FUTURE INTERNET TESTBEDS
EXPERIMENTATION BETWEEN
BRAZIL AND EUROPE

Grant Agreement No.: 288356

FIBRE-EU

Future Internet testbeds/experimentation between BRazil and Europe – EU

Instrument**:** ***Collaborative Project***
Thematic Priority: ***[ICT-2011.10.1 EU-Brazil] Research and Development cooperation, topic c) Future Internet – experimental facilities***

D6.5: Final report on dissemination activities

Authors:WP6
Revised by: Carlos Bermudo, SebastiàSallent
Due date of the deliverable: Month 38
Actual submission date: 22/8/2014
Start date of project: June 1st 2011 Duration: 38 months
Version: v.0.1

Project co-funded by the European Commission in the 7th Framework Programme (2007-2013)		
Dissemination Level		
PU	Public	✓
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Abstract

This document presents the dissemination actions performed after the period reported in D6.4 (Dissemination Report for Year 2), i.e., from October 2013 (M29) to July 2014 (M38). Information is organized according to each tasks of WP6. The actions were driven by the updated dissemination plan (D6.3) and the latest Intermediate Review report analysis.

TABLE OF CONTENTS

1 Acronyms

CSBC	Brazilian Computer Society Congress
D6.3	"Updated Dissemination Plan" deliverable, issued by WP6 on M17
DoW	Description of Work
EU	European Union
FI	Future Internet
FIA	Future Internet Assembly
FIRE	Future Internet Research and Experimentation
GENI	Global Environment for Network Innovations
MCTI	Brazilian Ministry of Science, Technology and Innovation
MoU	Memorandum of Understanding
PoP	Point of Presence
QPR	Quality Progress Report
RedCLARA	Cooperación Latino Americana de Redes Avanzadas (Latin American Cooperation of Advanced Networks)
SBRC	Brazilian Symposium on Computer Networks and Distributed Systems
TERENA	Trans-European Research and Education Networking Association
TNC	TERENA Networking Conference
WP6	Work Package for Dissemination and Collaboration
WPEIF	Workshop on Future Internet Research and Experimentation

2 Reference Documents

- FIBRE's Description of Work (available under request)
- D6.1 – Dissemination Plan[1]
- 1st Partial Review: Report Analysis and Actions (available under request)
- D6.3 – Updated Dissemination Plan[2]
- D1.3.1 – Periodic Activity Report for year 2 (available under request)
- AR2. Intermediate Review: Report Analysis and Actions (available under request)

[1]http://www.fibre-ict.eu/images/stories/deliverables/fibre_d6.1.pdf
[2]http://www.fibre-ict.eu/images/stories/deliverables/fibre_d6.3_disseminationplan_v0.4.pdf

3 Printed and Electronic Dissemination Material

3.1 Posters and leaflets

Two new posters and 1 new leaflet were produced in the reported period. Altogether, 16 posters were created during the project lifetime.

All project posters and leaflets can be consulted and downloaded at: http://www.fibre-ict.eu/index.php/dissemination/posters

As requested in the latest intermediate review report, 3 new leaflets describing each pilot use case separately are under preparation. As of the date of publishing this deliverable only the leaflet for Use Case 1 (Seamless mobility) was concluded (see Figure 1).

