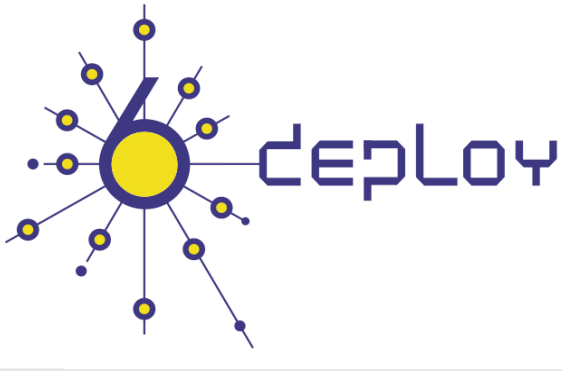
e-infrastructure



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Abstract:

This deliverable presents a report from the workshop held in La Paz (Bolivia) on April 14th and 15th 2009. The presentation material is listed, the attendees and their affiliations are given, and the opportunities for further co-operation and follow-up actions are described.

Keywords:

IPv6, Support, Training, Testbeds, Modules, 6DISS, 6DEPLOY, Hands-on exercises

Disclaimer

Revision History

The following table describes the main changes to the document since created.

Revision	Date	Description	Author (Organization)
v0.1	23/06/2009	Document creation based on Martel's model	Alvaro Vives (Consulintel)
v0.2	23/08/2009	Added content provided by LACNIC	Alvaro Vives (Consulintel)
v0.3	14/09/2009	Document revision	Alvaro Vives (Consulintel)
v0.4	30/09/2009	Document Revision	Sarah Kenehan (Martel)

Executive Summary

One of the main activities in the 6DEPLOY project is to organise workshops to train the different Internet communities in the areas of IPv6 deployment, configuration, and usage. This project is a follow up of previous project activities within and outside the Framework Programmes of the European Commission.

This deliverable presents a report from the workshop held in La Paz (Bolivia) in April 14th and 15th 2009. The following workshop details are described in this report: a) the workshop attendees and their affiliations, b) the programme outline, c) the material presented, and d) an assessment of the opportunities for further co-operation and follow-up actions planned.

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1. INTRODUCTION

1.1 6DEPLOY Objectives

The following comprise the 6DEPLOY objectives:

- organize workshops for the e-Infrastructure community and give practical advice and hands-on support for deploying IPv6 in their environments;
- work on deployments in Europe and in developing countries, exchanging experiences and best practices;
- improve the competitiveness of European industry by sharing experiences from IPv6 deployments in other regions;
- gain expertise with which to support *more commercial* deployments in European industries (e.g. Emergency Services, Health, Broadcast, Transport, Schools, Environment, Gaming, etc.);
- help to build consensus between European researchers by enabling and exploiting synergy among related projects (e.g. GÉANT-2, SEEREN-2, SEE-GRID, EUMEDCONNECT, CLARA, ALICE);
- encourage and enhance the effectiveness of the coordination between National and pan-European e-Infrastructure initiatives by being a focal point for IPv6 activities, giving IPv6 training, and supporting IPv6 deployments;
- open up the ICT programme to the participation of third country organisations in International Cooperation Partner Countries, including countries in Africa, Asia, and Latin America, by involving organisations that influence e-Infrastructures on those continents;
- improve scientific cooperation between Europe and the declared target regions (Africa, Asia, and Latin America) by exchanging knowledge and experiences through direct practical support for deployment, training events, etc. The project therefore also helps support other Community policies, most notably the development policy. Telecommunications infrastructures and the capability to access information worldwide are key measures of a country's progress. IPv6 has been a cornerstone of European Internet policy for several years.; and
- support interoperability and standards by sharing information on the latest IPv6 standards, equipment hardware and software releases, and IPv6 policies (RIRs).

One of the main activities in the 6DEPLOY project is therefore to organise workshops to

train the different Internet communities in the areas of IPv6 deployment, configuration, operation, and management. This activity is a follow up of previous projects' activities within and outside the Framework Programmes of the European Commission.

