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**Authors (organisations):**

**Abstract:**

This deliverable presents a report from the three workshops held in Santiago de Chile (Chile) from 8<sup>th</sup> - 10<sup>th</sup> August 2011, Lima (Peru) from 10<sup>th</sup> - 12<sup>th</sup> August 2011, and Quito (Ecuador) from 16<sup>th</sup> - 18<sup>th</sup> August 2011. 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, LAC, Training, Testbeds, Modules, 6DEPLOY, 6DEPLOY-2

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# Executive Summary

One of the main activities in the 6DEPLOY-2 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 three workshops held in Santiago de Chile (Chile) from 8<sup>th</sup> - 10<sup>th</sup> August 2011, Lima (Peru) from 10<sup>th</sup> - 12<sup>th</sup> August 2011, and Quito (Ecuador) from 16<sup>th</sup> - 18<sup>th</sup> August 2011. The following workshop details are described in this report: a) the workshop attendees and their affiliations, b) the programme outline, c) the material presented, d) "hands-on" exercises, e) an assessment of the opportunities for further co-operation and follow-up actions planned, and f) an analysis of the feedback questionnaires from the participants.

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# 1. INTRODUCTION

## 1.1 6DEPLOY-2 Objectives

The following comprise the 6DEPLOY-2 objectives:

- to support the deployment of IPv6, in Europe and developing regions
- to sustain the wealth of 6DEPLOY training material (e-learning package with subtitles in national languages, presentation material, exercises, etc.)
- to create a catalyst of global IPv6 expertise through the installation of strategically-placed sustainable IPv6 training labs
- to synchronise with the training schedules of AfriNIC and LACNIC (and also APNIC) to exploit training opportunities cost effectively in Africa, Latin America and Asia
- to revive the IPv6 Cluster
- to describe deployment examples on the project Website
- to exploit the expertise and high quality training material from 6DEPLOY, including presentations, the e-learning course and the available IPv6 Labs, and - whilst continuing to offer professional training to organisations in Europe and developing countries - focus on supporting real deployments
- to maintain and update the 6DEPLOY material and include new training media, and multiply its training effectiveness through courses which educate other trainers about the basics of IPv6, so that they can teach others (“training trainers”)
- to extend to global scale the IPv6 Labs. Sustainability is achieved initially through the careful selection of locations for the installations (e.g. within NRENs) where the connectivity, funding and qualified staff support are all secured
- to support the (human) networking between the Lab managers with regular workshops.

One of the main activities in the 6DEPLOY-2 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 project’s activities within and outside the Framework Programmes of the European Commission.



## 1.2 6DEPLOY-2 Workshop Methodology

The 6DEPLOY-2 methodology relating to the workshops is shown in the diagram below:

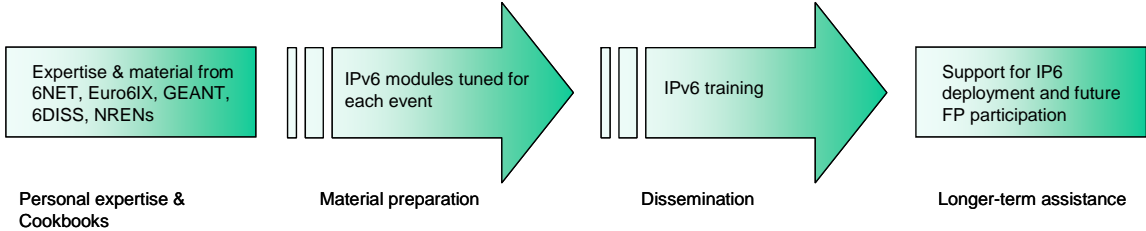


Figure 1-1: 6DEPLOY-2 methodology (diagrammatically)

The approach is to use course material available from 6DEPLOY 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-2 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 several managed testbeds) is available from 6DEPLOY 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 D1.1.1: "Report of the available training material and the assignment of partners responsible for maintaining each item".

This deliverable presents a report from the three workshops held in Santiago de Chile (Chile) from 8<sup>th</sup> - 10<sup>th</sup> August 2011, Lima (Peru) on 10<sup>th</sup> - 12<sup>th</sup> August 2011, and Quito (Ecuador) from 16<sup>th</sup> - 18<sup>th</sup> August 2011. The workshop comprised both slide

presentations and “hands-on” exercises using remote testbeds for routing exercises.

Chapter 2 of this document explains the general motivation for running IPv6 workshops, and then for each workshop there is a specific Chapter (Chapters 3-5) that describes the specific details of the workshop, in terms of the attendees, the modules that were presented, the “hands-on” exercises that were performed, and the analysis of the feedback questionnaires that were filled in by the participants. Chapter 6 identifies opportunities for further collaboration in the region and follow up actions, and Chapter 7 provides some general conclusions.

## 2. THE WORKSHOPS (GENERAL)

Workshops are one of the main mechanisms used by 6DEPLOY-2 to transfer information and to build collaboration.

6DEPLOY-2 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-2 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-2, 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-2 WORKSHOP IN SANTIAGO DE CHILE

This IPv6 Workshop was held in Santiago de Chile (Chile) from 8<sup>th</sup> - 10<sup>th</sup> August, 2011. In the following paragraphs we provide information about the workshop, including the programme outline, and the material that was presented.

Details of the workshop and the training material used can be found in 6DEPLOY's project web site:

[http://www.6deploy.eu/index.php?page=20110808\\_santiago\\_chile\\_chile](http://www.6deploy.eu/index.php?page=20110808_santiago_chile_chile)

#### 3.1 Overview

The 6DEPLOY-2 representatives at the workshop were Jordi Palet, from Consulintel and Carlos Martinez, Juan Carlos Alonso from LACNIC.

An introduction to IPv6 was given. Specific IPv6 material was presented, including an introduction to basic IPv6, concepts on the transition and coexistence of IPv4 and IPv6, as well as different transition mechanisms and IPv6 DNS.

In addition, IPv6-related routing concepts and changes from IPv4 were included in the theory part, to prepare for the routing "hands-on" exercises carried out using remote 6DEPLOY-2 testbeds.

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

#### 3.2 Attendees

Below is a list of people who attended:

No.	Name	Affiliation
1	HUGO SALGADO	NIC CHILE; UNIVERSIDAD DE CHILE
2	ANDRÉS MUÑOZ ORDENES	DUAM S.A. INNOVACIÓN AL SUR DEL MUNDO
3	ALEJANDRO SALINAS	NICLABS
4	MAURICIO BARRERA	NOVARED S.A
5	ROBERTO ARANEDA	NOVARED
6	GABRIEL TORRES	UNIVERSIDAD TÉCNICA FEDERICO SANTA MARÍA
7	LUIS PALMA	CLARO CHILE
8	CAROLINA COFRÉ	MANQUEHUENET
9	MAURICIO LÓPEZ RIFFO	GTD INTERNET S.A.

10	ARTURO NEIRA	CLARO CHILE
11	MANUEL DIAZ	NIC CHILE; UNIVERSIDAD DE CHILE
12	CARLOS CARRASCO	CLARO CHILE
13	RICHARD MILLA	NETLINE
14	EDUARDO HUMBERTO TORO RIVERA	AURA INC
15	JOSE CARLOS OJEDA	ENTEL
16	EDUARDO HORMAZABAL	IIA
17	CLAUDIO ANDRES GARCIA VIVERO	UTEM
18	JUAN PAULO SOTO C.	UNIVERSIDAD DEL BÍO-BÍO
19	CRISTIAN ROJAS	SEGC USACH LTDA.
20	ALBERT ASTUDILLO	REUNA
21	OSVALDO CAMPOS	UNIVERSIDAD DE CHILE - DIR. SERVICIOS DE TECNOLOGÍAS DE INFORMACIÓN (STI)
22	YURI A. GONZÁLEZ FARIAS	UNIVERSIDAD DE LOS LAGOS
23	CARLOS IGNACIO GIRALDO	INTERNEXA CHILE S.A.
24	FRANCISCO RETAMAL	ENTEL CHILE S.A.
25	PABLO LO GIUDICE	NETGLOBALIS
26	JAVIER GONZALEZ	NETGLOBALIS
27	ALVARO MUNIZAGA	IIA
28	OSCAR MERIÑO	UNIVERSIDAD DE ATACAMA
29	CLAUDIO ULLOA	UNIVERSIDAD DE TARAPACA
30	DIANA GOMEZ	INTERNEXA CHILE S.A.
31	CESAR CANO	INTERNEXA CHILE S.A.
32	EDUARDO ZAPETTINI	REUNA

**Table 3-1: Santiago de Chile Workshop list of participants**

The participants represented a broad sector of the ICT community. They were technical people whose knowledge about IPv6 ranged from almost no knowledge at all to having significant experience with IPv6 deployment. Some had already performed IPv6 experiments or were planning some level of deployment at their institutions.

### 3.3 Workshop programme

The agenda was agreed on after close collaboration with the local organisers. The meeting agenda and the related material were submitted in advance so that the local organisers could decide which topics should be prioritised and so manage the logistics accordingly. The programme of the workshop is presented in the following table:

Date	Title of session
08/08/2011	Introducción a IPv6
	Practicas con hosts

	Mecanismos de transición
	Practicas de transición
09/08/2011	Direccionamiento IPv6
	Seguridad IPv6
	DNS IPv6
	Routing con IPv6
10/08/2011	Routing LAB: Addressing, OSPF, BGP

Table 3-2: Santiago de Chile Workshop programme

### 3.4 Presentation material

The following material was presented:

Modules	Presented by	Affiliation
Introducción a IPv6	Jordi Palet	Consulintel
Practicas con hosts		
Mecanismos de transición		
Practicas de transición		
Seguridad IPv6		
Direccionamiento IPv6	Carlos Martinez	LACNIC
DNS IPv6	Carlos Martinez, Juan Carlos Alonso	LACNIC
Routing con IPv6		
Routing LAB: Addressing, OSPF, BGP		

Table 3-3: Santiago de Chile Workshop list of modules used

#### 3.4.1 Modules

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

- **Introducción a IPv6:** This module is a summary of different issues, to refresh and introduce some useful content to be used in the "hands-on" exercises. It explains why a new version for IP, IPv6, has been developed. A brief history of IPv6, its motivation and benefits are given. IPv6 packet header, extensions headers and differences from IPv4 headers. In addition, IPv6 addressing architecture, the different types of addresses (unique local IPv6 addresses, interface IDs, multicast addresses), their textual representation, how these are built and related to a layer 2 address, are explained.
- **Mecanismos de transición:** Transition concepts and mechanisms are

introduced.

- **Direccionamiento IPv6:** This module explains the IPv6 addressing architecture, the different types of addresses (unique local IPv6 addresses, interface IDs, multicast addresses), their textual representation, how these are built and related to a layer 2 address.
- **Seguridad IPv6:** Several issues are covered, such as the IPsec model, privacy extensions, ND threats, IPv4 vs. IPv6 Threat Analysis, IPv6 security issues, practical IPv6 security issues and firewalling IPv6.
- **DNS IPv6:** This module describes new Resource Records for IPv6 DNS, availability of IPv6 in the root servers zone and CC-TLDs, etc. In addition DNS64/NAT64 concepts are presented.
- **Routing con IPv6:** This module mainly describes the differences between IPv4 and IPv6 routing protocols for OSPFv3, EIGRP, RIPng, BGP4+, and ISIS.

### 3.4.2 Hands-on exercises

To help ensure the workshop attendees will be able to install IPv6 in their own environment after the course is over, a set of practical exercises has been designed, known as 'hands-on modules'. These exercises are performed on remote testbeds, which were established in the 6DISS, 6DEPLOY and 6DEPLOY-2 projects, thanks to Cisco donations.

Below is a brief description of the "hands-on" exercises that were performed:

- **Prácticas con hosts:** These exercises illustrate how to install IPv6 on several platforms, mainly Linux, Vista, and Windows XP operating systems. Use of link-local addresses, ping and traceroute. Configuration of static addresses. Concepts like addresses, autoconfiguration, and neighbor discovery protocol using hosts.
- **Prácticas de transición:** Some transition concepts and mechanisms were used, mainly tunnel-based ones.
- **Routing Lab: Addressing, OSPF, BGP:** IPv6 routing protocols are configured by the trainees on the testbed routers. Internal Gateway Protocol (OSPF) and External Gateway Protocol (BGP) are tested.

## 3.5 Analysis of the Feedback Questionnaires

A questionnaire has been specially designed for the purpose of getting feedback from the participants regarding the suitability of the course material, and the presenters' ability to convey information, and the relevance of the information to the expectations



of the attendees.

Personal information was not mandatory, so as to allow for anonymous responses.

Each participant was first asked to indicate:

- his/her organisation and job responsibilities, and
- his/her plans for IPv6 deployment in his/her organisation.

Then, for each theoretical presentation and “hands-on” session, each participant was requested to assess “usefulness”, “quality of presentation”, “familiarity with the topic”, “quality of the course documentation”, “general organisation”, etc.