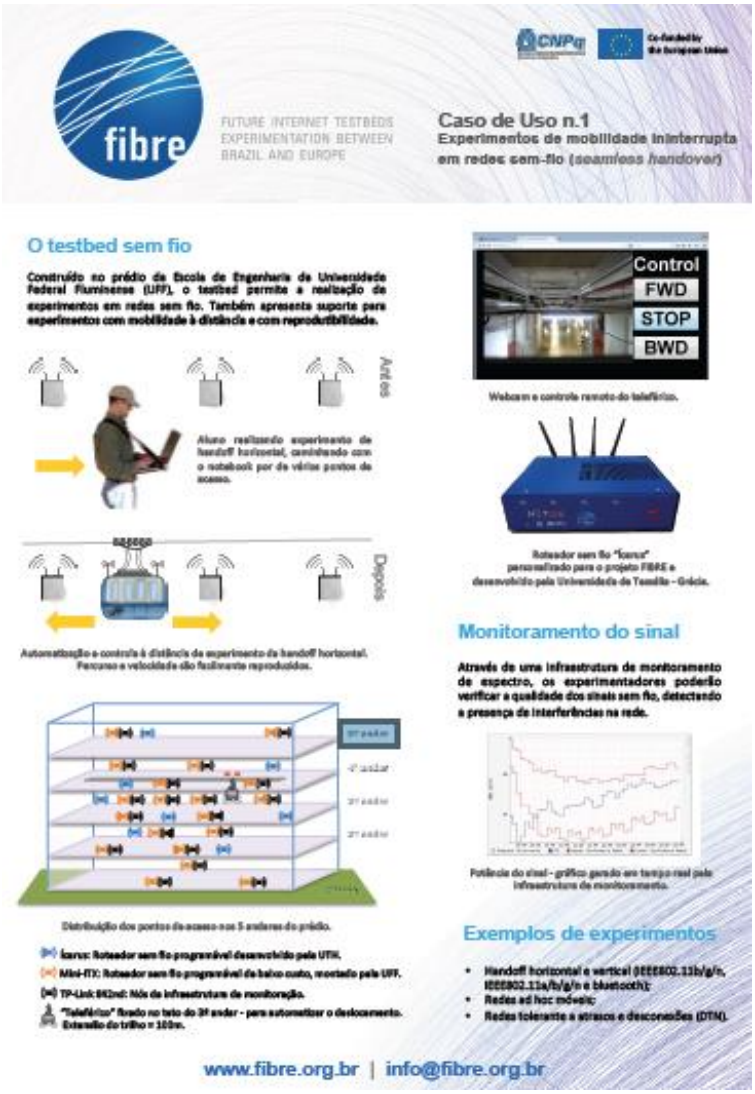

Figure 1: Leaflet for Use Case 1 – printable A4 size, Portuguese version

3.2 Video animation

The project used one of the CNPq grants to hire an undergraduate student from a Visual Arts course. However, it was an unsuccessful experience, as we learned that it is hard to keep students from the Design and Journalism field for many months. For the professional curriculum of this type of student, it's worth working as an intern in a Design studio instead of having a scientific-technical grant from CNPq.

The two Design students hired by the project abandoned the animation work before concluding it.

To conclude the FIBRE animation video in the remaining 2 months of the project period, we used some remaining FIBRE-BR funds to hire illustration services from a freelance professional designer.

Due to the time and budget constraints, we decided to create a comic strip instead of a video animation. The professional designer is illustrating the storyboard presented in D6.4. Once the storyboard illustration is concluded, each illustration will be put together as a printed comic strip. We also plan to use the illustrations to create a simple animation, in a slide-show style.

We present below some illustrations concluded so far.

Figure 2: illustrations to compose a comic strip and animation – work in progress

3.3 Social Media

To increase the reach of the project website, we created FIBRE account in five different social media platforms: Facebook, Twitter, YouTube, SlideShare and Wikipedia. The table below highlights the page view statistics in each platform by the date of 31st July 2014.

Web Social Platform	Statistics Highlights
Facebook	136 total page "Likes" 1,011 people reached by the top post (about WP4 face-to-face meeting, posted on 9/September 2013)
Twitter	51 followers
YouTube	All posted videos have gathered 1,055 visualizations in total
SlideShare	16 followers All 26 posted presentations have gathered 12,009 visualizations in total
Wikipedia	English version: 346 page views in the last 90 days. Portuguese version: 160 page views in the last 90 days.

4 Organization of workshops, tutorials and other events

4.1 Course: Introducing OpenFlow for Network Innovation

RNP promotes annually a Training Seminar targeted to Network Engineers and IT technicians, including its PoP operators. The Seminar event – called SCI (http://portal.rnp.br/web/sci2013/) – is composed of a selection of short courses lasting 20 hours each. Usually it is organized as 4h daily classes during 1 week.

In the 19th SCI, held in Fortaleza, Brazil, from 21 to 25 October 2013, we invited DATACOM industry to present an OpenFlow course using the FIBRE Platform to perform part of the hands-on activities.

The course was entitled "Introducing OpenFlow for Network Innovation" and was very important to train the RNP PoP operators from the PoPs that are hosting a FIBREnet node.

