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Abstract:
This deliverable reports on several workshops that were held in the Caribbean region in 2008 and 2009. Specifically, this deliverable reports on workshops that took place in Port-au-Prince (Haiti), La Habana (Cuba), Port of Spain (Trinidad & Tobago), and Santo-Domingo (Dominican Republic). 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, Caribbean, Support, Training, Testbeds, Modules, 6DISS, 6DEPLOY, Hands-on exercises

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v0.9	11/3/2009	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 reports on several workshops held in the Caribbean region during the last half of 2008 and the beginning of 2009. Specifically, this deliverable reports on workshops that took place in Port-au-Prince (Haiti), La Habana (Cuba), Port of Spain (Trinidad & Tobago), and Santo-Domingo (Dominican Republic). 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) an assessment of the opportunities for further co-operation and follow-up actions planned, and e) an analysis of the feedback questionnaires from the participants.

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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 project's 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:

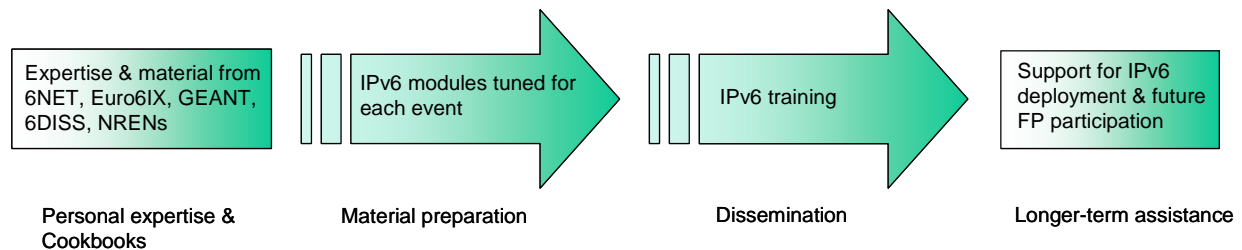


Figure 1-1: 6DEPLOY methodology (diagrammatically)

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".

The present deliverable reports on several workshops held in the Caribbean region during the last half of 2008 and the beginning of 2009; specifically, it describes

workshops that took place in Port-au-Prince (Haiti), La Habana (Cuba), Port of Spain (Trinidad & Tobago), and Santo-Domingo (Dominican Republic).

Chapter 2 of this document explains the general motivation for running IPv6 workshops, and Chapters 3, 4, 5, and 6 describe the specific details of each workshop, in terms of the attendees, the modules that were presented, and the “hands-on” exercises (if appropriate). Chapter 7 identifies opportunities for further collaboration in the region and follow up actions, and Chapter 8 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 PORT-AU-PRINCE (HAITI)

This workshop was held in Port-au-Prince (Haiti) on August 28th and 29th 2008, and was sponsored by AHTIC (Haitian IT Association). 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 AHTIC-LACNIC IPv6 Workshop was both an example of awareness work conducted by LACNIC, as well as an example of the interest in new technologies - specifically IPv6 – currently being expressed by developing countries.

The workshop's participants included technical and management personnel from all the ISPs on the Island of Haiti, Network Administrators, University students, and consultants.

The event was organized by the AHTIC and LACNIC. The ISP Multilink provided the IPv4 and IPv6 connectivity, where the IPv6 link to the venue was the first IPv6 connection in Haiti. The Multilink's backbone is "IPv6 enabled", as the workshop necessitated IPv6 ability, and one extra request for IPv6 addresses from Haiti was received during the event.

The workshop was conducted by Roque Gagliano (LACNIC) and Ariel Sabiguero (invited speaker by LACNIC). Reynold Guerrier from Multilink gave a small talk describing IPv6 implementation at their network and at the meeting. The hands-on practice was possible thanks to the PCs borrowed from the local University (Université National des Sciences d'Haiti).

Most of the presentations were conducted in French, 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	ALEXANDRE	P.Sneide	ACN
2	AUGUSTE	Lesly	BNC
3	BAYARD	Allen	ACCES HAITI
4	CELESTIN	Marc Olivier	HAINET
5	CHARLOTIN	Jato	PERSO

6	COQUILLON	Gustave	ACN
7	DARTIGUE	Christine	UNIBANK
8	DESTINÉ	Jonas	HAITI DATA Network
9	DORMEVIL	M.Edward Gérard	INUQUA
10	ETIENNE	Gérald	INUQUA
11	ETIENNE	Jean Derby	VALERIO CANEZ
12	EXINVIL	Dieuner	EISIH
13	FORTUNE	Epiphane	HAINET S.A
14	FRANCOIS	Guerschon	RDDH
15	GEORGES	Evans	EISIH
16	GUERRIER	Rossini	UNIBANK
17	GUSTAVE	Héroid	COMCEL
18	HENRY	Max Larson	FDS
19	JEAN	jean Pierre Richard	Micro Crédit National
20	JEAN	Jocelyn-Dady	COMCEL
21	JEAN BAPTISTE	Jean Raynald	COMCEL
22	LACOUR	Maskenrood	MTPTC
23	LOUIS JEAN	Daniel	FDSA
24	MILLIEN	Nicksonn	MTPTC
25	NICOLAS	Evens	TURBONET
26	PAUL	Georges-Keny	MULTILINK
27	REIMERS	Joseph	TURBONET
28	RENÉ	Jacob	TURBONET
29	ROC	Bertrand	Keijzer Computer
30	ROSARION	Ronald	HAINET S.A
31	ROSIER	Hérode	La Couronne
32	SAINT-PHARD	Jean Richard	UNIBANK
33	SÉRAPHIN	David	BNC
34	SINGH	Satnam	ACN
35	SYLVAIN	Carlos	COMCEL
36	TANIS	Patrick	COMCEL
37	VINCENT	Jean Rony	COMPHAITI

Table 3-1: Port of Prince Workshop list of participants

All attendees had a technical background with experience in IPv4 networks. They represented a wide range of the ICT community. One of the remarkable lessons from the activity was learning of the integration of the ICT community in Haiti, exhibited by the fact that most of the attendees were friends with each other, probably thanks to the work done by the AHTIC.

Haiti is experiencing an important advance in its ICT development thanks to technologies such as WIMAX and 3G. During the lunch period, a presentation was given by Access Haiti (a local ISP), which showed off their new products and backbone to the Dominican Republic.

As a result of the Workshop, the AHCIT, together with local ISP, agreed to continue working for the deployment of IPv6 in the country and to put together a local Task Force (TF) on the issue.

In section 3.6 more details about the attendees can be found based on their answers to

the questionnaire.

3.3 Workshop programme

The workshop programme is presented in the following table:

Date	Time	Title of session
28/08/08	14:00	Pourquoi IPv6? Introduction à la problématique, Saturation de l'IPv4 et scénarios futurs possibles
28/08/08	15:45	Politiques de LACNIC concernant l'IPv6
28/08/08	16:30	Introduction à IPv6
29/08/08	9:00	Introduction à IPv6 (suite)
29/08/08	10:00	Planification du déploiement de l'IPv6
29/08/08	11:30	Planification du déploiement de l'IPv6 (suite)
29/08/08	14:00	IPv6, travaux en laboratoire
29/08/08	16:00	Configuration de services IPv6 en laboratoire: DNS Server, RADVD, DHCPv6

Table 3-2: Port of Prince Workshop programme

3.4 Presentation material

The following material was presented:

Modules	Hands-on exercises	Presented by	Affiliation
Pourquoi IPv6?		Roque Gagliano	LACNIC
Introduction à la problématique, Saturation de l'IPv4 et scénarios futurs possibles		Roque Gagliano	LACNIC
Politiques de LACNIC concernant l'IPv6		Roque Gagliano	LACNIC
Introduction à IPv6		Ariel Sabiguero	UdelaR
Planification du déploiement de l'IPv6		Roque Gagliano	LACNIC
IPv6, travaux en laboratoire	Basics 1	Roque Gagliano	LACNIC
		Ariel Sabiguero	UdelaR
Configuration de services IPv6 en laboratoire: DNS Server, RADVD, DHCPv6	Basics 2	Roque Gagliano	LACNIC
		Ariel Sabiguero	UdelaR

Table 3-3: Port of Prince Workshop list of modules and hands-on exercises used

3.4.1 Modules

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

- **Pourquoi IPv6? Introduction à la problématique, Saturation de l'IPv4 et scénarios futurs possibles:** This module explains why a new version for IP, IPv6, has been developed. A brief history of IPv6, the motivation for its development, and the benefits of deployment are given.
- **Politiques de LACNIC concernant l'IPv6:** This module explains LACNIC's IPv6 allocation and assignment policies for ISPs in the region.
- **Introduction à IPv6:** This module describes the IPv6 protocol, including IPv6 packet headers, extensions headers, and the differences from IPv4 headers. Packet size issues and upper layer considerations are also addressed. This module further describes new protocols associated with IPv6: e.g. Neighbour Discovery Protocol, SEND, ICMPv6, MLD, DHCPv6, etc.
- **Planification du déploiement de l'IPv6:** This module explains how to plan an IPv6 deployment in an enterprise or ISP network.

3.4.2 Hands-on exercises

To help ensure that the workshop attendees will be able to install IPv6 in their own environment after the course is over, a set of practical exercises, known as hands-on modules, has been designed. These exercises were performed on both participants' laptop and on local equipment available in the workshop room.

The hands-on exercises included the automatic and manual configuration of local interfaces, routes, and DNS servers. Both Windows XP and Linux were tested. A local packet sniffer was provided to explore the new protocol. Additionally, a local Free-BSD machine was provided to exhibit the RADV, DHCPv6, and DNS services.

The following figure shows the local network deployed:

