# Building a BuB Community (C4EU 5.5.1: Report on support actions - training and networking -a )

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**Abstract**

This report summarizes the training, networking and communication efforts of the BuB4EU branch of the Commons for Europe project. Four fellows have joined the project so far and they are provided training and guidance to complete the BuB pilots they are working on. Each of the fellows has both one academic advisor and one mentor with extensive BuB experience. These two roles complement each other in the education of the student. The collaboration tools are those commonly present in collaborative initiatives: workshops, mailing list, git repository and talks at international forums.

**Index Terms**

Bottom-up-Broadband (BuB), training, workshops, presentations

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## I. Introduction

This report summarizes the training and communication efforts of the BuB4EU branch of the Commons for Europe project. After this introduction, Section II provides information about this document and how to collaborate. Section III introduces the fellow program that we have prepared to back the execution of the selected pilots. Section IV describes the roles of mentor and adacemic advisor that will help the fellows participating in the pilots. Those that are interested in BuB4EU meet in the workshops detailed in Section V and participate in the mailing list as explained in Section VI. Additionally, we are preparing a web as mentioned in Section VII. The BuB4EU branch and the obtained results have also been presented in external international forums that are introduced in Section VIII. Finally, Section IX offers some concluding remarks.

## II. About this document

This report has been produced using open source tools such as LaTeX [1] and *git* [2]. LaTeX is widely used in academia to prepare print-class documents. It automatically takes care of numbering, cross-referencing, tables of contents, bibliography, etc. *Git* is a high performance distributed revision control which is used in many open source projects, such as the linux kernel. Git makes it easy and safe to collaborate as each contributor works on his own personal copy. Good contributions can be easily shared with others, and it is always possible to revert to a previous version.

Our git repository is publicly available in *github*:

https://github.com/jbarcelo/C4EU-deliverables

Anyone who is familiar with LaTeX and *github* can contribute to this document. The firs step is to make a copy (a *fork* in *github* jargon). The contributor can work in this copy and make changes to improve the document. After that, it is necessary to request that these changes are merged into the original copy of the document (a *pull request* in github jargon).

If you see anything that can be improved, feel free to contribute. This document is alive in the sense that it will keep evolving as long as contributors make changes and improve it.

The system automatically keeps track of all the contributors and their contributions. It is possible to see who is contributing more actively and which are the exact changes made by each contributor. And everything is public on the web.

## III. Fellow program for supporting BuB pilots

Each of the pilots selected for execution receives the backing of a fellow. Fellows are recruited among the last year students of a four year networking undergraduate program. The selection process relies on academic grades, Curriculum Vitae and personal interview.

For project management purposes, each fellow has to prepare four different deliverables regarding the pilot. First, a pilot charter which is a high-level description of the pilot. Then, a detailed planning with the tasks to be carried out throughout the pilot execution. When the first results are available, they will be covered by an execution deliverable. This execution deliverable is a checkpoint to verify that the pilot is on track and advancing according the schedule. Finally, upon completion of the pilot, the fellow will prepare a memory for publication and will explain the pilot in a public presentation.

The Bottom-up Broadband fellows will participate in a join training 3-days session with the Code for Europe fellows organized by the project co-ordinator ESADE. Besides this sessions, they are receiving intensive training and support combining the different tools described in the remainder of this document.

## IV. Mentor program and academic advice

The fellows selected to participate in the Commons for Europe (C4EU) project do so as part of their education at the university. Specifically, this training is divided in two different blocks: *practicum* and *degree thesis*. The practicum involves real-world work in which the fellows have the opportunity to use the skills they have learned in regular courses. It is also the opportunity to realize that real-world work is far away from the courses taught at the university, which means that the fellows have to make an extra effort to get acquainted with technologies and work-flows that they have not learned in class.