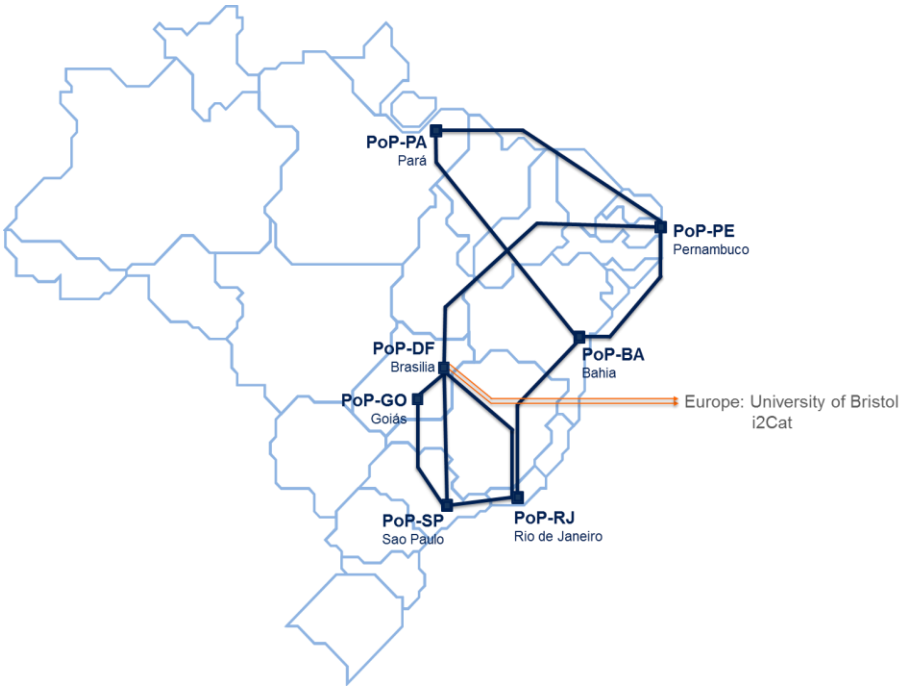

Figure 3: RNP PoPs hosting the DATACOM OpenFlow switches that enable the FIBREnet

4.2 Second open workshop

The second open workshop was successfully organized in Barcelona, in the premises of UPC, on 5th November 2013. The agenda included opening speeches by the UPC dean and the General Director of ICT in Generalitat Catalunya. The keynote speech was given by the OFELIA project coordinator Hagen Woesner. FIBRE members explained the project activities to the audience, along with the presentation of three demos. The last session involved a discussion among industry representatives (Telefonica, Colt) and representatives from academia working in FI research (Universidad del País Vasco, Spain).

Figure 4: Opening speech of UPC dean in 2nd workshop

4.3 Third open workshop

The 3rd (and final) FIBRE Workshop was held in Florianopolis, Brazil, on Friday 3rd May, in conjunction with WPEIF (Workshop on Future Internet Research and Experimentation) - one of the most popular workshops inside SBRC. The agenda of the workshop is available online at: http://indico.rnp.br/conferenceTimeTable.py?confId=189#20140509

Figure 5: 3rd FIBRE workshop in conjunction with WPEIF

Figure 6: Group photo at 3rd FIBRE workshop

5 Collaboration / Participation in external events

5.1 ICT 2013

FIBRE participated in ICT 2013 in Vilnius (6-11 November) with a project poster and three demos. ICT 2013 was a very big and successful event, attracting more than 5000 attendants. It was a great opportunity to let people know about FIBRE project and the capabilities offered by the federated experimental facility. An updated poster, an updated set of leaflets and two demos were prepared for this event.

Figure 7: FIBRE booth at ICT 2013 in Vilnius

5.2 FIA 2014

FIBRE was exhibited in the Demo area of Future Internet Assembly in Athens (18-20 March). A demo of Bandwidth on Demand services provisioning through an OpenFlow-based infrastructure was prepared for the occasion (essentially, a presentation of the project's Pilot Use Case 3).

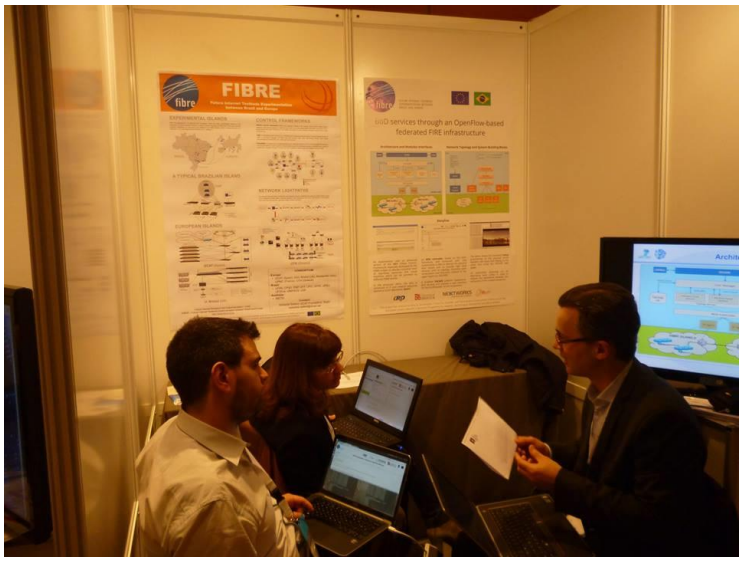

Figure 8: FIBRE partners discussing at the project booth in FIA 2014

5.3 SBRC 2014

The 32nd edition of SBRC (Brazilian Symposium on Computer Networks and Distributed Systems), held in Florianopolis (Brazil) from 5-9 May 2014, featured the official launching of FIBRE testbed to the research community, i.e., we are now welcoming experimenters from outside the project members.

