



FUTURE INTERNET TESTBEDS
EXPERIMENTATION BETWEEN
BRAZIL AND EUROPE



Grant Agreement No.: 288356

FIBRE-EU

Future Internet testbeds/experimentation between BRazil and Europe – EU

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

D6.4 Dissemination Report for Year 2

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Abstract

This document presents all the dissemination actions during the second year of the project (October 2012 to September 2013). Information is organized according to each tasks of WP6. The actions were driven by the updated dissemination plan (D6.3), which was compiled after the first year of the project based on gained experience and valuable feedback from the reviewers.



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1 Acronyms

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
QPR	Quality Progress Report
RedCLARA	Cooperación Latino Americana de Redes Avanzadas (Latin American Cooperation of Advanced Networks)
UPC	Universitat Politècnica de Catalunya
WP	Work Package
WP6	Dissemination and Collaboration

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2 Scope

The purpose of this document is to present all dissemination actions taken during the second year of the project. They are categorized by their nature and the task they belong to.

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3 Reference Documents

- FIBRE's Description of Work (available under request to WP1)
- D6.3 – Updated Dissemination Plan
http://www.fibre-ict.eu/images/stories/deliverables/fibre_d6.3_disseminationplan_v0.4.pdf

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4 Printed and Electronic Dissemination Material

4.1 Creation of YouTube channel

One of the goals identified after the first year of the project was the need for audiovisual dissemination material. For this reason we created a YouTube channel¹, in order to organize the audiovisual material we were capturing. The material mainly comprises short interviews of FIBRE key members, recorded during face-to-face meetings of the consortium. For instance, several interviews were prepared and captured during the 1st project workshop in Salvador, whence the screenshots in Figure 1.



Figure 1: Screenshots from video interviews of FIBRE members

More recently, during the FIBRE-BR meeting² held in Brasilia on May 4th, new short interviews were recorded, summing up nine videos recorded so far.

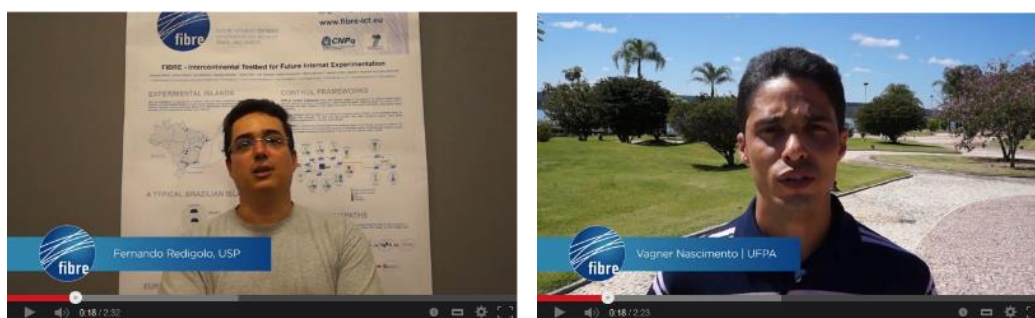


Figure 2: Newest video interviews recorded during FIBRE-BR meeting in Brasilia

The material is targeting a broad non-expert audience, the purpose is that people with only basic understanding of networking and Internet concepts be able to watch the videos and get a grasp of the scope and objectives of the project.

The advantages of using a YouTube channel are:

- The ability to subscribe, and be notified when new material is added.

¹ <http://www.youtube.com/FIBREProject>

² <http://indico.rnp.br/conferenceDisplay.py?confId=167>

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- Easily embeddable in web pages. FIBRE's public website has been extended with a suitable plugin and all the videos can be also viewed from there.

4.2 Wikipedia entry

A Wikipedia entry for the project has been created:

[http://en.wikipedia.org/wiki/FIBRE %28Future Internet testbeds / experimentation between en BRazil and Europe%29](http://en.wikipedia.org/wiki/FIBRE_%28Future_Internet_testbeds_%2F_experimentation_between_BRazil_and_Europe%29)

A screenshot can be viewed in Figure 3. The Wikipedia page aims as a point of presence of the project in the Internet, apart from the official project website and also enhances its semantic connection with the Future Internet Research area.



Figure 3: Wikipedia entry for FIBRE project

Additionally, a link to the project website is incorporated in the "Future Internet" Wikipedia entry: http://en.wikipedia.org/wiki/Future_Internet.