1.2 6DEPLOY Workshop Methodology

The 6DEPLOY methodology relating to the workshops is shown in the diagram below:

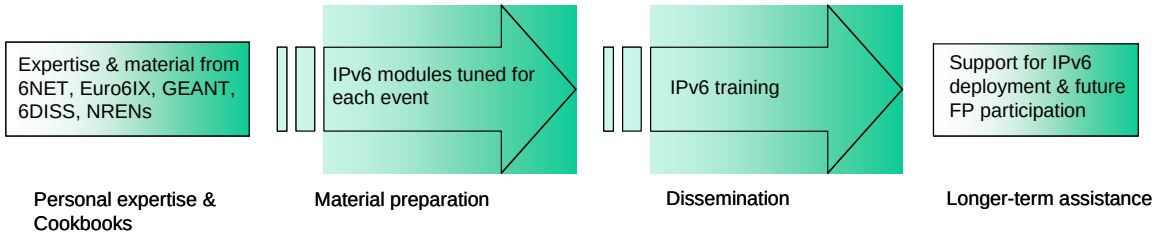

Figure 1-1: 6DEPLOY methodology (diagrammatically)

The approach is to use course material available from 6DISS and elsewhere that relates to IPv6, the e-learning course, and the 6NET IPv6 Deployment Guide book, together which will form the basis of the training material. This training material is supplemented with knowledge from partners' participation in events such as IPv6 Forum meetings, IPv6 Task Force meetings, Internet2 meetings, and the IETF, and from the experience of similar activities brought to the project by the representatives of the Internet Registries in North and South America, the Asia-Pacific region, Africa, and Europe. The knowledge is disseminated through training sessions that, for practical reasons, are often held in conjunction with AfriNIC, LACNIC, APNIC, AfNOG, APRICOT, and ISOC meetings.

After each workshop, feedback reports are collected from the participants, enabling 6DEPLOY to assess the impact of the presentations and to identify any areas that need improvement.

The full set of dissemination materials (including the e-learning course and 2 managed testbeds) is available from 6DISS and partners´ own sources. This includes presentation slides on all issues of Internet deployment and evolution; especially IPv4-IPv6 transition strategies, DNS, DHCP, routing, QoS, MobileIP, multicast, renumbering, auto-configuration, security, monitoring and management tools, and applications. This material was described in the deliverable D1.1: "IPv6 training material and related usage procedures".

This deliverable presents a report from the workshop held in La Paz (Bolivia) on April 14th 15th 2009.

Chapter 2 of this document explains the general motivation for running IPv6 workshops, and Chapter 3 describes the specific details of the workshop, in terms of the attendees, the modules that were presented, and the “hands-on” exercises given (if appropriate). Chapter 4 identifies opportunities for further collaboration in the region and the recommended follow up actions, and Chapter 5 provides some general conclusions.

2. THE WORKSHOPS (GENERAL)

Workshops are one of the main mechanisms used by 6DEPLOY to transfer information and to build collaboration.

6DEPLOY is structured to provide an ideal platform for the discussion of deployment scenarios and the exchange of best practices, thereby avoiding duplication of effort, by preventing the waste of time on techniques that are known not to have been deprecated, and generally making the most efficient use of the available resources in a region. Partners in 6DEPLOY have deployed IPv6 on a production basis in their own NRENs and University networks, and have documented their experiences in Cookbooks and in IETF informational/best common practice RFCs. The manufacturer in the consortium is building IPv6 products.

The workshops are not only intended to lead to an improved quality of the Internet infrastructure in developing countries, but will also raise the competence of the attendees and, in exploiting the personal contacts made through 6DEPLOY, facilitate and encourage the participation of their organisations in future FP7 calls and beyond.

