austerity measures, the dismantling of the welfare state and rising inequalities in Europe; 2) Solidarities, which appear fragmented but also constituted, with refugees being denied human rights but also new social movements emerging; 3) Subjectivities that are formed and result in resistance and protest, but also in apathy, despair, depression, and anxiety, as authoritarianism, nationalism, racism, xenophobia, right-wing extremism, spirals of violence, and ideological fundamentalisms have proliferated throughout the world, including in Europe.

Taking stock with the above matters, the general question of the conference was: How can sociology's analyses, theories and methods, across the whole spectrum of ESA's 37 research networks and various countries, be advanced in order to explain and understand capitalism, solidarities and subjectivities in the processes of the making, unmaking and remaking of Europe?

Summary: The presentation by Dimitris Boucas on "Sustainability of Community Networks in the UK and Greece: Evidence from Key Actors" was part of a panel of presentation on media and attracted a great deal of interest. Around 50 participants attended.

Additional notes: Abstracts of the conference are available in the conference book of abstracts¹⁸; the abstract

¹⁸https://www.europeansociology.org/sites/default/files/ESA-2017-Athens_Abstract-Book_final.pdf

of the above presentation is at p.542

2.4.11 Global Information Infrastructure and Networking Symposium

Type: International Conference

Title: IEEE Global Information Infrastructure and Networking Symposium (GIIS'2017)

Date: 25-27 October 2017

Place: Saint-Pierre, France

URL: <http://im2017.ieee-im.org/>

Actors: Academia, industry

Audience: 30 people

Dissemination Level: International

Description: GIIS is a conference on socio-technical aspects of Internet technologies.

Summary: Felix Freitag from UPC presented the paper *On Edge Microclouds To Provide Local Container-based Services*, by R. Baig, R. Pueyo, F. Freitag and L. Navarro.

2.4.12 ECREA conference DCC

Type: Conference

Title: European Communication Research and Education Association Digital Culture and Communication Section Conference. "Digital Culture meets data: Critical approaches".

Date: November 6-7, 2017

Place: Brighton, UK

Participants: Melanie Dulong de Rosnay

URL: <https://dcecrea.wordpress.com/2017-dcc-conference-brighton/call-for-papers-2017-conference/>

Dissemination level: International

Audience: 50

Actors: Academia, Local Authorities

Description: European Communication Research and Education Association (ECREA) sponsors a bi-annual conference related to the Digital Culture and Communication (DCC) Section. This year focus was on data analysis, citing from the conference web site:

"Algorithms and big data are today shaping our sociocultural and technical relations and our everyday experiences. Digital culture and communication are inevitably changing as media infrastructures, media practices and social environments become increasingly 'datafied'. We may think of surveillance, algorithmic profiling and self-tracking for example. Wearable technologies such as fitness trackers allow people to understand the body as a data-producing object. Our use of commonplace media technologies is mediated by data in ways that we do not ask for, nor even necessarily know about or consent to. Data interpellate us. Yet data are obscure and enigmatic."

Summary: Melanie Dulong de Rosnay gave a talk entitled "Data as a Commons: Community Networks as Alternative Model" at the ECREA (European Communication Research and Education Association) Digital Culture and Communication Section Conference.

This paper considers how CNs may constitute sustainable alternatives and counter-projects for local communities in the context of "smart" cities. They have the potential to enable data sovereignty and technological

independence, as an alternative to commercial ISPs. Data transiting through infrastructure controlled by commercial ISPs can be monetised without permission nor benefit sharing with local communities, and lead to algorithmic profiling and exclusion. Developing technological and economic autonomy can empower citizens to govern their local infrastructure, manage their own data and retain it locally, while possibly mitigating some of the excesses of big data and surveillance by managing their data as a commons.

The paper was well-received, and allowed to make contact, in addition to media and communications scholars, with a researcher from the BBC working on decentralised architectures.

2.4.13 Conference on Computer Networks Histories

Type: Conference

Date: December 14-15, 2017

Place: Lugano, Switzerland

URL: <http://www.cnh.usi.ch/>

Dissemination Level: International

Actors: Academia

Audience: 30

Participants Dominique Trudel, Félix Tréguer (CNRS)

Description (from the conference material): International Conference Computer Networks Histories: Local, National and Transnational Perspectives

Summary: This conference brings internationally renowned historians of the Internet. Dominique and Félix presented their work on the history of first-generation Community Internet Access Providers based on Deliverable 5.1.

2.5 Local events

2.5.1 ninuxday 2017

Type: Assembly

Date: November 25-26, 2017

Place: Bologna, Italy

URL: <http://ninux.org/NinuxDay2017/TimeTable>

Dissemination Level: National (Italy)

Actors: Existing Community Networks

Audience: 25

Participants Leonardo Maccari

Description: The yearly meeting of the ninux community

Summary: As in 2016, in November 2017 about 20 people of the ninux community gathered, this time in the city of Bologna, to discuss about the state of the network and of the community. According to the participants, the community is more or less stable, with some new islands (that's the way ninux communities are called) that are growing in the center-South of Italy, and some other ones, especially in the North, that struggle to make the transition from one-man projects to real communities. An interesting development came from the organizers themselves, as one of the activists bootstrapped a new network in Val Samoggia (50 km from Bologna in a rural and mountain area), which is currently used to connect a few houses in the territory, and is expanding mostly due to the lack of Internet connection in that area.

Leonardo Maccari from netCommons (UniTN) participated in the meeting, and gave a presentation discussing the results of the project, and the way these results can help the various communities. Actually, more than one "ninux island" already had ongoing work related with netCommons activity. Among them, three are worth mentioning:

Two of the ninuxers from Cosenza (more than 9 hours of car from Bologna!) described their current effort in re-designing the Pico-Peering Agreement, which is historically been used by the ninux community. Their goal is to introduce a few modifications to make the agreement more binding, in order to encourage newcomers to participate actively to their network. Currently, the netCommons team from Trento is reviewing the agreement to clarify the legal status of some of the new clauses. This is a direct impact that the legal analysis performed in WP4 will have on the ninux community.

A large discussion took place on renewing the governance instruments that ninux uses. The more the community enlarges from the initial core of people residing in Rome, the more new tools to take decisions are needed. netCommons will help this process. We will simplify and summarise the findings from WP1 in order to fuel the discussion in the ninux community, and give guidance to make the community scale better.

The ninux community from Florence participated in a call for funding community projects opened by RIPE. Leonardo Maccari was directly involved in keeping the contacts with RIPE and writing the proposal, which focuses on two themes, the first is the development of a hardware device needed by the community to auto-point antennas. This is a technological project that is currently undergoing and involves already several people in ninux Florence. The second is the extension of the OpenWISP platform to support community building functions, as suggested in the deliverable D2.7. The community was already testing OpenWISP to manage the network and will contribute to the improvement of OpenWISP if the funding will be granted.

The ninux community also agreed to participate in a new national event called merge-it. This new event is an Italian community conference on the model of the Fosdem international meeting. The organizers accept proposal for new tracks to be added to the already planned ones (led by the most important associations dealing with open source and open knowledge in general) and ninux proposed to have a dedicated half-day track. If the proposal gets accepted, netCommons will surely support this event.

The ninuxday is a very important moment to gather all the active people in ninux, and it was proposed that the next ninuxday be held in some new island, in order to help their development. Alternatively, it was decided that the next ninuxday will be held in Rome, which is also candidate to host the next Battle of The Mesh. In any case, the community recognized the importance of increasing the frequency of meetings (and thus, the merge-it proposal) and work together to grow and involve new people.



