

# Fiber From The Farm (FFTF)

## *(C4EU 5.4.1: Report on Pilots on Fiber Deployment -a)*

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### **Abstract**

Optical Fiber is certainly the best technology available for data transmission in terms bandwidth, latency, reliability and stability. As installation costs decrease, it is expanding beyond its original realm and major application in the carrier backbone and is moving into the local loop. Following this trend community networks are gradually adopting it. The present technical report accounts for progress made during the first year of optical fiber pilots in the Commons4Europe project.

### **Index Terms**

Bottom-up-Broadband (BuB), Community Networks (CNs), Fiber From The Farm (FFTF/FFTx), Optical Fiber (OF), Points-of-Presence (POPs)

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## I. INTRODUCTION

Despite the scepticism of some people about the capacity of community networks (CNs) to incorporate the optical fiber (OF) technology in guifi.net there are many on-going initiatives<sup>1</sup> to do so. The fact that some of these projects are already in the stage of being fully operational, bringing of Gbs/s broadband Internet access to places (such as rural areas) where the traditional telcos are currently offering connections of few Mbs/s at most, proves that it is totally feasible to deploy and operate OF infrastructure according to the CNs principals following a bottom-up approach, thus that the aforementioned scepticism is totally unfounded.

The present document reports the presence of OF in guifi.net, paying special attention to the three projects that have been selected as FO pilots [1] in the Commons4Europe project and how they have progressed over the first year. The Gurb<sup>2</sup> project has been selected as a pilot because it was the first FO project started and the most advanced one.. The Vic<sup>3</sup> pilot has been selected because it is a case of OF in an urban area. Finally Rubí<sup>4</sup> has been selected as a case where the project at the moment is blocked.

TODO explain funny terms such Bottom-up Broadband, FFTF,

All this has end up in a cross-fertilization

It is also where guifi.net project was started in 2003. Most of the houses have WiFi access to guifi.net network since long time ago

## II. ABOUT THIS DOCUMENT

This report has been produced using open source tools such as  $\LaTeX$  [2] and *git* [3].  $\LaTeX$  is widely used in academia to prepare print-class documents. It automatically takes

<sup>1</sup>In the guifi.net jargon each of these initiatives is called a *project*

<sup>2</sup>Gurb, population 2.538, density 49,19 hab/km<sup>2</sup>, located in the *comarca* of Osona, Catalonia. It is a typical Catalan rural village formed by a few streets and many disseminated farms, some of them rather isolated.

<sup>3</sup>Vic, population 40.900, density 1.336,60 hab/km<sup>2</sup>, the capital of the *comarca* of Osona, Catalonia. It is a typical middle size Catalan city of the Catalan rural areas where most of the population lives in the urban area with several industrial parks.

<sup>4</sup>Vic, population 73.979, density 2.290,37 hab/km<sup>2</sup>, located in the *comarca* of Vallès Occidental, Catalonia. It is a typical middle size Catalan city of the Barcelona surroundings where most of the population lives in the urban with several industrial parks.

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  $\text{\LaTeX}$  and *github* can contribute to this document. The first 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. DEPLOYMENTS

TODO Bla (see Figure ??) bla

#### A. Pilot's deployments

- 1) Gurb:
- 2) Vic:
- 3) Rubí:

#### B. Other deployments

### IV. POINTS-OF-PRESENCE (POPs)

A Point-Of-Presence (POP) is an artificial demarcation point or interface point between communicating entities. In our case we are referring to optical fiber interconnection

points. From 2010 until now the guifi.net community has raised six points of presence over the Catalan territory. This POPs are following the network model of freedom and neutrality specified in the XOLN?? licence. Thus anyone is able to connect to them but always respecting the same conditions. From a general perspective guifi.net community is building a set of neutral exchange points, leaving the infrastructure available to the individuals, associations or either companies. Figure 1 shows the fiber network map of guifi.net POPs (not all of them).

The current guifi.net POPs are managed, maintained and also economically sustained for the community. To interconnect all of them it is need to use third party infrastructure. The FFTH projects are able to deploy some kilometres of optical fiber but not hundreds or even thousands.

In Catalonia there exist a set of deployed fibers which are owned by the Catalan government, available to any entity and rented for a regularized price. Most of the guifi.net POPs are connected to such network to interchange data between them. Figure 2 shows a slice of the network fiber map provided by the government.

#### *A. Pilot's POPs*

1) *Gurb*: Gurb is a small village in a rural area of the geographical center of Catalonia. Back in 2004 the first guifi.net community was born here. Probably because of that Gurb is nowadays one of the places where the bottom-up broadband model has more influence. As seen in section ?? the community users deployed some optical fiber kilometres to reach the government infrastructure and connect with other POPs. It is a very important point-of-presence because it allows a small data center provided and maintained by the community. There are even ISP companies connected to such POP following and using the open-network model to provide Internet connectivity to end users.