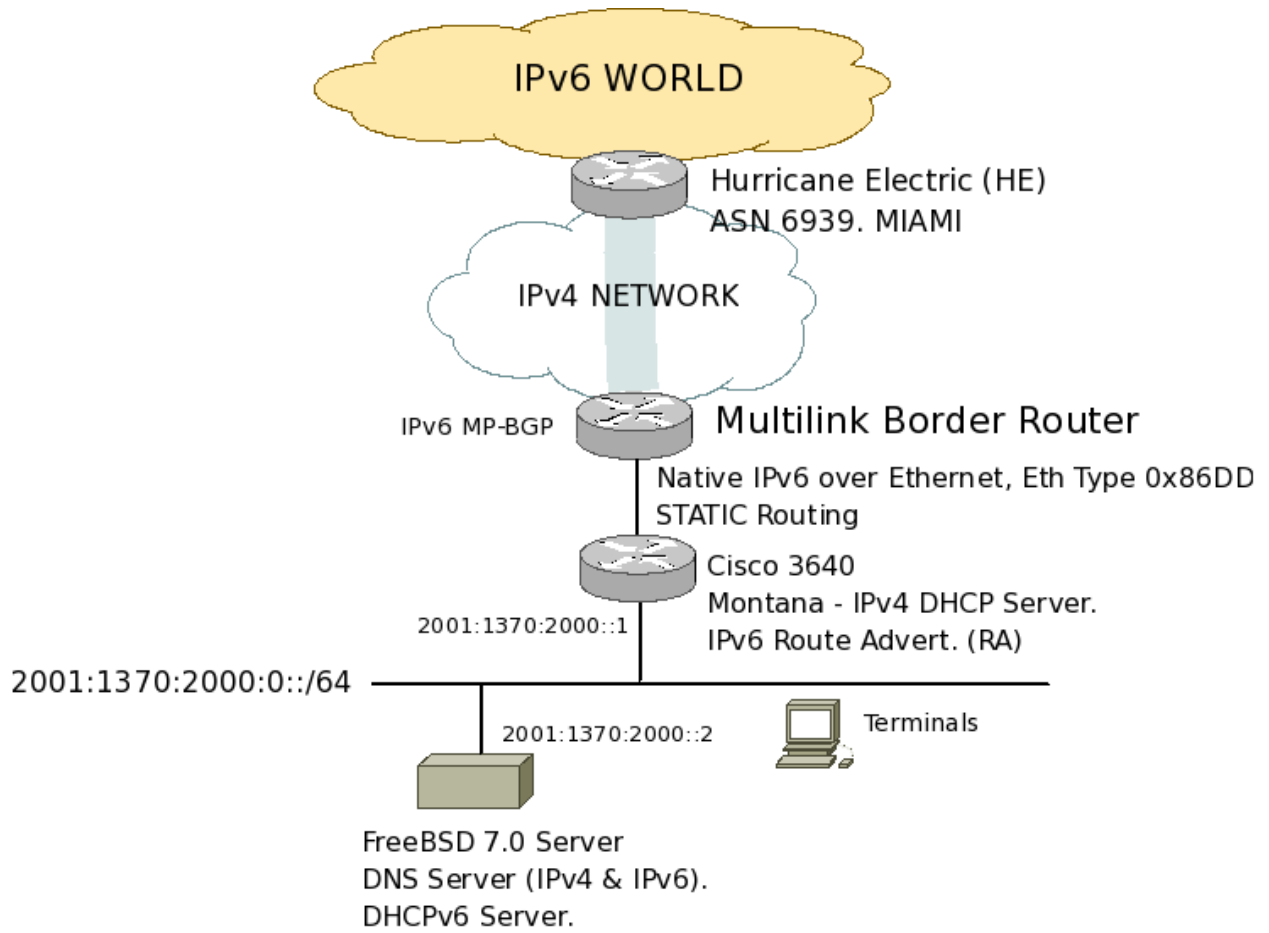


Figure 3-1: Local Network at Port of Prince, Haiti.

3.5 Photographs taken at the event



Figure 3-2: Presenting the Port of Prince Workshop material



Figure 3-3: Attendees to the Port of Prince Workshop



Figure 3-4: Practice at Port of Prince Workshop

3.6 Analysis of the Feedback Questionnaires

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

Offering personal information on the questionnaire was not mandatory for the participants, 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, each participant was requested to assess "usefulness", "quality of presentation", "familiarity with the topic", "quality of the course documentation", "general organisation", etc.

3.6.1 General questions related to participants and IPv6

About the participants		
38 participants were present, 38 questionnaires were returned		
Employment sector	Government	2
	University or other higher education	4
	Schools or further education	0
	Research	0
	Health	2
	Commercial	27
	Other (please specify)	Several (3)*
Job function	Government Advisor	0
	Senior Manager	0
	IT Manager	6
	Systems Administrator	4
	Network Administrator	18
	Researcher / Postgraduate	0
	Undergraduate	3
	Other (please specify)	Several (5)*
Usage of IPv6		
Do you use IPv6 yourself?	Yes	2
	No	31
Does your organisation use IPv6?	Yes	1
	No, but planned in the next year	3
	No, but planned in the longer term	14
	No, and no plans as yet	14

* See the graphics section for more information

Table 3-4: General questions from Haiti's Workshop participants

3.6.2 Questions regarding the workshop

About the Workshop				
Usefulness of the topic	Very useful	Useful	Slightly useful	Not useful
Presentation 1	16	14	3	0
Presentation 2	13	18	2	0
Presentation 3	16	13	4	0
Presentation 4	23	12	0	0
Quality of the presentation	Excellent	Good	Average	Poor
Presentation 1	14	18	1	0
Presentation 2	8	23	2	0
Presentation 3	7	21	4	0
Presentation 4	12	17	3	0
Familiarity with the topic?	None	Some	Most	All
Presentation 1	4	11	8	8
Presentation 2	4	9	11	8
Presentation 3	5	10	9	8
Presentation 4	2	10	10	10
Quality of the course documentation	Excellent	Good	Average	Poor
	11	21	2	0
General workshop organisation	Excellent	Good	Average	Poor
	9	22	1	0
Recommend to your colleagues?	yes	no		
	30	0		

Table 3-5: Questions regarding the Port of Prince Workshop

3.6.3 Results graphics

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

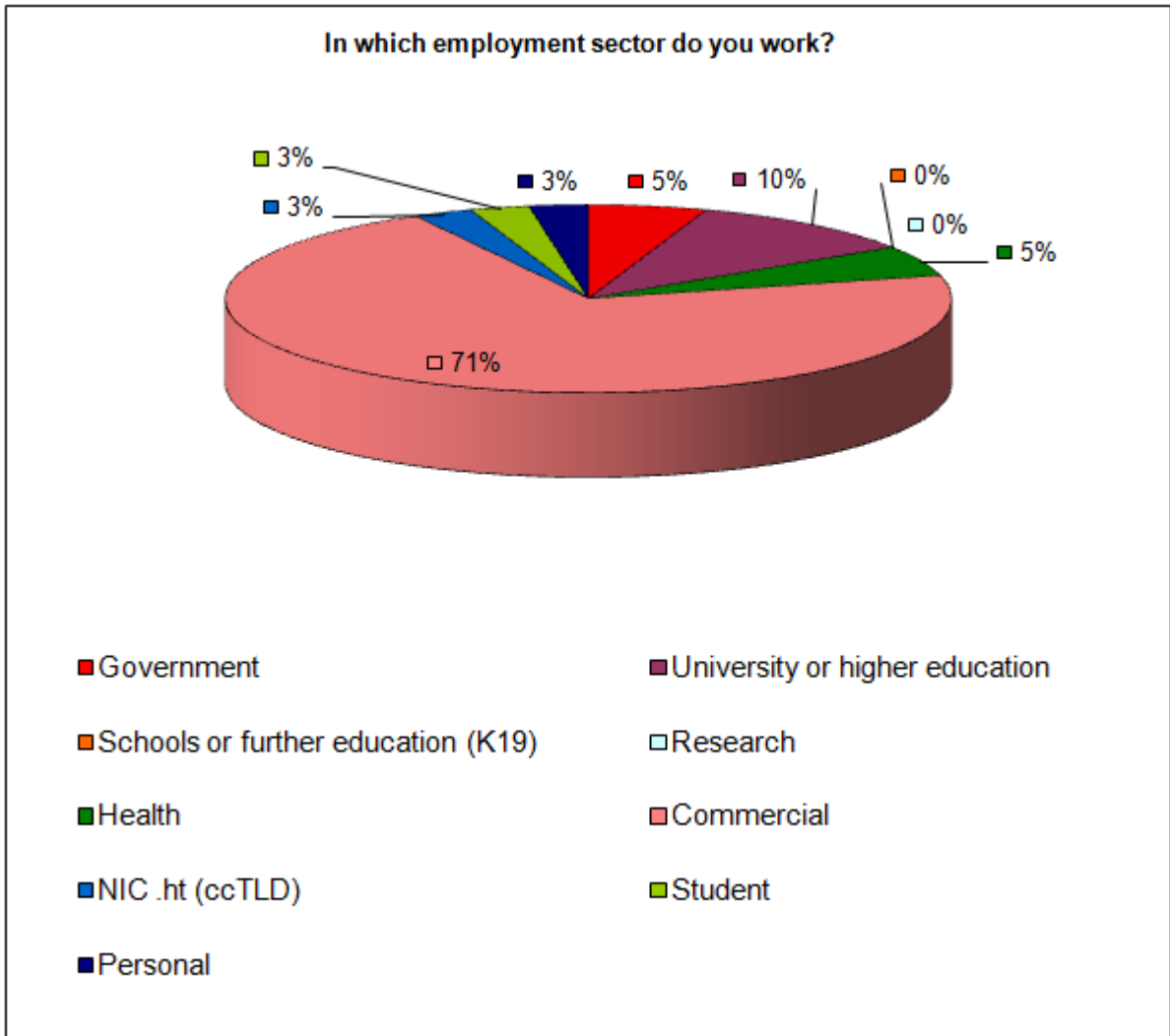


Figure 3-5: In which employment sector do you work?

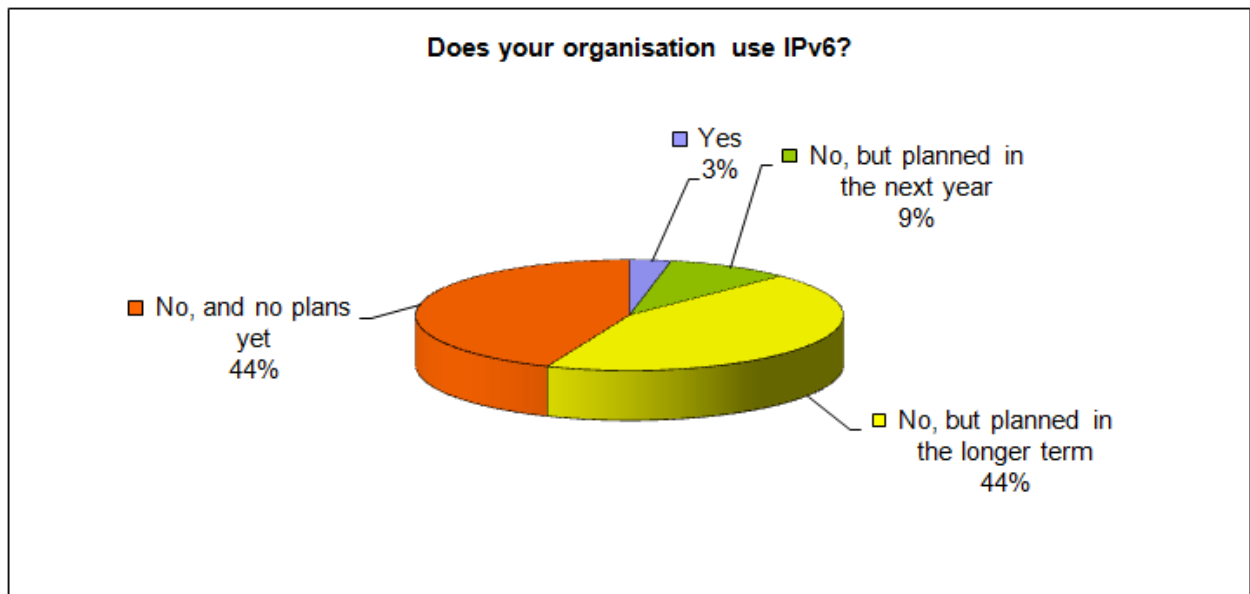


Figure 3-6: Does your organisation use IPv6?