TABLE I
PILOTS, FELLOWS AND MENTORS

| Pilot | Student | Mentor | Main Academic Advisor |
|---|---|---|---|
| Open Sensor Network | Alejandro Andreu | Alex Posada and Tomas Diez | Jaume Barcelo |
| Free Europe WiFi | Ignacio Justel | Givanni Calcerano | Albert Domingo |
| FFTx | Jorge Beltran | Roger Baig | Jaume Barcelo |
| Mobile Node | Fernando Gros | Efrain Foglia | Jaume Barcelo |

The *practicum* is not a controlled environment as the course lab assignments are. Things can go wrong, and it is important to understand and accept it. Furthermore, there is not a teacher that *knows the solution*. This means that the level of effort to achieve results is much higher in the practicum than in a course assignment, as it is possible to get stuck and it may take days or longer to find a solution or a workaround. The effort is measured in the European Credit Transfer System (ECTS). The *practicum* has a value of 20 ECTS credits, which is equivalent to 500 hours of work.

The fellows are not alone in this quest. A *mentor* is assigned to each student to indicate the tasks that the student has to do and provide the necessary help and guidance. As the practicum is tied to a real-world work, the *mentor* needs to be someone that has been working in this real-world for some time.

Besides the actual technical skills acquired in the execution of the *practicum*, the fellows are also expected to practice *soft* skills such as participation in meetings, effective communication, organization of work to meet schedules, generation of documentation, etc. For some people, the practicum can be the starting point of a professional career.

A mentor has been assigned to each of the student participating in the C4EU project. It is important that the mentor is someone from outside the university that is very familiar with bottom-up-broadband and with the pilot. Table I summarizes the pilots under consideration, the student assigned to each pilot and the mentor assigned to each student.

In addition to the *practicum*, the fellows also have write their *degree thesis*. This thesis is an academic document that is necessary to obtain the degree. In the thesis, the fellows will comprehensively describe their pilot. As an academic document, it has to be carefully

written, well structured and profusely documented. It is necessary to include introductory material, related work and references. It is also important to include a detailed work-plan with descriptions of the tasks. The work should be described in such a way that an external evaluator can understand what is the contribution and why it is important. The role of the academic advisor is to guide the fellows in the successful completion of the academic work in coordination with the mentor.

The *thesis* has also a value of 20 ECTS credits, which means 500 additional hours of work. This part of the work will be supervised by an academic advisor from the university. There is hard deadline for the *thesis* in June. Not meeting this deadline would represent a delay of one year in the obtention of the degree. For this reason, it may be a good idea to plan the work in such a way that the thesis is finished considerably earlier, to have some *safety margin* in case of unexpected events.

LaTeX is a popular document preparation system in the academia, that we will also use in the preparation of the thesis. It is convenient to structure a large document in chapters, sections and subsection. It also provides support for references and cross-references. And automatically generates tables of contents, tables of figures, bibliography, etc. Our idea is to use LaTeX also for the preparation of the documentation of the C4EU project, in such a way that it can be re-used in the preparation of the thesis of the fellows.

Another tool that can be helpful in the preparation of the documentation is github. Github is a web based extension of the git revision control system, and makes it possible that different people work in parallel on the same document, suggest changes, rollback modifications, etc. in a distributed fashion.

### *A. Mentors for the OSN pilot*

Recently two researches joined the initiative and they will be helping the fellow to complete the pilot. A short biography is shown below.

- *Alex Posada*: He is an engineer who researches in the field of interactive media, produces and creates music and is actively involved in many interactive projects which normally involve sensors. Hence he will be able to contribute to the Open Sensor Network project.

- *Tomas Diez*: He is the project manager in FabLab Barcelona —workshop offering personal digital fabrication—, located in the Institute for Advanced Architecture of Catalonia (IAAC). He has executed projects in Latin America as well as in Europe. He focuses on the research for a more fluid language between machines and humans, and is currently working on Smart Citizen, a very similar initiative to Open Sensor Network.

### *B. Mentor for the FFTx pilot*

The mentor for the FFTx pilot is Roger Baig Vias and he will help Jorge Beltran to perform this project. Roger is from Barcelona and he studied Industrial and Electronic Engineering at Universitat Politcnica de Catalunya (UPC). He also did a master at Universitat Autnoma de Barcelona (UAB). Now he is working in the Private Foundation guifi.net by the Open, Free and Neutral Network where he does tasks as international projects, dissemination and promotion. Roger also takes part in CONFINE (FP7) and C4EU (CIP) projects.