Figure 2.9: The flier of the ninuxday 2017

2.6 Invited talks, public panels

2.6.1 Invited seminar at Madeira Interactive Technologies Institute (M-ITI)

Type: Workshop

Date: February 15, 2017

Place: Funchal, Madeira, Portugal

Dissemination Level: Local

Actors: Academia, CAPS Communities, Scientific Communities

Audience: 30

Participants Melanie Dulong de Rosnay

Description (from the conference material): seminar of the Madeira Institute for Technology

Summary: Melanie Dulong de Rosnay gave an invited seminar talk at the Madeira Interactive Technologies Institute (M-ITI) entitled 'From Digital Rights Management to Peer to Peer Law'.

2.6.2 Colloquium on the Commons (in French)

Type: Symposium

Date: June 8–10, 2017

Place: University Paris II, France

URL: <http://fundfordemocraticculture.org/activites/colloque/>

Dissemination Level: National

Actors: Academia, General Public, Local Authorities, Local Stakeholders

Audience: 80

Participants Melanie Dulong de Rosnay

Description (from the conference material): Panel Big Data, Partage des Données et Communs

Summary: Melanie Dulong de Rosnay presented netCommons to an audience composed of legal academics working on the commons and local communities experiencing different kind of commons. CNs raised interest in particular from farmers in the South West of France as a bottom-up alternative to ISPs and from lawyers as complex commons which must be protected from regulations which are ignoring their status. An interesting point to note is the similarities which were drawn at the regulatory level with energy alternatives, which had been presented at a previous session.

Video of the presentation is available at: https://youtu.be/MXLYLo4VwN0?list=PL_6NLusUVxROONpC-Lr389N8KrvsvvFj6



Figure 2.10: Colloquium on the Commons, Paris

2.6.3 Wireless community mesh networks: fresh connectivity for 7 billion people

Type: Conference

Date: October 11, 2017

Place: Cambridge, United Kingdom

URL: <https://talks.cam.ac.uk/talk/index/85291>

Dissemination Level: Local (UK)

Actors: Academia, General Public, Local Authorities, Local Stakeholders, Scientific Communities

Audience: 100

Participants Leandro Navarro (UPC)

Description (from the conference material): An invited talk as part of the Computer Laboratory Wednesday

Seminars, University of Cambridge¹⁹.

Summary: Internet is for everyone (RFC 3271), and as Vint Cerf says inquoteit won't be if it isn't affordable by all that wish to partake of its services. Global access to Internet for everybody requires not only the increase of the service availability, but also a dramatic reduction of its cost, especially in geographies and populations with low penetration (e.g., rural and underserved communities). The Internet, unlike the acoustic space, is an artificial infrastructure that requires for the magic of communication some artificial digital devices. There are different models to achieve this: mobile devices and mobile operators, telecom providers with cables or fibre. Different models may be required to serve a widely diverse global population. We discuss the case of community networks, crowdsourced networks built by citizens, that contribute and coordinate their own network devices to create a shared network infrastructure. These networks have a governance based on the principles of common-pool resources (E. Ostrom) to preserve the local connectivity as a key resource for the community. There are successful examples around the world based on diverse technologies: optical fibre, GSM, but we will focus on wireless mesh networks. We will show their characteristics, and explore several key challenges, solutions and research questions that have to do with affordability, performance, scalability, resilience, sustainability, governance.



Figure 2.11: Invited talk by Leandro Navarro at the Computer Laboratory Wednesday Seminars, University of Cambridge

2.6.4 #SWAP: What about politics?

Type: International Symposium

¹⁹Slides are available on-line at <http://people.ac.upc.edu/leandro/docs/cam.pdf>

Title: #SWAP: What about politics?

Date: November 3-4, 2017

Place: Brussels, Belgium

Organizers: iMAL.org

URL: <http://imal.org/en/activity/so-what-about-politics-swap>

Actors: Researchers, activists, civil society

Audience: 100 people

Dissemination Level: International

Description (from the conference material): So, what about politics? looks at initiatives that could be seen as the avant-garde of a new political era. In a critical period of crisis in our political systems, we welcome artists, activists, academics using innovative technological tools to reclaim political processes or to shape new forms of organisation, from local collectives to global movements. The symposium revolves around questions such as: What are the politics of a P2P society? How can we perceive a network as a real “distributed agora?” What can we learn from artist- or activist-led experiments focusing on collectivity and political agency? And most important: What are the concrete tools and initiatives today that really try to facilitate and use new forms of agency such as liquid democracy, e-governance, civic intelligence, platform cooperativism and autonomous self-organisation?

Summary: Panayotis Antiniadis gave a presentation of behalf of both MAZI and netCommons projects around the concept of the “Organic Internet”. The original abstract of the talk is:

“The idea of an Internet built “by the people for the people” has stimulated the imagination and narratives, and led to various technological and political initiatives already from the early days. Today, this utopian vision is more and more supported and the efforts to achieve it are intensified at multiple levels, because of the increasing and threatening power of the Internet global corporations. This power and its detrimental effects, on the one hand helps to communities to engage in the co-creation of viable alternatives, but also gives rise to certain misconceptions that could lead to self-defeating strategies of resistance like the blockchain hype and the so-called decentralized Internet. In this talk I will make a historical overview of community and DIY networking, including both artistic and activist perspectives, and reflect on possible strategies for future steps toward effective research and action in this area, with a focus on the social and political dimensions”

Additional notes: Video of talk by Panayotis Antoniadis is available on-line²⁰.

2.7 CN Oriented Workshops

2.7.1 Exercise about designing Business Model Canvas for CN in Delhi

Type: Workshop

Date: September 20, 2017

Place: Delhi, India

URL: <http://cnxapac.org/>

Dissemination Level: International

Actors: CAPS Communities, Existing Community Networks, Local Authorities, Local Stakeholders, Policy Makers

Audience: 30

²⁰See https://www.youtube.com/watch?v=G_fMfX7oigQ

Participants Leandro Navarro prepared the materials and Carlos Rey-Moreno (APC.org) presented the contribution, which is supported by netCommons and presented material that is outcome of netCommons research.

Description (from the conference material): Community Network is a proven technology, with success stories from in Iran, Egypt, Russia, South Africa, Nigeria, Tunisia and Brazil. Digital Empowerment Foundation and AirJaldi in India; Nepal Wireless in Nepal; Mesh Bukav and Mesh Goma in Africa; GufiNet in Spain; Taswireless in Tasmania are just some of the names in the area of community networks. Community Network Exchange (CNX) aims to develop a platform where community network providers can share their learning, experience, regulatory, spectrum, licensing, technological barrier and many other issues to discuss it further. It will also give an opportunity to fellows who were part of training & exchange activity to share their learning and experiences and share policy briefing papers, among others.

Summary: Discussion and workshop about "Understanding Challenges around Making Community Networks Sustainable". The netCommons model of the external Business Model Canvas for CN (D1.3) was presented and discussed. Leandro Navarro was presented by Carlos Rey-Moreno (APC) in the name of the netCommons team. The participants, mainly interested in CNs in India mainly but also Asia and other regions, did an exercise to design their own. Event in collaboration with APC.org and Internet Society.