Many project members worked shifts at the FIBRE exhibition booth, starting Monday through Thursday, informing visitors about the project activities and inviting them to create accounts.

Figure 9: FIBRE Exhibition booth at SBRC 2014

5.4 TNC 2014

The TERENA Networking Conference (TNC) is the largest and most prestigious European research networking conference, with more than 650 participants attending

this annual event. TNC brings together decision makers, managers, networking and collaboration specialists, and identity and access management experts from all major European networking and research organisations, universities, worldwide sister institutions, as well as industry representatives.

The text above was extracted from the TERENA website to explain the scope of TNC 2014, which was held in Dublin, Ireland, from 19 to 22 May.

A FIBRE paper was selected to be presented in the session named "From network architecture to testbed". The presentation can be watched from TERENA's Video Archive (https://tnc2014.terena.org/web/media/archive/4A).

In addition to the project presentation, FIBRE was also present in the Exhibition area. OCF live demos were performed in the FIBRE booth.

Figure 10: FIBRE presentation and booth at TNC 2014

5.5 CSBC 2014

The Brazilian Computer Society Congress (CSBC) is an event promoted annually by the Brazilian Computer Society (SBC). In 2004, the 23th edition of the congress hosted the "II EU-Brazil Cooperation Workshop in ICT - EUBR 2014", with the participation of all projects funded by the European Union and CNPq under the first two EU-Brazil Coordinated Calls.

In addition, to highlight the project outcomes in a presentation given by the project coordinators, a live demonstration was performed in the exhibition area.

Figure 11: FIBRE poster and live demo in the exhibition area

Figure 12: The project coordinators presenting FIBRE at CSBC 2014

6 Publications

Below we list the publications during the period October 2013 – July 2014 covered by the current deliverable.

Book Chapters

Rothenbeg, C. E. ; Salvador, M. ; Marques, D. ; Lucena, S. ; Salvatti, J. J. ; Farias, Fernando Nazareno ; Cerqueira, E. ; Abelem, A. J. G. "Hybrid Networking Towards a Software Defined Era". In: Fei Hu. (Org.). Network Innovation through OpenFlow and SDN: Principles and Design. 1ed. New York - USA: CRC Press, 2014, v. 1, p. 153-198.

Journal Publications

Channegowda, M.; Nejabati, R.; Simeonidou, D., "Software-defined optical networks technology and infrastructure: Enabling software-defined optical network operations [invited]", Optical Communications and Networking, IEEE/OSA Journal of, vol.5, no.10, pp. A274,A282, October 2013.

Conference Publications

K. Choumas, N. Makris, T. Korakis, L. Tassiulas and M. Ott, "Exploiting Openflow Resources towards a CCLAN", in the proceedings of EWSDN, Berlin, Germany, October 2013.

Ishimori, A. N.; Farias, Fernando Nazareno Nascimento; Cerqueira, E. C.; Abelem, Antonio. "Control of Multiple Packet Schedulers for Improving QoS on OpenFlow/SDN Networking". In: The Second European Workshop on Software Defined Networks (EWSDN 2013), 2013, Berlin - Germany. Proceedings of the Second European Workshop on Software Defined Networks. New York: Editor IEEE. v. 1. p. 34-42.

Rodrigues, J. J.; Farias, Fernando Nazareno ; Abelém, A. J. G. "An Algorithm for managing and controlling loops at link layer on Software Defined Networks". In: International Workshop on Advances in ICT Infrastructures and Services, 2013, Morro de São Paulo - BA. Proceedings of International Workshop on Advances in ICT Infrastructures and Services. Paris - France., December 2013. v. 1. p. 12-16.

Pinheiro, R.; Pinheiro, B. A.; Abelém, A. J. G. "A Strategy for Distributing and Managing Software Defined Network Applications". In: International Workshop ADVANCE '2013, December 2013, Morro de São Paulo - BA. Proceedings of International Workshop on ADVANCEs in ICT Infrastructures and Services. Paris - France, 2013. v. 1. p. 20-24.

Pinheiro, B. A.; Chaves, R.; Cerqueira, E. C. ; Abelém, A. J. G. "CIM-SDN: A Common Information Model extension for Software-Defined Networking". In: Global Communications Conference 2013 (The 5th IEEE International Workshop on Management of Emerging Networks and Services (IEEE MENS), 2013, Atlanta-USA. Proceedings of Global Communications Conference 2013. NY: Editor IEEE, 2013. v. 1. p. 34-40.

T. Vlachogiannis, M. Channegowda, S. Peng, R. Nejabati, D. Simeonidou, "Demonstration of Network Function Virtualization (NFV) Content Delivery using an SDN-enabled Optical Network", (University of Bristol), IEEE GLOBECOM, Atlanta, GA USA, December 2013.