4.3 Updated project poster and demo poster

The project poster has been updated, in order to keep up with the project state. The new poster was prepared for and presented in Future Internet Assembly (FIA) 2013 in Dublin. It was also presented in the annual Brazilian Symposium for Computer Networks and Distributed Systems (SBRC), which took place in Brasilia, in May 2013. It can be viewed in Figure 4.

An additional poster was prepared by University of Bristol for the needs of the FIBRE demo presented in FIA 2013, titled: "Live Migration over a SDN-based packet optical network". It can be viewed in Figure 5.



FIBRE - Intercontinental Testbed for Future Internet Experimentation

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EXPERIMENTAL ISLANDS

With the globalization of experimental IT research, there has been considerable interest in the federation of distinct testbed facilities, in order to permit carrying out experiments that span multiple testbeds. Federation is a key issue in the design of the FIBRE testbed, which is being deployed as a federation of 13 local experimental facilities (a.k.a. 'islands').

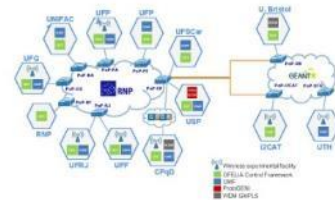


CONTROL FRAMEWORKS

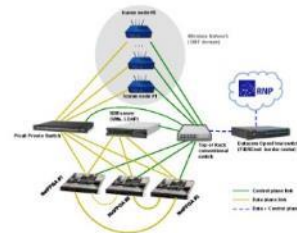
OFLIA Control Framework (OCF) was originally created in the context of the OFELIA testbed project (www.ofelia.eu) but today it is supported by a larger community where FIBRE and GEANT are present. OCF is synchronized with other initiatives in USA (GENI) and follows an SDN-oriented architecture (SDN-based Facility Architecture).

OMF is a framework with the focus on controlling and managing network devices. It was developed based on XMPP in the Ruby language. The OMF suite also provides OML (OMF Monitoring Library), which allows instrumentation of applications for collecting measurements.

ProtoGENI is a control and monitoring based on an enhanced version of the Emulab management software. The Emulab testbed is used to perform experimental research on distributed systems. ProtoGENI was created to provide the integration between Emulab and other testbeds in order to build the Cluster C facility of GENI.



A TYPICAL BRAZILIAN ISLAND

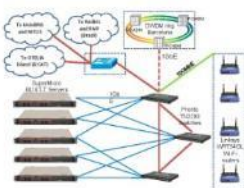


NETWORK LIGHTPATHS

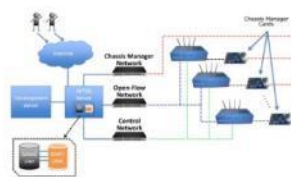
The physical interconnection of Brazilian and European islands is deployed through two point-to-point circuits (a.k.a. lightpaths) linking FIBRE's Brazilian gateway at the University of São Paulo (USP, Brazil) to i2CAT (Spain) and University of Bristol (UK), spanning multiple network domains.



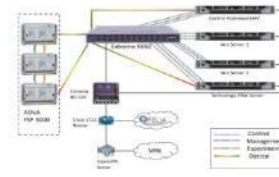
EUROPEAN ISLANDS



i2CAT (Spain)



UTH (Greece)



U. Bristol (UK)

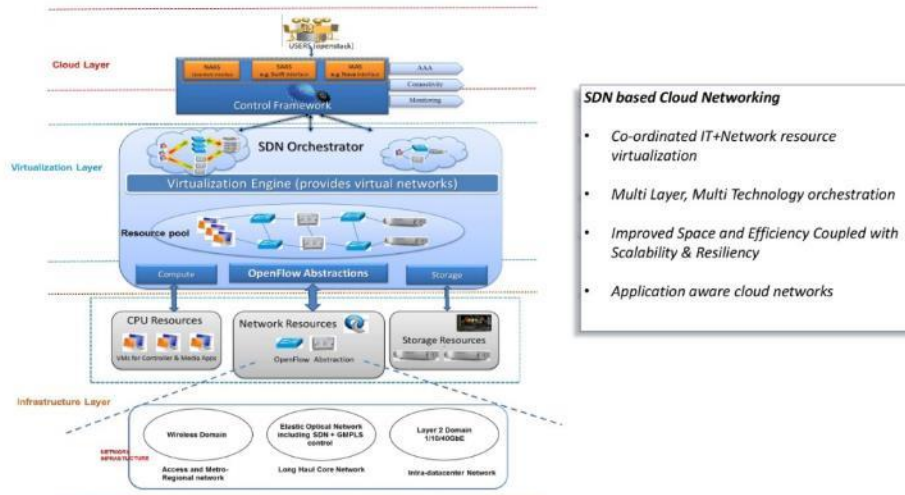
This work makes use of results produced by the FIBRE project, co-funded by the Brazilian Council for Scientific and Technological Development (CNPq) and by the European Commission within its Seventh Framework Programme.