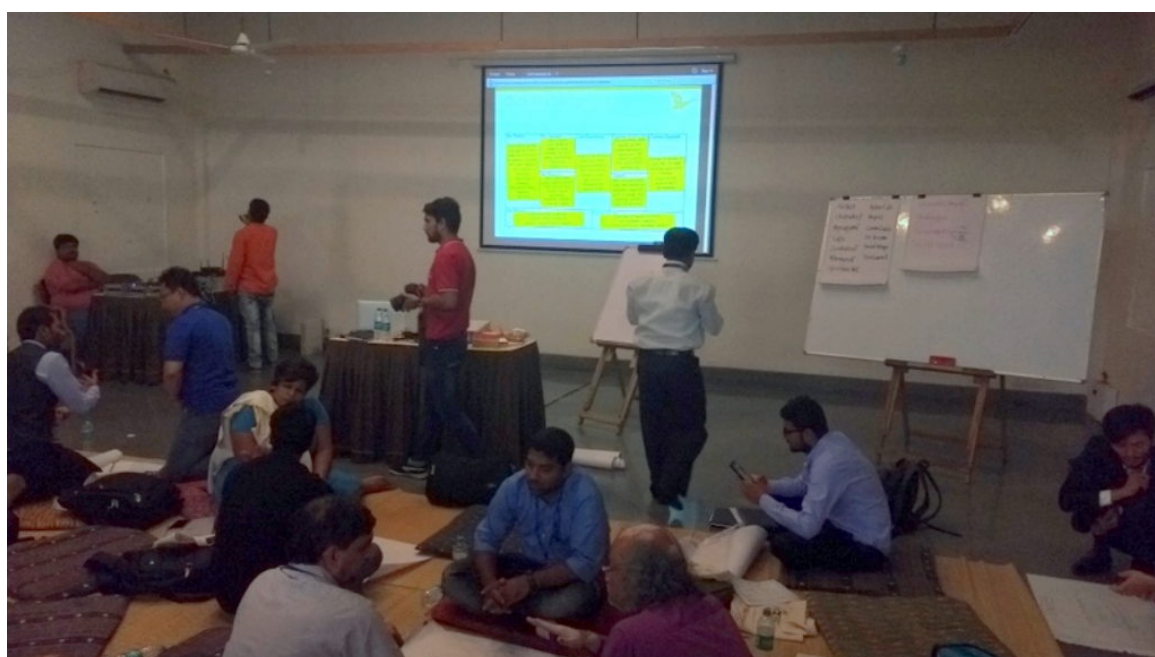


Figure 2.12: CNExchange workshop on business models

3 Advocacy

3.1 European Electronic Communications Code

The beginning of 2017 was an important moment for netCommons, due to the upcoming reform of the telecommunications policy of the European Union through an "Electronic Communications Code", still under discussion in the European Parliament.

The Code will repeal the existing directives on telecommunications and mainly aims at increasing connectivity in the EU territory. While a harmonization and an update of the current policy seem more than appropriate, the upcoming Code could greatly hamper CNs development. Among other issues, the Code initially proposed by the European Commission would prevent small actors to participate in the investment of the network infrastructure, would extend to a minimum of 25 years the duration of the rights to use radio spectrum and would provide for unbalanced Universal Service obligations, making persons geographically isolated or in difficult situations into second-class citizens.

Due to this situation clearly hampering social and civil rights in the realm of communications and networking infrastructure, in March 2017, netCommons coordinated a very successful collaborative process, with representative of many CNs in Europe, to draft together an Open letter, that was announced through a Press Release on March 16th¹.

More than 30 CNs signed the letter and more than 35 organizations supported it. In addition to the significant impact created in international and local media, the open letter was sent to EU Members of Parliament, to the EU Council and EU Commission officials working on broadband policy.

As a follow up to this open letter, netCommons in collaboration with La Quadrature du Net published a detailed report with recommendations for all important amendments of the draft text to help MEP make the right decision².

Finally, on October 17th (morning) netCommons co-organized a workshop at the EU Parliament, sponsored by MEP Miapetra Kumpala Natri and MEP Julia Reda (see also Sec. 2.1.6). The goal of the workshop was both to present European community networks and their achievements as CAPS infrastructure commons, and to discuss some of the regulatory hurdles that are inhibiting their growth.

This workshop was a great opportunity to foster engagement between community networks practitioners and policy-makers, after the open letter and the series of notes on how the European Electronic Communications Code may impact community networks.

3.2 Radio Equipment Directive

The expert group decided to provide a set of use cases in which the RED (Directive 2014/53/EU)³ would have endangered the freedom of users, and among them there is one use case dealing with Freifunk and CNs. Monic Meisel (Freifunk) took the lead on this and netCommons⁴ contributed to improve the content with the intervention of Leonardo Maccari, while netCommons deliverables were included as references to strengthen certain arguments (e.g., D1.2 [3] on the important role of CNs across the world).

¹ See <https://netcommons.eu/?q=news/open-letter-eu-policy-makers-community-networks>

² Available at https://www.netcommons.eu/sites/default/files/netcommons_eecc_notes_imco_itre.pdf

³ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0053>

⁴ See <https://freifunk.net/blog/2017/12/das-problem-mit-der-eu-funkrichtlinie/>

4 Local meetings with CNs and beyond

In this second year of activity, we had local contacts with CNs and activists in Spain, Italy, Greece, Switzerland and France. The following sections quickly overview these, often informal, contacts and interactions, trying to clarify the role of netCommons and the contribution that netCommons research is bringing to these communities and, we hope, to more people and groups through them.

4.1 Spain

UPC is working with guifi.net and particularly with the *expansió de la Xarsa Oberta (eXO)* association in Barcelona¹. UPC is part of the QMPSU mesh network, with several nodes at UPC locations². Based on netCommons work, UPC provides several experimental services including a monitoring service. We collaborate in the local community cloud experimental deployment based on the Cloudy software.

Moreover, UPC collaborates with the guifi.net Foundation to explore business and sustainability models for community networks helping to properly blend and balance the local experience of guifi.net on the one hand, and the more open and global research results of netCommons on the other hand. Meetings between netCommons members from UPC and guifi.net members are very frequent and generally informal and short, so that an analytic representation of all of them is difficult and most of all useless.

UPC is part of the “Barcola” expert group on collaborative economies of the City Council of Barcelona (Ajuntament), in the area of community networking infrastructures, connected to social inclusion policies to reduce digital gaps, and the use of community currencies. This activity benefits from all the research done in netCommons, with special reference to the legal and social studies carried out by non-UPC netCommons researchers, whose outcome and results can be represented to the Barcola expert group to inform and influence their recommendations.

Thanks to this activity and the collaboration in the refinements of the municipal ordinance model, the basis for agreements between CNs and municipalities, although much more ambitious, the ordinance is now fully aligned with EU directive (EU/61/2014) for cost reduction and with the Spanish Royal Decree of transposition last September (RE/330/2016).

The investment model, which in 2015 received the European Broadband Award of the European Commission (EC), is aimed at ensuring a proper distribution of the costs and benefits of the infrastructure according to the contributions and usage. As a result of the collaboration with UPC and netCommons, the *economic compensation system* has been consolidated and the corresponding *sanctioning regime* has been developed and it is now being implemented. These developments have been put in practice in the Garrotxa county with the Xafogar project, described in detail in D1.4 [4].

Finally, UPC participates in several of the weekly guifi.net technical meetings in Barcelona (guifi.labs).

