Bottom-up Broadband Pilots in Europe (C4EU 5.1.3: Report on Selection of Opportunities and Projects - c)

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Abstract

This report covers the second call for pilots of the Bottom-up Broadband initiative, the consensus process that led to the definition of the pilots to be executed, and also the teams and pilot charters of the pilots that will be executed.

Index Terms

Bottom-up-Broadband (BuB), wifi, fiber, sensor networks, BuB pilots

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I. Introduction

This report presents the advancements in the pilots carried out in the BuB4EU branch of the C4EU European project. Section II explains that it is a collaborative document and how to contribute. The agreed selection criteria that were used to choose the pilots are described in III. Sections IV, V, VI, VII and VIII introduce the pilots considered in the project. The concluding remarks are offered in Section IX.

The appendices contain the project charters prepared by the fellows for each of the pilots.

This second report on selection of opportunities and projects follows the earlier works [**?**] and [**?**], which contained detailed information about all the pilot proposals that had been presented in response to the first call for pilots.

II. About this document

This report has been produced using open source tools such as LaTeX [**?**] and *git* [**?**]. 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 or her 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. Selection Criteria and Pilot Selection

Out of the twelve pilot proposals that were collected in the first call for pilots [**?**], we selected five of them to be considered within the C4EU project. The pilots we are focusing on are the Open Sensor Network pilot (OSN), the Free Europe WiFi pilot (FEW), the Fiber From The X pilot (FFTx), the Northern Quarter Network pilot (NQN) and the Mobile Node pilot (MON).

First we introduce the criteria that was used for the selection and then we describe how the selected pilots meet those criteria.

A. Selection Criteria

The number of pilots proposals received in response to the call for pilots [**?**] was large and it was not possible to execute them all with the available resources. The decision was to make a selection of the most representative and relevant, and focus the efforts on them.

As described in the report “Principles and early results (C4EU 5.6.1: Evaluation of Results and Best Practices -a)”, we are interested in pilots that serve the needs of the people. For this reason, we were interested in pilots with a committed community of backers.

As we consider three different technologies in the pilot (sensors, fiber and WiFi/SuperWiFi), it was important that the three of them were represented in the selected pilots.

Finally, it was important that the pilot was easy to replicate in different cities across Europe.

B. Alignment of the selected pilots and the selection criteria

A first selection criterion was the existence of a community that backed the pilot. For the Open Sensor Network pilot, it exists a closely related initiative called Smart Citizen

(www.smartcitizen.me) that has rised around 18,000 Euro in crowdfunding, and therefore we believe there is interest from the part of the citizenship for these kind of technologies.

The ProvinciaWiFi solution in Italy has a huge user base that gives credit to the model. For this reason we believe that the extension of the model to other cities and countries may enjoy the same success.

The FFTx pilot provides bottom-up-broadband to only a dozen of families right now. However, as this bandwidth is distributed using the wireless community network, it benefits a considerably larger number of users. The fiber connections are so fast (1 Gbps) that the owners are happy to share it with others.

Another criterion for selection has been the diversity of technologies. Tab. I taken from [**?**] summarizes the advantages and shortcoming of the different technologies. At this stage of the project, SuperWifi is not yet mature enough to serve the goals of the BuB initiatives, as it is still in a research stage.

Regarding the distribution of the pilots with respect to technologies, there is one pilot for sensor nodes (OSN), two involving WiFi (NQN, FEW), two involving fibre (FFTx, NQN), and one involving a mobile mesh node (MON). There are already some of the pilots that mix different technologies and the vision is that in the future, as they evolve, the different pilots and technologies can be seamless combined as in Fig. 1.

We have also chosen pilots that can cover multiple cities in Europe. With the exception of the pilots involving fiber (NQN, FFTx) which by its very nature are localized, the others can be tested and demonstrated in any of the participating cities.

C. Resources devoted to selected pilots

Each of the selected pilots receives the backing of a fellow. Commons for Europe also covers the trips of the fellow for training purposes and for developing the pilot. Finally, the project also covers the hardware needed for development and demonstration purposes. The estimated value of the package devoted to each pilot is 4,000 Euro.