I. Machado, L. Ciuffo, D. Marques, T. Salmito, M. Stanton, A. Abelem, J. Rezende, M. Salvador, S. Sallent, L. Bergesio, S. Fdida, M. Channegowda, L. Tassiulas and D. Giatsios, "Building an infrastructure for experimentation between Brazil and Europe to enhance research collaboration in future Internet", in proc. of TERENA Networking Conference, Dublin, Ireland, April 2014.

R. Pinheiro, B. A. Pinheiro, R. Esteves and A.J.G. Abelem, "RepoSDN: An Repository Organization and Coordination Method of Software Defined Networks Applications". In Network Operations and Management Symposium (NOMS), 2014 IEEE (ManFI), 2014, Krakow, Poland. Proceedings of Network Operations and Management Symposium (NOMS), 2014 IEEE (ManFI). New York - USA: IEEE Publisher, 2014. v. 1. p. 1-4.

The complete list of publications is available in the project website at: http://www.fibre-ict.eu/index.php/publications

By 31st July, FIBRE has an overall publication record of 10 journal/magazine papers, 26 conference papers, 6 M.Sc. Thesis and 6 undergraduate monographs. More MS.C theses are expected to be concluded by the end of the year. The list of publications in the project website will be updated as new FIBRE publications are accounted.

7 Metrics

In D1.3.1 "Periodic report for year 2", in response to the Project Interim Review, some measurable metrics were proposed to assess the dissemination impact:

1. Number of training courses using FIBRE as an educational tool;
2. Number of students enrolled in those courses;
3. Number of users (experimenters) registered to use the testbed;
4. Number of developers registered to program the testbed related software;
5. Number of projects and experiments that were executed in the testbed.

Additional metrics, committed in the DoW, includes:

6. Number of publications
7. Number of posters and leaflets
8. Number of training events
9. Number of workshops

In order to be able to measure part of the metrics listed above, we sent the survey presented in Annex I to all project members. The results, described below, will be used as a baseline to evaluate the testbed outreach in the next months.

7.1 Number of training curses using FIBRE as educational tool

The consortium adopted a cautious policy as far as opening the testbed for external users at its early stages is concerned. The rationale behind this approach is that unless all the tiny building blocks of the platform have been vigorously tested, unexpected failures might take place. This entails the risk of creating bad first impressions to users, which would discourage them from re-considering using the platform in the future.

As mentioned in D1.3.1, professors of computing networks will be addressed as the most important type of users, as they have the power to disseminate the usage of FI testbeds to the next generation of researchers. To do so, we started with the professors inside the project, asking them to test the platform with their students.

We counted **32** professors working in FIBRE (25 from Brazil and 7 from Europe), reaching **23** educational institutions. Most of the institution representatives are also professors in their universities, however there is a group of graduate students working in FIBRE and one in Europe that also teach computer networks in undergraduate courses and specialization courses.

In total, 20 professors from Brazil filled the survey. From this sample, we extracted the following statistics:

- The professors work in **53** different training courses (from undergrad to doctorate)
- Number of students reached in 2014: **716**
- Number of training courses currently using FIBRE: **4**