Figure 4: Updated project poster used in Year 2 dissemination events



Live migration over a SDN based packet-optical network



Live Demo Setup

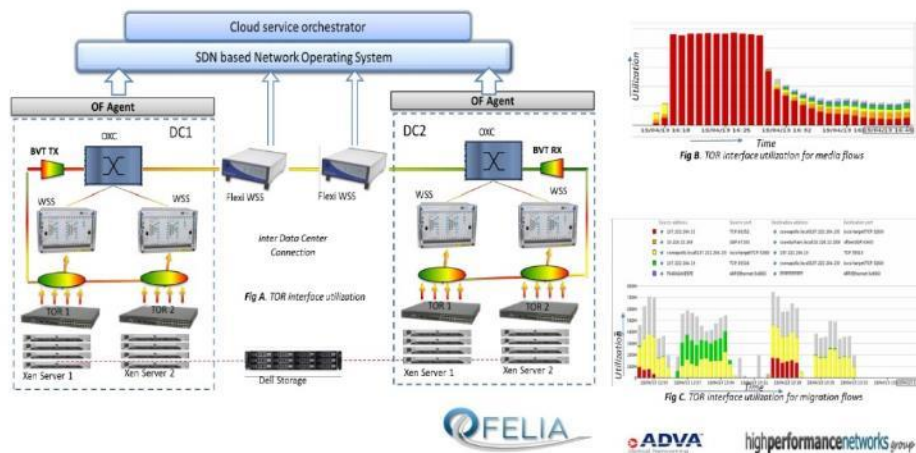


Figure 5: Poster for FIBRE demo presented in FIA 2013

4.4 Updated project leaflet

A new leaflet, in Portuguese, targeting non-technical audience was recently prepared for responding to a request from the Brazilian Ministry of Science, Technology and Innovation (MCTI). This leaflet is available at: <http://www.fibre-ict.eu/index.php/dissemination/posters>



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4.6 Video animation

As request in the first periodic annual review, a video animation explaining the role of FIBRE in the Future Internet area started to be produced. Due to the limited budget allocated for dissemination, this work is being done by a undergraduate student from Visual Arts and Design course, using the available scholarships from the Brazilian part of the project. The animation is expected to be concluded by the end of October 2013. The current screenplay and storyboard are presented below.





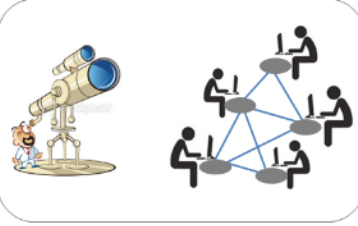

 <p>The Internet is quite old. It was created in the 60's, being older than the Walkman and the videocassette! Have you thought about that?</p> <p>The e-mail is one of the first applications over Internet. The first e-mail was sent in 1969!</p>	 <p>The current Internet architecture, designed about 40 years ago, has undergone many extensions and patches to include new features over the years.</p> <p>For example, video streams and online banking applications were not foreseen when the Internet was invented.</p>
 <p>The inclusion of new functionalities, which had not been anticipated in the initial design, is transforming the Internet architecture in a sort of "patchwork".</p> <p>In every adaptation, the degree of complexity of the resulting architecture increases, preventing the continuous development of the Internet.</p> <p>It's a common jargon to say that the Internet has become "ossified".</p>	 <p>Certainly, if the Internet was reinvented today, its design would be different.</p> <p>Overcoming limitations of today's Internet in order to make it more <u>efficient and secure</u> requires changing this architecture through the design called Future Internet.</p>
 <p>But how researchers can test and validate new architectures without disturbing the operation of the current Internet?</p> <p>Just like astronomers use telescopes and biologists use microscopes, "Future Internet clientists" use testbeds as their instruments. Testbeds are networks devoted for experimentation, connected to the current Internet.</p>	 <p>... and that's the goal of the FIBRE project: to build a large Future Internet testbed in Brazil, integrated with other existing ones in Europe.</p>

Figure 7: Initial screenplay to guide the animation (1)



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In other words, the testbed created by the FIBRE project works like a big "playground" for researchers to test new models of network architectures and applications.