### *C. Mentor for the FEW pilot*

As explained before, Nacho Justel will be guided by Giovanni Calcerano from Provicia WiFi. Giovanni is graduated in Mathematics, and developed his carrer mostly as consultant in the field of high-level technical computing / scientific / statistical experience with over ten-year experience in the business sector. He is currently working at Provincia di Roma, being the responsably of European projects as OpenData, among others. For more information, about his professional career, you can take a look at his LinkedIn profile.

### *D. Mentor for the Mobile Node pilot*

Fernando, will be guided by Efraín Foglia. Efraín has been working in different areas related to Design and Art. Nowadays he is doing research on the field of the relation between Design & Art and digital networks, taking into account also their social and political implications. He is an active member of guifi.net and exo.cat, two platforms which work on the design and deployment of open networks.

He graduated in Design of Graphic Communication in UAM (Mexico) and is currently working on his PhD at the Universitat de Barcelona (UB) about "'*Art in MediaCity*"'

## V. BuB4EU Workshops

Together with the mailing list, one of the main tools to exchange results and foster the discussion is the organization of workshops. This workshops are announced on the mailing list and are open for everyone to participate. There are two differentiated participation options: attendant and speaker.

The speakers are those that are more deeply involved in the project and prepare a short paper (one page) and some supporting slides for the talk. The attendants simply listen and offer comments and feedback.

Each of the workshops has been organized by one of the members of the team.

### *A. 1st BuBEU workshop*

Date: July 24th.

Organizer: Jaume Barcelo

Attendants:

- Daniele Arena
- Roger Baig
- Jaume Barcelo
- Ramon Roca
- Jorge Beltran
- Fernando Gros
- Alejandro Andreu
- Nacho Justel
- Boris Bellalta
- Luis Sanabria
- Simon Oechsner
- Albert Domingo

The following papers were presented:

- **Let the networks grow, let the knowledge flow**: It is an introduction both to the workshop and the BuB concept done by Jaume Barcelo.
- **Introduction to Open Sensors Network**: Describes the main objectives and issues that will affect the OSN Pilot, which is executed by Alejandro Andreu.
- **C4EU Northern Quarter Network**: Describes the bases of the pilot and the main task which are planned to do. This pilot is implemented by Fernando Gros
- **CKAN: An Open Data Portal for Sensor Information Publication**: Describes what the CKAN tool is, and how is being implemented. This pilot is carried out by Manuel Palacin and Ivan Fernandez.
- **C4EU Rubi**: Describes the Rubi pilot, the tasks that have been done and the ones that needs to be done yet. This pilot is executed by Jorge Beltran
- **Spectrum Sensing with USRP**: Describes the progress on detecting TV White spaces using and USRP. This pilot is carried out by Luis Sanabria-Russo
- **Free Europe WiFi**: Describes the main aspects of the pilot and briefly analyzes some of the issues with which they will have to deal with. This pilot is executed by Nacho Justel.

*B. 2ond BuBEU workshop*

The second workshop, consisted of a set of presentations and demos that tried to show to the partners the current progress of each pilot.

Date: October 4th.

Organizer: Fernando Gros

Attendants:

- Miquel Oliver
- Javier Gonzlez
- Jaume Barcelo
- Jorge Beltran
- Fernando Gros
- Alejandro Andreu
- Nacho Justel
- Boris Bellalta

- Luis Sanabria
- Federico Capoano
- Andrea Ferraresi
- Albert Domingo

The following are the papers that were presented:

- **Open Sensor Networks**: Alejandro Andreu
- **Key aspects and Main factors in NQN**: Fernando Gros
- **Practicum, Mentor, Thesis, Advisor**: Jaume Barcelo
- **FTTF/FTTP**: Jorge Beltran
- **Wireless Data Transmission with Ettus USRP-E110**: Luis Sanabria
- **OpenWISP Modules**: Nacho Justel

Note that there have been some issues related to some of the pilots. The pilot C4EU Rubi has been canceled due to some problems with the city council. Therefore, Jorge Beltran will carry out the FTTF/FTTP instead.

The C4EU NQN pilot has suffered some delays due to issues with the communication between the UPF and the MDDA. We will continue waiting for a reasonable time to see if that problems can be solved and the pilot can start.