### 3.5.1 General questions related to participants and IPv6

<b>About the participants</b>		
32 participants were present, 23 questionnaires were returned		
<b>Employment sector</b>	Government	3
	University or other higher education	8
	Schools or further education	0
	Research	5
	Health	0
	Commercial	7
	Other (please specify)	(5)*
<b>Job function</b>	Government Advisor	1
	Senior Manager	2
	IT Manager	3
	Systems Administrator	6
	Network Administrator	12
	Researcher / Postgraduate	1
	Undergraduate	0
	Other (please specify)	(1)*
<b>Usage of IPv6</b>		
Do you use IPv6 yourself?	Yes	9
	No	11
Does your organisation use IPv6?	Yes	11
	No, but planned in this year	3
	No, but planned in the next year	3
	No, but planned in the longer term	3
	No, and no plans as yet	0

\* See the graphics section for more information

**Table 3-4: General questions related to participants and IPv6**

### 3.5.2 Questions regarding the workshop

<b>About the Workshop</b>				
<b>Usefulness of the topic</b>	Very useful	Useful	Slightly useful	Not useful
Presentation 1 – Introducción a IPv6	14	3	0	0
Presentation 2 – Mecanismos de Transición	17	0	0	0
Presentation 3 - Direccionamiento IPv6	17	1	0	0
Presentation 4 - Seguridad IPv6	12	4	1	1
Presentation 5 - DNS IPv6	12	4	2	0
Presentation 6 - Routing con IPv6	14	3	1	0
Practice 1 – Prácticas con Hosts	10	5	1	0
Practice 2 – Práctica Mecanismos de Transición	11	3	4	0
Practice 3 - Routing LAB: Addressing, OSPF, BGP	13	4	1	0
<b>Quality of the presentation</b>	Excellent	Good	Average	Poor
Presentation 1 – Introducción a IPv6	12	5	0	0
Presentation 2 – Mecanismos de Transición	12	5	0	0
Presentation 3 - Direccionamiento IPv6	14	4	0	0
Presentation 4 - Seguridad IPv6	12	5	0	1
Presentation 5 - DNS IPv6	13	4	1	0
Presentation 6 - Routing con IPv6	14	4	0	0
Practice 1 – Prácticas con Hosts	11	4	2	0
Practice 2 – Práctica Mecanismos de Transición	10	5	3	0
Practice 3 - Routing LAB: Addressing, OSPF, BGP	12	5	1	0
<b>Familiarity with the topic?</b>	None	Some	Most	All
Presentation 1 – Introducción a IPv6	0	3	12	2
Presentation 2 – Mecanismos de Transición	2	9	6	0
Presentation 3 - Direccionamiento IPv6	0	7	9	1
Presentation 4 - Seguridad IPv6	4	9	5	0
Presentation 5 - DNS IPv6	6	6	4	2
Presentation 6 - Routing con IPv6	2	10	6	0
Practice 1 – Prácticas con Hosts	5	8	4	0
Practice 2 – Práctica Mecanismos de Transición	6	9	3	0
Practice 3 - Routing LAB: Addressing, OSPF, BGP	5	7	6	0
<b>Quality of the course documentation</b>	Excellent	Good	Average	Poor
	7	8	1	1
<b>General workshop organisation</b>	Excellent	Good	Average	Poor
	3	9	3	0
<b>Recommend to your colleagues?</b>	yes	no		
	18	0		

Table 3-5: Questions regarding the workshop

### 3.5.3 Results graphics

Following are some graphics that represent the above results in a more friendly way, so as to ease their interpretation.

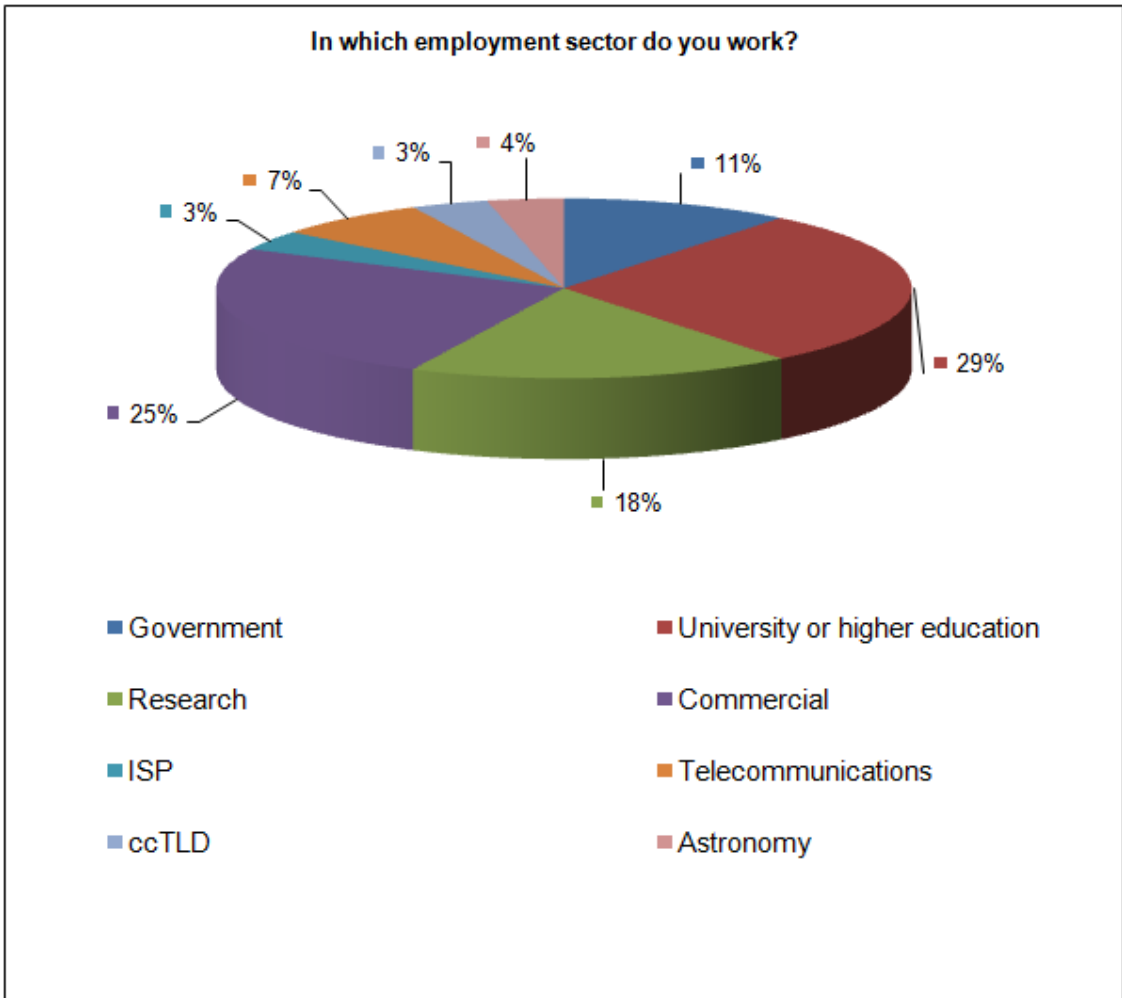


Figure 3-1: In which employment sector do you work?

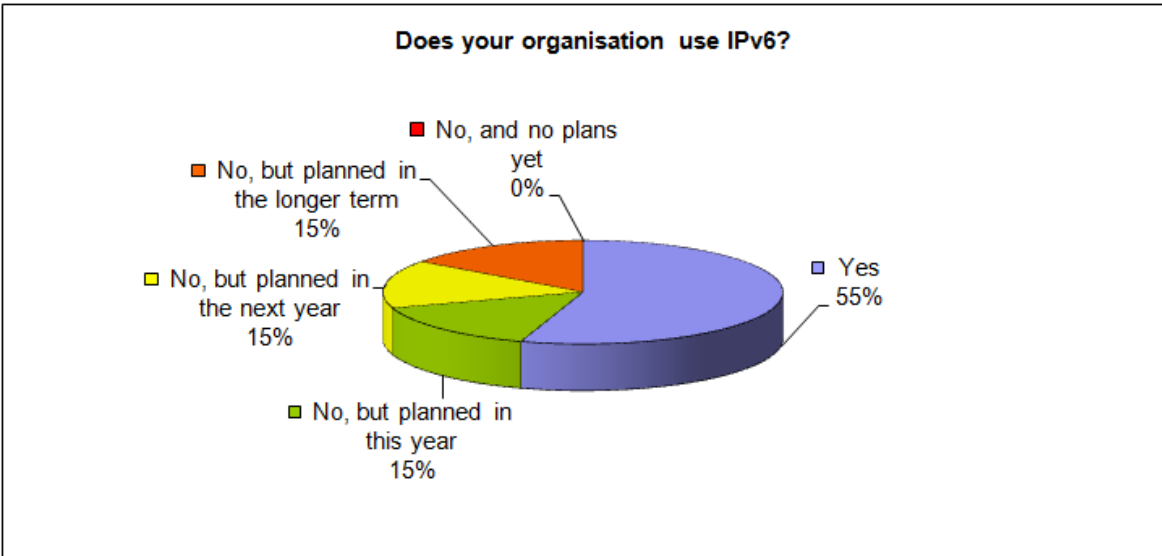


Figure 3-2: Does your organisation use IPv6?

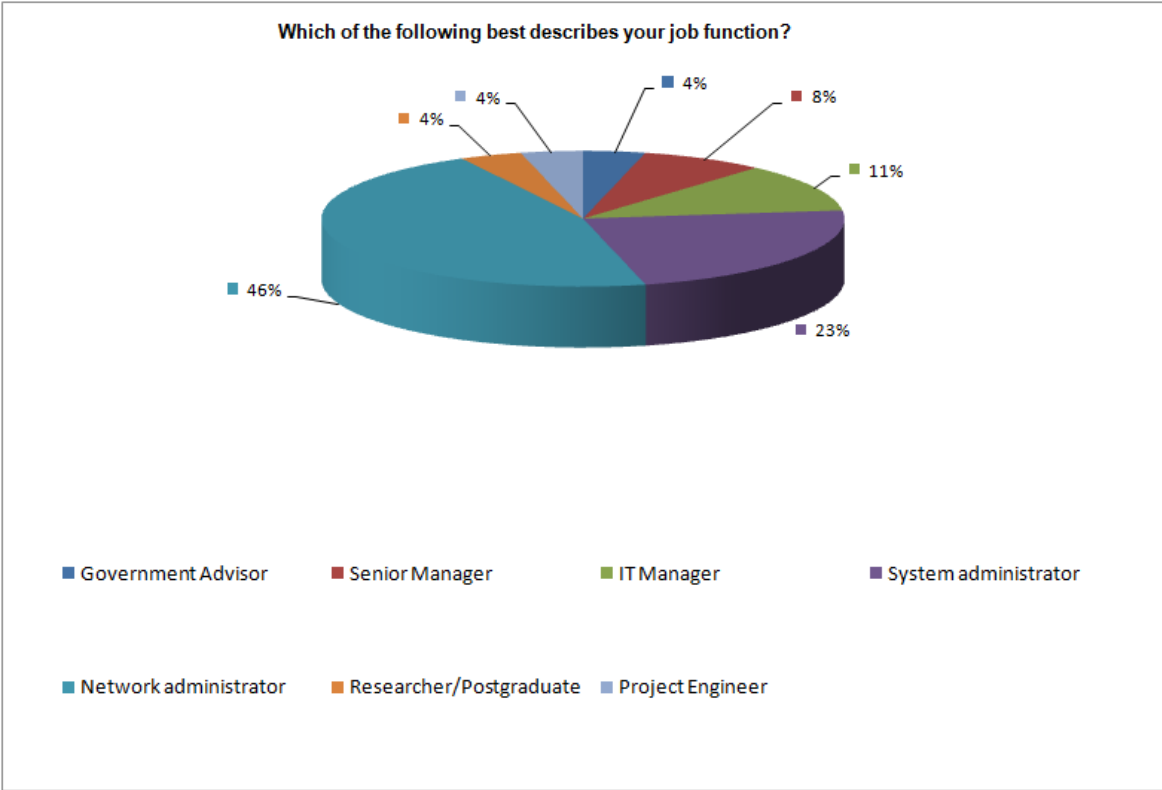


Figure 3-3: Which of the following best describes your job function?

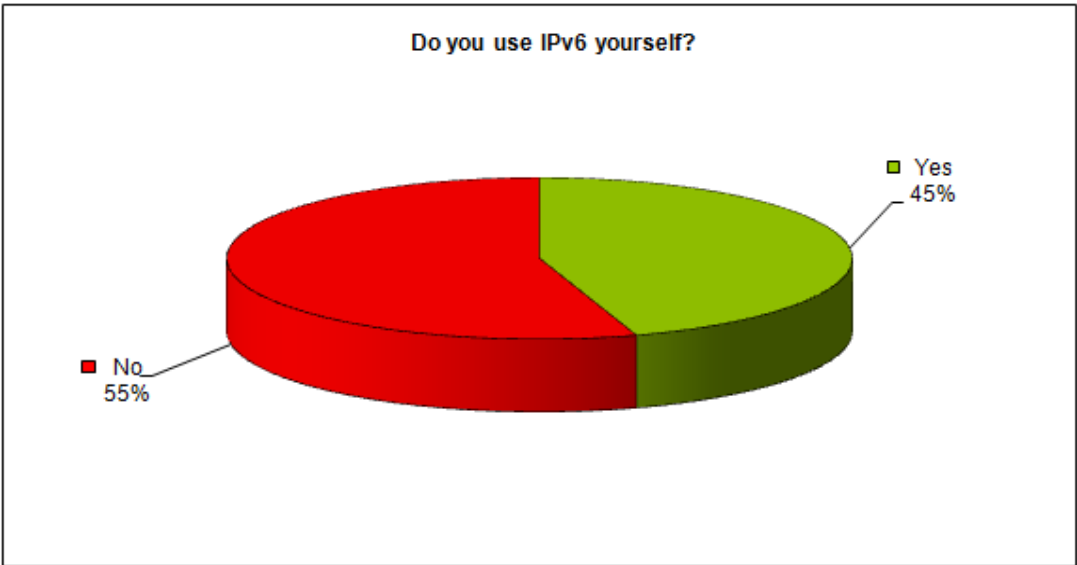


Figure 3-4: Do you use IPv6 yourself?

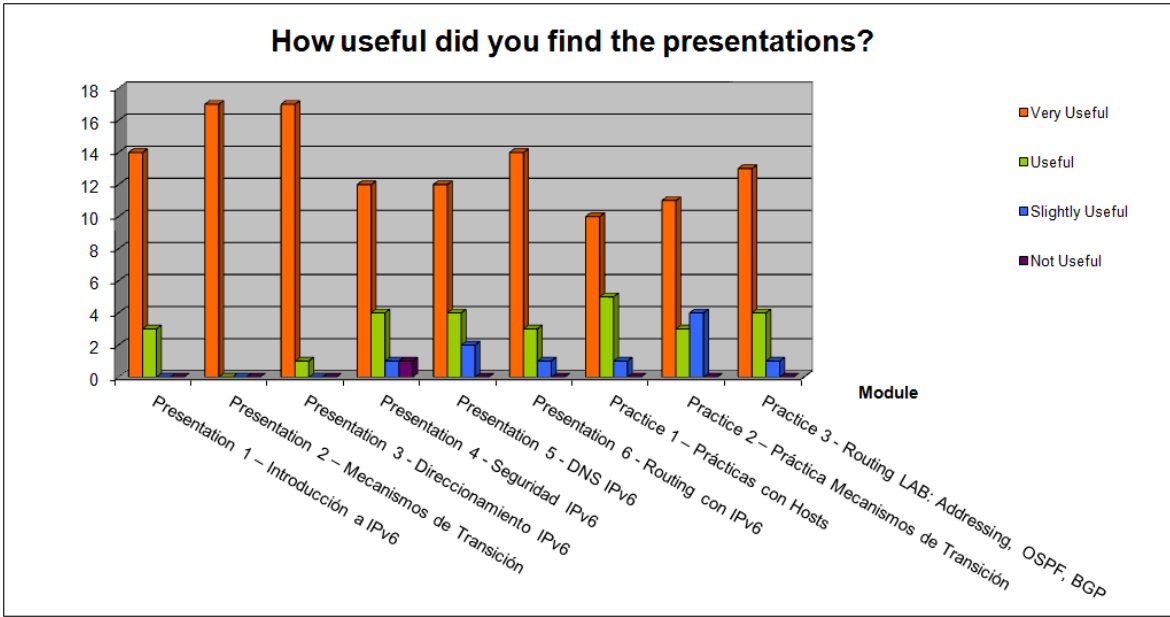


Figure 3-5: How useful did you find the presentations?