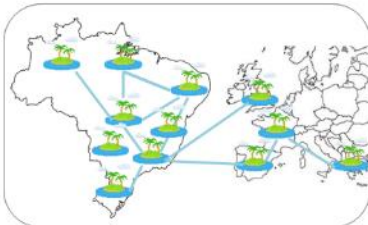
Without the availability of an environment devoted for experimentation, it would be impossible to promote the evolution of the current Internet.



Universities, research centres and even companies participate in the FIBRE project. Many of these institutions host the so called "experimental islands", which are like small-local testbeds.



... In practice, the FIBRE testbed is a **federation** of several experimental islands. This way, each institution has autonomy over their own local resources, while using resources from other islands to setup experiments over long distance networks.



This model allows new institutions to join the testbed at anytime.



Visit the FIBRE website for further information and get prepared for running Future Internet experiments on FIBRE.

Figure 8: Initial screenplay to guide the animation (2)

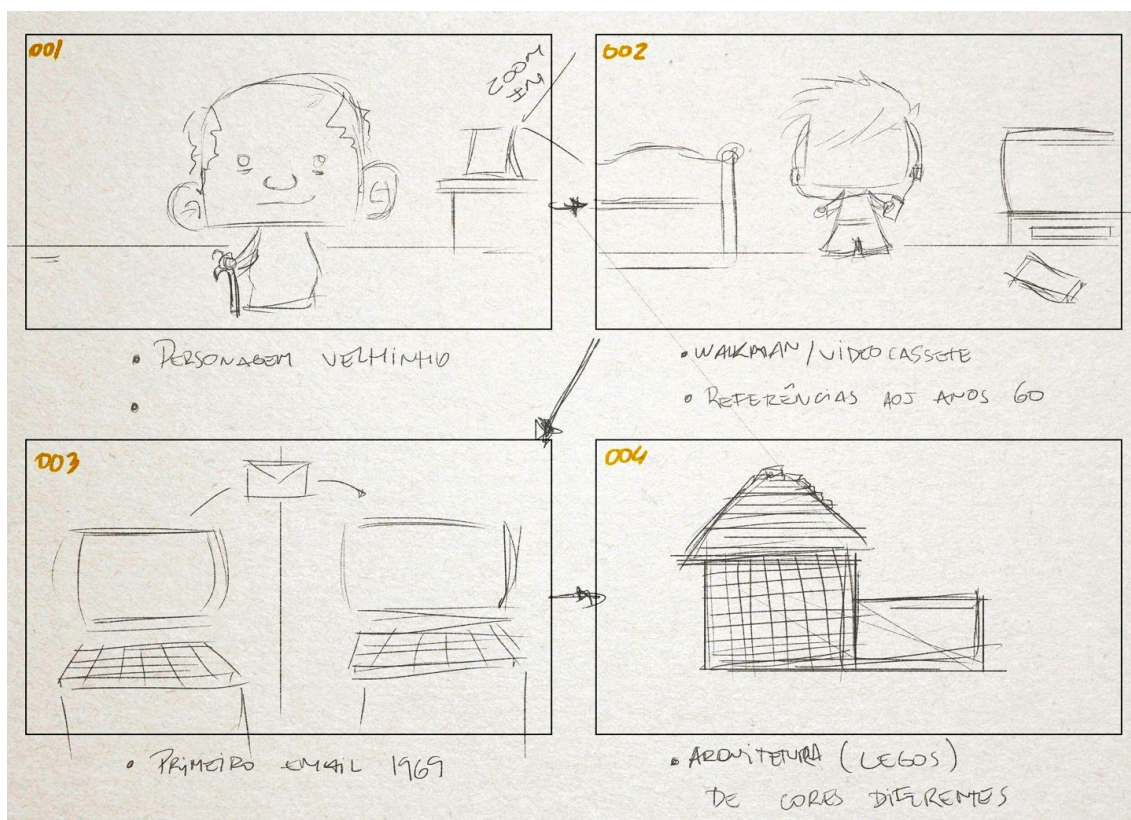


Figure 9: Draft storyboard

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5 Organization of workshops, tutorials and other events

