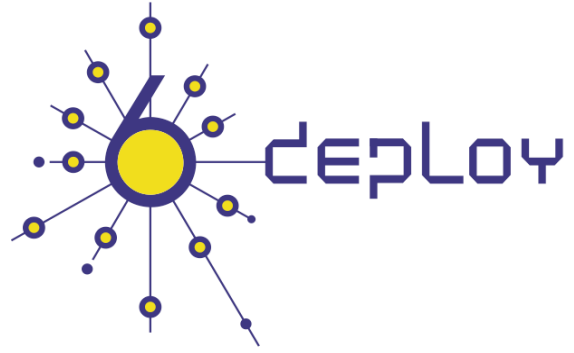




e-infrastructure



Title:	Deliverable D1.9 Report from the 8th Workshop	Document Version:	0.4
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Project Number:	Project Acronym:	Project Title:
223794	6DEPLOY	IPv6 Deployment Support

Contractual Delivery Date:	Actual Delivery Date:	Deliverable Type* - Security**:
31/7/2009	31/10/2009	R – PU

- Type: P – Prototype, R – Report, D – Demonstrator, O – Other
- ** Security Class: PU- Public, PP – Restricted to other programme participants (including the Commission Services), RE – Restricted to a group defined by the consortium (including the Commission Services), CO – Confidential, only for members of the consortium (including the Commission Services)

Responsible and Editor/Author:	Organization:	Contributing WP:
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Abstract:

This deliverable presents a report from the workshop held in Lima (Peru) on May 11th and 12th 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

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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 Lima (Peru) on May 11th and 12th 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:

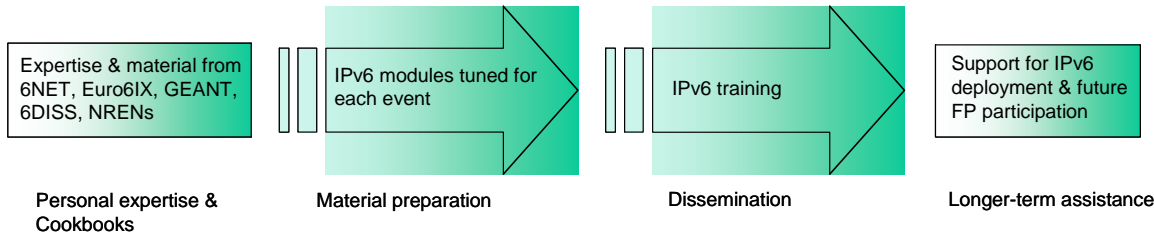


Figure 1-1: 6DEPLOY methodology (diagrammatically)

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 Lima (Peru) on May 11th and 12th 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 LIMA (PERU)

This IPv6 Workshop took place in Lima, Peru, on May 11th and 12th 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	VERA MANRIQUE	MARCO ALONSO	Biblioteca Nacional del Peru
2	CORDOVA YAMAUCHI	CLAUDIA GYSELLA	CLARA
3	ACUÑA SANCHEZ	MARISOL PATRICIA	CONCYTEC
4	CIURLIZZA MELLON	ALEJANDRA	CONCYTEC
5	FERNANDEZ PARDO	WALTER	Dirección Regional de Educación de Lima Metropolitana
6	GARCIA CORTAVITARTE	MILNER	INDECI
7	SILVA TEJEDA	ARTURO	INDECOPI
8	MAGUIÑA	DNIEL	INEI
9	VELÁSQUEZ DÍAZ	CHRISTIAN DAVID	INICTEL - UNI
10	CHUCHON NUÑEZ	MARIANO	INICTEL-UNI
11	POMIANO RIVERA	EVELIN MELINA	INICTEL-UNI
12	SAMANIEGO MANRIQUE	JAVIER EULOGIO	INICTEL-UNI
13	LEON CEDANO	DANIEL EDUARDO	INICTEL-UNI
14	VILLAFANI CASTRO	RAUL	INICTEL-UNI
15	QUINTO ANCIETA	JAVIER RICHARD	INICTEL-UNI
16	LEON ATIQUIPA	ALEX RUBEN	INICTEL-UNI