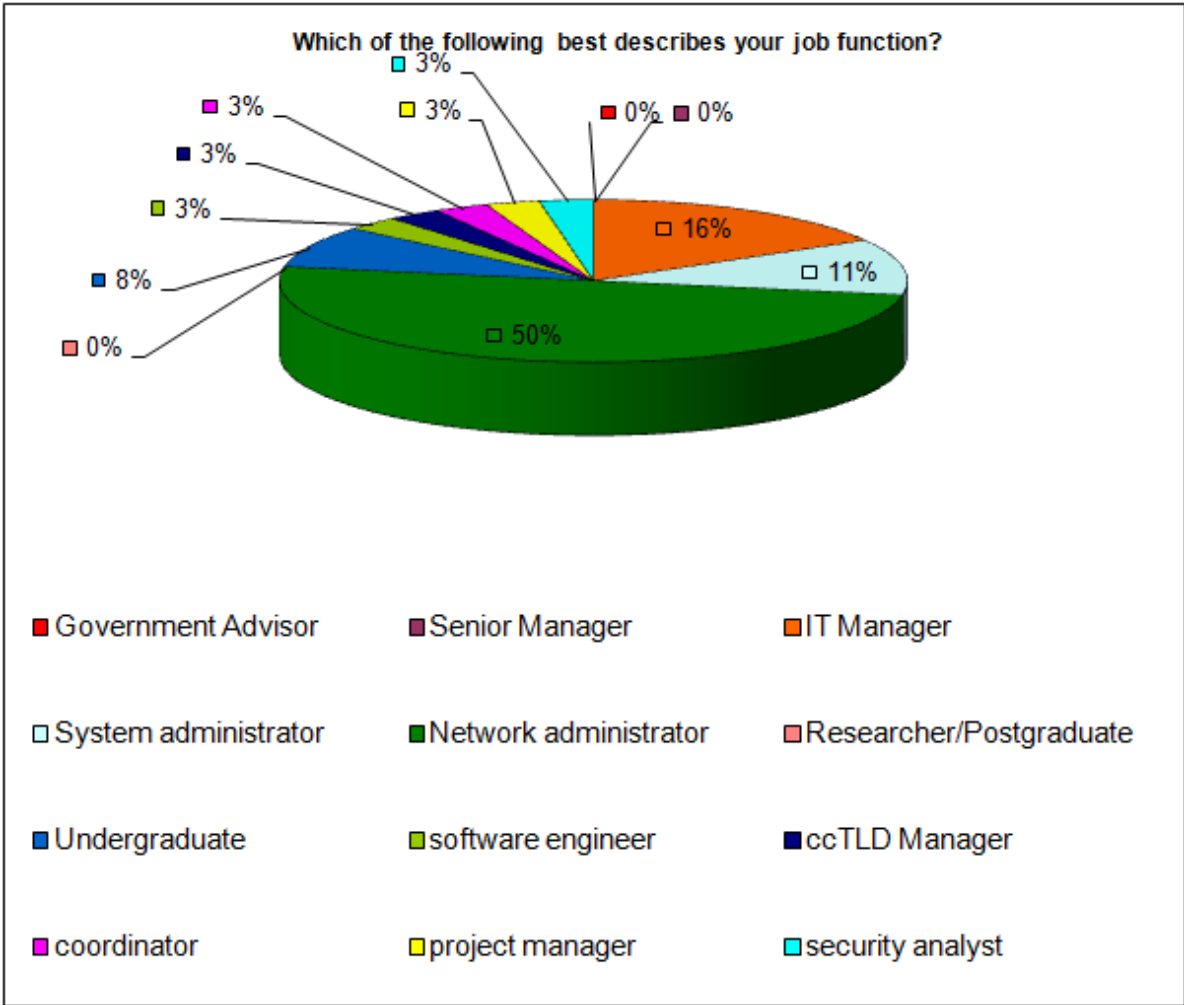


Figure 3-7: Which of the following best describes your job function?

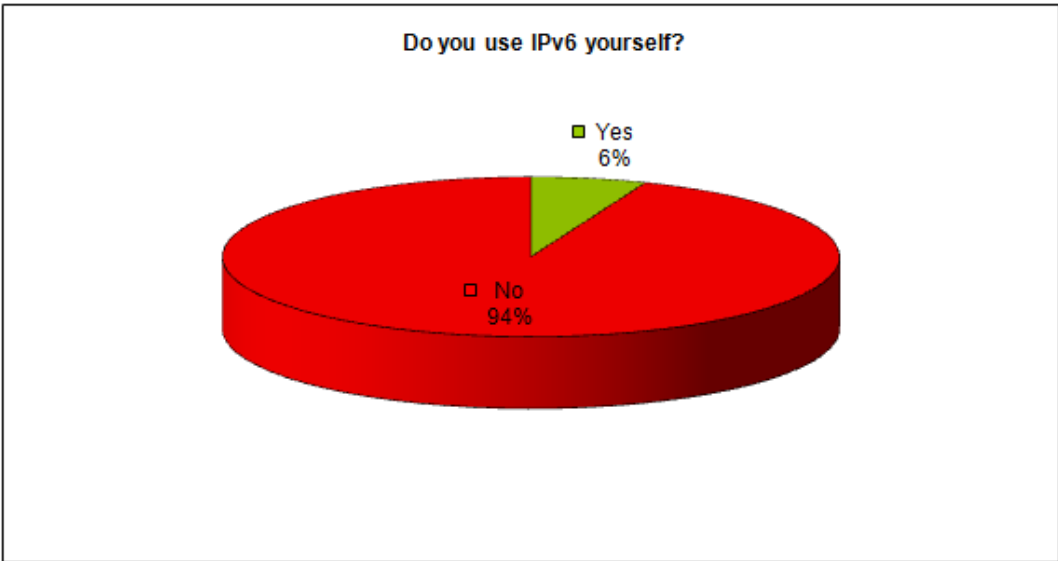


Figure 3-8: Do you use IPv6 yourself?

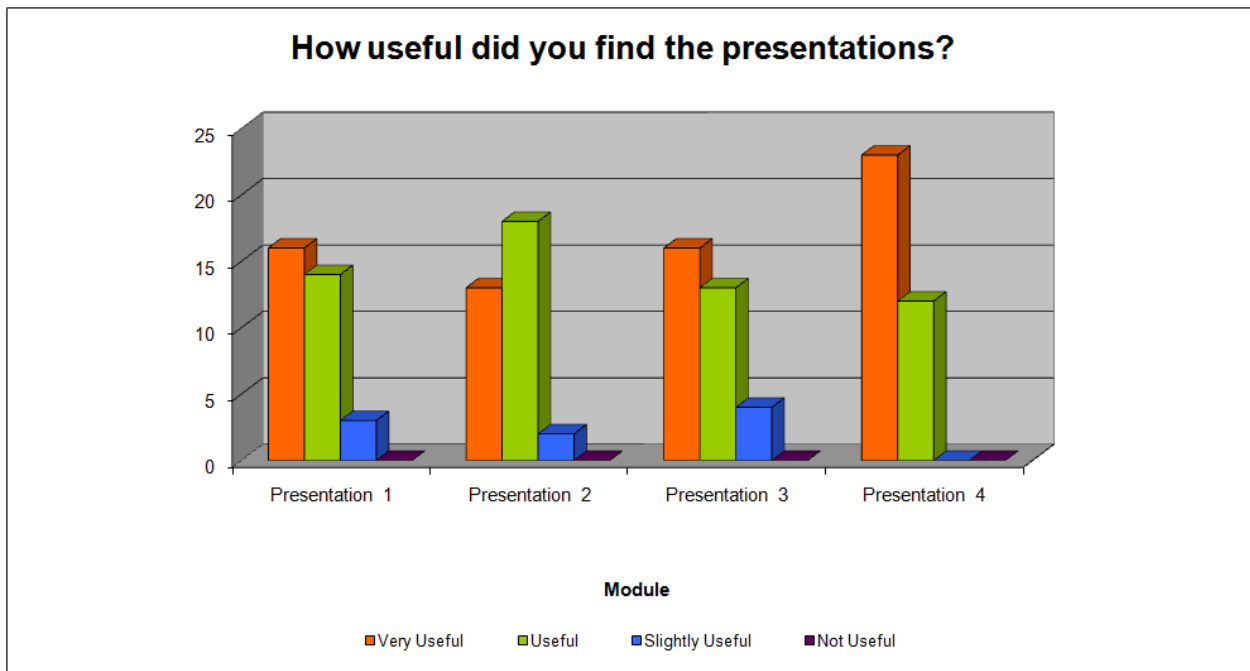


Figure 3-9: How useful did you find the presentations?

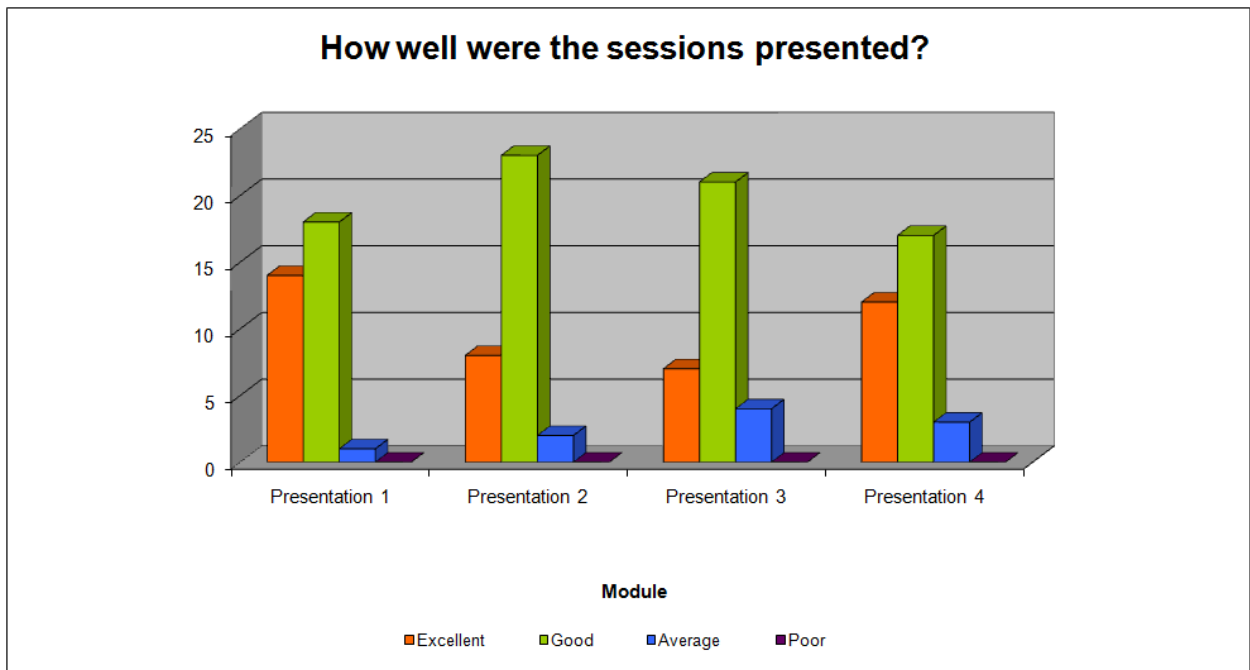


Figure 3-10: How well were the sessions presented?

How much of the workshop material was already familiar?

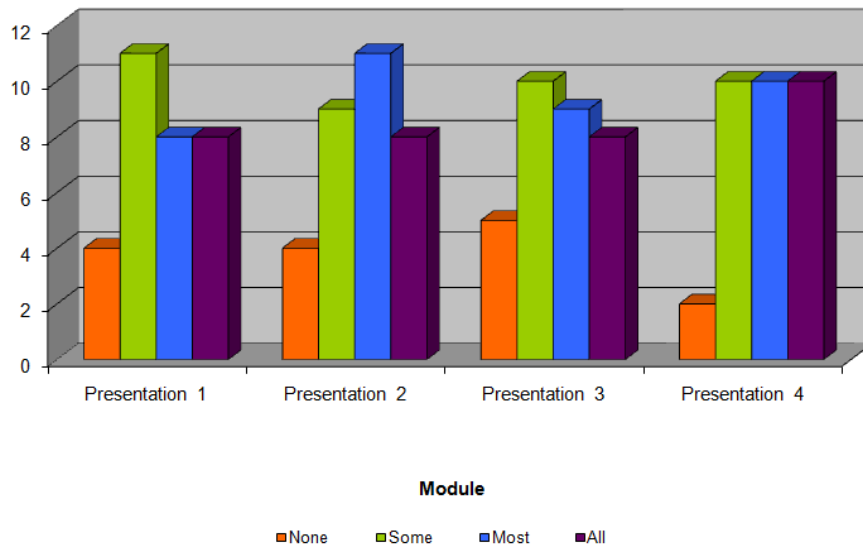


Figure 3-11: How much of the workshop material was already familiar?