5.1 First open workshop

The first open workshop of FIBRE was successfully organized in Salvador on the 26th and 27th November 2012. The workshop brought together both members of the academic community and industry representatives. There was a special session dedicated to the industry players, as well as another that gathered policy makers from Brazil. The workshop also included a poster session, two training sessions and a session with three live demonstrations, one of them being a live song demonstration between Barcelona (i2CAT) and Sao Paulo (USP) streamed over the FIBRE infrastructure (see Figure 11). More details can be found on the workshop's organization website (<http://indico.rnp.br/conferenceDisplay.py?confId=156>) and on FIBRE's Facebook page.



Figure 10: Photo from 1st project workshop in Salvador



Figure 11: Live song performance streamed from Barcelona to Sao Paulo (FIBRE demo)

5.2 FIBRE-BR hands-on training tutorial

A tutorial to promote hands-on training with the CMFs adopted by the project (OCF, OMF and ProtoGeni) was organized and took place on May 4th in Brasilia. It attracted 26 participants from several Brazilian universities. More details in <http://indico.rnp.br/conferenceTimeTable.py?confId=168#20130505>.

The OCF tutorial presented by Prof. Cesar Marcondes (UFSCar) was recorded in video and made available in the FIBRE YouTube channel (see Figure 12). The group photo after the conclusion of the tutorial can be viewed in Figure 13. It's also worth mentioning that an extensive list of guidelines and manuals describing how to setup an experimental island is being produced by the Brazilian students. This material can be consulted at: <http://noc.fibre.org.br/>



Figure 12: OCF tutorial recorded in video



Figure 13: Attendants of the FIBRE-BR meeting

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6 Collaboration / Participation in external events

6.1 Collaboration with Industry

The work done by RNP to setup the overlay network to connect all Brazilian island triggered a partnership with DATACOM – an equipment manufacturer industry based in Brazil (<http://www.datacom.ind.br>). DATACOM is supplying ten OpenFlow switches which are being used to deploy the Brazilian testbed. Although DATACOM was chosen among many other suppliers, including major network industries based in USA, this partnership is not restricted to providing hardware equipment. DATACOM is also collaborating to provide a one-week course about OpenFlow during a RNP training seminar that will be held in October 2013. The Seminar is open to the public. Experiments using the FIBRE testbed will be presented as use case examples of OpenFlow.

6.2 Participation in external events

The FIBRE project is extensively cited and presented by the project members in many workshops, seminars and classes. The most relevant events are described in this section.

6.2.1 FIRE engineering workshop

Thanasis Korakis of UTH participated in the FIRE Engineering Workshop in Ghent in November 2012, and gave a presentation titled “FIBRE project: Brazil and Europe unite forces and testbeds for the Internet of the future”.

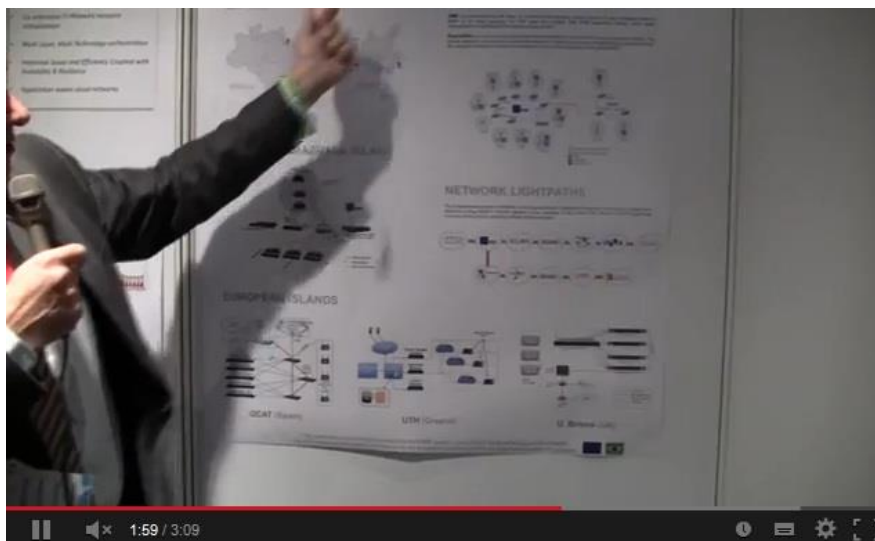


Figure 14: Thanasis Korakis (UTH) presenting FIBRE at the FIRE Engineering Workshop

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6.2.2 Future Internet Assembly

FIBRE participated in Future Internet Assembly 2013 in Dublin in May 2013 with one poster and one demo. Overall, four FIBRE partners attended the event. The presentation of the project by project coordinator Sebastia Sallent (screenshot in Figure 15) is available in YouTube at: https://www.youtube.com/watch?feature=player_embedded&v=iMnGRkintbg



Showcases over the FIBRE testbed at Hands-On FIRE! / FIA-Dubli...