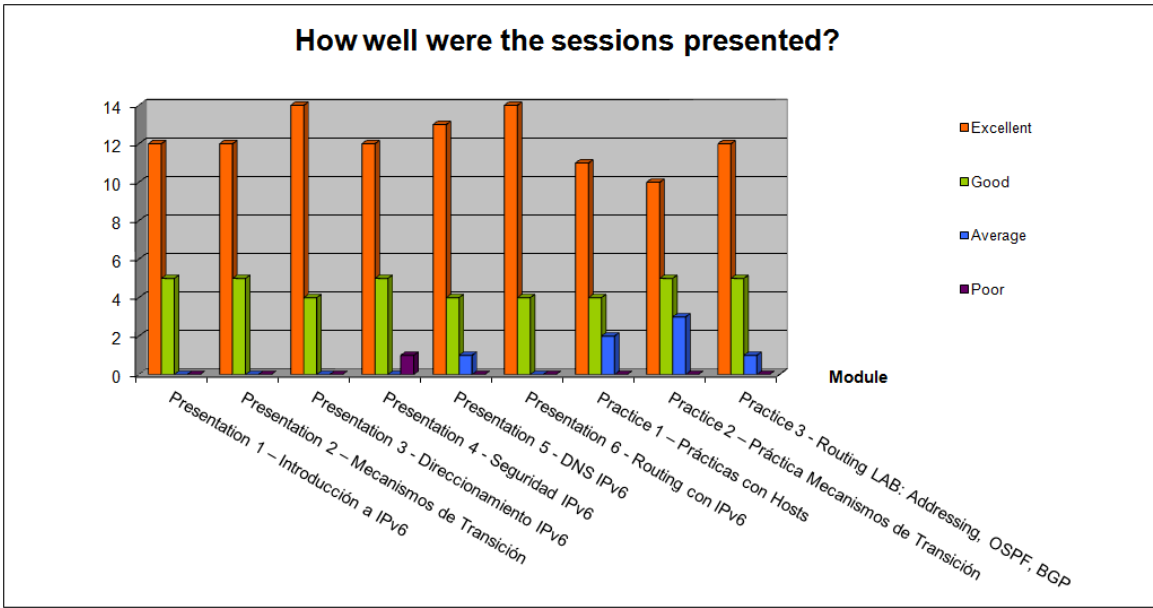


Figure 3-6: How well were the sessions presented?

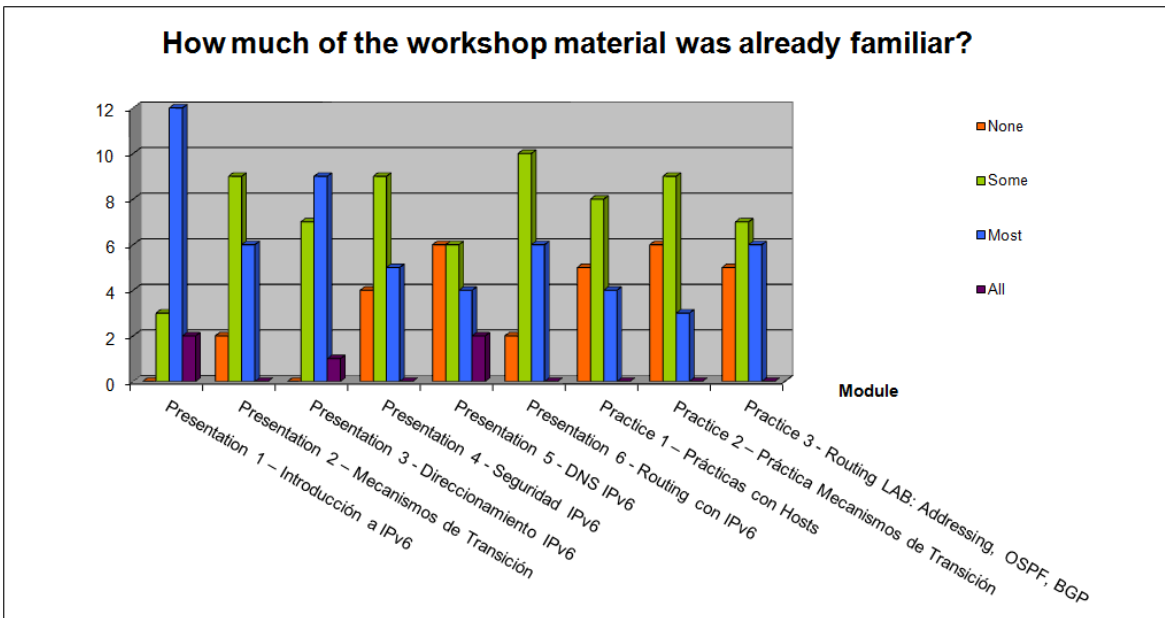


Figure 3-7: How much of the workshop material was already familiar?

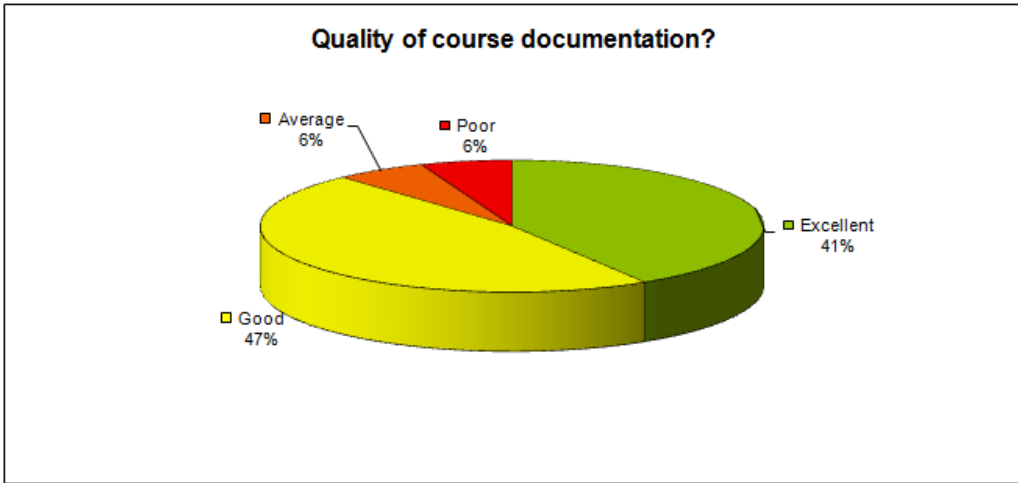


Figure 3-8: Quality of course documentation?

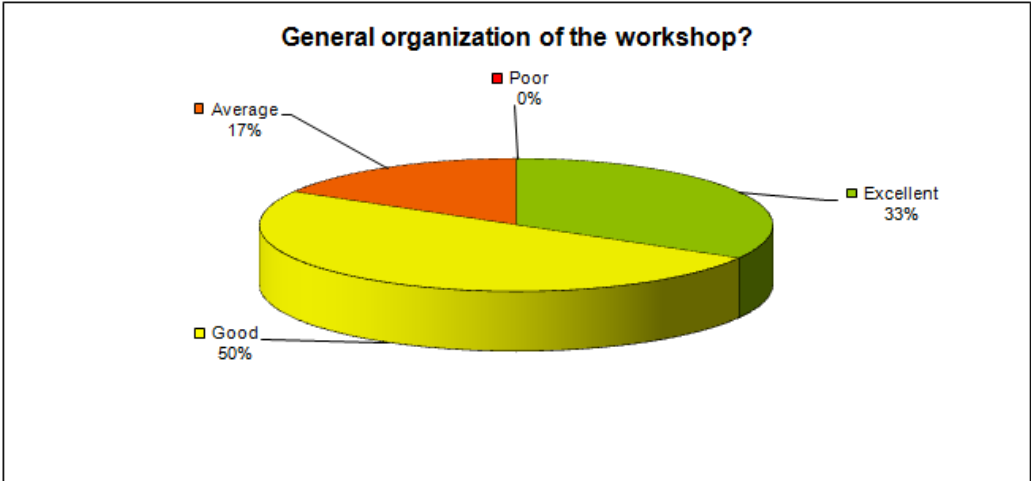


Figure 3-9: General organization of the workshop?

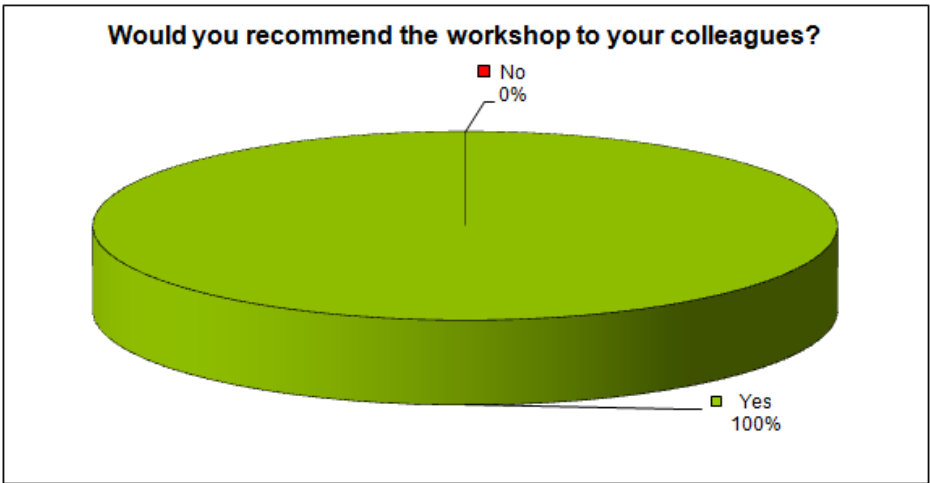


Figure 3-10: Would you recommend the workshop to your colleagues?

### 3.5.4 Participants comments

It should be noted that the participants had different technical backgrounds. For example, some were network engineers (and therefore more interested in routing protocols and troubleshooting practices) while others were system administrators (and therefore more interested in applications and monitoring tools). Depending upon their background, some participants would have preferred to spend more time on Management, Applications, "hands-on", or to have a "hands-on" session related to security issues.

Within the questionnaire there were three open questions where the trainees could give their feedback on the workshop. Below are almost all of the responses. Note that some are repeated (number put between parentheses).

Here are some comments provided by the trainees:

== Begin of the excerpts

*What topics would you have liked to **hear more about**?:*

- (1) *Transition Techniques and mechanisms*
- (1) *Best practices with IPv6*
- (3) *Routing*
- (1) *Transition mechanisms lab*
- (2) *IPv6 software development*
- (1) *Remote VPNs*
- (2) *Real deployments on fixed and mobile ISPs*
- (2) *IPv6 on LTE, mobile phone networks*
- (1) *IPv6 servers implementation.*

*What topics would you have liked to **hear less about**?*

- (1) *DNS IPv6.*
- (1) *BGP.*

End of the excerpts ==



## 4. THE 6DEPLOY-2 WORKSHOP IN LIMA (PERU)

This IPv6 Workshop was held in Lima (Peru) from 10<sup>th</sup> - 12<sup>th</sup> August 2011. In the following paragraphs we provide information about the workshop, including the programme outline, and the material that was presented.

Details of the workshop and the training material used can be found in 6DEPLOY's project web site:

[http://www.6deploy.eu/index.php?page=20110810\\_lima\\_peru](http://www.6deploy.eu/index.php?page=20110810_lima_peru)

### 4.1 Overview

The 6DEPLOY-2 representative at the workshop were Jordi Palet, from Consulintel and Arturo Servin, Ruben Rodriguez from LACNIC.

An introduction to IPv6 was given. Specific IPv6 material was presented, including an introduction to basic IPv6, concepts on the transition and coexistence of IPv4 and IPv6, as well as different transition mechanisms and IPv6 DNS.

In addition, IPv6-related routing concepts and changes from IPv4 were included in the theory part, to prepare for the routing "hands-on" exercises carried out using remote 6DEPLOY-2 testbeds.

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

### 4.2 Attendees

Below is a list of people who attended:

No.	Name	Affiliation
1	ISP ADMINISTRATOR	NEXTEL DEL PERU S.A.
2	RAUL VILLAFANI CASTRO	INICTEL - INSTITUTO NACIONAL DE INVESTIGACION Y CAPACITACION DE TELECOMUNICACIONES
3	JAVIER RICHARD QUINTO ANCIETA	INICTEL-UNI
4	WATTSON ALEXANDER RAMIREZ RODAS	NOKIA SIEMENS NETWORKS
5	LUIS ALBERTO VENEGAS	NEXTEL DEL PERU S.A.
6	ANALIA MORON PEÑA	UNIVERSIDAD PERUANA DE CIENCIAS APLICADAS
7	VLADIMIR TOLENTINO	NOKIA SIEMENS NETWORKS

8	JUAN MENDOZA	TELMEX PERU
9	CARLOS ALBERTO NESTAREZ	ITALTEL PERU
10	CLAUDIA SOFIA ANGLES PARI	INTERNEXA S.A.
11	JUAN CARLOS GUARDAPUCLLA ZARZANAULA	ITALTEL PERU SAC
12	JÉSSICA ARÓSTEGUI GUILLÉN	BT LATAM PERU S.A.C.
13	MARCO CACERES	BT LATAM PERU S.A.C.
14	SONIA ROMERO LLANOS	BT LATAM PERU S.A.C.
15	ANDRES LEIVA	INICTEL-UNI
16	NANCY JULIA CORDOVA GAMARRA	TELEFONICA DEL PERU S.A.
17	CARLOS ENRIQUE ROJAS SOSA	AMERICATEL PERU S.A.
18	VICTOR HUGO ALVARADO SALDAÑA	AMERICATEL PERU S.A.
19	RUBEN RODRIGUEZ	RED CIENTÍFICA PERUANA; RED ACADÉMICA PERUANA- RAAP
20	ALBERTO CHICHIZOLA	OPTICAL
21	JUAN RAMÍREZ	RCP
22	HECTOR PAREDES	WINET
23	MIGUEL ANGEL CERPA	ECONOCABLE
24	VERÓNICA ALMANZA AVENDAÑO	OPTICAL NETWORKS
25	CESAR RAVINES NUZZO	TELDAT
26	ALEX TERNERO	OPTICAL NETWORKS
27	ALDO PIZARRO ESPINOZA	CE NET SRL
28	MIGUEL ANGEL HEREDIA	ECONOCABLE
29	HENRRY HUAMAN CARDENAS	ITALTEL PERU SAC
30	CLAUDIA CÓRDOVA	RED CLARA
31	JEFFRY CORNEJO ALVA	WINNER
32	MARIO LOZADA	NOKIA SIEMENS NETWORKS
33	FIDEL MENDOZA	CLARO
34	VIVECA CARRERA	INTERNEXA S.A.