Quality of course documentation?

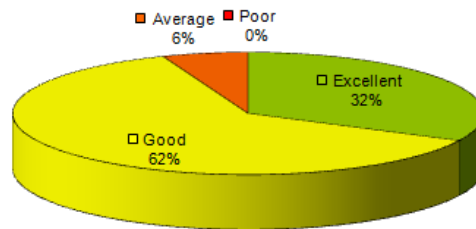


Figure 3-12: Quality of course documentation?

General organization of the workshop?

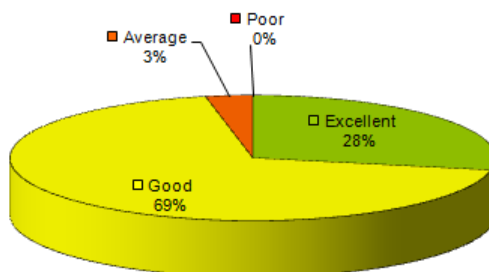


Figure 3-13: General organization of the workshop?

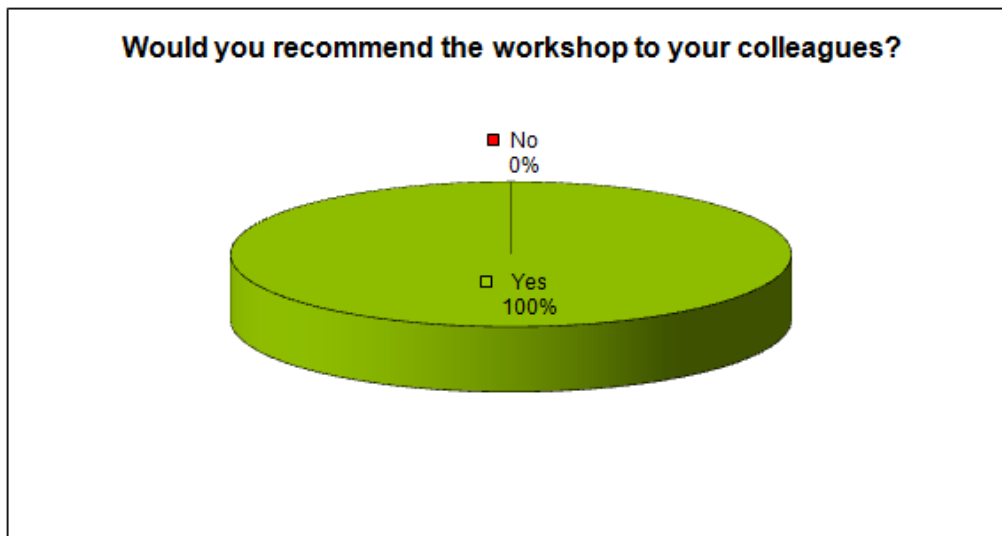


Figure 3-14: Would you recommend the workshop to your colleagues?

3.6.4 Participant 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. It is also worth mentioning that a few attendees remarked that the sessions were too short, and that they would have been happy to work much later in the evening on more “hands-on” exercises.

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 (indicated by the number in parentheses).

Here are some comments provided by the trainees:

== Begin of the excerpts

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

- (3) DHCPv6 and DNS*
- (3) IPv6 deployment and timeline around the world; IPv6 implementation in a network; IPv6 configuration*
- (3) ICMPv6*
- (2) Configuring IPv6 in Microsoft*
- (2) Routing*

- (1) WIMAX
- (1) National Backbone for Haiti
- (1) Converting MAC to IPv6
- (1) Configuration, deployment IPv6 in Microsoft and Linux, more about assignement of IPv6 address, unicast and multicast
- (1) Linux configuration on IPv6
- (1) LACNIC Policies
- (1) IPv6 Planning
- (1) IPv6 and Security
- (1) IPv6 VOIP
- (1) IPv6 over Cisco

What topics would you have liked to hear less about?

- (4) Anything
- (2) Routing
- (1) Presentation 1
- (1) IPv6 configuration on Microsoft
- (1) IPv6 Header structure
- (1) Protocols and standards

Any other comments:

- (5) Need more time for practicing
- (1) The seminar was good; we love presenters and issues that have been discussed. We hope that ATHIC and LACNIC organize another such
- (1) Then I have to thank for giving me this opportunity to take parte in this workshop. For all my heart thank you guys
- (1) The presentations were very interesting and useful
- (1) Lack of practice lab; electricity issue; language issue
- (1) Too much time spent on presentations and not enough time spent in LABs
- (1) Was a great seminar. Good documentation. I learnt a lot
- (1) Bravo!
- (1) Good Job!

End of the excerpts ==

4. THE 6DEPLOY WORKSHOP IN LA HABANA (CUBA)

The second Caribbean workshop was held in La Habana (Cuba) on October 15th 2008, in conjunction with the 5th International Convention of Information Technologies and Advanced Telematic Services, i.e. CITMATEL 2008. The workshop is described below, including descriptions of the attendees and their affiliations, the programme outline, and the material that was presented.

4.1 Overview

The IPv6 Workshop was both an example of awareness work conducted by LACNIC-CITMATEL, as well as an example of the interest in new technologies - specifically IPv6 – currently being expressed by developing countries. There were representatives from almost all the networks that exist in Cuba thus confirming the receipt of the message that Cuban networks are transitioning to IPv6.

The new legal framework that exists since August 14th 2008 establishes a phased transition to IPv6 that involves all the existent data networks in the country. The objective of this workshop was to provide overviews of the reasons for the transition and of the protocol itself, and descriptions of the transition concepts, approaches, and mechanisms. The legal documents can be found on the following Cuban IPv6 Task Force web page: <http://www.cu.ipv6tf.org/taller2008.htm>

Individuals present at the workshop included Raul Echeberria (LACNIC) and Alvaro Vives (Consulintel), both as representatives of 6DEPLOY. In addition, there were some Cuban speakers from MIC (Ministry of Informatics and Communications) and the MES (Ministry of Higher Education) who, respectively, gave an overview of the new legal framework for IPv6 in Cuba and an introduction to IPv6.

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

4.2 Attendees

No.	Name
1	Jesús Martínez Alfonso
2	Jorge Daniel Villa Hernández
3	Mónica Peña Casanova
4	Olga Lidia Ramos Puig
5	José Hubert Ramos Fernández
6	Raúl Echeberria
7	Álvaro Vives Martínez

8	Eduardo Leyva Corzo
9	Rosa Yamile García Núñez
10	Reynaldo Montero de Miranda
11	Iván Botello González
12	Humberto Muñoz Dussac
13	Liudmila Rivero Perez
14	Julio Almeida Gomez
15	Miguel González Omaña
16	Líber Guzmán Royo
17	Sibel Alonso Baldor
18	Juan Carlos Hernández García
19	Ricardo Pardo Ribat
20	Rafael López Guerra
21	Jorge Lodos Vigil
22	José E. Vila Menéndez
23	Jineht García Moreira
24	Liuba González Toledo
25	Patricia Frutos Mena
26	Jesús González Vidal
27	Seriosha Luis Hernández
28	Armando Estévez Alonso
29	Mirta Ramirez Rodríguez
30	Rolando López Paz
31	Jackeline Núñez Rodríguez
32	Reinier Rengifo Perez
33	Jorge Luis Díaz Aguilera
34	Manuel Diaz Tito
35	Eliecer Lahens Gemes
36	Joel Alvarez Domenech
37	Francisco Rabeiro Dupont
38	Eligio Caballero Sánchez
39	Alejandro Alfonso Regueiro.
40	Yaremis Miranda
41	Rafael Guirola
42	Humberto Rodríguez
43	Yosmel Fundora Pedroso
44	Ariel Fumero Flores
45	Andy Guillén Arencibia
46	Francisco Rodríguez
47	José Antonio Acuña Corrales
48	Carlos Manuel Reyes Pérez
49	Alynn Benítez Castellanos
50	Wilfredo Valero Valero
51	Carlos Grima Valdés
52	Ernesto Guillén Soriano
53	Dayrel Almaguer Chávez
54	Mabel Cabeza Alonso
55	Adolfo Quintana Hernández
56	Luis Cobo Espinosa
57	Oscar Acosta Sánchez
58	Oscar Jerónimo López
59	Ernesto Alen Cardoso
60	Jorge L. Legrá Alvarez

61	Domingo Sánchez Perdomo
62	Gerardo Gómez Parets
63	Fernando Belén Ochoa
64	Lizado Reyes Dominicó
65	Luis Omar Alcalde Padrón
66	Héctor Cabrera García
67	Pedro Acevedo Ibáñez

Table 4-1: Habana 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 Cuba, 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.

In section 4.5 more details about the attendees can be found based on their answers to the questionnaire.

4.3 Workshop programme

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

Date	Time	Title of session
15/10/08	09:00	Situación de agotamiento de direcciones IPv4 y el desarrollo de IPv6 en América Latina
15/10/08	10:00	Coffe Break
15/10/08	10:15	Introducción a IPv6
15/10/08	11:15	IPv6 en Cuba
15/10/08	12:00	Diferentes aproximaciones a la adopción de IPv6
15/10/08	13:00	Lunch
15/10/08	14:00	Mecanismos de transición: Dual-Stack, Túneles, Tunnel Broker, 6to4, Teredo, Softwires y Traducción
15/10/08	15:30	Questions and Answers
15/10/08	16:00	End of Workshop

Table 4-2: Habana Workshop Programme

4.4 Presentation material

The agenda was agreed on after close collaboration with the local organisers from CITMATEL. The following material was presented:

Modules	Presented by	Affiliation
Situación de agotamiento de direcciones IPv4 y el desarrollo de IPv6 en América Latina	Raul Echeberría	LACNIC
Introducción a IPv6	Jorge Villa	MES, Cuba
IPv6 en Cuba	Rosa Yamile García	MIC, Cuba
Diferentes aproximaciones a la adopción de IPv6	Alvaro Vives	Consulintel
Mecanismos de transición: Dual-Stack, Túneles, Tunnel Broker, 6to4, Teredo, Softwires y Traducción	Alvaro Vives	Consulintel

Table 4-3: List of modules and hands-on exercises used in Habana's Workshop

4.4.1 Modules

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

- Situación de agotamiento de direcciones IPv4 y el desarrollo de IPv6 en América Latina:** This module explained why a new version of IP, IPv6, has been developed. A brief history of IPv6, the motivation for its deployment, and the benefits of its deployment were given.
- 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.
- IPv6 en Cuba:** This module explained the different documents that compose the IPv6 legal framework for Cuba today.
- Diferentes aproximaciones a la adopción de IPv6:** This module gave an approach to IPv6 deployment as a complex Project and tried to provide general and IPv6-specific issues to be taken into account. Some specific issues were treated: addressing plan, business opportunities, and costs.
- Mecanismos de transición: Dual-Stack, Túneles, Tunnel Broker, 6to4, Teredo, Softwires y Traducción:** 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.