Figure 15: FIBRE presentation in Future Internet Assembly

6.2.3 Open Networking Summit

Marcos Salvador (CPqD) attended the Open Networking Summit (ONS) in Santa Clara, CA, in April 2013, and gave a presentation of the FIBRE project and its progress.

6.2.4 Brazilian Symposium on Computer Networks

The annual Brazilian Symposium on Computer Networks and Distributed Systems (SBRC) took place in Brasilia from 6 to 10 of May (<http://sbrc2013.unb.br/?lang=en>) with significant involvement of FIBRE partners from Brazil. The same FIBRE poster with FIA was presented in SBRC.

A dedicated workshop titled “Workshop on Future Internet Experimentation” was organized within SBRC by FIBRE partners. It attracted a significant number of attendants (as can be seen in Figure 16) and was held with great success.



Figure 16: WPEIF event at SBRC 2012, organized by FIBRE

6.2.5 Virtual Day on Future Internet for Latin America

FIBRE participated in Future Internet Virtual Day organized by RedClara on July 31st. “Virtual Days” are thematic seminars organised by RedCLARA, usually on a quarterly basis. In this kind of event, participants can attend the seminar using video-conferencing facilities (H.323) or watching the presentations on-line, streamed in video, and placing questions via Skype®. There was a special presentation of FIBRE. The event agenda is available online at: <http://eventos.redclara.net/indico/conferenceTimeTable.py?confId=253#20130731>.



Figure 17: Iara Machado (RNP) speaking at the Virtual Day on Future Internet

6.2.6 INFONOR, Chile

Leandro Ciuffo (RNP) presented FIBRE in the IFONOR conference held in Chile in August 2013 (<http://www.infonor-chile.cl/c/>).

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7 Ongoing activities and future goals

7.1 Organization of 2nd open workshop

The second project workshop will take place in Barcelona on 5th November 2013, in the premises of UPC. At the time of preparing this deliverable, the agenda has almost been finalized and is available at: <http://indico.rnp.br/conferenceTimeTable.py?confId=170#20131105.detailed>

As it can be seen from the agenda, once again we tried to focus on an interaction with industry players and policy makers. We also incorporated a demo session.

7.2 Presence in ICT 2013

ICT 2013 is a major ICT event organized by the EC. It will take place in Vilnius, Lithuania, on 6th – 8th November 2013. More than 4000 researchers, innovators, entrepreneurs, industry representatives, young people and politicians are expected.

FIBRE submitted an exhibit proposal and it was accepted. The project will have the chance to advertise its activities. We're planning to accommodate at least two short demos in our exhibit stand, along with dissemination material (leaflets). FIBRE will exhibit in the "International" ExpoDome, thereby the focus will be on collaboration of EU and Brazilian partner in the area of ICT research, and Future Internet research in particular.

7.3 OpenFlow course in partnership with DATACOM industry

As aforementioned in section 6.1, DATACOM will provide a one-week course on OpenFlow using FIBRE as a use case example. Operators from RNP's PoPs in charge of providing connectivity to the FIBRE testbed will be invited to attend the course, which is also open to the general public. The course will be held in the city of Fortaleza, Brazil, from 21 to 25 October 2013.

7.4 Major publication

There are ongoing discussions among the consortium for the preparation of an article explaining the activities and results of FIBRE. Our intention is to submit the article for publication in a relevant journal.

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7.5 User community

As the project is approaching its final stages and the testbeds have been in large part formed, it is crucial to create a user community, as wide as possible, so that the experimental resources are utilized for extensive FI research. Of course, there is already such a community, mainly comprised by researchers and students in the partners' institutes. However, we aspire to open up the facility to an even broader audience. In addition, we intend to build dedicated web presence points that will support this community.

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