**Table 4-1: Lima Workshop list of participants**

The participants represented a broad sector of the ICT community. They were technical people whose knowledge about IPv6 ranged from almost no knowledge at all to having significant experience with IPv6 deployment. Some had already performed IPv6 experiments or were planning some level of deployment at their institutions.

### 4.3 Workshop programme

The agenda was agreed on after close collaboration with the local organisers. The meeting agenda and the related material were submitted in advance so that the local organisers could decide which topics should be prioritised and so manage the logistics accordingly. The programme of the workshop is presented in the following table:

Date	Title of session
10/08/2011	Introducción a IPv6
	Practicas con hosts
	Mecanismos de transición
	Practicas de transición
11/08/2011	Seguridad IPv6
	DNS IPv6
	Routing con IPv6
12/08/2011	Routing LAB: Addressing, OSPF, BGP

Table 4-2: Lima Workshop programme

## 4.4 Presentation material

The following material was presented:

Modules	Presented by	Affiliation
Introducción a IPv6	Jordi Palet	Consulintel
Practicas con hosts		
Mecanismos de transición		
Practicas de transición		
Seguridad IPv6	Arturo Servin, Ruben Rodriguez	LACNIC
DNS IPv6		
Routing con IPv6		
Routing LAB: Addressing, OSPF, BGP		

Table 4-3: Lima Workshop list of modules used

### 4.4.1 Modules

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

- Introducción a IPv6:** This module is a summary of different issues, to refresh and introduce some useful content to be used in the "hands-on" exercises. It explains why a new version for IP, IPv6, has been developed. A brief history of IPv6, its motivation and benefits are given. IPv6 packet header, extensions headers and differences from IPv4 headers. In addition, IPv6 addressing architecture, the different types of addresses (unique local IPv6 addresses, interface IDs, multicast addresses), their textual representation, how these are built and related to a layer 2 address, are explained.

- **Mecanismos de transición:** Transition concepts and mechanisms are introduced.
- **Seguridad IPv6:** Several issues are covered, such as the IPsec model, privacy extensions, ND threats, IPv4 vs. IPv6 Threat Analysis, IPv6 security issues, practical IPv6 security issues and firewalling IPv6.
- **DNS IPv6:** This module describes new Resource Records for IPv6 DNS, availability of IPv6 in the root servers zone and CC-TLDs, etc. In addition DNS64/NAT64 concepts are presented.
- **Routing con IPv6:** This module mainly describes the differences between IPv4 and IPv6 routing protocols for OSPFv3, EIGRP, RIPng, BGP4+, and ISIS.

#### 4.4.2 Hands-on exercises

To help ensure the workshop attendees will be able to install IPv6 in their own environment after the course is over, a set of practical exercises has been designed, known as 'hands-on modules'. These exercises are performed on remote testbeds, which were established in the 6DISS, 6DEPLOY and 6DEPLOY-2 projects, thanks to Cisco donations.

Below is a brief description of the "hands-on" exercises that were performed:

- **Prácticas con hosts:** These exercises illustrate how to install IPv6 on several platforms, mainly Linux, Vista, and Windows XP operating systems. Use of link-local addresses, ping and traceroute. Configuration of static addresses. Concepts like addresses, autoconfiguration, and neighbor discovery protocol using hosts.
- **Prácticas de transición:** Some transition concepts and mechanisms were used, mainly tunnel-based ones.
- **Routing Lab: Addressing, OSPF, BGP:** IPv6 routing protocols are configured by the trainees on the testbed routers. Internal Gateway Protocol (OSPF) and External Gateway Protocol (BGP) are tested.

#### 4.5 Analysis of the Feedback Questionnaires

A questionnaire has been specially designed for the purpose of getting feedback from the participants regarding the suitability of the course material, and the presenters' ability to convey information, and the relevance of the information to the expectations of the attendees.

Personal information was not mandatory, so as to allow for anonymous responses.

Each participant was first asked to indicate:

- his/her organisation and job responsibilities, and
- his/her plans for IPv6 deployment in his/her organisation.

Then, for each theoretical presentation and “hands-on” session, each participant was requested to assess “usefulness”, “quality of presentation”, “familiarity with the topic”, “quality of the course documentation”, “general organisation”, etc.

#### 4.5.1 General questions related to participants and IPv6

<b>About the participants</b>		
34 participants were present, 23 questionnaires were returned		
<b>Employment sector</b>	Government	0
	University or other higher education	2
	Schools or further education	0
	Research	3
	Health	0
	Commercial	7
	Other (please specify)	(8)*
<b>Job function</b>	Government Advisor	0
	Senior Manager	1
	IT Manager	1
	Systems Administrator	1
	Network Administrator	17
	Researcher / Postgraduate	4
	Undergraduate	0
	Other (please specify)	(2)*
<b>Usage of IPv6</b>		
Do you use IPv6 yourself?	Yes	8
	No	11
Does your organisation use IPv6?	Yes	5
	No, but planned in this year	4
	No, but planned in the next year	6
	No, but planned in the longer term	3
	No, and no plans as yet	1

\* See the graphics section for more information

**Table 4-4: General questions related to participants and IPv6**

#### 4.5.2 Questions regarding the Lima workshop

<b>About the Workshop</b>				
<b>Usefulness of the topic</b>	Very useful	Useful	Slightly useful	Not useful
Presentation 1 – Introducción a IPv6	15	3	0	0
Presentation 2 – Mecanismos de Transición	12	4	0	0
Presentation 3 - Direccionamiento IPv6	14	4	0	0
Presentation 4 - Seguridad IPv6	11	5	2	0
Presentation 5 - DNS IPv6	9	9	0	0
Presentation 6 - Routing con IPv6	13	5	0	0
Practice 1 – Prácticas con Hosts	12	4	2	0
Practice 2 – Práctica Mecanismos de Transición	12	5	1	0
Practice 3 - Routing LAB: Addressing, OSPF, BGP	15	3	0	0
<b>Quality of the presentation</b>	Excellent	Good	Average	Poor
Presentation 1 – Introducción a IPv6	15	3	0	0
Presentation 2 – Mecanismos de Transición	13	4	0	1
Presentation 3 - Direccionamiento IPv6	14	4	0	0
Presentation 4 - Seguridad IPv6	13	4	0	1
Presentation 5 - DNS IPv6	12	5	1	0
Presentation 6 - Routing con IPv6	14	4	0	0
Practice 1 – Prácticas con Hosts	14	4	0	0
Practice 2 – Práctica Mecanismos de Transición	13	4	1	0
Practice 3 - Routing LAB: Addressing, OSPF, BGP	14	3	1	0
<b>Familiarity with the topic?</b>	None	Some	Most	All
Presentation 1 – Introducción a IPv6	0	7	9	2
Presentation 2 – Mecanismos de Transición	2	9	5	2
Presentation 3 - Direccionamiento IPv6	0	9	7	2
Presentation 4 - Seguridad IPv6	5	8	4	1
Presentation 5 - DNS IPv6	6	6	4	2
Presentation 6 - Routing con IPv6	3	6	7	2
Practice 1 – Prácticas con Hosts	7	4	6	1
Practice 2 – Práctica Mecanismos de Transición	8	3	5	2
Practice 3 - Routing LAB: Addressing, OSPF, BGP	6	4	7	1
<b>Quality of the course documentation</b>	Excellent	Good	Average	Poor
	5	12	1	0
<b>General workshop organisation</b>	Excellent	Good	Average	Poor
	9	8	0	0
<b>Recommend to your colleagues?</b>	yes	no		
	18	0		

Table 4-5: Questions regarding the Lima workshop

### 4.5.3 Results graphics

Following are some graphics that represent the above results in a more friendly way, so as to ease their interpretation.

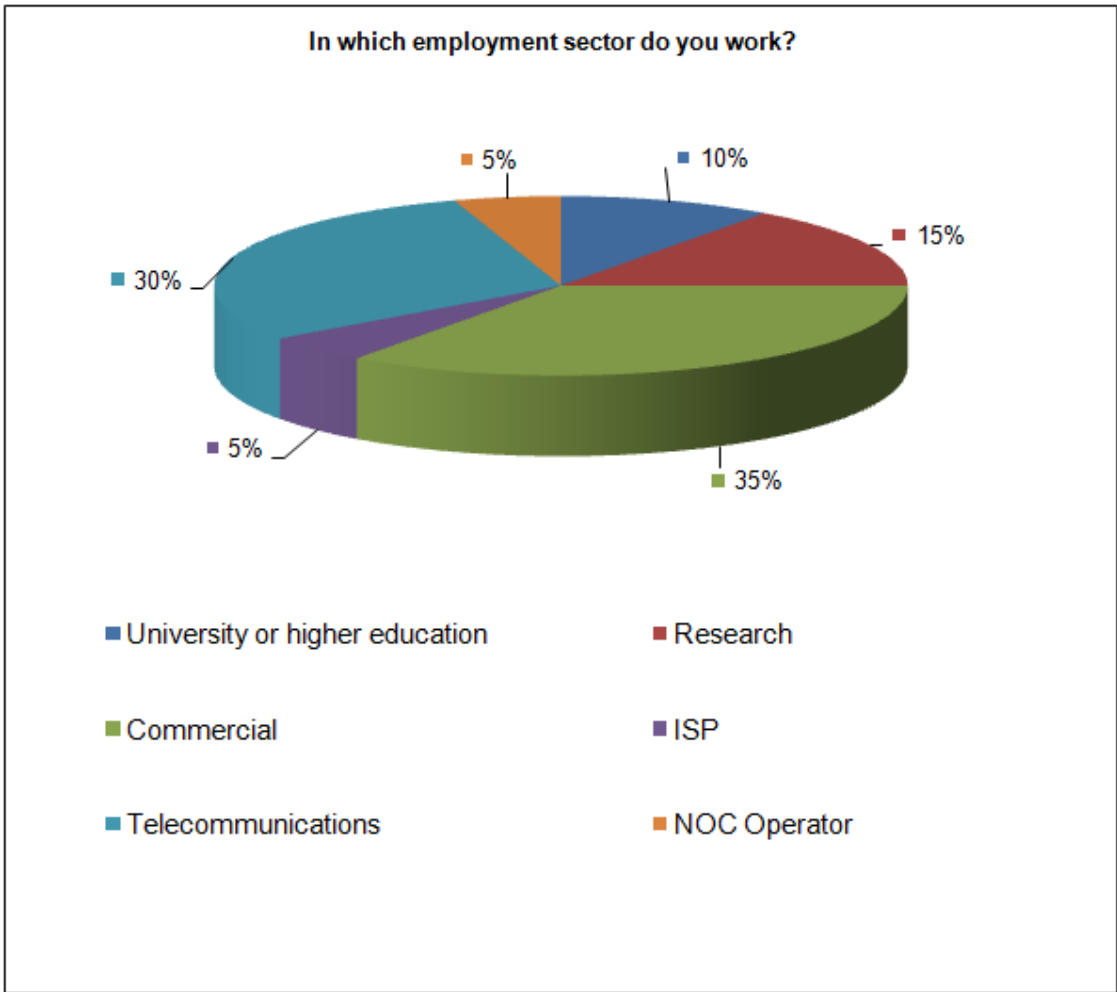


Figure 4-1: In which employment sector do you work?

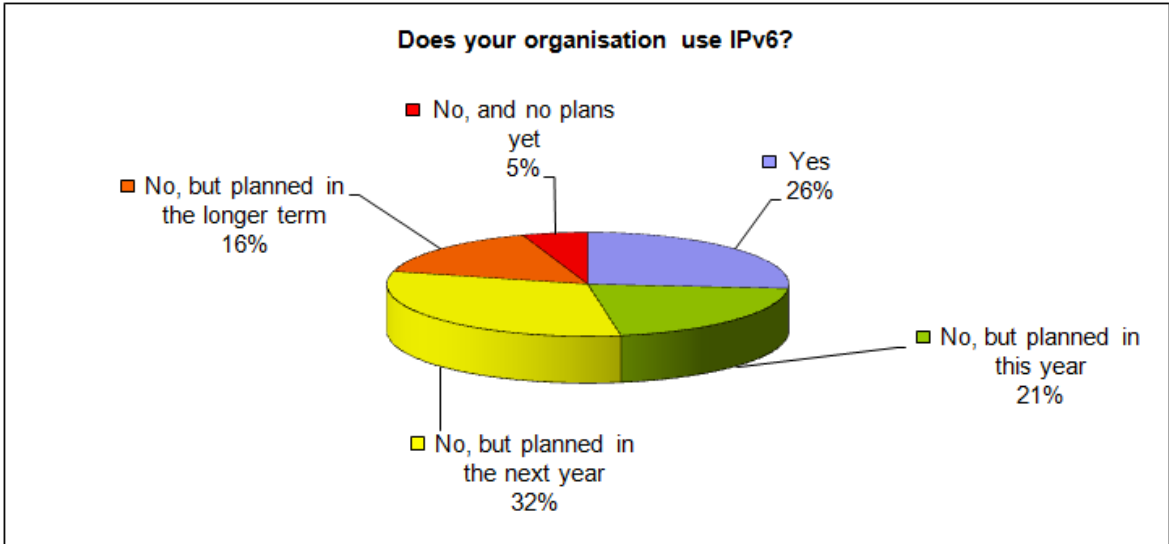


Figure 4-2: Does your organisation use IPv6?