Impacts from the workshops will include:

- a positive effect towards preventing the “brain drain” from developing countries by bringing interesting and state-of-the-art activities into these regions, thus making information and knowledge resources accessible to scholars both locally and globally;
- an expansion of the conditions for growth by enabling the exchange of ideas, launching joint experiments and projects, disseminating RTD results, and activating market forces; all of which are substantial elements in the process of regional development;
- making European research and industrial concerns aware of the highly skilled personnel who can contribute to the urgently needed improvement of ICT infrastructures, resulting in an increase of the demand for specialized services provided by the highly skilled academics and researchers of the region; and
- the identification of IPv6 deployment activities in the region and an exchange of information about deployment experiences.

While IPv6 standards and services are quite stable, regional variations in practices and operations will require slightly different approaches for collaboration and dissemination. Therefore, the material for these workshops was collected, and the workshop

schedules, formats, and contents were tailored in conjunction with the local organisers so as to suit the type of participants, the subjects to be addressed, the location, the host organisation, the sponsors, etc.

3. THE 6DEPLOY WORKSHOP IN LA PAZ (BOLIVIA)

This IPv6 Workshop took place in La Paz, Bolivia, on May 14th and 15th 2009. This workshop was part of LACNIC's IPv6 Tour 08/09. The workshop is described below, including descriptions of the attendees and their affiliations, the programme outline, and the material that was presented.

3.1 Overview

The event was organized by LACNIC. The audience included people from Internet Service Providers, universities, local companies, and governmental agencies.

Individuals present at the workshop included Jordi Palet, from Consulintel representing 6DEPLOY, and Ruth Puente and Juan Carlos Alonso both from LACNIC.

A short presentation of the 6DEPLOY project was given during which the different ways the project could help them with IPv6 issues were clearly stated.

All the presentations were conducted in Spanish in order to accommodate the local audience.

3.2 Attendees

Below is a list of people that attended at least one session:

No.	Surname	First name	Affiliation
1	Abasto Revilla	Hubert	Banco Central de Bolivia
2	Alarcón Mariaca	Maurice	Banco Nacional de Bolivia
3	Alejandro Patiño	Jorge	ADSIB
4	Banegas	Oswaldo	COTAS LTDA
5	Benitez	Raúl	AXS BOLIVIA S.A.
6	Canaza	Miriam	Ministerio de Educación
7	Cárdenas	Gary	Banco Nacional de Bolivia
8	Castillo	Ricardo	Banco BISA
9	Chávez	Jose Luis	Banco Central de Bolivia
10	Chávez Gallardo	Luis Enrique	Cámara Nacional de Comercio
11	Clavijo	Selene	STC
12	Deheza	Sergio	AXS BOLIVIA S.A.
13	Espinoza B.	Neida	Ministerio de Educación
14	Espozo Espinoza	Eloy	Universidad Católica Boliviana " San Pablo"
15	Flores	Catalina	Ministerio de Educación
16	Gálvez	Javier	MEGALINK
17	Garnica	Oscar	COTES NET
18	Gonzáles	Guillermo	ENTEL S.A.
19	Gottschalck	Daniel	Guevara Gutierrez Servicios Legales