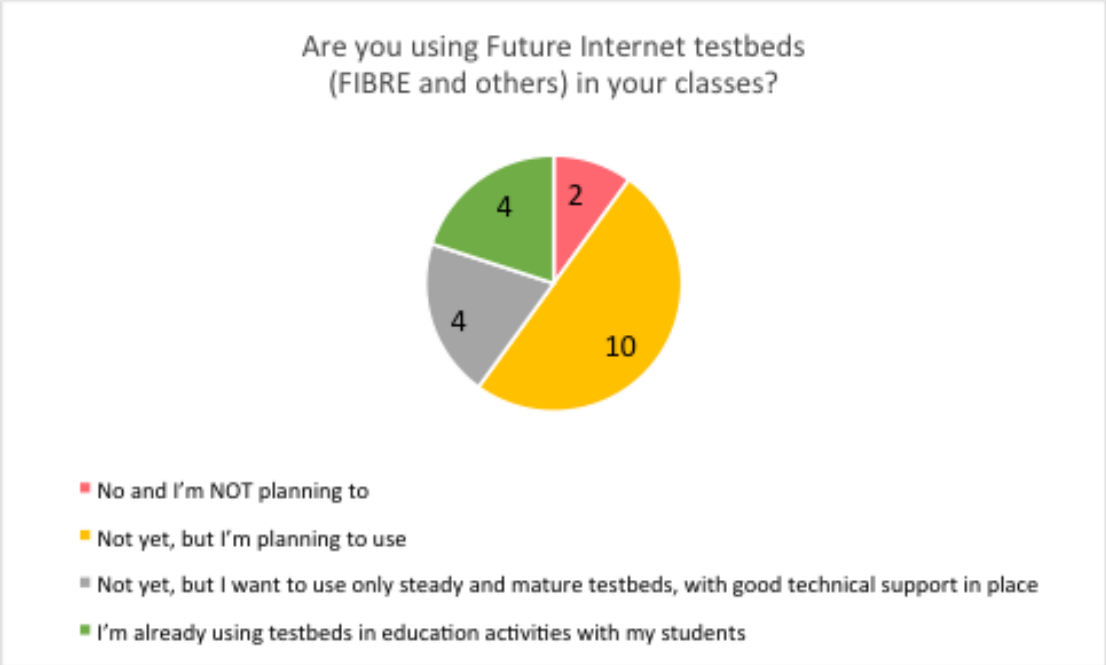

Figure 13: Professors using FI testbeds in the classroom

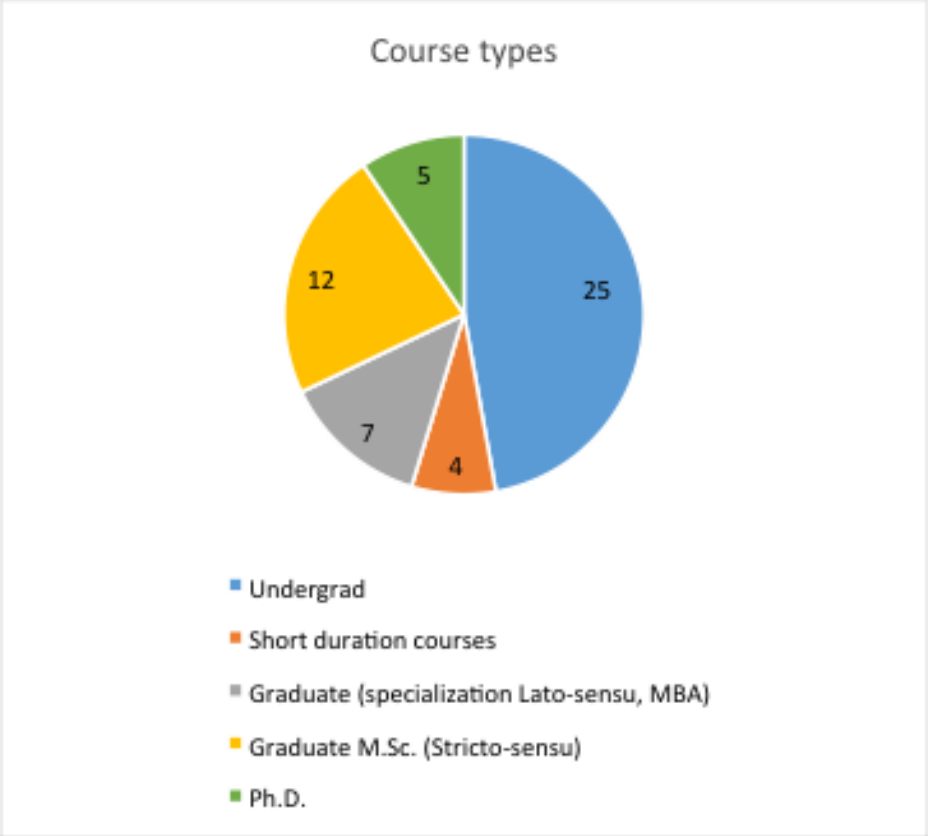

Figure 14: Course types

In Europe, NITOS, the testbed of UTH, is being used in networking courses for several years now. During the last academic year alone, it was used in four classes (1 exclusively undergraduate, 1 exclusively postgraduate and 2 offered to both undergraduate and postgraduate students). Approximately 150 students in total took these courses. Each course typically includes several (typically 6-8) experiments that are being conducted during the lab hours with the help of teaching assistants, as well as projects and assignments for which experimentation in the testbed is required.

7.2 Number of students enrolled in those courses

Considering only the 5 courses using FIBRE in education activities (Figure 13), the total number of students enrolled in 2014 is **140**. Usually professors are giving practical exercises to their students, asking them to run simple experiments. However, not all students are registered in the testbed.

A future work is to catalogue the experiments performed by the students in order to create a list of possible exercises to be performed in Computer Network classes. This material would be distributed to encourage other professors.

7.3 Number of users (experimenters) registered to use the testbed

Fetching the LDAP from the FIBRE NOC located in Brazil, we identified 30 users registered to use the testbed, which includes island operators. Fetching the numbers from EU OCF islands, **34** users are registered.

7.4 Number of developers registered to program the testbed related software

According to the survey, **13** FIBRE members identified themselves as CMF developers.

7.5 Number of projects and experiments that were executed in the testbed

According to the answers to the question 10 of the Survey (see Annex I), **153** experiments were executed by Brazilian users.