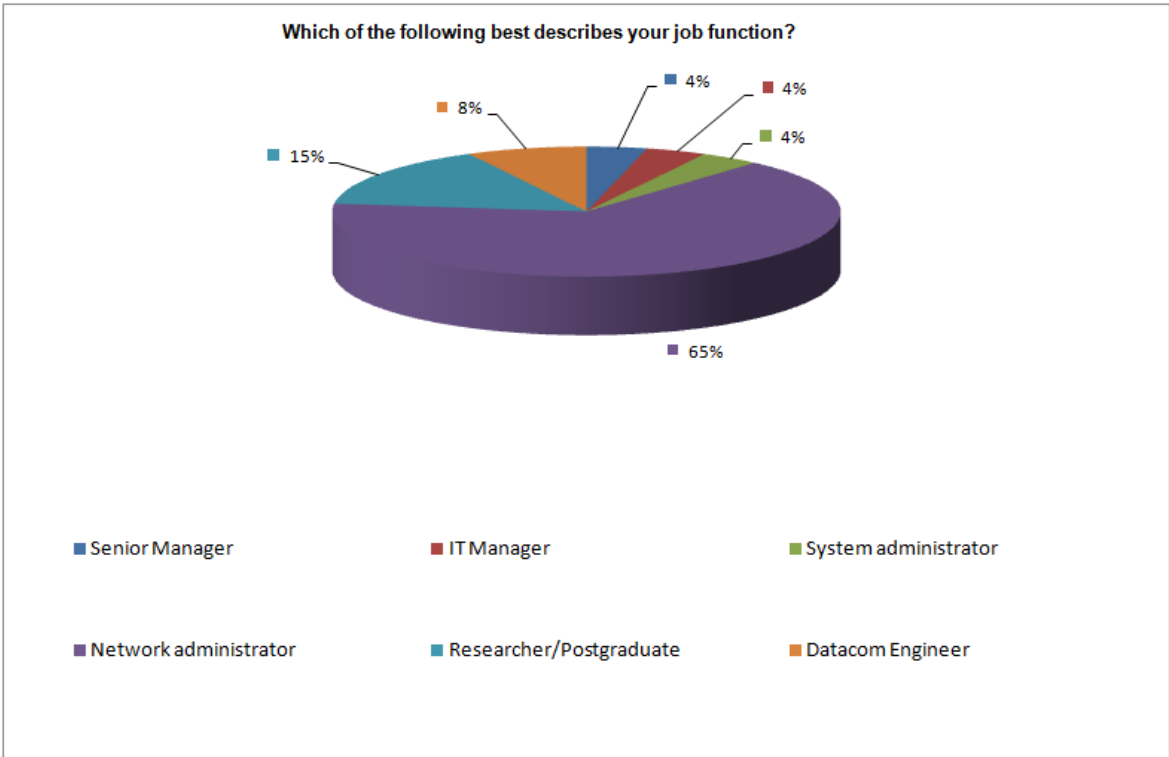


Figure 4-3: Which of the following best describes your job function?



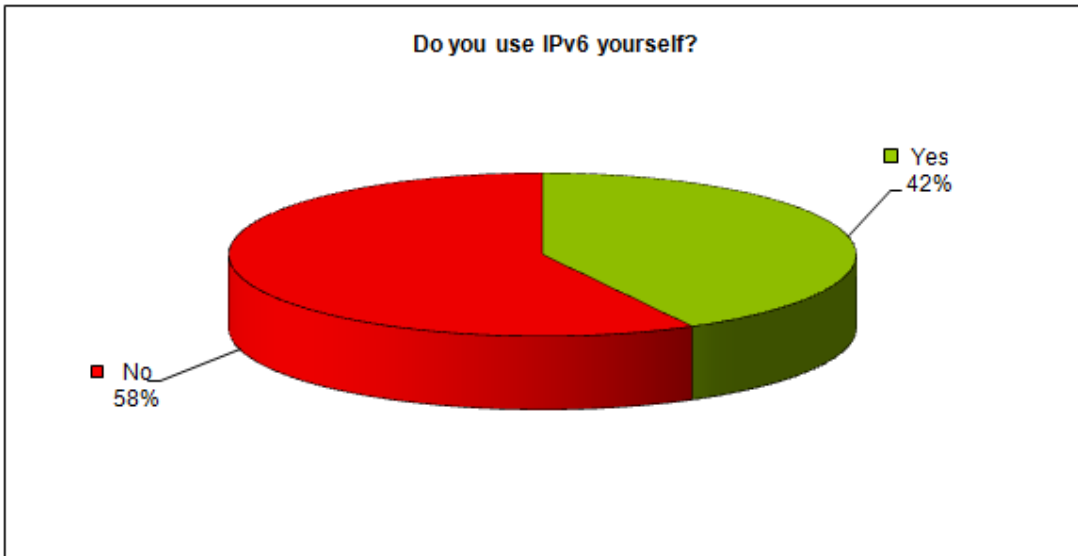


Figure 4-4: Do you use IPv6 yourself?

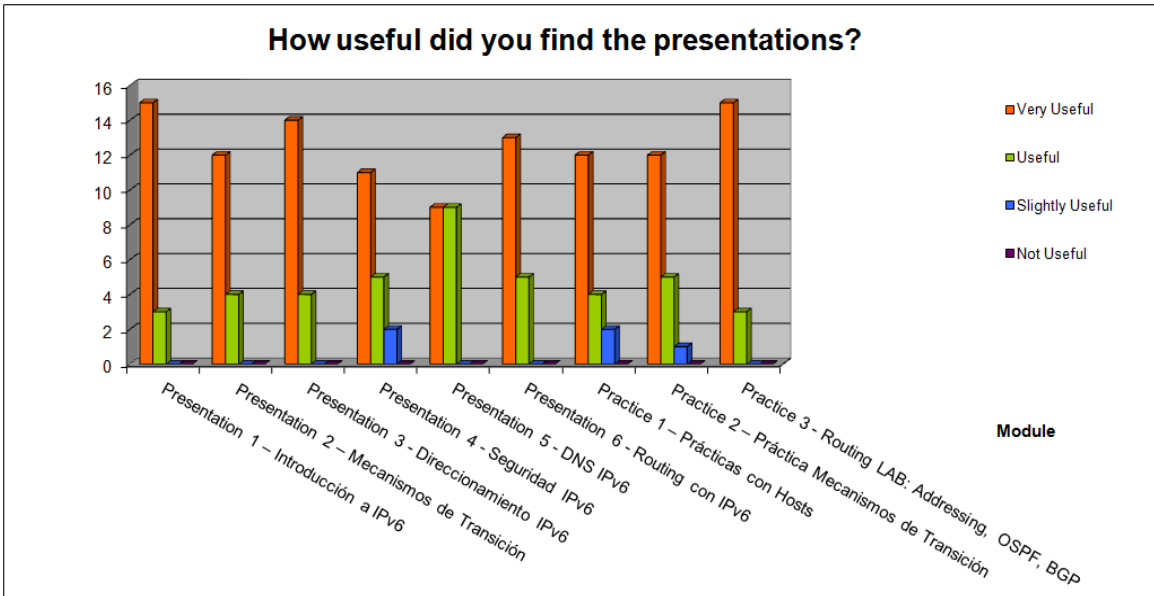


Figure 4-5: How useful did you find the presentations?

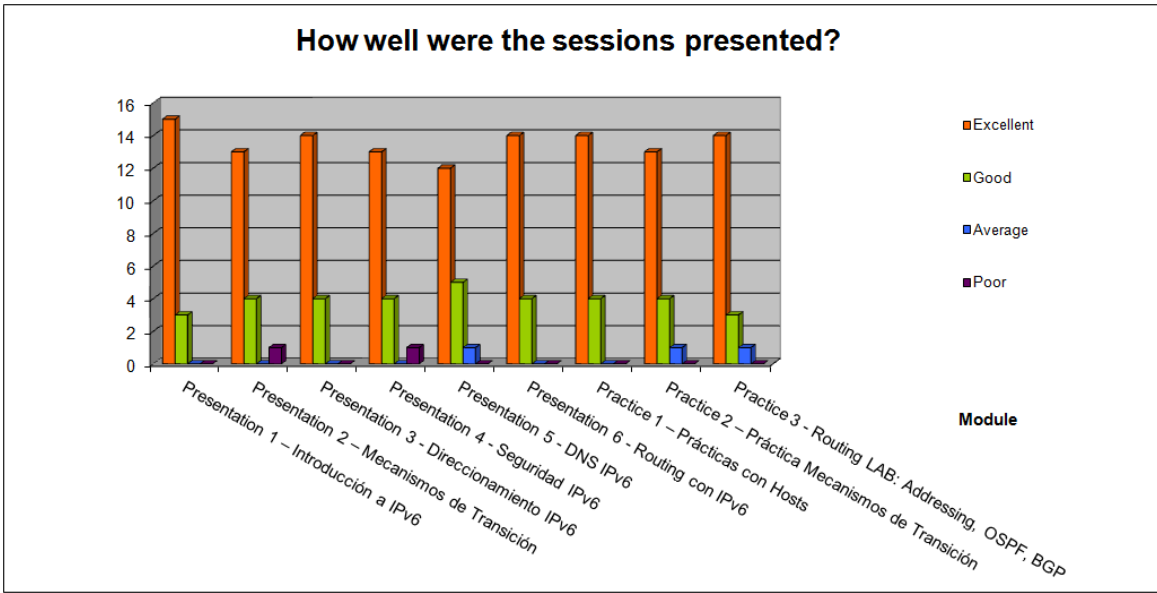


Figure 4-6: How well were the sessions presented?

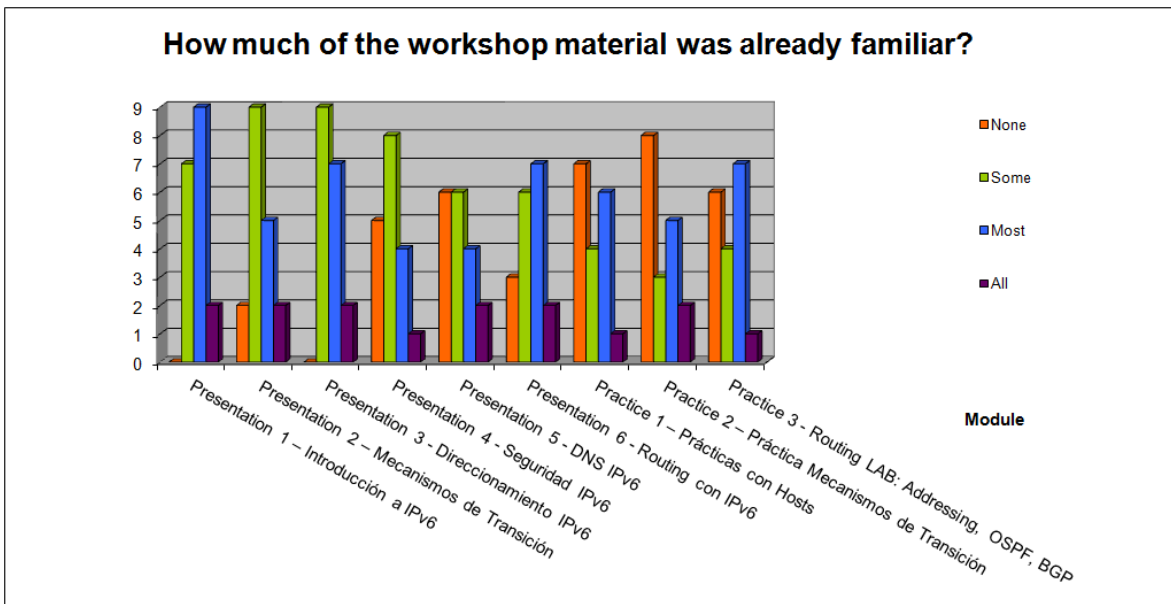


Figure 4-7: How much of the workshop material was already familiar?

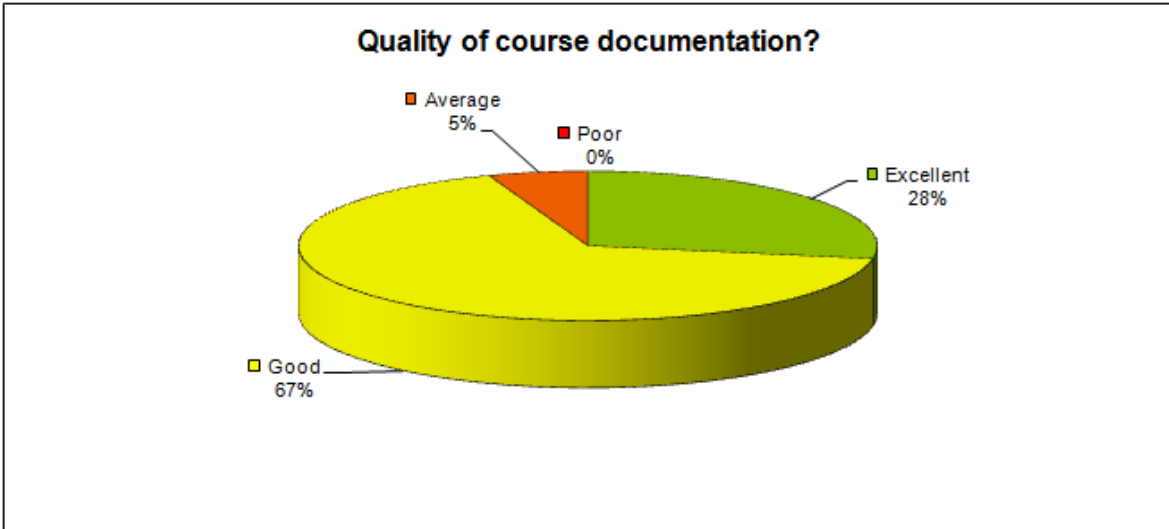


Figure 4-8: Quality of course documentation?