4.5 Analysis of the Feedback Questionnaires

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

Offer personal information was not mandatory of the participants 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, 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

About the participants		
67 participants were present, 54 questionnaires were returned		
Employment sector	Government	18
	Schools or further education	1
	Commercial	21
	Research	1
	Other (please specify):	8
	Television	1
	Telecom	6
	Transport	1
Job function	Government Advisor	2
	Director	2
	IT Manager	8
	Systems Administrator	11
	Network (adm. and inst.)	29
	Researcher / Postgraduate	2
	Software engineer	1
Usage of IPv6		
Do you use IPv6 yourself?	Yes	8
	No	44
Does your organisation use IPv6?	Yes	14
	No, but planned in the next year	16
	No, but planned in the longer term	11
	No, and no plans as yet	12

* See the graphics section for more information

Table 4-4: General questions from La Habana Workshop participants

4.5.2 Questions regarding the workshop

About the Workshop				
Usefulness of the topic	Very useful	Useful	Slightly useful	Not useful
Presentación 1 – Situación de agotamiento de direcciones...	37	13	1	1
Presentación 2 – Introducción a IPv6	35	13	3	2
Presentación 3 – IPv6 en Cuba	32	14	5	0
Presentación 4 – Adopción de IPv6	33	12	5	1
Presentación 5 – Mecanismos de Transición	32	10	1	0
Presentación 6 – Preguntas y Respuestas	10	14	2	0
Quality of the presentation	Excellent	Good	Average	Poor
Presentación 1 – Situación de agotamiento de direcciones...	35	14	1	0
Presentación 2 – Introducción a IPv6	27	9	4	0
Presentación 3 – IPv6 en Cuba	29	17	3	0
Presentación 4 – Adopción de IPv6	31	16	3	0
Presentación 5 – Mecanismos de Transición	34	13	2	0
Presentación 6 – Preguntas y Respuestas	12	13	1	0
Familiarity with the topic?	None	Some	Most	All
Presentación 1 – Situación de agotamiento de direcciones...	6	11	14	17
Presentación 2 – Introducción a IPv6	8	20	19	4
Presentación 3 – IPv6 en Cuba	11	18	14	5
Presentación 4 – Adopción de IPv6	13	26	8	4
Presentación 5 – Mecanismos de Transición	17	20	6	4
Quality of the course documentation	Excellent	Good	Average	Poor
	13	22	6	1
General workshop organisation	Excellent	Good	Average	Poor
	28	21	1	0
Recommend to your colleagues?	yes	no		
	49	0		

Table 4-5: Questions regarding the Habana 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.

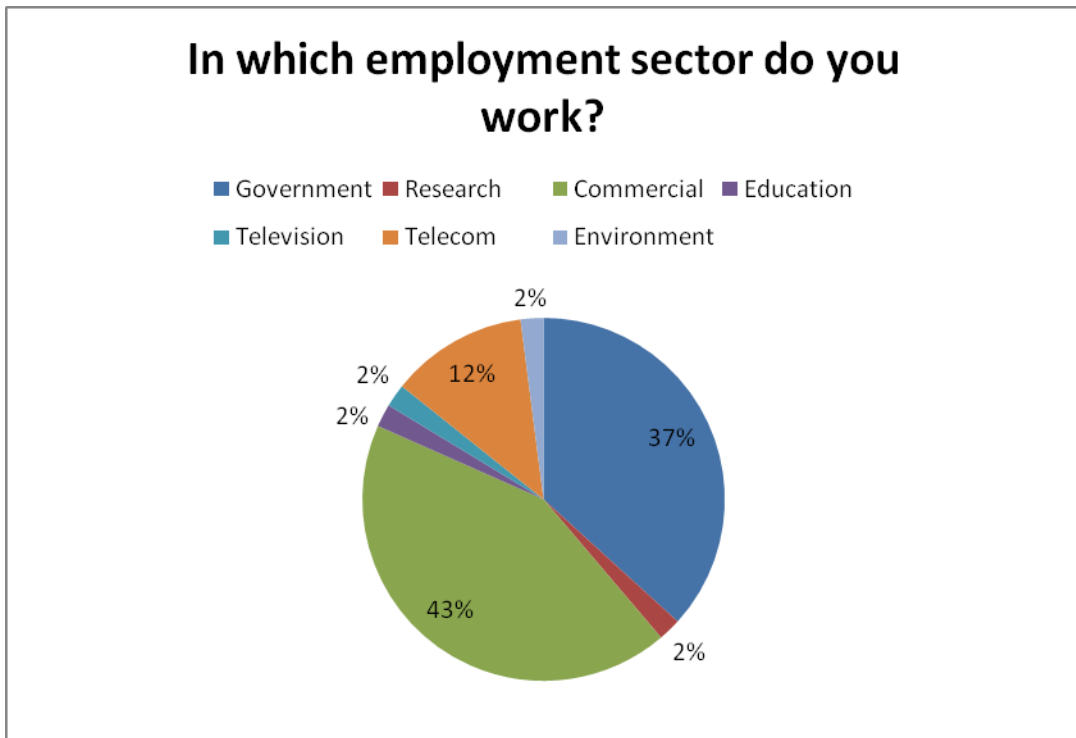


Figure 4-1: In which employment sector do you work?

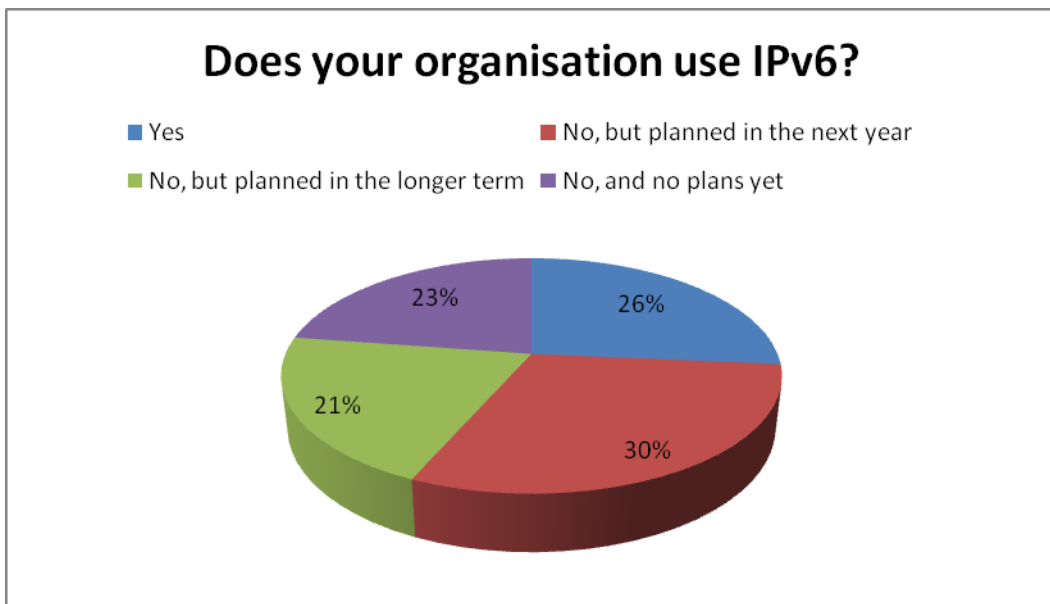


Figure 4-2: Does your organisation use IPv6?

Which of the following best describes your job function?

- Senior Manager
- IT Manager
- System administrator
- Network (adm and inst)
- Researcher/Postgraduate
- Director

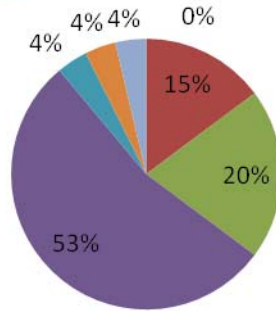


Figure 4-3: Which of the following best describes your job function?

Do you use IPv6 yourself?

- Yes
- No

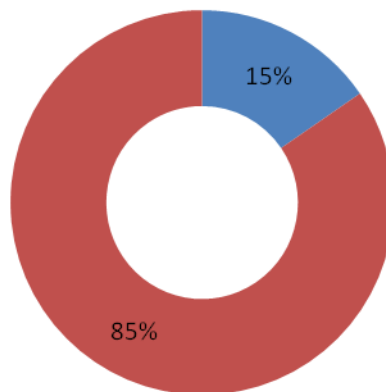


Figure 4-4: Do you use IPv6 yourself?

How useful did you find the presentations?

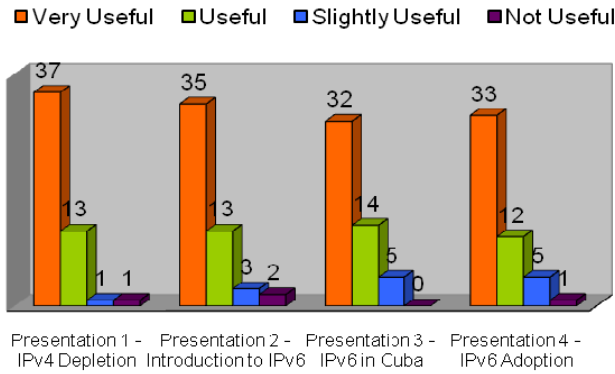


Figure 4-5: How useful did you find the presentations?

How well were the sessions presented?

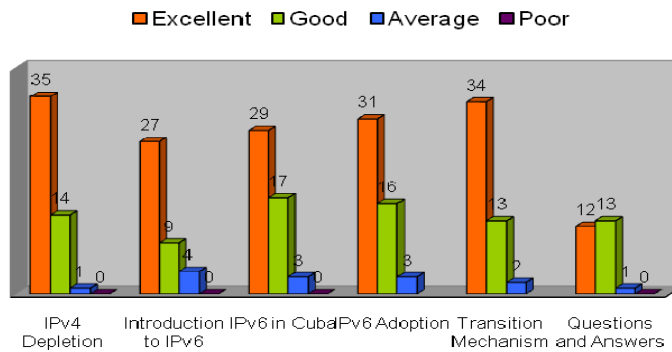


Figure 4-6: How well were the sessions presented?

How much of the workshop material was already familiar?

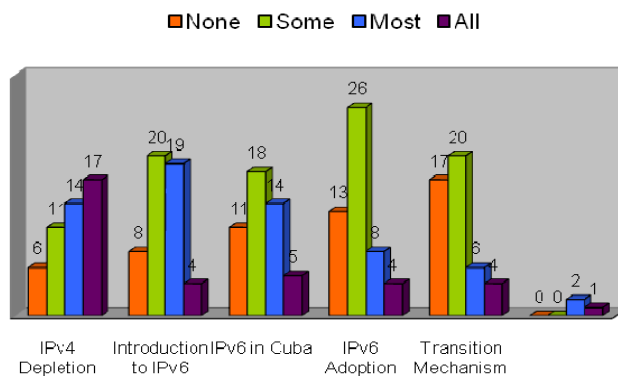


Figure 4-7: How much of the workshop material was already familiar?

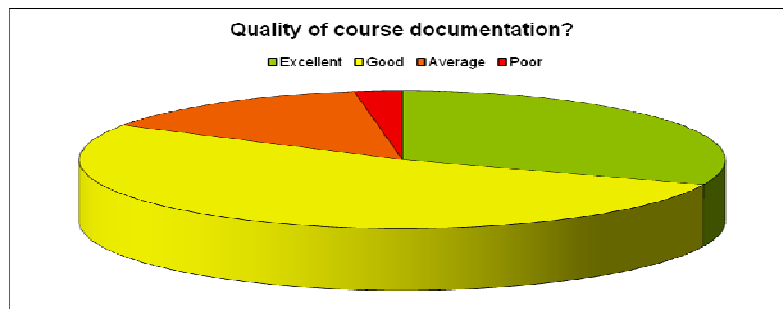


Figure 4-8: Quality of course documentation?

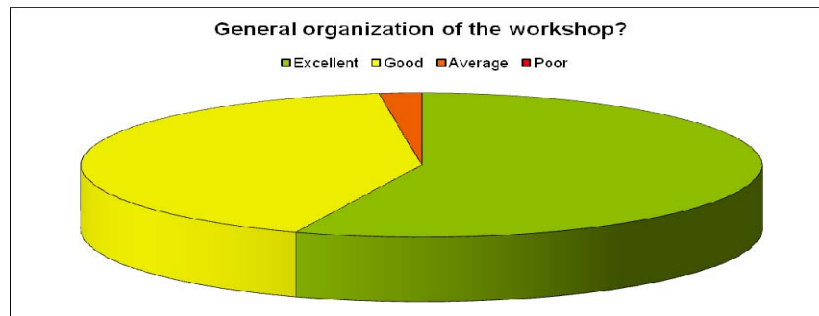


Figure 4-9: General organization of the workshop?