4.2 Italy

UniTN works very closely with the ninux.org community at many levels and participates in many related meetings and core events, like the ninux day 2017 (see Sec. 2.5.1). Given the loose organization model of ninux, which is not a legal person nor does it have a defined structure, the collaboration is based on personal

¹eXO is a Catalan association deeply tied to guifi.net, fostering open and neutral network development, see <https://exo.cat>

²QMPSU is a mesh network in Barcelona that use Quick Mesh Project (qMp) software release and setup, see <http://qmp.cat/Home>

informal meetings and discussions on mailing lists. This activity is followed and carried out mainly by Leonardo Maccari who is member of the Florence “island” of ninux and obviously has continuous interaction with the local activists.

Indeed, ninux Florence also has strong ties with the local section of Associazione Ricreativa Culturale Italiana (ARCI), the largest Italian volunteering association for culture dissemination and many other activities, thus through these contacts the larger audience of ARCI members is getting acquainted with netCommons research results and with the notions related to shared, commons based communication infrastructure. Activities based on the use of PeerStremer-NG are also being discussed with ARCI, since this association is often organizing local events (assemblies, concerts, seminars, etc.) that can be of interest streamed live locally.

A different activity has been carried out with the ninux Calabria group, that, after knowing about netCommons activities got in contact with UniTN team, volunteered to translate the Free Open & Neutral Network (FONN) compact in Italian (translation that was then checked and improved by Federica Giovannella), and finally received, always through the UniTN team, legal advice on how to improve their local organization and setup a charter. This activity is reported and documented in D4.2 [5], specifically in Annex 7 where the mail exchange is reported.

4.3 Greece

The AUEB-RC team have met multiple times with members of the team that operates the Sarantaporo.gr CN, in particular Vassilis Chryssos, George Klissiaris, Antonis Broumas, and Nikolas Kiourtzis, the first two are contracted by AUEB-RC to work in netCommons. These face-to-face meetings, many of which have seen the participation of NetHood members as well, have served as ways to disseminate information and opportunities that emerge in the project towards the Sarantaporo.gr community.

The AUEB-RC have teamed with Sarantaporo.gr and GAIA Epicheirein, a Greek SME active in the area of smart farming service provision, to prepare a joint research proposal, centered on the way synergies between the common-based infrastructures of Sarantaporo.gr and the commercial priorities of GAIA could flourish and benefit both parties. The proposal was submitted in response to a national Call for collaborative research projects.

NetHood is active in establishing contacts with the municipality of Athens around the topic of refugee integration that allows for several opportunities for funding and pilots related to community networking.

NetHood is also actively contributing to the creation of a new CN in the centre of Athens, Exarcheia Net. Among others, NetHood has organized a series of events (see Sec. 2.1.2 and Sec. 2.1.3) that brought experts from abroad, like Juergen Neumann and the libremesh team, to inspire and consult the young activists in Athens in their first steps toward a new CN, which unlike the well-known AWMN will be more open to the local community. In this context, there are on-going interactions also with other civil society organizations in the neighbourhood like an association of residents.

4.4 Switzerland

In the context of the WP5 task on the “right to the hybrid city”, NetHood has started exploring possible connections between the cooperative housing movement in Zurich and related cooperative models for Internet access and software development.

The fact that NetHood leads a related pilot study in the context of the MAZI project, has enabled fruitful collaborations with key projects like Kraftwerk1 and NeNa1, effectively improving the synergies between MAZI and netCommons.

In the former case, we have started a working group with the company that developed Kraftwerk1’s Intranet and which is thinking of updating its overall business strategy to explore more cooperative models along the

”platform cooperativism” model.

Second, we work with board members of the NeNa1 cooperative to include in their “operational concept” the technological dimension missing today in the cooperative housing projects in Zurich.

In parallel, there is an effort to establish links with related organization on the “technological side”, and some first contacts have been made with the yetnet Internet access cooperative and the housing cooperative offering shared Internet access services to its residents³.

Other related organizations that will be contacted soon in the context of an ISOC Switzerland’s event⁴, include the Chaos Computer Club Zurich and the Digitale Gessellschaft (“Digital Society”).

One very interesting observation that emerged from these contacts is that the movements for cooperative housing are often utterly unaware of the possibility to have similar cooperative models for networking infrastructure, and that in Switzerland, or at least in Zurich Internet connectivity is mainly considered very personal and accessed through cellular mobile devices.

4.5 France

From September 2017 on, the CNRS team has continued to work with the legal working group of FFDN by taking part in monthly conference calls about the future of the regulatory framework in Europe, sharing analysis and updates on the EU code for telecommunications.

An outcome of these contacts has been helping them document their data retention practices and to understand better the global framework of GDPR as well as the French law in order to move towards more informed guidelines and practices to be implemented in technical means for proper data handling. A “reverse” contribution of these contacts has been the possibility to ask them to review some aspects of WP4 that were of particular interest for them, getting useful feedback and with the positive “side-effect” of making them acquainted with our work and aware of the valuable information they can find in netCommons deliverables.

³See <http://www.fgzzh.ch/>

⁴See <https://www.isoc.ch/events/vit>

5 Other dissemination activities

5.1 Social media

As explained in D6.1 [6], netCommons is active on Twitter, and its account is gaining constantly new followers (over 400 at the time of writing of this deliverable), including most of the well known activists in the area of CNs, and a significant number of “impressions”, with a peak of more than 18000 during the month of the workshop at the European Parliament (Sec. 2.1.6).

5.2 CAPS Networking

netCommons continued its engagement with other CAPS projects at different levels, participating, when possible in DSI and CHiC organized events. Of particular interest is the collaboration with other three CAPS projects that deal with different aspects of participatory design and free communication, namely, MAZI, EMPATIA and Commonfare. The first step of this collaboration was the organization of a participatory design working group at the C&T conference in Troyes, France, followed by a workshop organized by EMPATIA at MAZI’s summer school in Volos, and more plans for collaborations are on the way.

Moreover, netCommons contributed to the DSI Manifesto workshop in Rimini with a presentation by Leonardo Maccari, while netCommons was also mentioned in a presentation by Panayotis Antoniadis, whose main focus was on the MAZI project.

5.3 Interviews

Panayotis Antoniadis appeared in the Greek National TV, with a 20min interview in a report from a conference on the commons in Thessaloniki shown on May 25 2017¹.

The corresponding documentary had significant impact and the journalists decided to do a second one in 2018 and thus took a second interview of Juergen Neumann after the netCommons panel at Universe 2017, and recently went to the Sarantaporo area to take interviews from local actors for a dedicated documentary on the Sarantaporo.gr CN to appear in 2018.

5.4 Popular media

The netCommons panel at the Universe 2017 was covered by a very popular alternative news site called, The Press Project².

Also, the two articles that appeared in the The Conversation Global (one in 2017 and one in 2018), have together over 16000 readers according the the platform’s analytics page.

¹<http://webtv.ert.gr/ert3/25me2017-antidrastirio-kina-ke-kinoniki-allilengya-ikonomia/>

²See <https://www.thepressproject.gr/article/112431/Koinotika-Diktua-Apo-tin-prosbasi-sto-Diaktuo-mexri-tin-organosis-tis-topikis-koinotitas>

5.5 External blog entries

netCommons published a blog entry at ISOC’s web site, summer 2017 as part of the effort to attract respondents for the WP5 survey on Internet attitudes³.