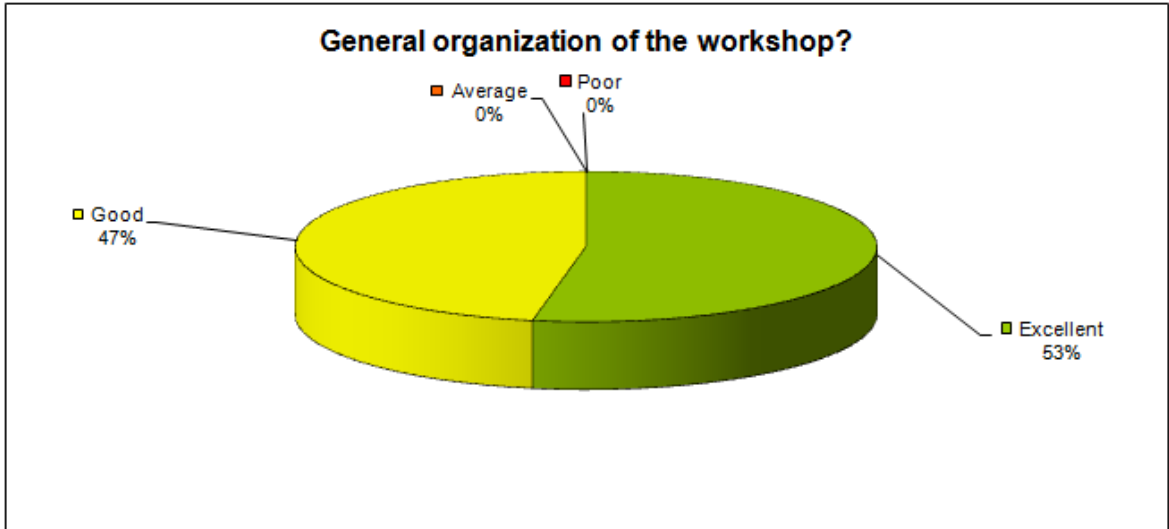


Figure 4-9: General organization of the workshop?

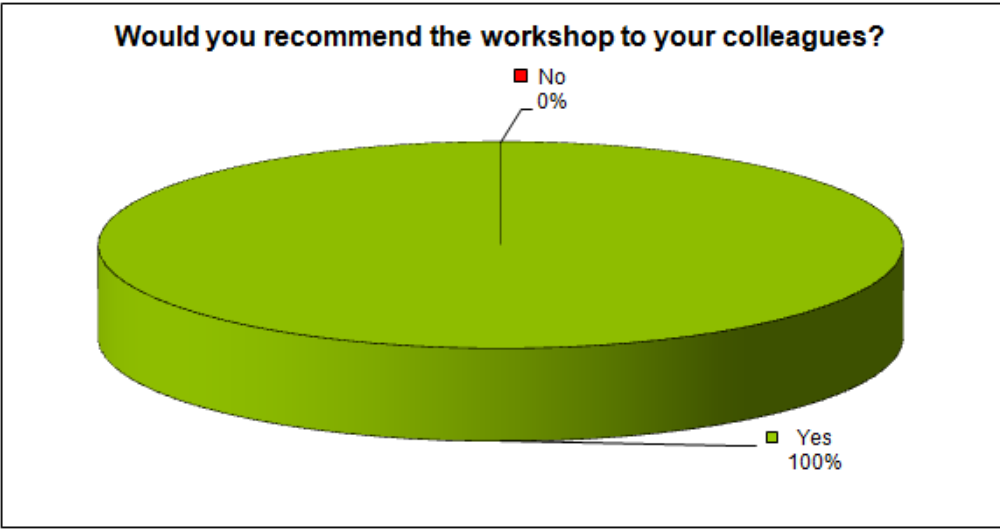


Figure 4-10: Would you recommend the workshop to your colleagues?

#### 4.5.4 Participants comments

It should be noted that the participants had different technical backgrounds. For example, some were network engineers (and therefore more interested in routing protocols and troubleshooting practices) while others were system administrators (and therefore more interested in applications and monitoring tools). Depending upon their background, some participants would have preferred to spend more time on Management, Applications, "hands-on", or to have a "hands-on" session related to security issues.

Within the questionnaire there were three open questions where the trainees could give their feedback on the workshop. Below are almost all of the responses. Note that some are repeated (number put between parentheses).

Here are some comments provided by the trainees:

== Begin of the excerpts

*What topics would you have liked to **hear more about**?:*

- (1) *DNSsec.*
- (2) *IPv6 over MPLS.*
- (1) *ISO 27001.*
- (4) *Routing, BGP, OSPF.*
- (1) *IPv6 deployment strategies on government institutions.*
- (5) *Security.*
- (1) *IPv6 Addressing.*
- (2) *More hands-on.*

- (1) *Transition mechanisms lab.*

*What topics would you have liked to **hear less about**?*

- (1) *IPv6 hosts configuration.*
- (1) *Theory.*
- (1) *RPKI.*
- (1) *Tunnels.*

*Any **other comments**:*

- (2) *Excellent workshop, thanks a lot.*
- (2) *Continue doing this kind of workshops.*
- (1) *It has been a good workshop but WiFi connectivity problems made labs difficult, being the most important part in my opinion.*

End of the excerpts ==

## 5. THE 6DEPLOY-2 WORKSHOP IN QUITO (ECUADOR)

This IPv6 Workshop was held in Quito (Ecuador) from 16<sup>th</sup> - 18<sup>th</sup> August 2011. In the following paragraphs we provide information about the workshop, including the programme outline, and the material that was presented.

Details of the workshop and the training material used can be found in 6DEPLOY's project web site:

[http://www.6deploy.eu/index.php?page=20110815\\_quito\\_ecuador](http://www.6deploy.eu/index.php?page=20110815_quito_ecuador)

### 5.1 Overview

The 6DEPLOY-2 representatives at the workshop were Jordi Palet, from Consulintel and Claudio Chacón from LACNIC.

An introduction to IPv6 was given. Specific IPv6 material was presented, including an introduction to basic IPv6, concepts on the transition and coexistence of IPv4 and IPv6, as well as different transition mechanisms and IPv6 DNS.

In addition, IPv6-related routing concepts and changes from IPv4 were included in the theory part, to prepare for the routing "hands-on" exercises carried out using remote 6DEPLOY-2 testbeds.

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

### 5.2 Attendees

Below is a list of people who attended:

No.	Name	Affiliation
1	NELSON GEOVANNY CORNEJO RAMOS	PARTICULAR
2	WILNER ANDRES GALLEGO GARZON	ETB (ETB - COLOMBIA)
3	JUAN CARLOS PROAÑO	ESCUELA POLITECNICA NACIONAL
4	LUIS HUMBERTO PÉREZ ITURRALDE	MEGASUPPLY S.A.
5	EFRAIN HERRERA	MEGASUPPLY S.A.
6	TALINA VELASTEGUI	EPN
7	GABRIEL LOPEZ	ESCUELA POLITECNICA NACIONAL
8	EDISON PATRICIO JIMÉNEZ RIVERA	ESCUELA POLITÉCNICA NACIONAL
9	JAVIER EDUARDO LÓPEZ PRADO	TELCONET S.A (TELCONET S.A)
10	MARCELO RAMÍREZ	ESCUELA POLITÉCNICA NACIONAL
11	PATRICIO GARCÍA	TELCONET S.A

12	MILTON TIPAN	TELCONET S.A
13	ADRIAN BONILLA	TELCONET S.A
14	MILTON SIMBANA	TELCONET S.A
15	CHRISTIAN DAVID LOZA BONILLA	ESCUELA POLITÉCNICA NACIONAL
16	CARLOS EGAS	NETSOSE
17	FRANCISCO ANTONIO GARAY CONTRERAS	CLARO - ECUADORTELECOM
18	CESAR MACIAS DUARTE	ECUADORTELECOM S.A.
19	DULCE MARÍA VÉLEZ	CLARO
20	CARLOS CADENA	MEGADATOS
21	PABLO ARMIJOS	MEGADATOS
22	ANTONIO VENEGAS	TRANSELECTRIC
23	FABIÁN MEJÍA	AEPROVI
24	GUSTAVO INDACOCHEA	PUNTONET S.A.
25	CARLOS GUZMAN	ETAPA EP
26	CHRISTIAN MACHADO	ECUANET
27	ANDRES RAMOS	INTERNEXA S.A. E.S.P
28	WILSON MACHASILLA	PUNTONET
29	PATRICIO MENA	NEW ACCESS
30	MORALES DANY	NEW ACCESS
31	SUSANA NARVAEZ	CNT
32	FRANKLIN VERGARA	TVCABLE
33	MARCOS DÁVILA	INET
34	DAVID JARAMILLO	CNT
35	JUAN CARLOS MOSQUERA	TVCABLE
36	JUAN LOAIZA	RADIOTELSA
37	PAOLA LOAIZA	TRANSNEXA
38	CECILIA VALLEJO	CLARO
39	ALEXIS BARRETO	CLARO
40	VICTOR HUGO ALVARADO SALDAÑA	AMERICATEL PERU S.A.
41	HUMBERTO ALEJANDRO ZAMBRANO	PROGRAMAX
42	JOSÉ MARÍA GOMEZ DE LA TORRE	SUPERTEL
43	ANA LUCÍA NAZAMUÉS QUENGUAN	SUPERTEL
44	AUGUSTO CABRERA DUFFAUT	ETAPA EP
45	CRISTIAN GUERRA	CELEC EP -- TRANSELECTRIC
46	GABRIELA CARRERA	CELEC EP - TRANSELECTRIC
47	JACOB NEPTALI REYES BOQUE	PROGRAMAX
48	FRANKLIN ALEXANDER ORDÓÑEZ GIRÓN	BRIDGE TELECOM
49	MARCO ANTONIO VELEPUCHA CUESTA	NECUSOFT - NETTPLUS

**Table 5-1: Quito Workshop list of participants**

The participants represented a broad sector of the ICT community. They were technical people whose knowledge about IPv6 ranged from almost no knowledge at all to having significant experience with IPv6 deployment. Some had already performed IPv6 experiments or were planning some level of deployment at their institutions.

### 5.3 Workshop programme

The agenda was agreed on after close collaboration with the local organisers. The meeting agenda and the related material were submitted in advance so that the local organisers could decide which topics should be prioritised and so manage the logistics accordingly. The programme of the workshop is presented in the following table:

Date	Title of session
16/08/2011	Introducción a IPv6
	Practicas con hosts
	Mecanismos de transición
	Practicas de transición
17/08/2011	Seguridad IPv6
	DNS IPv6
	Routing con IPv6
18/08/2011	Routing LAB: Addressing, OSPF, BGP

Table 5-2: Quito Workshop programme

### 5.4 Presentation material

The following material was presented:

Modules	Presented by	Affiliation
Introducción a IPv6	Jordi Palet	Consulintel
Practicas con hosts		
Mecanismos de transición		
Practicas de transición		
Seguridad IPv6	Claudio Chacón	LACNIC
DNS IPv6		
Routing con IPv6		
Routing LAB: Addressing, OSPF, BGP		

Table 5-3: Quito Workshop list of modules used

#### 5.4.1 Modules

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

- Introducción a IPv6:** This module is a summary of different issues, to refresh and introduce some useful content to be used in the "hands-on" exercises. It



explains why a new version for IP, IPv6, has been developed. A brief history of IPv6, its motivation and benefits are given. IPv6 packet header, extensions headers and differences from IPv4 headers. In addition, IPv6 addressing architecture, the different types of addresses (unique local IPv6 addresses, interface IDs, multicast addresses), their textual representation, how these are built and related to a layer 2 address, are explained.

- **Mecanismos de transición:** Transition concepts and mechanisms are introduced.
- **Seguridad IPv6:** Several issues are covered, such as the IPsec model, privacy extensions, ND threats, IPv4 vs. IPv6 Threat Analysis, IPv6 security issues, practical IPv6 security issues and firewalling IPv6.
- **DNS IPv6:** This module describes new Resource Records for IPv6 DNS, availability of IPv6 in the root servers zone and CC-TLDs, etc. In addition DNS64/NAT64 concepts are presented.
- **Routing con IPv6:** This module mainly describes the differences between IPv4 and IPv6 routing protocols for OSPFv3, EIGRP, RIPng, BGP4+, and ISIS.
- 

#### 5.4.2 Hands-on exercises

To help ensure the workshop attendees will be able to install IPv6 in their own environment after the course is over, a set of practical exercises has been designed, known as 'hands-on modules'. These exercises are performed on remote testbeds, which were established in the 6DISS, 6DEPLOY and 6DEPLOY-2 projects, thanks to Cisco donations.

Below is a brief description of the "hands-on" exercises that were performed:

- **Prácticas con hosts:** These exercises illustrate how to install IPv6 on several platforms, mainly Linux, Vista, and Windows XP operating systems. Use of link-local addresses, ping and traceroute. Configuration of static addresses. Concepts like addresses, autoconfiguration, and neighbor discovery protocol using hosts.
- **Prácticas de transición:** Some transition concepts and mechanisms were used, mainly tunnel-based ones.
- **Routing Lab: Addressing, OSPF, BGP:** IPv6 routing protocols are configured by the trainees on the testbed routers. Internal Gateway Protocol (OSPF) and External Gateway Protocol (BGP) are tested.

## 5.5 Analysis of the Feedback Questionnaires

A questionnaire has been specially designed for the purpose of getting feedback from the participants regarding the suitability of the course material, and the presenters' ability to convey information, and the relevance of the information to the expectations of the attendees.

Personal information was not mandatory, so as to allow for anonymous responses.

Each participant was first asked to indicate:

- his/her organisation and job responsibilities, and
- his/her plans for IPv6 deployment in his/her organisation.

Then, for each theoretical presentation and "hands-on" session, each participant was requested to assess "usefulness", "quality of presentation", "familiarity with the topic", "quality of the course documentation", "general organisation", etc.