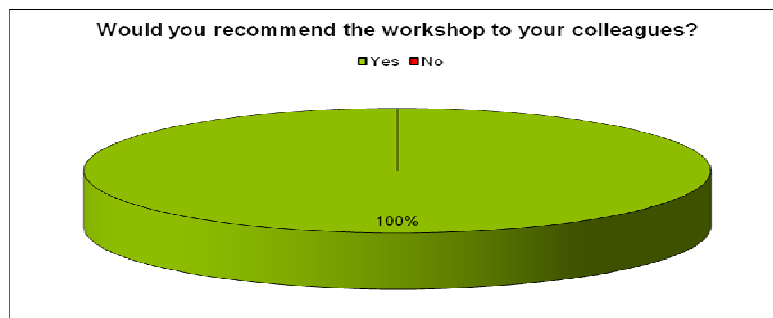


Figure 4-10: Would you recommend the workshop to your colleagues?

4.5.4 Participant comments

Like in the workshop in Haiti, it should be noted that the participants had different technical backgrounds. The answers given by them are the result of this situation.

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 (some were present in more than one questionnaire).

What topics would you have liked to hear more about?
IPv6 in Cuba
Transition mechanisms and coexistence of IPv4 and IPv6
Technical support
Practical issues
Cuban experiences in IPv6 implementation

About technical details of the protocol and its implementation
General characteristics of IPv6
IPv6 Firewall use
IP/MPLS networks and VPN MPLS services, and transition to IPv6
Costs of IPv6 implementation, tangible benefits
IPv6 implementation with tools from the South
QoS Security
What topics would you have liked to hear less about?
Too much introduction about IPv6
IPv4 depletion
About regulations
Basic contents present in other multiple places
Any other comments:
Very interesting workshop
Very useful for IPv6 transition
It could be useful to introduce a practical example of configuration and transition of a small network to IPv6.
Good, thank you and congratulations
Look for a retro-alimentation mechanism which could allow the evaluation of this project
The introduction to IPv6 was very good but the technical level was high. The presentations about adoption of IPv6 and transition mechanisms were too dense.
Guarantee IPv4 connections for the workshops and very important IPv6 for the demos
Thanks!
All sessions were introduced in an excellent way. We should organize events more often about this issue.

5. THE 6DEPLOY WORKSHOP IN PORT OF SPAIN (TRINIDAD & TOBAGO)

The third Caribbean workshop was held in Port of Spain (Trinidad and Tobago) on October 31st 2008, at the LACNIC CTU IPv6 Workshop. The workshop is described below, including descriptions of the attendees and their affiliations, the programme outline, and the material that was presented.

5.1 Overview

The LACNIC IPv6 Workshop was both an example of awareness work conducted by LACNIC, as well as an example of the interest in new technologies - specifically IPv6 – currently being expressed by developing countries.

The workshop took place during the CIF (Caribbean Internet Forum) Internet Day. It included technical, policy-oriented, and strategic presentations given by Mr. Raúl Echeberría (CEO LACNIC) and Mr. Roque Gagliano (LACNIC). An IPv6 “shutdown” experiment was performed during the session that ended with an IPv6 round table conducted by local players (two ISPs, one university, and a government office were represented).

As a conclusion to the Workshop, the round-table participants, the CTU, and LACNIC elaborated the basic ideas for the establishment of a local IPv6 task force in order to boost the adoption of IPv6 in Trinidad and Tobago.

5.2 Attendees

There were over 30 participants in the workshop. The following represents the participants that returned the questionnaire (see 5.6).

No.	Surname	First name	Affiliation
1	Taran	Rampersad	N/A
2	Burton	Samuel	Water and Severage Authority
3	Nigel	Cassimire	CTU
4	Vincent	Roberts	Government of Grenada
5	Lennox John	Andrews	European Commission
6	Brian	Supersad	Telecommunication Services of Trinidad and Tobago
7	Darren	Charles	Telecommunication Services of Trinidad and Tobago
8	Anita	Hankey	Ministry of Energy, Trinidad and Tobago
9	Tommy	Chen	The University of the West Indies Open Campus

10	Lonella	Edwards	Infolink Services Ltd
11	Ronald	Mohammed	Telecommunication Services of Trinidad and Tobago
12	Paul Bryan	Harrison	UTT
13	S.	Baksh	PIL
14	Richard	Sherman	Ericsson, Puerto Rico
15			Ministry of Education, Trinidad and Tobago
16	Victor	Taylor	CTW Barbados

Table 5-1: Port of Spain Workshop list of participants

The participants represented a wide range of the ICT community, both local and from different parts of the Caribbean, as the event was held as part of the Caribbean Internet Forum.

In section 5.6 more details about the attendees can be found based on their answers to the questionnaire.

5.3 Workshop programme

The workshop programme is presented in the following table:

Date	Time	Title of session
31/10/08	11:15 am	LACNIC: Services, Activities and Policy Development- Raúl Echeberría, CEO LACNIC
31/10/08	11:45 am	Discussion
31/10/08	12:00 pm	Lunch Session
31/10/08	1:00 pm	IPv4 Depletion and IPv6 Deployment- Raúl Echeberría, CEO LACNIC
31/10/08	1:45 pm	Why IPv6? –Roque Gagliano, LACNIC
31/10/08	2:30 pm	Coffee Break
31/10/08	3:20pm	LACNIC IPv6 Policies – Roque Gagliano, LACNIC
31/10/08	4:00 pm	IPv6 in Trinidad and Tobago round Table (prov) Moderates: Nigel Cassimire Participants: - Raúl Echeberría, LACNIC - Ronald Mohammed, TSTT - Calvin George, 360 Com - Mr. Ravi Deonarine, UWI- St. Augustine - Representative from the local government
31/10/08	5:00 pm	Adjourn

Table 5-2: Port of Spain Workshop Programme

5.3.1 IPv6 Experiment:

During the workshop, an IPv4 “shutdown” experiment was performed during which the local IPv4 connectivity was temporarily blocked and all the Notebooks in the room were configured with IPv6 Support. Special prizes were given to attendees that performed tasks well, such as accessing a web or an email server in IPv6.

The local IPv6 connectivity was configured through collaboration with LACNIC and the local ISP TSTT (Telecom Services Trinidad and Tobago), which became the first IPv6 experience for the biggest local Internet provider.

The following diagram shows the local network at the event. A private IPv4 announcement was needed in the IPv6-only network to allow Windows XP to resolve DNS.

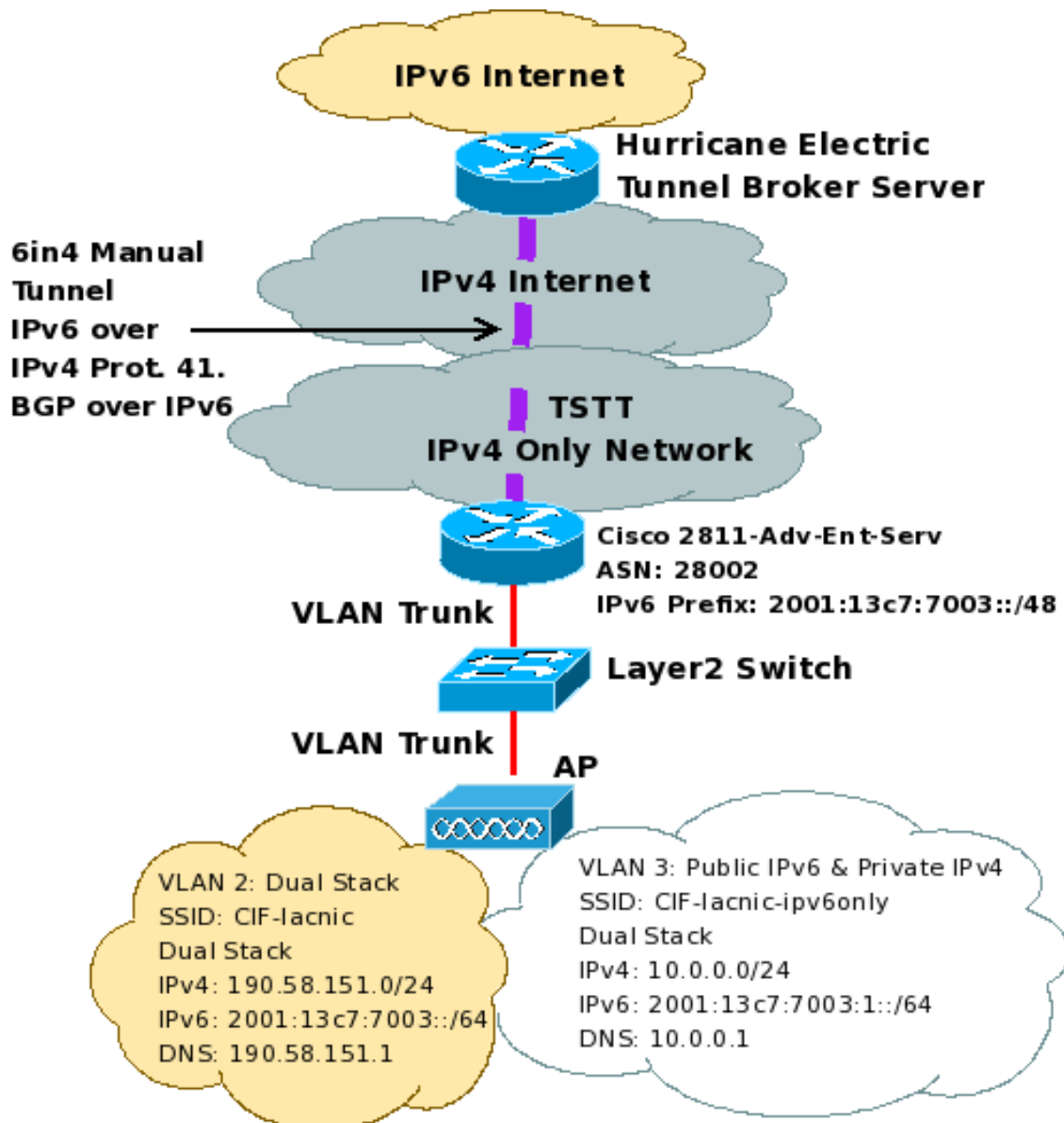


Figure 5-1: Trinidad and Tobago Workshop, Local Network

5.4 Photographs taken at the event



Figure 5-2: Raul Echeberria (LACNIC) presenting



Figure 5-3: Attendees to Port of Spain Workshop (1)



Figure 5-4: Attendees to Port of Spain Workshop (2)

5.5 Analysis of the Feedback Questionnaires

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

Offering personal information was not mandatory of the participants, 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, 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

About the participants

32 participants were present, 16 questionnaires were returned

Employment sector	Government	5
	University or other higher education	2
	Schools or further education	6

223794	6DEPLOY	D1.7: Report of Caribbean Workshops	
	ICT Consulting		1
	Telecommunication		1
	International Organization		1
	Other (please specify)		0
Job function	Senior Manager		7
	IT Manager		3
	Systems Administrator		1
	Network Administrator		1
	Researcher / Postgraduate		1
	Systems Engineer		1
	Senior Consultant		2
Usage of IPv6			
Do you use IPv6 yourself?	Yes		2
	No		14
Does your organisation use IPv6?	Yes		1
	No, but planned in the next year		4
	No, but planned in the longer term		7
	No, and no plans as yet		4

* See the graphics section for more information

Table 5-3: General questions from Port of Spain Workshop participants

5.5.2 Questions regarding the workshop

About the Workshop				
Usefulness of the topic	Very useful	Useful	Slightly useful	Not useful
Presentation 1: IPv4 Depletion and IPv6 Deployment	9	5	0	0
Presentation 2: Why IPv6?	11	3	0	0
Presentation 3: IPv6 Policies	10	4	0	0
Presentation 4: IPv6 Transition	10	4	0	0
Quality of the presentation	Excellent	Good	Average	Poor
Presentation 1: IPv4 Depletion and IPv6 Deployment	12	2	0	0
Presentation 2: Why IPv6?	13	1	0	0
Presentation 3: IPv6 Policies	13	1	0	0
Presentation 4: IPv6 Transition	14	0	0	0
Familiarity with the topic?	None	Some	Most	All
Presentation 1: IPv4 Depletion and IPv6 Deployment	5	6	4	0
Presentation 2: Why IPv6?	6	5	4	0
Presentation 3: IPv6 Policies	8	5	2	0
Presentation 4: IPv6 Transition	9	5	1	0

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Quality of the course documentation	Excellent	Good	Average	Poor
	5	10	0	0
General workshop organisation	Excellent	Good	Average	Poor
	4	12	0	0
Recommend to your colleagues?	yes	no		
	16	0		

Table 5-4: Questions regarding the Port of Spain 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.