### *C. 3rd BuBEU workshop*

At the third workshop were presented the project charters of the BuB projects that are carried out by UPF fellows. Also a new pilot were proposed.

Date: 19th November 2012

Organizer: Nacho Justel

Attendants:

- Miquel Oliver
- Roger Baig
- Jaume Barcelo
- Adriana Marti
- Jorge Beltran
- Fernando Gros

- Alejandro Andreu
- Nacho Justel
- Pedro Vilchez

Talks:

- **Summary about Bologna C4EU meeting**: Miquel Oliver and Nacho Justel
- **FreeEurope WiFi Project Charter**: Nacho Justel
- **Open Sensor Networks Project Charter**: Alejandro Andreu
- **FFTx Project Charter**: Jorge Beltran
- **Mobile Node Project Presentation**: Fernando Gros
- **New pilot proposal: Guifi.net structure for UPF**: Pedro Vilchez
- **BuB C4EU web page status**: Adriana Mart

## VI. Open mailing list

To coordinate the Bottom Up Broadband efforts we use a mailing list. The mailing list runs on free software and it is provided by the guifi.net community network. It is an open mailing list and anyone can subscribe or check the archived mails following this link “https://lists.guifi.net/listinfo/bub”.

We have received several external subscriptions from people that is interested in the general idea of BuB. It is a convenient tool for the daily work and to keep track of progress between meetings and workshops. It is particularly useful for people interested in BuB that cannot attend the meetings or events, as it provides a means for collaboration and contribution that is not tight to particular schedules or locations.

The list has been growing since its creation, and currently has 30 subscribed members and around 40 emails per month. This is the list of registered email addresses:

- aandreuisabal at gmail.com
- adriana.guifinet at gmail.com
- albert.armisen at esade.edu
- albert.domingo at upf.edu
- alberthoms at gmail.com
- boris.bellalta at upf.edu

- d.arena at caspur.it
- efrain.foglia at uvic.cat
- fernandogrgo at gmail.com
- g.calcerano at provincia.roma.it
- ignacioalberto.justel01 at estudiant.upf.edu
- ivonne at waag.org
- jaume.barcelo at upf.edu
- javier.gonzalez at upf.edu
- joranbel at gmail.com
- josepjc at gmail.com
- laura.castellucci at esade.edu
- lluis.dalmau at guifi.net
- m.goretti at caspur.it
- melissajolee at gmail.com
- miquel.oliver at upf.edu
- nemesis at ninux.org
- pau.escrich at guifi.net
- pederindi at gmail.com
- ramon.roca at guifi.net
- roger.baig at guifi.net
- sanabriarusso at gmail.com
- xevi.nadal at guifi.net
- beatrix373 at gmail.com
- tomasdiez at iaac.net

The combination of the active mailing list and periodical workshops makes it possible to sustain an intense working effort over long periods of time. Besides, it helps in building a community of contributors which is one of the goals of the project. We are very grateful to all those people which, despite not being formally in the project, contribute in making it a success.

## VII. Web

Both *Commons for Europe* and *Code for Europe* have a webpage that present themselves to the world. For obvious reasons having a website is good and BuB should have one too. More people could be reached hence this kind of networks could become more popular.

This website should have a brief description explaining our goal as well as giving access to all the documents we work on, such as presentations, deliverables, etc. A link to the mailing list would be adequate since individuals could be interested in becoming a part of this project.

This website shall not be just a presentation letter but also have advanced functionalities for the parts already involved in it.

## VIII. International Forums

### A. Battlemesh

Two people from the Commons for Europe project participated in Battlemesh v5 (Athens, March 26th to April 1st) and presented the project there. Battlemesh is a yearly meeting of wireless community networks enthusiasts in which the latest routing protocols are tested. Battlemesh is attended by community networks leaders, and therefore it is the right place to get in touch with such communities.

### B. 18th EUNICE Conference on Information and Communications Technologies

Albert Domingo presented the paper “White Spaces in UHF Band: Catalonia Case Study and Impact of the Digital Divident” [3], combining information regarding white spaces availability and population density.