5.6 PhD theses

In 2017, PhDs that were partially supported by netCommons (Manos Dimogerontakis [7] – UPC, Ester López [8] – UPC, Felix Treguer – CNRS, and Axel Neumann [9] – UPC) were successfully defended. In UniTN two PhD grants were supported by or spin around netCommons topics (Luca Baldesi and Lorenzo Ghio), while more PhDs works on netCommons at AUEB-RC.

5.7 Awards

Félix Tréguer of the CNRS netCommons team received the 2017 Emerging Scholar Best Paper Award of the CP&T (Communication Policy & Technology) section of the IAMCR (international association for media and communications research) for his paper Alternative Internet Networks: History and Legacy of a “Crazy Idea”, based on the 3rd part of D5.1 on Alternative Communication Technologies Throughout History, which he presented in the netCommons joint panel at the Cartagena conference in July.

5.8 Testimonials

In the context of a CAPS publication, we received two public statement of appreciation from prominent personalities in the area of CNs, global Internet access, and commons theory: David Hammerstein, from Commons Network, and Jane Coffin, from ISOC. Their statement were:

“Commons Network was present at the European Parliament workshop on community networks on October 17th and we were extremely impressed by the professional level of the presentations and the long-time commitment of the participants from a number of EU member states who share diverse but common projects around Europe. netCommons is a remarkably valuable initiative not only takes innovative technical measures to create community internet networks for rural areas and and urban neighborhoods. It is also an experience in bottom-up self-governed social innovation in favor of the regeneration of the commons. netCommons is also an excellent example of local resilience, of the collective mastering of useful digital know-how that permits strong social flexibility in face of crisis situations or dramatic climactic conditions that may arise. Yes, it is also a live research experience in decentralized empowerment, of recuperation of control over far-away centralized services that are now taken back by local communities. There are also a number of other collateral positive externalities concerning cost, privacy, open source and general social inclusiveness. The Commons Network will continue to promote the work of netCommons on the ground in cities around the EU and in policy proposals in the areas of research and telecommunications. We consider this a stimulating and alternative way forward for technology both with and for society. – David Hammerstein, Commons Network.”

³<http://internetsociety.org/blog/development/2017/08/take-brief-survey-support-community-networks>

“The Internet Society would like to lend its voice to support the work being done by the netCommons Project. We share their objectives to connect more people for socio-economic development through bottom-up community-based efforts. Their efforts to develop community networks are helping change the way people are connected, provide more affordable access, and help encourage policy-makers and regulators to think about new policies to create change. We greatly appreciate the work they are doing.
– Jane Coffin, Director, Development Strategy, ISOC.”

6 Impact on CNs

6.1 Visibility, Reliance, and Advocacy

The collaboration with netCommons has created the opportunity to make the activities of several CNs visible in different international forums, as is the case with collaboration such as the IEEE Advanced Solutions working group (IEEE and World Bank) with guifi.net, the GAIA IRTF working group (several CNs involved). Indeed, this is a bi-directional breeding: International forums get to know CNs and their activities, and CNs become aware of the existence of these forums and how they can be part of them and find important material, information and support for their activities within these forums.

In general, the dissemination activities in netCommons are contributing to make CNs more visible not only globally, as it may look obvious, but also more visible and recognized locally. Moreover, the support and interaction with netCommons makes them more self-conscious and self-reliant, as they have access to important facts and information that would be otherwise difficult to reach and interpret, and they immediately find that they are not a marginal phenomenon on the fringe of legality, but part of a global movement with international recognition and a clear socio-technical-economic importance as proven by the EC supported research of netCommons. This local dimension may look marginal for guifi.net or FFDN, whose dimension, local activism, and economic impact has made them well known in the entire Catalonia and France and beyond. Indeed, the backing of netCommons has made guifi.net management more reliant and more aware of their rights and of the global legal framework and how to influence it or use it for local advocacy, and is helping FFDN organizing their bylaws reform and governance models. For other CNs, from ninux, to Sarantaporto.gr, to Freifunk, to many smaller ones whose feedback to us is too vague or informal to be reported here, the interaction with netCommons means instead starting a process of re-thinking their own status, scope, and definition (both from a legal and from a technical point of view). It is difficult to state now where this process will lead them, but we will try to collect more feedback before the end of the project, even if we deem that the process will continue for many years to come (changing processes of volunteer-based system are slow and often non-linear) leaving a long lasting impact and footprint by netCommons.

The direct impact of the advocacy activity was discussed in detail in Chapter 3 and is not treated here, but we remark that its value is turning out to be fundamental, as the very existence of CNs is jeopardized by regulations and laws whose scope seems to be only that of large, traditional telcos.

6.2 Networking

netCommons has created opportunities for networking across different CNs, that has resulted in better knowledge and direct exchange among representatives of these CNs, mainly in the European domain. Many of the events organized by netCommons as described in Chapter 2 have played exactly this role.

It is also worth to note that Félix Tréguer (CNRS) was the initiator of a specialized mailing list to help coordinate the efforts of CNs in EU, called “telecommons”¹, which was used for some of the advocacy efforts that followed (see Chapter Chapter 3), and hopefully will be used for other purposes as well. The list was created under the domain of an existing advocacy group (La Quadrature du Net) and not under the domain netCommons on purpose: to avoid biasing it too much, to avoid it being perceived as an academic initiative only, to positively stress the existence of communities that netCommons support, and also to make it easier its transition to “normal operation” when netCommons will finish.

¹<https://lists.laquadrature.net/cgi-bin/mailman/listinfo/telecommons>

In parallel, Panayotis Antoniadis (NetHood) and Vassilis Chrysos (AUEB, Sarantaporo.gr) have participated in the team that developed the Bylaws of a new ISOC Special Internet Group on Community Networks, which has been already announced (at the closing ceremony of IGF2017)² and which will soon start its operations that will hopefully have significant impact on the further development and sustainability of CNs across the world, beyond the EU.

Leonardo Maccari is one of the co-organizers of a session dedicate to ninux at the merge-it conference. Merge-it³ is a new Italian event that aims at gathering all the national experiences whose goal is to do voluntary work on digital openness. It is organized on the model of the well known Free Open Source Developers' European Meeting (FOSDEM) conference⁴ and will have its first edition in early 2018. Ninux decided to participate and host a session, and Maccari will open the ninux session with an introduction and a talk about netCommons. Moreover, netCommons publicized and advertised the event among other Italian community networks and community ISPs, in order to take the chance to share experiences with similar experiences. The conference will be in 2018 and will be documented in D6.3, but the organization started in 2017, after the ninux-day.

6.3 Economic Initiatives and Funding Spawned by netCommons

Ambr Research Labs. As part of the Ambr⁵ startup, Leandro Navarro (UPC) has been appointed as vice-director of the Ambr Research Labs (ARL), constituted in UK on November 22, 2017. The first public event were two presentations in the IETF 100 conference in Singapore. ARL will setup in 2018 a joint research laboratory at UPC, and will work with the guifi.net and ninux.org community networks in experimentally-driven research. The initial research will adopt research results from netCommons and the experience of the involved community networks.

ISOC grant 'Beyond the Net'. With the support of netCommons, Sarantaporo.gr successfully applied for ISOC's Beyond the Net grant⁶. The grant will fund multi-fold actions by the team operating Sarantaporo.gr, including training locals, network equipment upgrades and maintenance and others, which aim at securing its long-term sustainability.