### 5.5.1 General questions related to participants and IPv6

<b>About the participants</b>		
49 participants were present, 11 questionnaires were returned		
<b>Employment sector</b>	Government	2
	University or other higher education	2
	Schools or further education	0
	Research	1
	Health	0
	Commercial	4
	Other (please specify)	(4)*
<b>Job function</b>	Government Advisor	0
	Senior Manager	1
	IT Manager	4
	Systems Administrator	2
	Network Administrator	7
	Researcher / Postgraduate	0
	Undergraduate	0
	Other (please specify)	(1)*
<b>Usage of IPv6</b>		
Do you use IPv6 yourself?	Yes	4
	No	7
Does your organisation use IPv6?	Yes	4
	No, but planned in this year	4
	No, but planned in the next year	3
	No, but planned in the longer term	0
	No, and no plans as yet	0

\* See the graphics section for more information

**Table 5-4: General questions related to participants and IPv6**

## 5.5.2 Questions regarding the workshop

<b>About the Workshop</b>				
<b>Usefulness of the topic</b>	Very useful	Useful	Slightly useful	Not useful
Presentation 1 – Introducción a IPv6	8	3	0	0
Presentation 2 – Mecanismos de Transición	8	2	0	0
Presentation 3 - Direccionamiento IPv6	9	1	1	0
Presentation 4 - Seguridad IPv6	8	3	0	0
Presentation 5 - DNS IPv6	7	2	0	1
Presentation 6 - Routing con IPv6	8	2	0	1
Practice 1 – Prácticas con Hosts	7	2	2	0
Practice 2 – Práctica Mecanismos de Transición	7	2	2	0
Practice 3 - Routing LAB: Addressing, OSPF, BGP	7	2	1	1
<b>Quality of the presentation</b>	Excellent	Good	Average	Poor
Presentation 1 – Introducción a IPv6	7	4	0	0
Presentation 2 – Mecanismos de Transición	7	4	0	0
Presentation 3 - Direccionamiento IPv6	7	4	0	0
Presentation 4 - Seguridad IPv6	7	4	0	0
Presentation 5 - DNS IPv6	7	3	0	1
Presentation 6 - Routing con IPv6	7	3	0	1
Practice 1 – Prácticas con Hosts	7	3	0	1
Practice 2 – Práctica Mecanismos de Transición	7	3	1	0
Practice 3 - Routing LAB: Addressing, OSPF, BGP	7	1	2	1
<b>Familiarity with the topic?</b>	None	Some	Most	All
Presentation 1 – Introducción a IPv6	0	9	2	0
Presentation 2 – Mecanismos de Transición	2	7	2	0
Presentation 3 - Direccionamiento IPv6	2	6	2	1
Presentation 4 - Seguridad IPv6	4	5	2	0
Presentation 5 - DNS IPv6	5	4	2	0
Presentation 6 - Routing con IPv6	4	4	3	0
Practice 1 – Prácticas con Hosts	4	5	2	0
Practice 2 – Práctica Mecanismos de Transición	7	2	2	0
Practice 3 - Routing LAB: Addressing, OSPF, BGP	5	4	2	0
<b>Quality of the course documentation</b>	Excellent	Good	Average	Poor
	2	8	1	0
<b>General workshop organisation</b>	Excellent	Good	Average	Poor
	5	4	1	0
<b>Recommend to your colleagues?</b>	yes	no		
	10	1		

Table 5-5: Questions regarding the workshop

### 5.5.3 Results graphics

Following are some graphics that represent the above results in a more friendly way, so as to ease their interpretation.

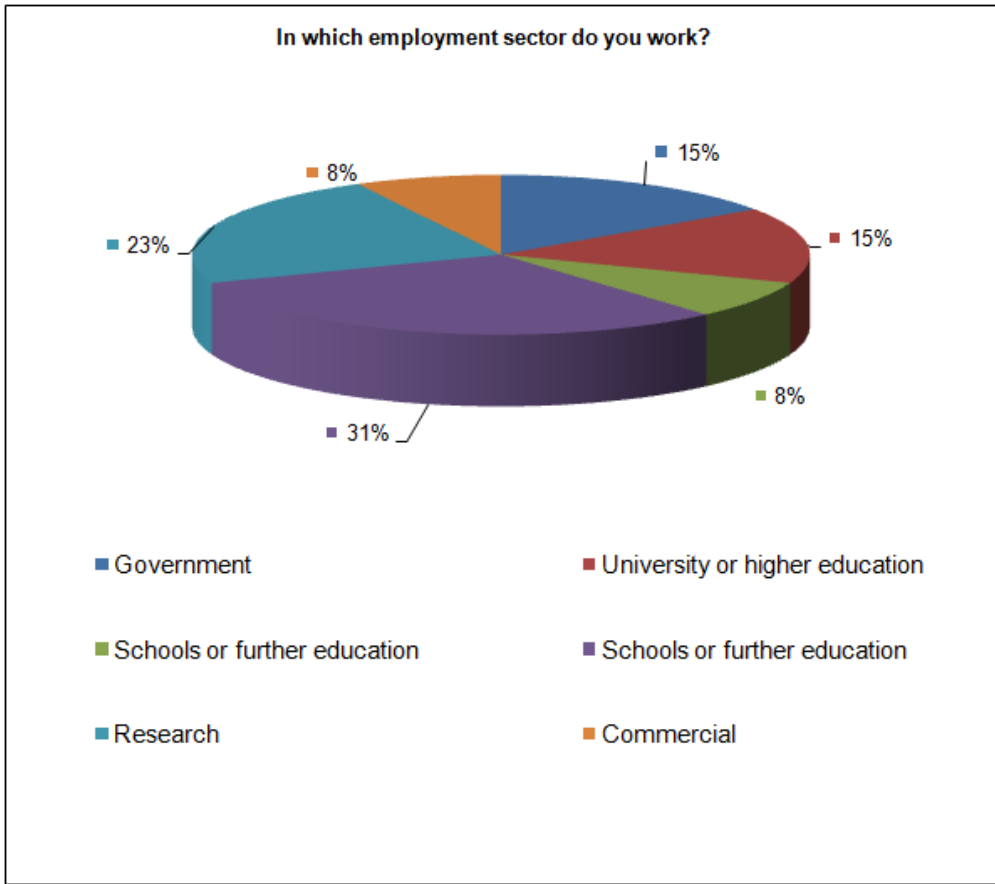


Figure 5-1: In which employment sector do you work?

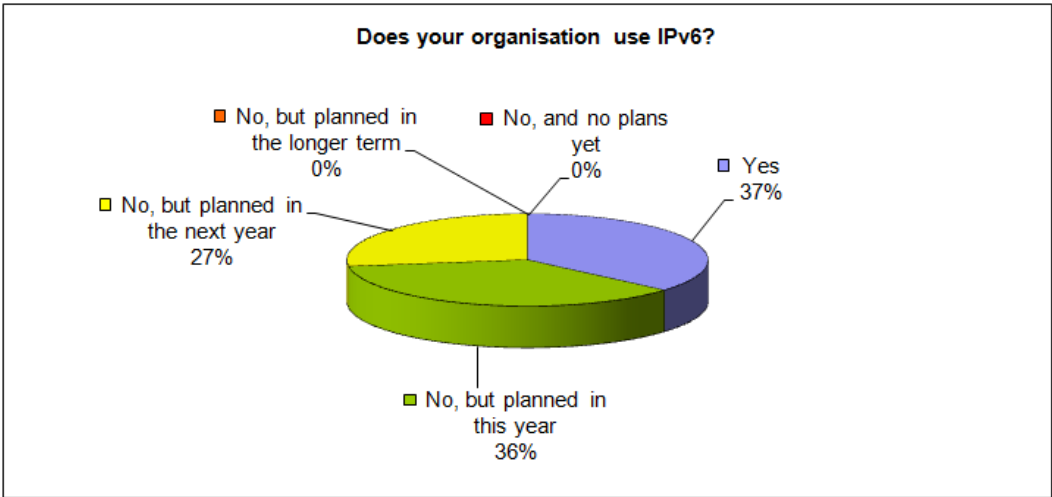


Figure 5-2: Does your organisation use IPv6?

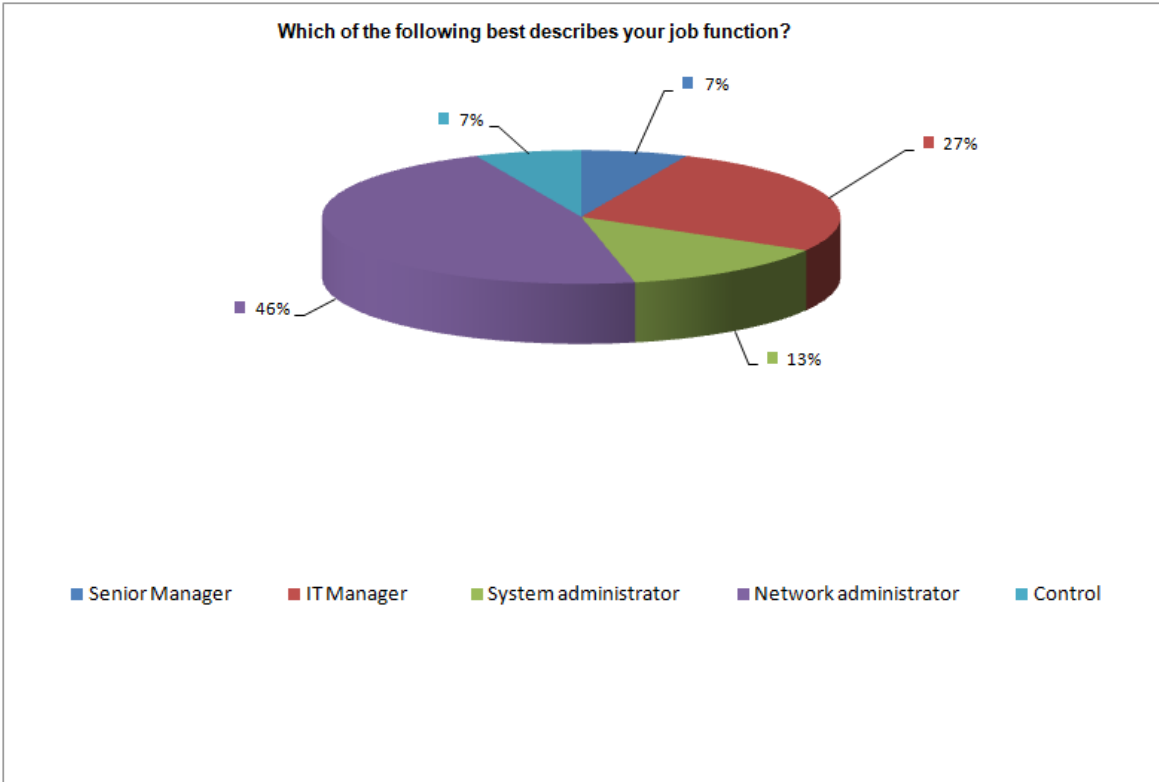


Figure 5-3: Which of the following best describes your job function?

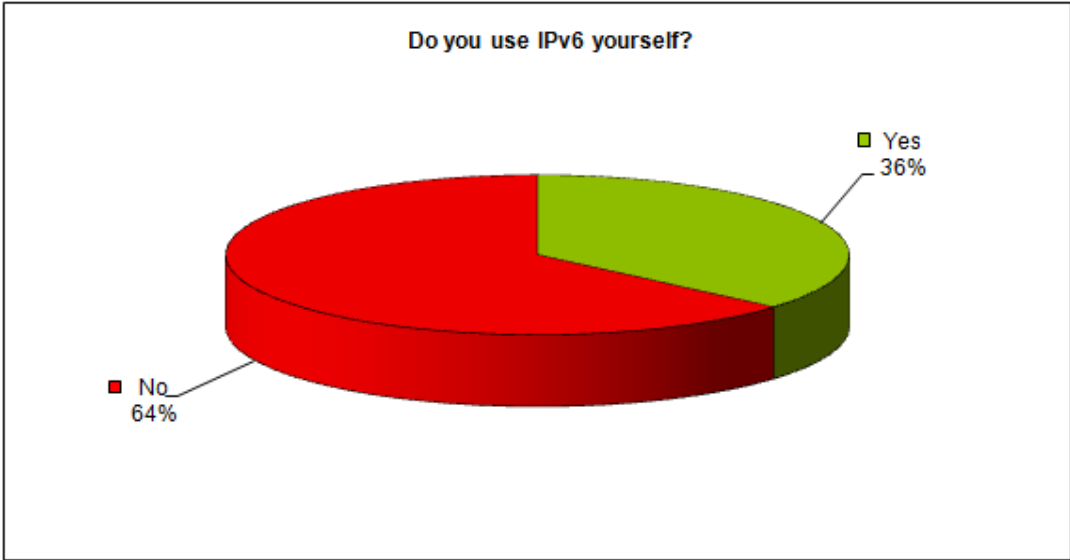


Figure 5-4: Do you use IPv6 yourself?

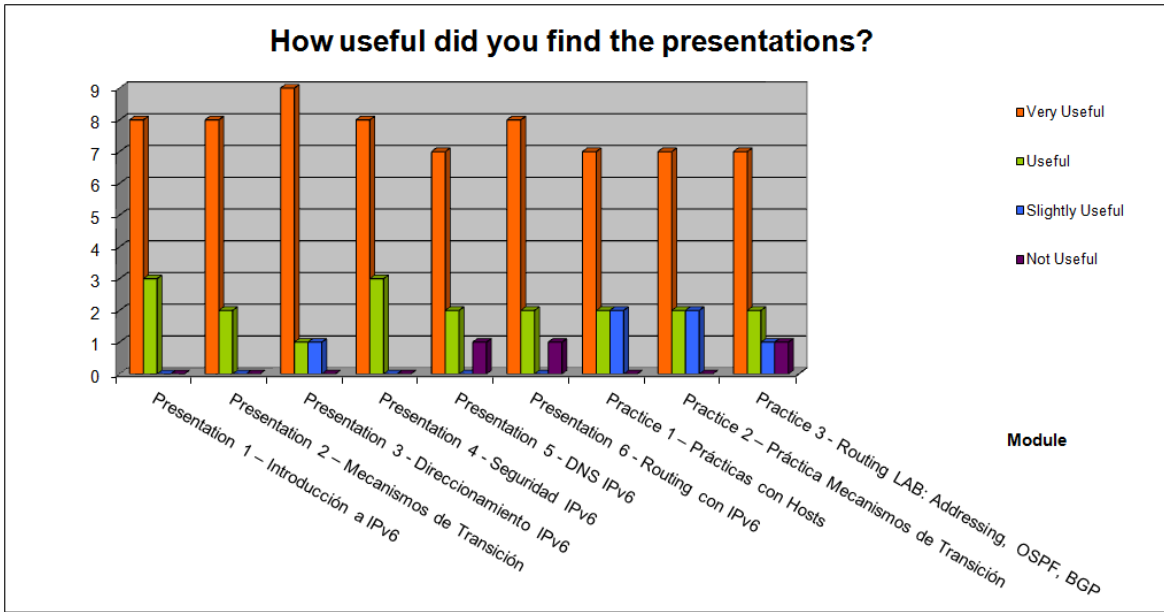


Figure 5-5: How useful did you find the presentations?