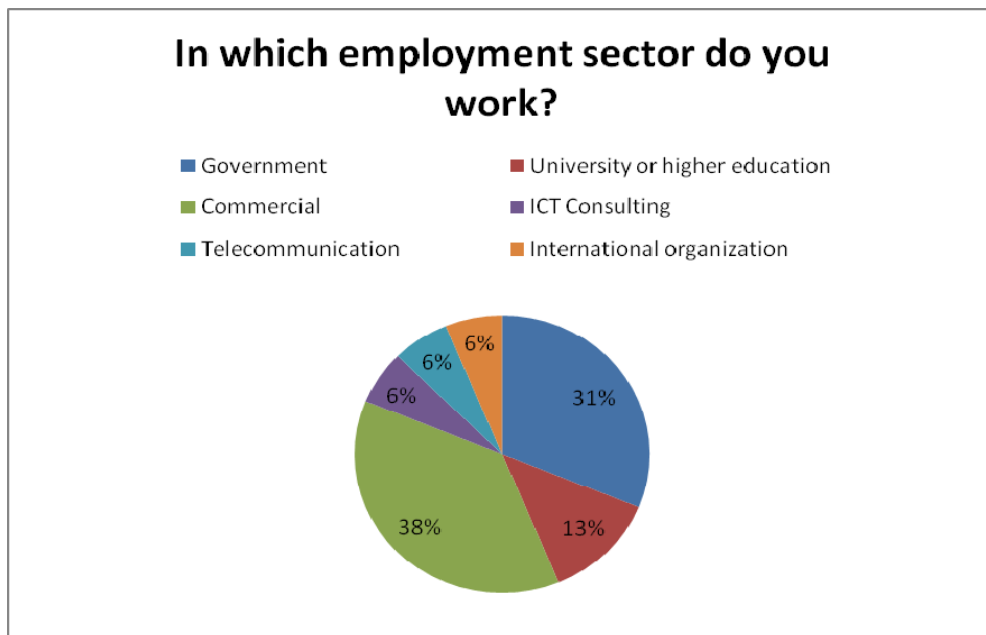


Figure 5-5: In which employment sector do you work?

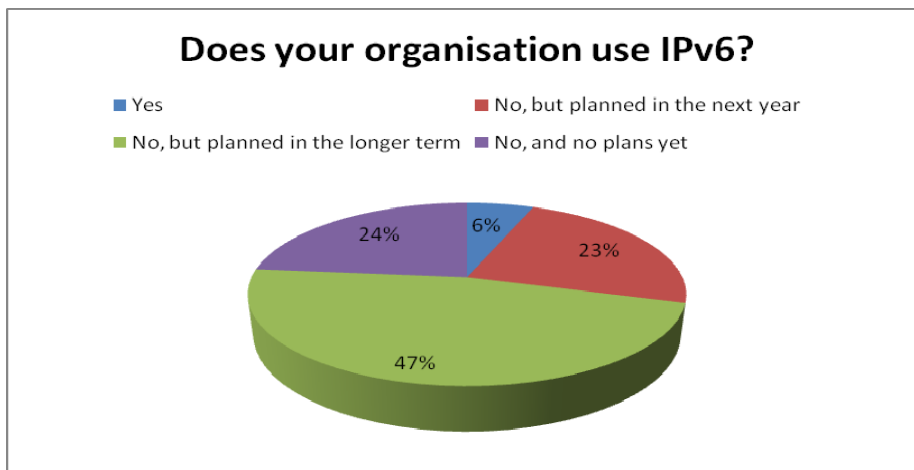


Figure 5-6: Does your organisation use IPv6?

Which of the following best describes your job function?

- Senior Manager
- IT Manager
- System administrator
- Network administrator
- Researcher/Postgraduate
- Systems Engineer

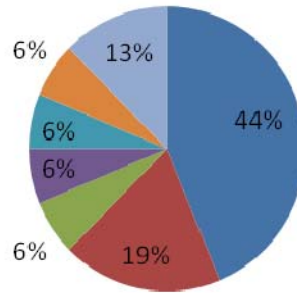


Figure 5-7: Which of the following best describes your job function?

Do you use IPv6 yourself?

- Yes
- No

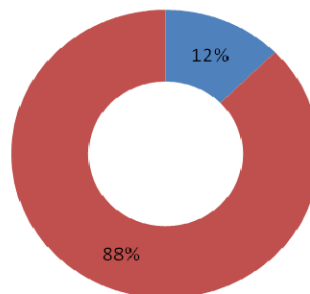
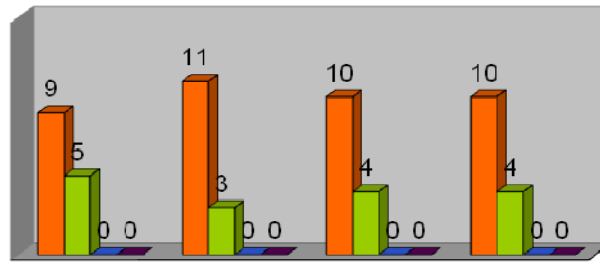


Figure 5-8: Do you use IPv6 yourself?

How useful did you find the presentations?

Very Useful Useful Slightly Useful Not Useful

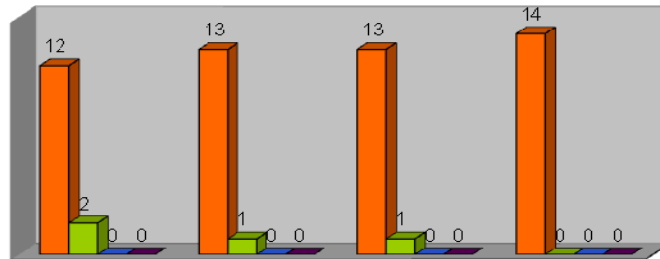


Presentation 1 - IPv4 Depletion and IPv6 Deployment
 Presentation 2 - Why IPv6?
 Presentation 3 - IPv6 Policies
 Presentation 4 - IPv6 Transition

Figure 5-9: How useful did you find the presentations?

How well were the sessions presented?

Excellent Good Average Poor



Presentation 1 - IPv4 Depletion and IPv6 Deployment
 Presentation 2 - Why IPv6?
 Presentation 3 - IPv6 Policies
 Presentation 4 - IPv6 Transition

Figure 5-10: How well were the sessions presented?

How much of the workshop material was already familiar?

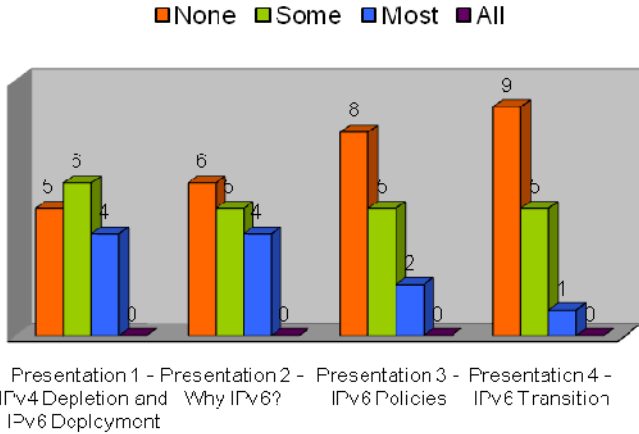


Figure 5-11: How much of the workshop material was already familiar?

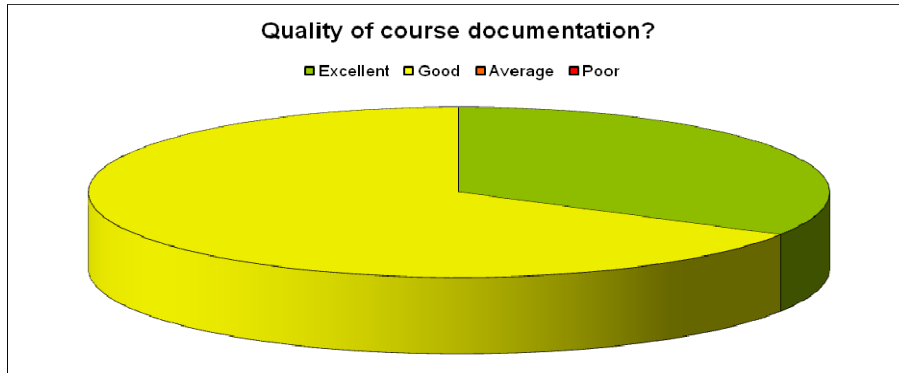


Figure 5-12: Quality of course documentation?

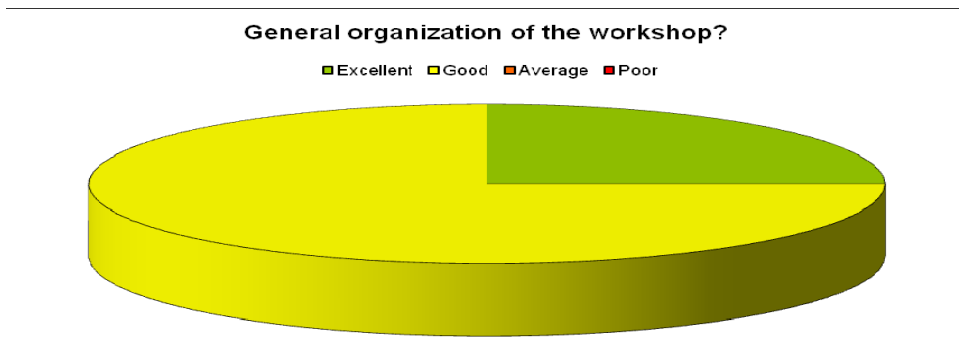


Figure 5-13: General organization of the workshop?

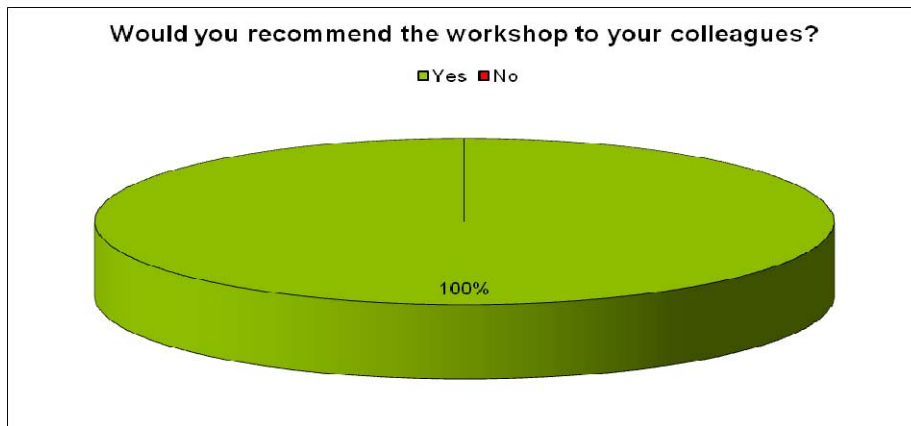


Figure 5-14: Would you recommend the workshop to your colleagues?