An additional small grant was offered to Sarantaporo.gr to initiate a novel transfer project with another similar area in Greece, Tzoumerka⁷, after a contact with local actors that was initiated in a workshop organized in the Sarantaporo village by netCommons (see Deliverable 3.3, Section 2.4).

Google Summer of Code Google Summer of Code (GSoC)⁸ is an effective mean to sustain the initiatives of CNs. In GSoC, a student receives a scholarship (that can reach 6000\$) to develop an open source project proposed by some community, and mentored by a senior developer. The FreiFunk CN yearly participates to GSoC as an "umbrella organization", delegating the management of the scholarships to some qualified member or to a university professor/PhD. GSoC is effective to connect the academia and CNs because as soon as the CN identifies a technological open issue that can be tackled with an open source solution a researcher can mentor the project. This has multiple good effects, the mentor/researcher enters in contact with the CN, the CN has resources to solve a specific problem, and a student gets acquainted with the community. In the past two years Leonardo Maccari mentored two GSoC projects that were assigned to a ninux activist in order to develop software related to Pop-Routing, one of the cutting-edge research results in Engineering supported by

²<http://cnsig.info>

³See <http://merge-it.net>.

⁴FOSDEM is a hacker volunteer-based conference dedicated to open source and sponsored by several economic major actors <https://fosdem.org/2018/about/>

⁵<http://ambr.com/>

⁶See <https://www.internetsociety.org/beyond-the-net/grants/2017/sarantaporo-gr-community-network/>

⁷See <http://www.sarantaporo.gr/node/408>

⁸<https://summerofcode.withgoogle.com/>

netCommons. Pop-Routing is an enhancement to mesh-routing protocols proposed by UniTN, published in several major ICT research conferences [10–12], and submitted as extended version to leading journals in the area. In particular, Pop-Routing can be applied to Optimized Link State Routing Protocol (OLSR) [13] and Optimized Link State Routing Protocol version 2 (OLSRv2) [14] and is being implemented as open source software⁹. Pop-Routing has been adopted by the CN of ninux Florence, that is going through a re-organization of some of its technical solutions¹⁰.

The same approach will be adopted for other GSoC projects in 2018, in order to give continuity to the interactions between UniTN and ninux Florence.

Other Grants More projects were drafted and proposed by CNs based on the input from netCommons. Among them, we mention the proposal from ninux to the RIPE open call for projects, that has been documented (with an Appreciation Letter attached to D2.7 [15]) from the ninux Florence community. The proposal received positive feedback but was not financed, although it represents a base for future projects.

6.4 Consolidation

The formalization of organizational, economic, technological, political, social aspects have helped in general to consolidate the CNs involved.

6.4.1 Interactions with Ninux

In the ninux case, a group of people from Calabria (Southern Italy) initiated a process of modification of the Pico-Peering Agreement (the license that every new ninux member has to accept). In this process they started an activity of self-learning research about the potential legal consequences of building and managing a CN in Italy. Ninux Calabria asked for advice on some legal issues related to the Italian “Codice delle Comunicazioni Elettroniche (CdCE)” (decreto legislativo (d.lgs.) 1.8.2003, n. 259, implementing the EU Directives on the telecommunications sector). The reason why this CN asked for advice was related to its will to modify its structure in order to have a more formalized configuration of the community. Given the fact that netCommons is known among Italian CNs, the Calabria ninux group contacted the project team and asked for legal advice. The community asked some very detailed questions about the interpretation of the mentioned Codice. In particular, the CN wanted to have a clear picture of what authorization is required to run a CN and the differences between an authorization for a private and for a public network. In addition, the CN asked what possible interaction and collaboration there could be between a CN and a commercial ISP and how to regulate this possible relationship. The interactions with ninux Calabria are documented in D4.2 [5].

During the ninuxday, some ninux activists raised the problem of lack of internal coordination among the various islands of the ninux community, and lack of instruments to collaboratively take decisions on themes that regard the whole community (such as the management of the few centralized points in the community, the domain name, the wiki etc.). The discussion finally made it evident that when the community expanded geographically the informal face-to-face governance that was used before (at the time the community was mainly concentrated in Rome) was not scaling well. Leonardo Maccari offered support in the identification of new governance structures and models to be proposed to the community, in order to make it scale organically. This activity will be carried on in 2018 based on the results of WP1, and will be better documented in D6.3.

⁹See <https://github.com/AdvancedNetworkingSystems/poprouting>

¹⁰See Gabriele Gemmi’s activity, documented in FreiFunk blog: <https://blog.freifunk.net/tag/poprouting/>

6.4.2 Interactions with Sarantaporo.gr CN

The participatory design process developed in the Sarantaporo area (see D3.3 [1]), supported the effort of the Sarantaporo.gr Non-Profit Organization (NPO) to intensify the training of locals in appropriating and maintaining their CN. This has led to a significant increase of local engagement with measurable impact on the refreshing of the CN's access network leading to improved performance and coverage¹¹.

6.4.3 Interactions with guifi.net CN

The collaboration with guifi.net is described in more detail in [16]. The most significant results are the following:

Community cloud model: Formalized during end 2016 and 2017 with the development of a organizational and governance model for community clouds. See Chapter 6 of [16] for details on the model and evaluation, and Chapter 2 of [17] for details on the Cloudy software.

Investment model: The investment model, which in 2015 received the European Broadband Award of the EC, is aimed at ensuring a proper distribution of the costs and benefits of the infrastructure according to the contributions and usage. As a result of the collaboration, the *economic compensation system* has been consolidated and the corresponding *sanctioning regime* developed and is being implemented. These developments have been put in practice in the Garrotxa county¹². See Chapter 5 of D1.4[16] for more details.

Ordinance: The municipal ordinance model, the basis for agreements with municipalities, although much more ambitious, is now fully aligned with EU directive (EU/61/2014) for cost reduction and with the Royal Decree of transposition last September (RE/330/2016). The work is a result of a question to the European Parliament (petition 1230/2016) regarding the Directive on cost reduction over resolution deadlines and positive administrative silence. The ordinance is pending adaptation to the royal decree, but can be completed on request from any public administration interested. See Chapter 5 of D1.4[16] for more details.

6.4.4 Interactions with other CN

Several significant interactions have taken place as follows, also reported in Chapter 5 of D1.4[16]:

- With FDN and Tetaneutral communities, part of FFDN, discussions and collaborations on policy issues and campaigns, and the development of an increasing public accountability and the promotion of more balanced participation of minorities.
- With the Zenzeleni CNs we are supporting them in the design and implementation of a federation for the replication to more than 10 similar communities in the region, based on the organizational and governance models resulting from WP1.
- We have collaborated with W4C (India) in the design of their economic sustainability models in the communities and its formalization.
- Furthermore, we have consolidated a collaboration of netCommons with TakNet/Net2Home, and we explore with them the development of an inside and outside canvas model and the corresponding organizational re-engineering in the Net2Home model.

¹¹ See <http://www.sarantaporo.gr/node/403>, in Greek

¹² A 734.5 km² county in the north of Catalonia: <https://en.wikipedia.org/wiki/Garrotxa>

6.5 Technical support

The software tools developed in WP3 are being tried and used by several community networks, mainly guifi.net, ninux.org and Sarantaporo.gr. See Chapters 2, 3, and 4 of D3.4 [17] for details on the respective software tools. In the third year of the project, WP3 has a specific period of testing and feedback gathering, which will document the adoption of software from the communities (see D3.4 for more details).