2) *Vic*: VIC HISTORY ABOUT KIDS AND FORCED WORKD

#### *B. Other POPs*

Other points-of-present not directly related with this project are:

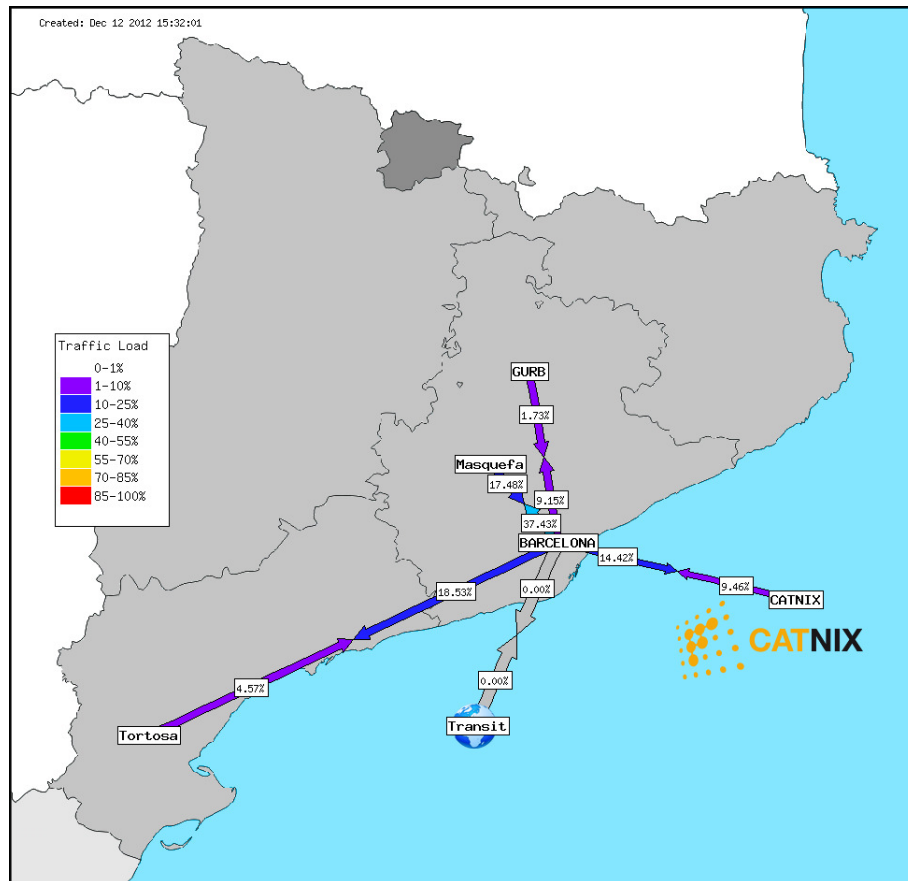


Fig. 1. Guifi.net fiber POPs network map

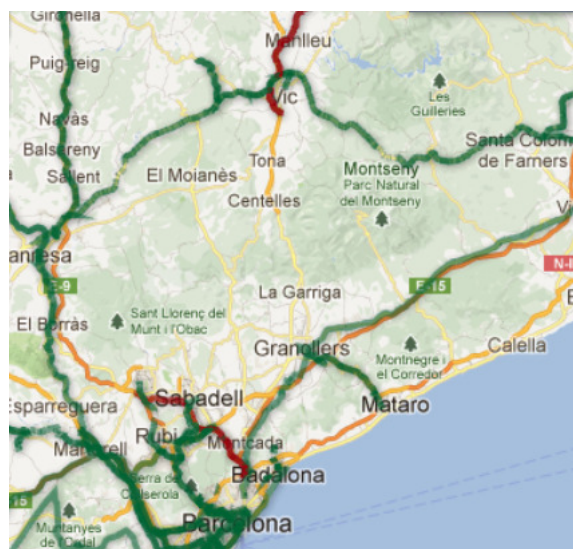


Fig. 2. Available regularized fiber

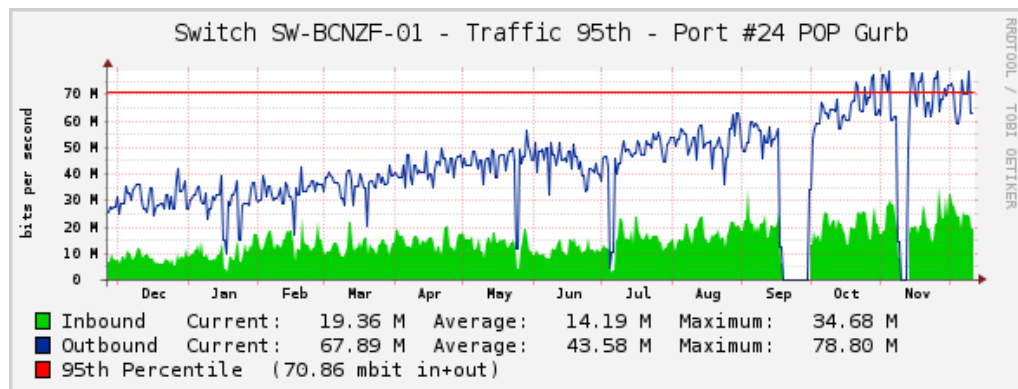


Fig. 3. Gurb's POP network load (year)