17	QUISPE CHOQUEHUANCA	MARCO ANTONIO	INICTEL-UNI
18	SOPLA ROJAS	WILLMANS JACKSSON	INICTEL-UNI
19	GALLEGOS PAZ	FERNANDO ARTURO	INICTEL-UNI
20	APARCO SEGAMA	GILBER HUGO	INICTEL-UNI
21	LOPEZ LOPEZ	BERNARDINO FELIZ	Instituto Nacional de Innovacion Agraria - INIA
22	OCAÑA MOSTACERO	MIGUEL	Instituto del mar del Perú - IMARPE
23	VALDIVIA CARRASCO	CARLOS FRANCISCO	Instituto Nacional de Ciencias Neurologicas
24	HURTADO RIMAYCUNA	FERNANDO MIGUEL	Instituto Nacional de Ciencias Neurologicas
25	PACHECO ROMERO	RICARDO	Instituto Nacional de Ciencias Neurologicas
26	OJEDA JUAREZ	ALFREDO	Instituto Nacional de Cultura
27	BUSTAMANTE MEJIA	ROBERTO	Instituto Nacional de Cultura
28	PIZARRO CASTRO	CESAR AUGUSTO	Instituto Peruano de Energía Nuclear – IPEN
29	ARIAS PEREZ	PABLO MELITON	Instituto Peruano de Energía Nuclear – IPEN
30	WINDHER ROJAS Y.	PHOOL	Instituto Tecnológico Pesquero del Perú – ITP
31	MAYTA FLORES	GERSON	IPv6 TF
32	FIGUEROA HERNANDEZ	JULIO	Ministerio de Trabajo Y Promocion del Empleo
33	CABANILLAS MIRANDA	BOGAR ALFONSO	Municipalidad de La Molina
34	VALDIVIA FUENTES	BENICIO	Municipalidad de Miraflores
35	SIERRA ALCAZAR	FRANCISCO	Municipalidad de Miraflores
36	BAZALAR VALENZUELA	MARLON	Municipalidad de Miraflores
37	CAMACHO ESPINOZA	GERARDO	Municipalidad de San Borja
38	YUTA VILLALTA	JESSICA	Municipalidad de San Luis
39	MENDOZA TORRES	SANTOS JAVIER	Municipalidad Distrital de Chao (La Libertad)
40	ORTIZ JAIMES	SAMUEL GILBER	Municipalidad Provincial de Huaura
41	GARAY PALOMO	WALDO PAUL	Municipalidad Provincial de Huaura
42	ZAVALETA CAMPOS	JORGE LUIS	Municipalidad Provincial del Callao
43	BALBUENA RODRIGUEZ	RICARDO	ONPE
44	ARNULFO	ALFREDO	Optical Networks
45	ESPINOZA ALMANZA	JUAN CARLOS	Optical Networks
46	MORENO CHAVEZ	GREGORIO	Optical Networks
47	MEZA BARFF	JAIME	Organismo Supervisor de Inversión en Infraestructura de Transporte de Uso Público - OSITRAN
48	ESPINOZA HUACACOLQUE	GINO PAOLO	Organismo Supervisor de Inversion Privada en Telecomunicaciones - OSIPTEL
49	UGAZ CACHAY	WINSTON	Organismo Supervisor de Inversion