### C. EC Flarch group workshop

The European Commission Future Internet Architecture group organized a workshop in Brussels to discuss the design principles of the Future Internet Architecture. The interest was in transformative evolution, to address challenges that could not be solved

by incremental infrastructure investment or incremental evolution of the protocols. Albert Domingo attended the workshop and presented the paper “Bottom-up Broadband Initiatives in the Commons for Europe Project” [4].

*D. International Summit of Wireless Community Networks*

The International Summit of Wireless Community Networks was performed in Barcelona between 4 and 7 of October 2012. The summit was a particular place where the participants could share your diverse knowledge and strategies about new technology infrastructure needs and formulating policy reforms to improve community wireless network. Three partners of our consortium participated in the event.

Ramon Roca spoke in the opening event, but also participated during all summit, first he informed all participants about the advantage of BuB business model against the traditional model - explaining why the BuB business model is better and he ended in agreement that infrastructure as a commons [5] can be much more efficient, Ramon also explained the successful completion of the second phase of BuB fiber deployment in Gurb.

Miquel Oliver (as representative of Univesitat Pompeu Fabra, participant in the Bottom-up Broadband project) talked about the C4EU project, and especially about the BuB branch of the project. And Federico Capoano, from Caspur, presented about the need of creating accessible documentation for non-geeks.

*E. 5th International Workshop on Multiple Access Communications*

This workshop took place in Maynooth (Ireland) on the 19th and 20th of November. The technical program comprised talks and demonstrations of the latest advancements of the field by academy and industry leading institutions.

Luis Sanabria presented the demo “Spectrum Sensing with USRP-E110” to detect the availability of white spaces in the band used for SuperWifi communications [6].

Fig. 1. Demo “Spectrum Sensing with USRP-E110” (UPF) and demo “Network Coding as a WiMAX Link Reliability Mechanism: an Experimental Demonstration” (MIT). Hamilton Institute, NUIM. Photo by Cristina Cano.

## IX. Conclusion

This report covers the training and networking efforts in the BuB4EU branch of the Commons for Europe project. As fellows are actively participating in this project, it is of paramount importance to provide them with help and guidance to make sure that they can accomplish their goals. Each student is assigned both an experienced BuB mentor and an academic advisor, which have complementing roles.

As we are interested in bottom up initiatives, it is very important to build a community with people and links that span beyond the consortium. To this end, we maintain an open mailing list and organize open workshops to attract new participants interested in the BuB concept.

## Acknowledgment

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## REFERENCES

[1] L. Lamport, *LaTeX: A Document Preparation System*. pub-AW, 1994, vol. 14.

[2] S. Chacon, J. Hamano, and S. Pearce, *Pro Git*. Apress, 2009, vol. 288.

[3] A. Domingo, B. Bellalta, and M. Oliver, "White spaces in uhf band: Catalonia case study and impact of the digital dividend," in *Information and Communication Technologies*, ser. Lecture Notes in Computer Science, R. Szab and A. Vidcs, Eds. Springer Berlin Heidelberg, 2012, vol. 7479, pp. 33–40. [Online]. Available: http://dx.doi.org/10.1007/978-3-642-32808-4_4

[4] J. Barcelo, B. Bellalta, R. Baig, R. Roca, A. Domingo, L. Sanabria, C. Cano, and M. Oliver, "Bottom-up Broadband Initiatives in the Commons for Europe Project," *arXiv preprint arXiv:1207.1031*, 2012.

[5] M. Oliver, J. Zuidweg, and M. Batikas, "Wireless Commons Against the Digital Divide," in *IEEE International Symposium on Technology and Society ISTAS*, New South Wales, Australia, 06 2010.

[6] L. Sanabria-Russo, J. Barcelo, A. Domingo, and B. Bellalta, "Spectrum Sensing with USRP-E110," in *Multiple Access Communications*, ser. Lecture Notes in Computer Science, B. Bellalta, A. Vinel, M. Jonsson, J. Barcelo, R. Maslennikov, P. Chatzimisios, and D. Malone, Eds. Springer Berlin Heidelberg, 2012, pp. 79–84. [Online]. Available: http://dx.doi.org/10.1007/978-3-642-34976-8_8