In Europe, as the EU testbeds existed before FIBRE started, the European islands have established some users independently of FIBRE. Nevertheless, we counted 52 slices created in the EU OCF islands by 31st July 2014.

7.6 Addition metrics committed in the DoW

The table below presents the measurable WP6 activities described in the DoW, comparing the pledged numbers with the actual delivered numbers.

Metric	Pledged number	Delivered number
Number of Workshops	3	3
Number of training events	2	3
Number of posters presenting the project	2	5 (Additionally, 11 posters present applications and experiments)
Number of leaflets	2	4 (More 3 leaflets to present each pilot use case will be finalized)

8 Presenting FIBRE to governmental representatives and industries

Concerning users from industry, we have decided to transform the Brazilian CPqD island in a catch-all island for industry partners. CPqD from Brazil and i2CAT from Europe will play the leading role in actively attracting industrial users. To start with, invited partners from the industry will be asked to use the platform and evaluate it. This decision was a very important accomplishment, as the usage policy from the Brazilian islands was previously preventing industries and SMEs to ask an account to use the platform.

Regarding the meetings with policy makers, FIBRE has been presented to:

- Closed meeting in Brasilia with representatives from MCTI, to discuss a possible agenda for Future Internet Research in Brazil - May 2012.
- AMERICAS ICT Forum – Brasilia, July 2013[3]
- General Director of ICT in *Generalitat de Catalunya* at 2nd open workshop in Barcelona (Nov. 2013).
- II EU-Brazil Cooperation Workshop in ICT - EUBR 2014, in conjunction with CSBC 2014.

No minimum number of this kind of activity was pledged in previous reports.

[3] http://www.americasportal.eu/content/second-ict-forum-brasilia

9 Deviations from the original workplan

Based on the DoW document, all WP6 foreseen activities were accomplished. However, additional activities and metrics were proposed throughout the project lifetime as a result from the intermediate project reviews, annual activity reports and updated Dissemination Plans.

The main deviation regards the production of a video animation. As explained in section 3.2, due to time and budget constraints we plan to deliver a simple "home made" animation, in a slideshow style. However, such a constraint led to the creation of an unforeseen dissemination material, which will be a comic strip.

The total number of Scientific Papers is still below the expectations. As explained in D1.5, we believe that he delay in opening the testbed to external experimenters affected the number of scientific publications, as most of the papers proposals were focused on explaining the testbed architecture and the FIBRE project itself. As a result, some submitted papers were rejected in some journals and peer-reviewed conferences, on the allegation of weak scientific impact. Nevertheless, we perceive an indirect scientific impact emanating from the involvement of many university professors in the project. Several Brazilian graduate and undergraduate students are using their work on WP2 as a case study for their B.Sc. and M.Sc. thesis.

The number of press releases about FIBRE is also below the amount pledged on D6.3. For what concerns the dissemination of the results of each FIBRE open Workshop, it was communicated in small reports in the FIBRE Website and Facebook page. In general, we adopted a cautious policy to avoid publicizing the testbed before all the tiny building blocks of the platform have been vigorously tested. The rationale behind this approach is to lower the risk of creating bad first impressions to users, which would discourage them from re-considering using the platform in the future. The dissemination of a press release announcing the readiness of the testbed to the general public still has to be done.

10 Ongoing activities

Although this document is the last WP6 deliverable, we have plans to conclude and develop further dissemination activities until the Project Final Review and beyond. The list of dissemination actions still to be done in 2014 is:

- To finalize the creation of leaflets for Pilot Use Cases 2 and 3.
- To finalize the production of the video animation.
- To create a new poster and leaflet in a comic strip style – for non-technical audience.
- To prepare a comprehensive article about FIBRE.
- To submit a presentation proposal to UbuntuNet-Connect 2014[4](defending Future Internet testbeds as an educational tool for Computing Network classes).
- Issuing one press release about the testbed.
- To invite selected industry players to test the facility (meetings scheduled for September - responsible: i2CAT for Europe, CPqD for Brazil).
- Update the Wikipedia pages (English and Portuguese versions).
- To better evaluate legal issues concerning the usage policy of the platform.
- To plan the website update, and eventually rebranding the FIBRE logo, aiming at the continuation of the platform after the project lifetime.

[4]http://www.ubuntunet.net/uc2014_cfp

11 Recommendations for the Future

In our view, future dissemination activities should mostly focus on network professors and students.