		IGNACIO	Privada en Telecomunicaciones - OSIPTEL
50	DÍAZ BARRIGA	OSCAR ANTONIO	Pontificia Universidad Católica del Perú
51	COHN MUROY	DENNIS STEPHEN	Pontificia Universidad Católica del Perú
52	MUNGUIA MARTINEZ	WALTER	Red Académica Peruana (RAAP)
53	VILLANES VERGARA	IGOR FRANZ	RENIEC
54	SALAZAR OCAMPO	WALTER	Telefónica del Perú
55	MIYASHIRO YREIJO	JOSE	Telmex Peru
56	LEON MEJIA	JULIO	Telmex Perú S.A.
57	ANGELES LAZO	ANA MARIA	Universidad Nacional Federico Villarreal
58	CARRILLO BALCEDA	JESUS ELIAS	Universidad Nacional Federico Villarreal
59	MUÑOZ RAMOS	VICTOR	Universidad Nacional Federico Villarreal
60	ARDITO SAENZ	FERNANDO RICARDO	Universidad Peruana Cayetano Heredia
61	PONCE ZAMORA	LIZETH JACQUELINE	Universidad Peruana Cayetano Heredia
62	PEREZ PICHIS	LUIS	Universidad Wiener
63	GONZALE LOLI	JOHN RONALD	Escuela Nacional de Ballet
64	QUIJANDRIA ZEGARRA	YVANNA	Universidad Tecnológica del Perú
65	PALOMINO ESPINOZA	WALTHER GROVHER	INICTEL-UNI
66	LAURA QUISPE	JOHNNY	INICTEL-UNI
67	PAUCAR	RONALD	INICTEL-UNI
68	MENDOZA VILLAIZAN	EDUARDO	INICTEL-UNI
69	SORIA LOPEZ	PEDRO	INICTEL-UNI
70	QUIROZ ARROYO	JOSE LUIS	INICTEL-UNI
71	MATOS	ELVIS	INICTEL-UNI
72	CUPE CHACALCAJE	JEAN	INICTEL-UNI
73	GUERRERO	CARLOS	America Movil Perú Sac
74	DIAZ	ARTURO	Pontificia Universidad Católica del Perú
75	TISZA CONTRERAS	JUAN	Universidad Tecnológica del Perú
76	VILCHEZ SANDOVAL	JESUS	Universidad Tecnológica del Perú
77	TELLO LEYVA	MIGUEL	Ministerio de Educación - ISTEP
78	LLAQUE TTORRES	IVAN	Ministerio de Salud
79	SANCHEZ CUBAS	MILTON	Asociación de Municipalidades del Marañon Andino
80	PERES P.	LUIS	Universidad Wiener
81	MEZA	WILDER	Claro
82	NOLASCO SOLIS	BETTY	Instituto Tecnológico Público "Manuel Arevalo Cáceres"
83	DEL VILLAR PRADO	ROBERTO	Centro Internacional de la papa
84	MOLINA VELARDE	ANGEL	INICTEL UNI
85	YARINSUECA	DAVID	PCM - ONGEI
86	PANTA SALAZAR	JAVIER	PCM - ONGEI

Table 3-1: Lima 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 Peru, 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
11/05/09	8:30	Registration
11/05/09	9:00	Opening
11/05/09	9:30	La Administración de los Recursos de Internet en América Latina & Caribe y el mundo
11/05/09	10:00	Cómo obtener recursos de Internet en la región
11/05/09	10:45	Coffe Break
11/05/09	11:00	LACNIC y la Sociedad de la Información. Formas de participación en LACNIC y Proyectos en ejecución
11/05/09	11:20	Proceso de desarrollo de políticas y propuestas actuales en discusión
11/05/09	11:40	Agotamiento IPv4 y transición a IPv6 Actividades de IPv6 en la región LAC
11/05/09	12:15	Open Mic
11/05/09	12:45	Lunch
IPv6 Workshop		
11/05/09	14:00	Introducción a IPv6
11/05/09	15:30	Prácticas en hosts
11/05/09	14:00	Coffe Break
11/05/09	14:15	Prácticas en hosts (cont.)
11/05/09	14:45	Mecanismos de transición IPv4-IPv6
IPv6 Workshop (cont.)		
12/05/09	10:00	Prácticas de transición
12/05/09	11:00	Coffe Break
12/05/09	11:15	Prácticas de transición
12/05/09	12:15	Casos de despliegue en redes de banda ancha
12/05/09	13:00	End of Workshop

Table 3-2: Lima 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 Lima's 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 workshop

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 Lima (Peru) on May 11th and 12th 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.6deploy.org/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/>