TABLE I
TECHNOLOGIES UNDER CONSIDERATION [**?**]

Technology	Characteristics
Fibre Optics	Mature technology, wired, very high throughput, relatively expensive, does not create nor suffer interference, reliable.
WiFi	Mature technology, wireless, high throughput, more economic than fibre, limited by interference and spectrum saturation.
Sensors	New technology, wireless, low throughput (for battery-powered devices), open data.
Super-WiFi	Future emerging technology, wireless, medium throughput, longer propagation distance and better penetration compared to WiFi, co-existence with incumbent networks.

IV. PILOT CHARTER: MESH NETWORKS OF PEOPLE

V. CONCLUSION

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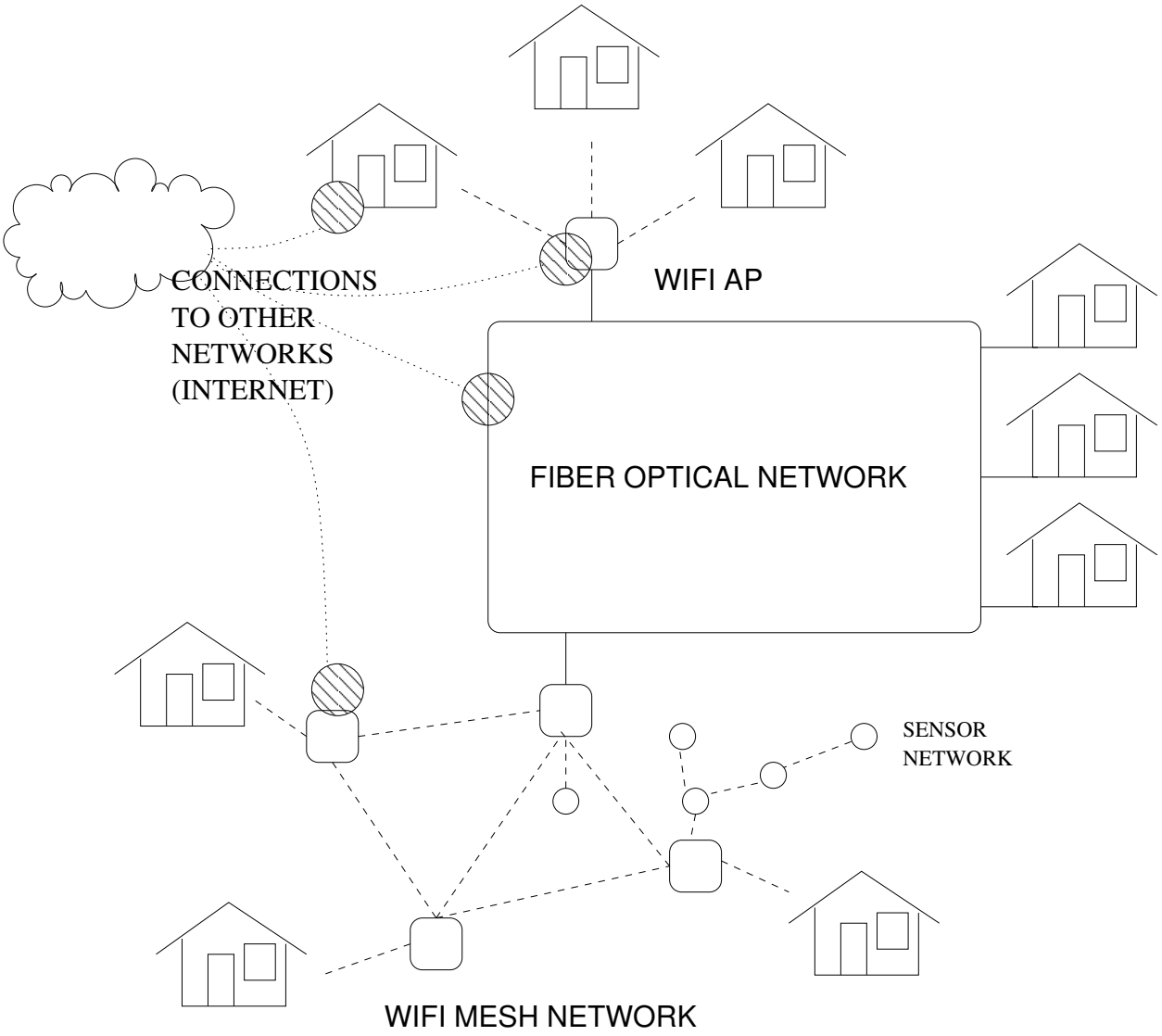

Fig. 1. A hybrid BuB deployment combining different technologies.