Nowadays, hands-on classes in computer networks rely on a couple of software tools and virtual machines to teach practical classes in laboratory. According to the results of the survey presented in Annex I, some of the most widely adopted tools are the Network Simulator[5] [7], CISCO's Packet Tracer[6] and OMNeT++ [7]. Through the use of a large-scale FI testbed, students can become familiar with building a virtualised, software-defined network, spanning multiple, geographically distributed nodes. Once the virtual network is built, students could carry out network experiments before saving their virtual network and freeing-up the computational and network resources involved. This will, in the first place, allow them a more concrete understanding of the current protocols and of their limitations.

With the use of FI testbeds in computer-network classes, we believe the next generation of researchers will be more capable of dealing with architectural experiments and of continuously evolving the current Internet architecture. Additionally, the use of a large-scale testbed introduces the students to a real-world situation, instead of using software tools to simulate networks in the laboratory.

In this view, future dissemination activities should target professors by teaching them how to use FIBRE testbed in their classes. Additionally, FIBRE should provide a repository of practical activities (exercises) that could be applied to their students. This would build a community of professors, feeding them with teaching material similar to "teachers' editions textbooks".

On the other hand, 2-day training events, "hackathon" style, should be organized to "babysit" students and researchers to deploy proposed experiments. Participants would need to apply by describing an experiment to run on the FIBRE testbed. A committee would select the participants based on the feasibility to deploy the proposed experiment in the FIBRE infrastructure.

Another important target for dissemination activities are industry and public administration. Industry is the de facto the definitive aim to be convinced of the FIBRE capabilities. Once industry adopts a new technology it will be spread to all the users as it will be more accessible. Industry can be targeted indirectly, for example through actual students, as presented previously, which in the future can be industry developers. Or through public administration, if governments decide to invest in some technology, industry will use this investment to make profit.

For this reason, now that FIBRE platform is fully operational, dissemination activities will also focus on industry companies so they can get good first impressions better than presenting beta versions with possible bugs that could lead to rejection. As a first example of these activities,

[5] http://www.isi.edu/nsnam/ns/
[6] https://www.netacad.com/web/about-us/cisco-packet-tracer
[7] http://www.omnetpp.org

i2CAT will start in September contacts with Catalan companies and government institutions (as it already did during the 2nd FIBRE Workshop in Barcelona) to present FIBRE in its full functionality. Similar steps are being initiated at European level through the other FIBRE EU partners.

12 Summary Table

The table below summarizes some of the numbers presented in the report, as of 31st July 2014

Open Workshops	3
Posters	16
Publications	10 journal/magazine papers, 26 conference papers, 6 M.Sc. Thesis and 6 undergraduate monographs
Testbed Users (EU+BR)	64
External events where FIBRE was presented	59

Annex I - WP6 Form to measure the dissemination metrics

This survey was deployed online using Google Docs tool.

Portuguese version:
https://docs.google.com/forms/d/1zJu9UwNkM99QHKU3TgRq6Pv2Sice0a-ftDBxlro41_0/viewform

English version:
https://docs.google.com/forms/d/1ewOutkTLP-OiqSgSs7pZe9zwHBrtZLzPSfe-GVboKt0/viewform

1) Your Name

2) Your Institution

3) About your activities in FIBRE:
   a. Administrative and managerial functions (including WP leaders, Task leaders, institution representative etc.)
   b. Island technical admin (includes installation and configuration of hardware and/or software)
   c. System developer of testbed related software (APIs, plugins, CMFs, Schedulers, MySlice, etc.)
   d. Testbed User / Experimenter

4) Evaluating the potential of FIBRE as an educational tool:
   a. In addition to the activities listed above, are you a professor/tutor in any Computing/Networking course? Please consider any external/private institution not member of FIBRE.
   If so, please list the courses.
   If not, skip to question 10.

5) If you answer positively the above question, please indicate the type of courses:
   a. Undergrad
   b. Short duration courses
   c. Graduation (specialization Lato-sensu, MBA)
   d. Graduation M.Sc. (Stricto-sensu)
   e. Ph.D.

6) If you teach Networking classes, please tell us what kind of software tools do you use for practical activities/exercises to your students (Please list the software tools, simulators, webservices, etc. you mostly use)

7) Are you using Future Internet testbeds (FIBRE and others) in your classes?
    a. No and I'm not planning to.;
    b. Not yet, but I'm planning to use.
    c. Not yet, but I want to use only steady and mature testbeds, with good technical support in place.
    d. I'm already using testbeds in education activities with my students

8) In your theoretical classes, do you mention the existence of FI testbeds and their importance for Internet research? (YES/NO)

9) How many students do you have?

10) About the number of experiments executed in the FIBRE testbed:
    a. Please estimate the number of experiments have you (and/or your students) executed so far. Type 0 for none. Please do not consider bogus experiments just for testing and validating the infrastructure.

11) Publications: List yours most recent and most important publications where FIBRE is mentioned/cited. In addition to scientific papers, please also consider PhD thesis and technical reports from you or your students.

END OF DOCUMENT