6.5.1 Interactions with OpenWISP

Deliverable D2.7 [15] documents the fruitful interaction between netCommons and the OpenWISP project. OpenWISP is a mature project to develop a web-based management interface for wireless networks, and mesh networks in particular. It is an open source project that is taking momentum both in community networks (as in the ninux Florence CN) and among bottom-up and small ISPs. UniTN developed an innovative visualization of the network topology that makes it evident what are the portions of the network that are more fragile and need specific attention. This work was derived from the scientific activity of network monitoring in T2.4, and at the time of writing, is under evaluation for inclusion in the main tree of OpenWISP. D2.7 includes a letter of appreciation from Federico Capoano (lead developer of OpenWISP and ninux member) that documents the fruitful interactions and the appreciation of the code realized by netCommons.

6.6 Other

The impact of netCommons on the CN ecosystem is testified through the significant presence of netCommons contributions in the activity of the Association for Progressive Communications (APC), which has adopted local connectivity, and specifically Community Networks, as a strategic topic for global development. Thanks to netCommons support, Leandro Navarro is one of the key contributors to this APC activity and in the definition of its recommendations. The fruitful engagement is recognized by the appointment (August 2017) of Leandro as member of the executive board of directors¹³, and the recently established newsletter by APC¹⁴.

¹³<https://www.apc.org/en/executive-board-directors>

¹⁴See <https://crm.apc.org/civCRM/mailling/view?reset=1&id=592>

7 Conclusions

By the end of the second year, netCommons has managed to built a strong and credible reputation beyond the academic circles where its researchers normally publish and develop their work. Among CNs, citizens associations and activists, the project has built a recognizable identity and a widespread recognition of its positive role in the effort of Community Networks to play a central role in understanding the phenomenon of CNs, supporting them and contribute to the the design of the future of the Internet. In parallel to this social impact, the scientific production of netCommons has been fully in line with, and often more successful than, the original plans in all the research dimensions composing the project: Legal, Social, and Technical.

The objectives of WP6, both in the original definition of the DoA, and as they were refined and detailed in Deliverable 6.1, were all achieved with success. The only exception is the production of divulgative material for the general public (e.g., wikipedia pages) that was not yet finalized. Moreover, the engagement with local authorities can be improved, even if the actual engagement does not depend only on the project, but also on the local response.

During the third and last year the main focus will be to disseminate the technical results of the project, software, methodologies, and guidelines. The fact that we have established already close relationships and a high level of trust brings us in a good position to contribute even more in the growth and sustainability of CNs in Europe and beyond. Besides, we will pursue both local engagement and general public education and divulgation.

Some public events are already fully planned in the initial part of 2018, in particular, in conjunction with the netCommons plenary meeting in Paris, a public event at Centre Pompidou, and a presentation of the netCommons project at UNESCO will be held on January 29th and 30th respectively.

8 List of Publications (2017)

Book Chapters

- 1) Panayotis Antoniadis. The Organic Internet: Building Communications Networks from the Grassroots. In Vincenzo Giorgino and Zachary Walsh, editors, *Co-Designing Economies in Transition*, chapter 13, pages 235–272. Palgrave Macmillan, New York, 2017. ISBN 978-3-319-66591-7. doi: 10.1007/978-3-319-66592-4. URL https://link.springer.com/chapter/10.1007/978-3-319-66592-4_13

This book chapter has also been translated into German by Thomas Raoseta and appeared in a print-only version as

Panayotis Antoniadis. Das demokratische internet. In Hans Widmer, editor, *Die Andere Stadt*, chapter 9. Paranoia City Verlag, Zurich, 2017. ISBN 978-3-907522-28-8. URL <http://www.paranoiacity.ch/anderestadt/anderestadt.html>

Journal Papers

- 2) Federica Giovanella and Mélanie Dulong de Rosnay. Community wireless networks, intermediary liability and the McFadden CJEU case. *Communications Law*, 22, 2017. ISSN 17467616. URL <https://halshs.archives-ouvertes.fr/halshs-01478116>
- 3) Félix Tréguer. Gaps and bumps in the political history of the internet. *Internet Policy Review*, 6, 2017. doi: 10.14763/2017.4.714. URL <https://policyreview.info/articles/analysis/gaps-and-bumps-political-history-internet>
- 4) Christian Fuchs. Information technology and sustainability in the information society. *International Journal of Communication*, 11:2431–2461, 2017. URL <http://ijoc.org/index.php/ijoc/article/view/6827/2057>
- 5) Leonardo Maccari, Nicolò Facchi, Luca Baldesi, and Renato Lo Cigno. Optimized p2p streaming for wireless distributed networks. *Elsevier Journal of Pervasive and Mobile Computing*, June, 2017. ISSN 1574-1192. doi: <https://doi.org/10.1016/j.pmcj.2017.05.006>. URL <https://ans.disi.unitn.it/users/maccari/assets/files/bibliography/Maccari2017Optimized.pdf>
- 6) David Franquesa and Leandro Navarro. Sustainability and participation in the digital commons. *interactions*, 24:66–69, 2017. ISSN 1072-5520. doi: 10.1145/3058139. URL <http://doi.acm.org/10.1145/3058139>
- 7) Luca Baldesi, Leonardo Maccari, and Renato Lo Cigno. On the use of eigenvector centrality for cooperative streaming. *IEEE Communication Letters*, June 2017. ISSN 1089-7798. doi: <https://doi.org/10.1109/LCOMM.2017.2713361>. URL <https://ans.disi.unitn.it/users/maccari/assets/files/bibliography/Baldesi2017Optimal.pdf>
- 8) Panagiota Micholia, Merkourios Karaliopoulos, Iordanis Koutsopoulos, Leandro Navarro, Roger Baig, Dimitris Boucas, Maria Michalis, and Panayiotis Antoniadis. Community networks and sustainability: a survey of perceptions, practices, and proposed solutions. *IEEE Communications Surveys & Tutorials*, 2017. URL <https://arxiv.org/abs/1707.06898>
- 9) Panayotis Antoniadis. How to build an organic internet and stand up to corporations. *The Conversation Global*, 2017. URL <https://theconversation.com/how-to-build-a-more-organic-internet-and-stand-up-to-corporations-70815>

This last article bridges between scientific publications and general ones. Papers are not peer-reviewed, but they are subject to strict editorial control for quality and interest of the argument