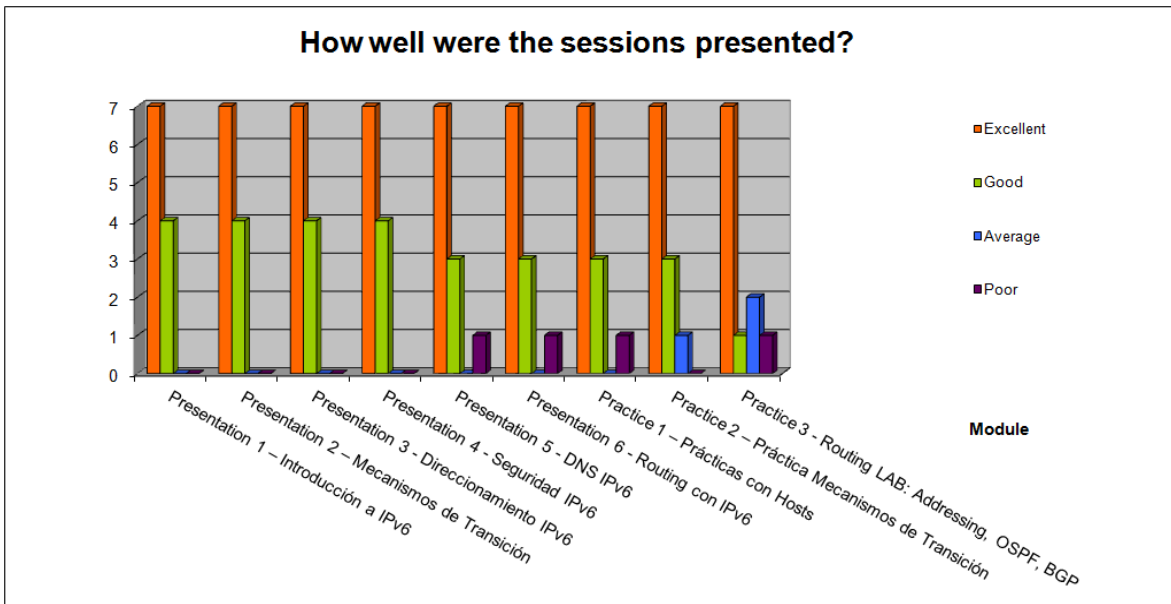


Figure 5-6: How well were the sessions presented?

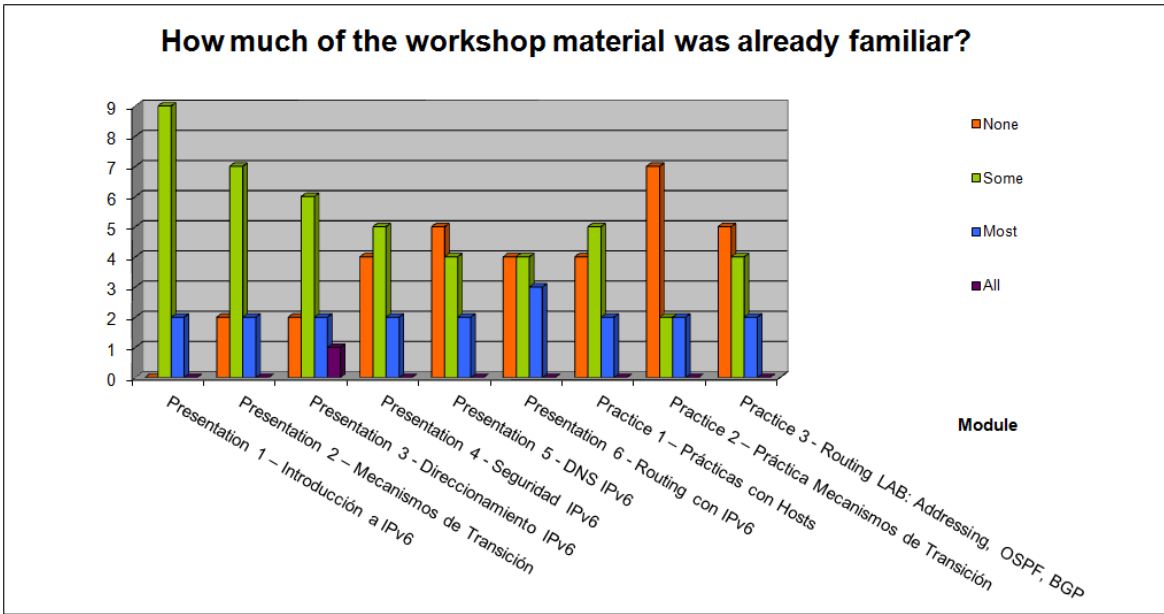


Figure 5-7: How much of the workshop material was already familiar?

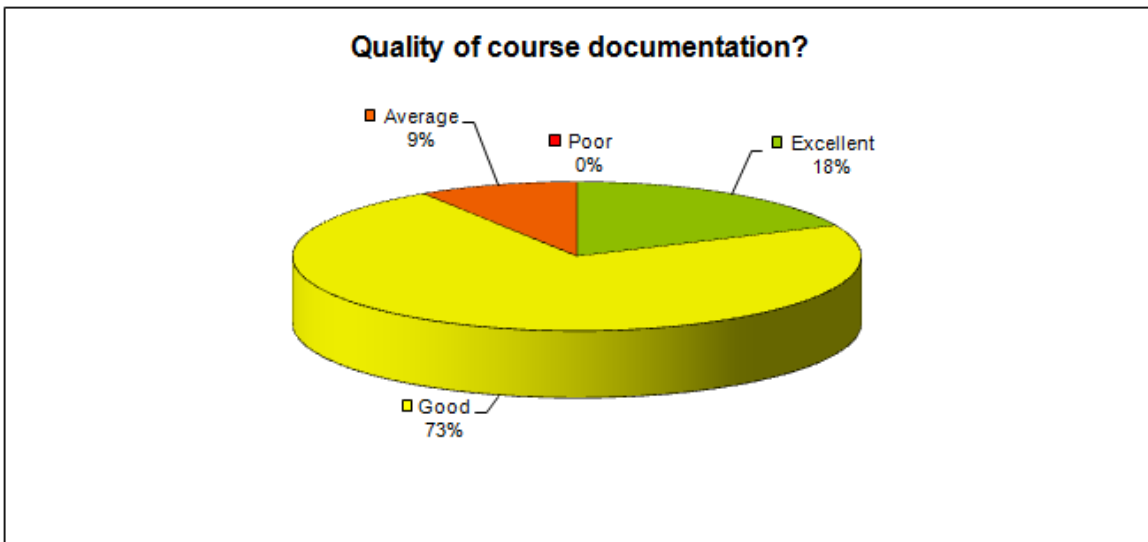


Figure 5-8: Quality of course documentation?

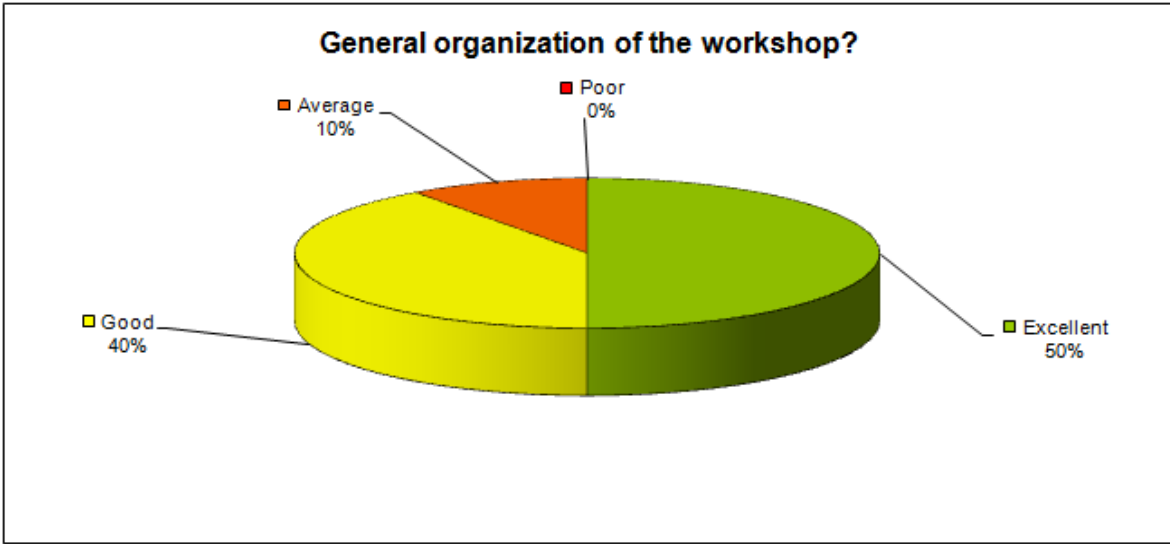


Figure 5-9: General organization of the workshop?

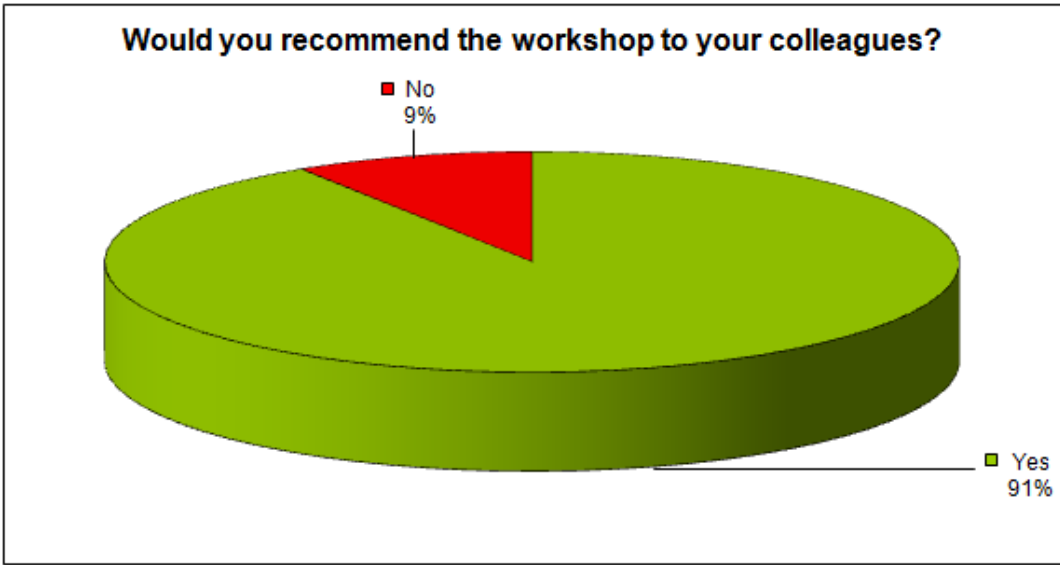


Figure 5-10: Would you recommend the workshop to your colleagues?

**5.5.4 Participants comments**

It should be noted that the participants had different technical backgrounds. For example, some were network engineers (and therefore more interested in routing protocols and troubleshooting practices) while others were system administrators (and therefore more interested in applications and monitoring tools). Depending upon their background, some participants would have preferred to spend more time on Management, Applications, "hands-on", or to have a "hands-on" session related to security issues.



Within the questionnaire there were three open questions where the trainees could give their feedback on the workshop. Below are almost all of the responses. Note that some are repeated (number put between parentheses).

Here are some comments provided by the trainees:

== Begin of the excerpts

*What topics would you have liked to **hear more about**?:*

- (2) *DNS IPv6.*
- (2) *Transition mechanisms.*
- (1) *IPv6 forwarding over Linux.*
- (1) *IPv6 hardware support.*
- (1) *More 6to4 labs.*
- (1) *Email over IPv6.*
- (1) *Security.*
- (1) *Create an IPv6 networks with security and DNS and mail servers.*
- (1) *Carrier Grade NAT.*

*What topics would you have liked to **hear less about**?*

- (1) *Addressing.*
- (1) *Routing protocols.*
- (1) *non-programmed practice.*
- (1) *Teredo, 6to4.*

*Any **other comments**:*

- (1) *This workshop is a very good thing, it provided me a reason to implement IPv6 and has been very interesting. I didn't know about the scarcity of IPv4 addresses.*
- (1) *Thanks for the workshop.*
- (1) *Congratulations to organizers for the contribution to the development not only of the country but the region as well.*
- (1) *Could you provide this training in Guayaquil?*

End of the excerpts ==

## 6. 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.eu](mailto:helpdesk@6deploy.eu) 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.

## 7. 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 three workshops reported in this document took place during August 2011. All of these workshops were coordinated by LACNIC, as a 6DEPLOY-2 representative, with local authorities in collaboration with Consulintel. Thanks to previous projects and training activities, most of the IPv6 education material needed to start 6DEPLOY-2 workshop training was available from the very beginning. The material included some of the issues of Internet deployment and evolution, especially IPv6 introduction, addressing, transition, and Routing.

Approximately 115 network engineers, system administrators, and regulators participated in the workshops. The topics presented were selected according to the participants' requirements, trying to accomplish their need of a more practical IPv6 routing workshop.

According to the evaluation forms and the comments from the participants at the workshop, it is clear that the workshop was a success, and that there is significant interest in more practical issues. The participants expressed positive comments on the workshop's usefulness and organisation.

During the 6DEPLOY-2 lifetime, stakeholders will continue to enhance today's "knowledge database". The reader and interested parties are referred to the 6DEPLOY-2 website to check for new material.

In summary, this workshop should be considered a success with regard to the dissemination of IPv6 in the LAC region.

## 8. REFERENCES

6DEPLOY-2 website: <http://www.6deploy.eu>

Hands-on modules: <http://www.6deploy.eu/index.php?page=hands-on>

How-to organise an IPv6 workshop:

<http://6diss.6deploy.eu/workshops/workshop-guidelines.pdf>

Training the trainers workshop: <http://6diss.6deploy.eu/workshops/ttt/>

e-learning package: <http://www.6deploy.eu/index.php?page=e-learning>

6DEPLOY-2 Workshops Agenda and detailed information:

<http://www.6deploy.eu/index.php?page=workshops2>