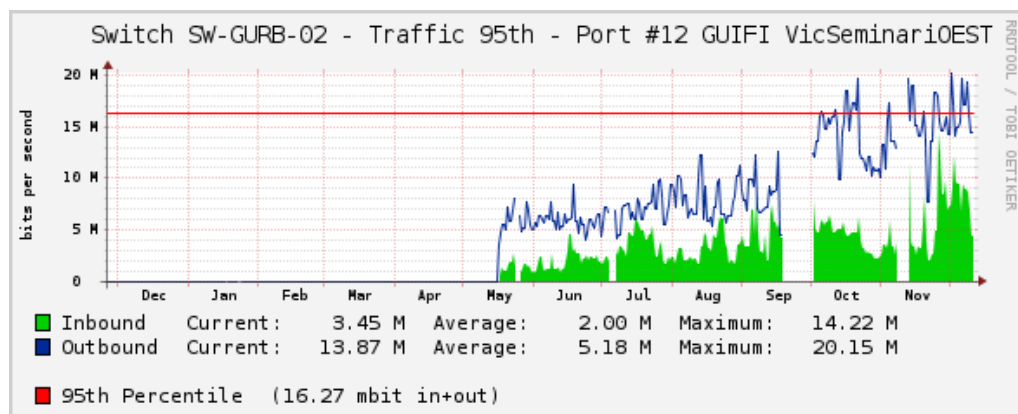


Fig. 4. Vic's POP network load (year)

- Masquefa: blablabla IGLU?
- Tortosa: It is a city placed on the sud of Catalonia. The guifi.net users started a goverment's funded project named OpenFPnet<sup>5</sup> which tries to create an open and neutral fiber backbone around the zone and the surrounding villages. Starting from that point they opened a POP to connect with the rest of guifi.net infraestructure. Currently this point-of-presence is economically maintained by some community users grouped in associations and some company with interests of use such fiber.
- Barcelona: The Catalonia's capital POP is the one placed in the Internet exchange point CATNIX.

<sup>5</sup><http://openfpnet.guifi.net>



1) *CATNIX*: CATNIX<sup>6</sup> is the name of the internet exchange point (IX) of Catalonia. It is a physical infrastructure provided by the government to leave the network operators exchange their information and connect their networks (autonomous systems).

All guifi.net POPs terminate to such infrastructure (as can be shown in figure 1) where all of them connect together to become part of the main community network.

Guifi.net Foundation operates its own backbone infrastructure using the ASN 49835 (Autonomous System Number). An open peering policy is followed to establish peering sessions with all potential partners. The Foundation is part of the CATNIX, so it is also possible to exchange data with other ISP and rent Internet uplink directly to an international carrier. Right now there is one symmetric Internet gigabit available. This is probably the most important POP of the current guifi.net network infrastructure.

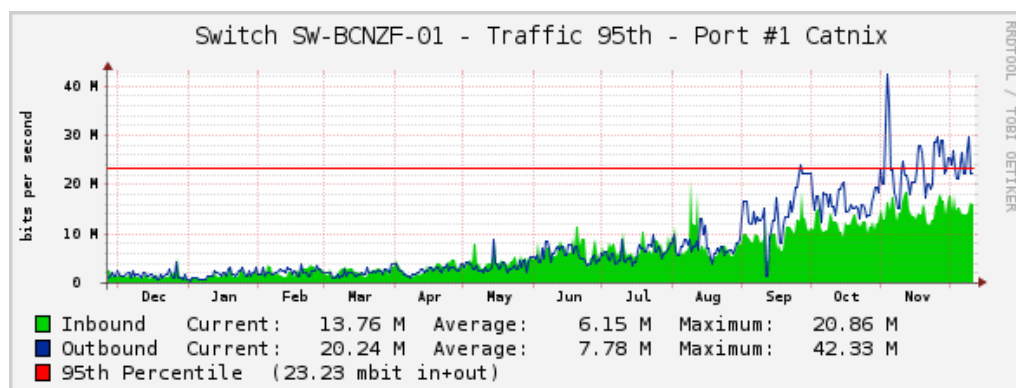


Fig. 5. CATNIX's POP network load (year)

2) *Tortosa*:

3) *Masquefa*:

## V. RESULTS

TODO table summarising results

\* several deployments and POPs in several environments: rural, sub-urban, urban, industrial

<sup>6</sup><http://www.catnix.net>

## VI. CONCLUSION

The results of the first year of fiber deployment are outstanding. Firstly, over 60 fiber connections have been made in 2012 (60 farms in the Gurb pilot), and 5 non-residential buildings in the Vic pilot). Secondly, 3 Points-Of-Presence (POPs) have been activated in 2012 and at least 4 expected for 2013, one of a selected pilots (Vic pilot). Thirdly, the activity is not restricted to the selected pilots since many other initiatives are going-on in parallel, some of them very autonomous and barely known by the guifi.net Foundation. Finally, the future is very promising since the model proves to be self-sustainable.

This document is publicly available as a common resource to be shared by the community.

## ACKNOWLEDGMENT

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