Conference with Proceedings

- 10) Francesco Maturi, Francesco Gringoli, and Renato Lo Cigno. A dynamic and autonomous channel selection strategy for interference avoidance in 802.11. In *13th Annual Conference on Wireless On-demand Network Systems and Services - WONS 2017*, Jackson, Wyoming, USA., Feb 2017. IFIP/IEEE, IFIP/IEEE. ISBN 978-3-901882-88-3. doi: 10.1109/WONS.2017.7888756. URL <http://2017.wons-conference.org/Papers/1570314864.pdf>
- 11) Michele Segata and Renato Lo Cigno. On the feasibility of collision detection in full-duplex 802.11 radio. In *13th Wireless On-demand Network systems and Services Conference (WONS 2017)*, pages 1–8, Jackson Hole, Wyoming, USA, Feb/2017 2017. IFIP/IEEE, IFIP/IEEE. ISBN 978-3-901882-88-3. doi: <https://doi.org/10.1109/WONS.2017.7888755>. URL <http://2017.wons-conference.org/Papers/1570314845.pdf>
- 12) E. Dimogerontakis, J Neto, R Meseguer, L Navarro, and L Veiga. Client-side routing-agnostic gateway selection for heterogeneous wireless mesh networks. In *IFIP/IEEE International Symposium on Integrated Network Management (IM)*, May 2017. URL <https://arxiv.org/abs/1708.02893>
- 13) E Dimogerontakis, R Meseguer, L Navarro, S. F Ochoa, and L Veiga. Community sharing of spare network capacity. In *IEEE International Conference on Networking, Sensing and Control (ICNSC)*, 05/2017 2017
- 14) E. Dimogerontakis, R Meseguer, L Navarro, S. F Ochoa, and L Veiga. Design trade-offs of crowdsourced web access in community networks. In *IEEE 21st International Conference on Computer Supported Cooperative Work in Design (CSCWD)*, 2017. URL https://upcommons.upc.edu/bitstream/handle/2117/115868/Analysis_Proxies_CSCWD.pdf
- 15) N Apolonia, F Freitag, and L Navarro. Gossip-based service monitoring platform for wireless edge cloud computing. In *IEEE International Conference on Networking, Sensing and Control (ICNSC)*, 05/2017 2017. URL https://upcommons.upc.edu/bitstream/handle/2117/114965/Monitor_ICNSC_CR_napolonia.pdf
- 16) Panagiota Micholia, Merkouris Karaliopoulos, and Iordanis Koutsopoulos. Mobile crowdsensing incentives under participation uncertainty. In *3rd ACM Workshop on Mobile Sensing, Computing and Communication*, pages 29–34, Paderborn, Germany, 2016. ACM. ISBN 978-1-4503-4343-5. doi: <http://doi.acm.org/10.1145/2940353.2940357>. URL <https://mm.aueb.gr/publications/2016-mscc.pdf>
- 17) M. Selimi, L. Cerdá-Alabern, M. Sánchez-Artigas, F. Freitag, and L. Veiga. Practical service placement approach for microservices architecture. In *17th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGrid 2017)*, 2017. URL https://upcommons.upc.edu/bitstream/handle/2117/114934/CCGrid2017_CameraReady.pdf
- 18) Maurizio Teli, Panayotis Antoniadis, Chiara Bassetti, Stefano De Paoli, Ileana Apostol, Giovanni Allegretti, and Michelangelo Secchi. Participatory design, beyond the local. In *8th International Conference on Communities and Technologies*, pages 325–328, Troyes, France, 2017. ACM. ISBN 978-1-4503-4854-6. doi: 10.1145/3083671.3083715. URL <http://dl.acm.org/citation.cfm?id=3083715>

Conference presentations

- 19) Félix Tréguer. Alternative internet networks: History and legacy of a “crazy idea”. In *Drawing Policy Lessons From the History of Alternative Media and Networks*, Cartagena, Colombia, 2017. URL <https://hal.archives-ouvertes.fr/halshs-01850948>

The paper associated to this presentation is a pre-print available in Open Access waiting to identify a proper publication venue.

- 20) Panayotis Antoniadis, Jens Martignoni, Roger Baig, David Franquesa, and Leandro Navarro. Community currencies for community networks. In *IV International Conference on Social and Complementary Currencies: Money, Consciousness and Values for Social Change*, Barcelona, Spain, 2017. Universitat Oberta de Catalunya, Universitat Oberta de Catalunya. URL http://nethood.org/slides/barcelona_currencies/antoniadis_et_al_barcelona_paper_draft.pdf
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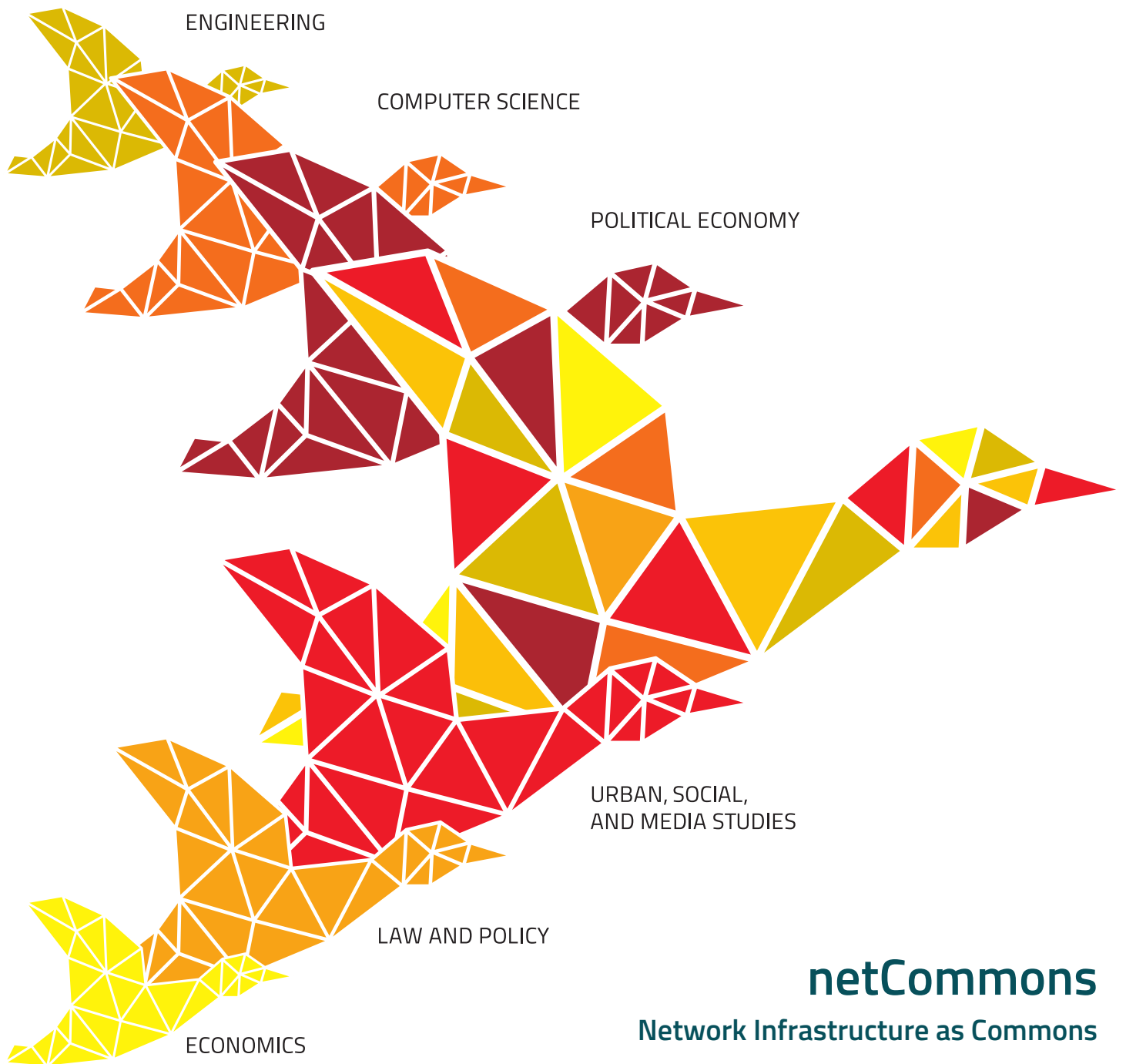
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