20	Ibañez Flores	Jannet	Ministerio de la Presidencia
21	Ishino	Javier	AXS BOLIVIA S.A.
22	Jiménez Dávila	Jeanette	Ministerio Obras Públicas, Servicios y Vivienda
23	Leyva	German	AXS BOLIVIA S.A.
24	Loayza	Diego	Louis Borger
25	López	Gonzalo	COMTECO
26	Loza Guachalla	Roberto	Universidad Mayor de San Andrés
27	Machicado	José	ADSIB
28	Maldonado de Chazal	Ruy	COTAS LTDA
29	Mamani Zuballos	Edwin	NUEVATEL PCS DE BOLIVIA
30	Mansilla	Katia	Universidad del Valle
31	Marín Arteaga	Marco Antonio	Mercantil Santa Cruz
32	Marín H.	Luis	INTEL
33	Nestor Rada	Franklin	Universidad del Valle
34	Nuñez Vargas	Marcos	COTEL LTDA
35	Ovando	Juan Carlos	BANCO MERCANTIL SANTA CRUZ
36	Pabón Morales	Edgardo I.	Ministerio de Salud
37	Plaza	Juan Carlos	NUEVATEL PCS DE BOLIVIA
38	Quisbert Blanco	Angel	COTEL LTDA
39	Quispe	José Luis	COTEL LTDA
40	Richter Medrano	Vladimir	Universidad del Valle
41	Rivera Ferrufino	Edgar	TELECEL S.A.
42	Riveros	Franz	Ministerio de Planificación del Desarrollo
43	Rocabado	Marcelo	Ministerio de Educación
44	Ruiz	Edgar	MEGALINK
45	Ruiz	Jesús	NUEVATEL PCS DE BOLIVIA
46	Salamanca	Gustavo	TELECEL S.A.
47	Salinas	Luis	Universidad Católica Boliviana " San Pablo"
48	Sanchez	Claudia	ADSIB
49	Sánchez	Sandro	Ministerio de Planificación del Desarrollo
50	Santa Cruz Parra	Anni	Universidad Real de Bolivia
51	Saucedo	Rodrigo	ADSIB
52	Suman	Arturo	BANCO MERCANTIL SANTA CRUZ
53	Tapia	Jose María	Universidad Mayor de San Andrés
54	Terrazas Morales	Joaquín	COTAS LTDA
55	Torres Salvador	Giovanna	Universidad Real de Bolivia
56	Uria	Freddy	Banco BISA
57	Vacaflor	Nelson	Ministerio de Planificación del Desarrollo
58	Vargas	Juan Carlos	MEGALINK
59	Veizaga	Marcoz	ENTEL S.A.
60	Velásquez Barrón	Farid	Ministerio de Obras Públicas, Servicios y Vivienda
61	Yupanqui	Nancy	Ministerio de Educación
62	Zambrano	Roberto	UMSA
63	Zorena	Luis	Banco Central de Bolivia

Table 3-1: La Paz Workshop list of participants

The attendees were technical people whose knowledge about IPv6 ranged from almost no knowledge at all to having some experience with IPv6 deployment. Some had already performed IPv6 experiments or were planning some level of deployment at

their institutions.

The participants represented a wide range of the ICT community. These people are precisely the ones who will collectively determine the rate of deployment of the latest Internet technologies in Bolivia, and therefore the impact will be that they will promote the upgrade of the networks to a state of the art that is comparable with EU countries.

3.3 Workshop programme

The agenda was agreed on after close collaboration with the local organisers. The workshop programme is presented in the following table:

Date	Time	Title of session
14/05/09	8:30	Registration
14/05/09	9:00	Opening
14/05/09	9:30	La Administración de los Recursos de Internet en América Latina & Caribe y el mundo
14/05/09	10:00	Cómo obtener recursos de Internet en la región
14/05/09	10:45	Coffe Break
14/05/09	11:00	LACNIC y la Sociedad de la Información. Formas de participación en LACNIC y Proyectos en ejecución
14/05/09	11:20	Proceso de desarrollo de políticas y propuestas actuales en discusión
14/05/09	11:40	Agotamiento IPv4 y transición a IPv6 | Actividades de IPv6 en la región LAC
14/05/09	12:15	Open Mic
14/05/09	12:45	Lunch
IPv6 Workshop		
14/05/09	14:00	Introducción a IPv6
14/05/09	15:30	Prácticas en hosts
14/05/09	14:00	Coffe Break
14/05/09	14:15	Prácticas en hosts (cont.)
14/05/09	14:45	Mecanismos de transición IPv4-IPv6
IPv6 Workshop (cont.)		
15/05/09	10:00	Prácticas de transición
15/05/09	11:00	Coffe Break
15/05/09	11:15	Prácticas de transición
15/05/09	12:15	Casos de despliegue en redes de banda ancha
15/05/09	13:00	End of Workshop

Table 3-2: La Paz Workshop Programme

3.4 Presentation material

The following material was presented at the IPv6 Workshop:

Modules	Hands-on Exercises	Presented by	Affiliation
Introducción a IPv6	Prácticas en hosts	Jordi Palet	Consulintel
Mecanismos de transición IPv4-IPv6	Prácticas de transición	Jordi Palet	Consulintel

Table 3-3: List of modules and hands-on exercises used in La Paz Workshop

3.4.1 Modules

Below is a brief description of each module's content:

- **Introducción a IPv6**: This module gave a brief history of IPv6, as well as an overview of the IPv6 protocol, including IPv6 packet headers, extensions headers, the differences from IPv4 headers, ICMPv6, types of addresses, and autoconfiguration.
- **Mecanismos de transición IPv4-IPv6**: This module explained different approaches to deploying IPv6 in an IPv4 environment. Transition concepts were introduced and several transition mechanisms were covered: Dual Stack, tunnels, tunnel broker, 6to4, Teredo, Softwires, and translation. Security concerns and 6PE were included for completeness.

3.5 Photographs taken at the event

Figure 3-1: Ruth Puente (LACNIC) presenting

Figure 3-2: Juan Carlos Alonso (LACNIC) presenting

Figure 3-3: Jordi Palet (Consulintel) presenting

Figure 3-4: Attendees of the La Paz Workshop (1)

Figure 3-5: Attendees of the La Paz Workshop (2)

Figure 3-6: La Paz Workshop Group Photo

4. OPPORTUNITIES FOR FURTHER CO-OPERATION

In all the workshops, the attendees were informed on how to stay in contact with the 6DEPLOY partners in case they have questions regarding IPv6 deployment, addressing plans, etc. In this respect, the role of the *helpdesk* was explained as being the way to submit questions. An e-mail to helpdesk@6deploy.org will be distributed to a mailing list composed of volunteers who are available to answer (or forward) any kind of questions, requests, etc. Also a web form can be used to send requests to the project.

Additionally, the attendees (and trainers from the region) can follow the e-learning course and/or check the availability of the 6DEPLOY remote labs and use these.

This workshop was part of the successful LACNIC IPv6 Tour that is being supported by the 6DEPLOY project and that is spreading IPv6 knowledge all around the Latin American and Caribbean region. More about this project can be found on the IPv6 Tour web site: http://lacnic.net/en/eventos/ipv6/.

5. CONCLUSIONS

Workshops are a key mechanism through which information, knowledge, and know-how are transferred to less experienced countries and participants. The workshops enable us to build constituencies and raise awareness; disseminate, benchmark, and validate the research results from the EU's Framework Programmes; promote European technologies; exchange best practices; and offer information related to standards and interoperability issues.

The workshop held in La Paz (Bolivia) on May 14th and 15th 2009 was organized by Consulintel and LACNIC, as 6DEPLOY representatives, collaborating with local authorities. Thanks to previous projects and training activities, most of the IPv6 education material needed to start 6DEPLOY workshop training was available from the very beginning. The material addressed most of the issues of Internet deployment and evolution, especially IPv4-IPv6 transition/co-existence strategies, DNS, Autoconfiguration, Routing and Applications.

A high number of attendees were achieved, including network engineers, system administrators, and regulators that participated in the workshops organized by 6DEPLOY. The topics presented were selected according to participants' requirements.

During the 6DEPLOY lifetime, stakeholders will continue to enhance today's "knowledge database". The reader and interested parties are referred to the 6DEPLOY website to check for new material.

In summary, this workshop should be considered a success with regard to the dissemination of IPv6, though this is only the first of many steps towards the deployment of real IPv6 networks and services in the region.

6. REFERENCES

6DEPLOY website: http://www.6deploy.org

6DISS website: http://www.6diss.org

Hands-on modules: http://6diss.6deployorg/publications/deliverables/hands-on.pdf

How-to organise an IPv6 workshop:

http://6diss.6deploy.org/workshops/workshop-guidelines.pdf

Training the trainers workshop: http://6diss.6deploy.org/workshops/ttt/

e-learning package: http://6diss.6deploy.org/publications/multimedia/e-learning.iso

e-learning on-line: http://6diss.6deploy.org/e-learning/