5.5.4 Participant comments

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. Here are some comments provided by the trainees:

What topics would you have liked to hear more about?
How to penetrate the unserved communities
Increased IPv4 costs for end-users.
Transitioning for ISPs, Enterprises, End users.
Actual implementation challenges and implications for SCADA deployment and usage.
What topics would you have liked to hear less about?
No comments here
Any other comments:
Internet pricing should be market based and not cost based. The Forum was however an eye-opener and brought greater understanding. Very important contacts were made.
Great presentation. Simple enough.
Will contact if necessary for support on establishing task force for IPv6 in Grenada

Figure 5-15: Open questions

6. THE 6DEPLOY WORKSHOP IN SANTO DOMINGO

This workshop was held in Santo-Domingo (Dominican Republic) on January 29th 2009. The workshop is described below, including descriptions of the attendees and their affiliations, the programme outline, and the material that was presented.

6.1 Overview

The event was organized by LACNIC, PUCMM, and INDOTEL with the support of TERREMARK. The event took place at the PUCMM facility. A tunnelled IPv6 connectivity was available at the site with access through the PUCMM local network. The audience included people from Internet Service Providers, Universities, local companies, and Governmental agencies. At the end of the event, INDOTEL launched the new academic network for the Dominican Republic with IPv6 support.

The workshop was conducted by Roque Gagliano (LACNIC) and Ricardo Patara (LACNIC).

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

6.2 Attendees

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

No.	Surname	First name	Affiliation
1	Marte	Jhonatan	Aster Comunicaciones
2	de la Hoz	David	Aster Comunicaciones
3	Mora	Hector	Banco Leon
4	Rodriguez	Edison	Bec-Tel
5	Moreno Castillo	Luis	Beverage Metrics
6	Tavarez Valdez	Elvis	Centro de Exportacion e Inversion de Rep. Dom.
7	Alcantara Mateo	Rafael Aliskair	Claro-Codetel
8	Perez	Timoteo	Codete-Claro
9	Feliz	Hector	CODETEL
10	Medina	Indhira	CODETEL
11	Pons Frías	Iván Ernesto	CODETEL
12	Dominguez	Jose R.	CODETEL
13	Mas Lara	Ovesnel	CODETEL
14	Casabella	Christian Walter	Colegio Dominicano de Abogados
15	Ruiz Ceballos	Edwin	DGTEC
16	Ceara	Rafael	DGTEC
17	Noel Pimentel	Pedro	Direccion General de Aduanas
18	Delgado	Alberto	INDOTEL
19	Moreno	Daniel	INDOTEL

20	Polonio	Denis	INDOTEL
21	Lora	Herlin	INDOTEL
22	Garcia Ortiz	Javier	INDOTEL
23	Guerrero	Johnny	INDOTEL
24	Molina	Mercedes	INDOTEL
25	Wagner O	Pedro B	INDOTEL
26	Henriquez	Raimundo	INDOTEL
27	Montero	Ramon	INDOTEL
28	Ramirez	Richal	INDOTEL
29	Alcantara	Jose	INDOTEL
30	Moreta	Jorge Luis	INDOTEL
31	Silverio	Erasmus J.	INDOTEL
32	Arango	Amparo	INDOTEL
33	Matos	Juan Antonio	Instituto Dominicano de Aviacion Civil (IDAC)
34	Hirujo	Fernando	Instituto Tecnológico de Santo Domingo (INTEC)
35	Cuevas	Eduardo	Instituto Tecnológico de Santo Domingo (INTEC)
36	Díaz Jorge	Kenny	ITS Infocomunicacion
37	Silesky	Ronald	ITS Infocomunicacion
38	Patara	Ricardo	LACNIC
39	Gagliano	Roque	LACNIC
40	Nadal	Alvaro	NAP DEL CARIBE
41	Moya	Chalibel	OPTIC
42	Cruz Tejada	Darling	OPTIC
43	Guzman	Edward	Orange Dominicana, S.A.
44	Noboa	Tomás	Organización Panamericana de la Salud
45	Defillo	Cesar	Ozytel
46	Lopez Guzman	Jorge Luis	Presidencia de la Rep. Dom.
47	Caminero	Maury	Privado
48	Carbucia Gonel	Deyanara	Privado
49	Báez Moreta	Karim	Privado
50	Méndez	Orlando	Privado
51	Sánchez Fermín	Steven	PUCMM
52	Rodriguez	Juan	PUCMM
53	Romero	Luis	PUCMM
54	Queliz	Pablo	PUCMM
55	Estevez	Arlene	PUCMM
56	Collado	Clara	PUCMM
57	Sanchez Estevez	Simon	SANBAT, S. A.
58	Estrella	Maireni	Secretaria De Estado De Relaciones Exteriores
59	González	Luis	Secretaria Estado Relaciones Exteriores
60	Lora	Ivan	SESPAS
61	Escolastico Mercedes	Luis Andres	SESPAS
62	Concepcion Figuereo	Manuel Aristide	SESPAS
63	Dolores Marrero	Juan Fco.	SST
64	Santana Yunes	Darwin	Tricom
65	Ceballos	Bernardo	Tricom S.A.
66	Alcantara	Melvin	Tricom S.A.
67	Tejada Tio	Jaqueline	UASD
68	Antigua	Ariel	UNAPEC
69	Concepción	Miguel A.	UNAPEC
70	Morillo Rodriguez	Ramon Antonio	Universidad APEC

71	De Moya	Cristian	Universidad Catolica Santo Domingo
72	Lambertus	Jimmy	Universidad Catolica Santo Domingo
73	Bello Diaz	Rafael	Universidad Catolica Santo Domingo
74	Pichardo	Sahira	Universidad Catolica Santo Domingo
75	Perez	Tony	Universidad Catolica Santo Domingo
76	Ramirez	Eddy	Viarktek Network Communication
77	Herrera	Victor	Viarktek Network Communication
78	Ramirez	Hector	VIVA
79	Chavez	Rafael	VIVA
80	Arquimedes Perez	Juan	Wind Telecom
81	Matos	Emigdio	
82	Reyes	Luis M.	
83	Joel Castilla	Juan	
84	Camacho	Mariel	
85	Mesa	Jose	
86	Batista	Francis	
87	Linares	Robert	
88	Mejía	Victor	
89	Martínez	Cesar	

Table 6-1: Santo Domingo Workshop list of participants

In section 6.6 more details about the attendees can be found based on their answers to the questionnaire.

6.3 Workshop programme

The workshop programme is presented in the following table:

Date	Time	Title of session
29/01/09	9:00	Introduction to IPv6
29/01/09	10:30	Coffee Break
29/01/09	11:00	Introduction to ICMPv6
29/01/09	12:30	Break
29/01/09	14:00	Planning IPv6
29/01/09	15:15	IPv4 Exhaustion, LACNIC IPv6 Activities and IPv6 adoption statistics
29/01/09	15:45	Coffee Break
29/01/09	16:00	IPv6 in Dominican Republic (DO): Presentations and Roundtable Moderator: Ricardo Patara, LACNIC. Participants: Melvin Alcantara (TRICOM), Amparo Arango (INDOTEL), Alfredo Vadillo (Terramark/NAP del Caribe)
29/01/09	17:00	Closure

Table 6-2: Santo Domingo Workshop programme

6.4 Presentation material

The following material was presented:

Modules	Hands-on exercises	Presented by	Affiliation
Introduction to IPv6		Roque Gagliano	LACNIC
Introduction to ICMPv6		Roque Gagliano	LACNIC
Planning IPv6		Roque Gagliano	LACNIC
IPv4 Exhaustion, LACNIC IPv6 Activities and IPv6 adoption statistics		Ricardo Patara	LACNIC

Table 6-3: Santo Domingo Workshop list of modules and hands-on exercises used

6.4.1 Modules

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

- **Introduction to IPv6:** This module included an introduction the history of IPv6 standardisation and deployment, and also a detailed overview of IPv6 protocol and addressing.
- **Introduction to ICMPv6:** This module included a review of all the functionalities included in ICMPv6, an overview of the packets format, and explanations of neighbour discovery, stateless auto-configuration, and DHCPv6.
- **Planning IPv6:** This module included descriptions of all of the different aspects needed to plan an IPv6 deployment, including an addressing plan, a routing plan, and an implementation plan.
- **IPv4 Exhaustion, LACNIC IPv6 Activities and IPv6 adoption statistics:** This section included a review of the problem of IPv4 address exhaustion and showed statistics of IPv6 deployment in the LACNIC region, particularly in DR.

6.4.2 Hands-on exercises

An IPv6 wireless network was available at the site and the participants were guided in configuring and testing IPv6 on their own notebooks. All the participants succeed in the configuration of IPv6 on their own machines.

6.5 Photographs taken at the event



Figure 6-1: Roque Gagliano (LANIC) Presenting



Figure 6-2: Attendees to Santo Domingo's Workshop



Figure 6-3: Attendees to the Workshop

6.6 Analysis of the Feedback Questionnaires

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

Offering personal information on the questionnaire was not mandatory for the participants, 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, each participant was requested to assess "usefulness", "quality of presentation", "familiarity with the topic", "quality of the course documentation", "general organisation", etc.

6.6.1 General questions related to participants and IPv6

About the participants

89 participants were present, 62 questionnaires were returned

Employment sector	Government	18
	University or other higher education	16
	ISP/Telecom	4
	Research	1
	Health	1

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		Commercial	14
		Other (please specify)	Several (7)*
Job function		Government Advisor	2
		Senior Manager	2
		IT Manager	6
		Systems Administrator	9
		Network Administrator	22
		Engineer	9
		Undergraduate	2
		Other (please specify)	Several (8)*
Usage of IPv6			
Do you use IPv6 yourself?		Yes	13
		No	49
Does your organisation use IPv6?		Yes	2
		No, but planned in the next year	12
		No, but planned in the longer term	21
		No, and no plans as yet	25

* See the graphics section for more information

Table 6-4: General questions from Santo Domingo Workshop participants

6.6.2 Questions regarding the workshop

About the Workshop				
Usefulness of the topic	Very useful	Useful	Slightly useful	Not useful
Presentation 1: Introduction to IPv6	47	15	1	0
Presentation 2: Planning IPv6	44	18	1	0
Presentation 3: IPv4 Exhaustion	35	26	0	0
Quality of the presentation	Excellent	Good	Average	Poor
Presentation 1: Introduction to IPv6	49	13	1	0
Presentation 2: Planning IPv6	45	17	1	0
Presentation 3: IPv4 Exhaustion	29	30	1	0
Familiarity with the topic?	None	Some	Most	All
Presentation 1: Introduction to IPv6	5	27	21	9
Presentation 2: Planning IPv6	7	33	16	5
Presentation 3: IPv4 Exhaustion	4	25	20	10
Quality of the course documentation	Excellent	Good	Average	Poor
	28	29	1	0
General workshop organisation	Excellent	Good	Average	Poor
	32	29	1	0
Recommend to your colleagues?	yes	no		
	61	1		

Table 6-5: Questions regarding the Santo Domingo Workshop

6.6.3 Results graphics

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

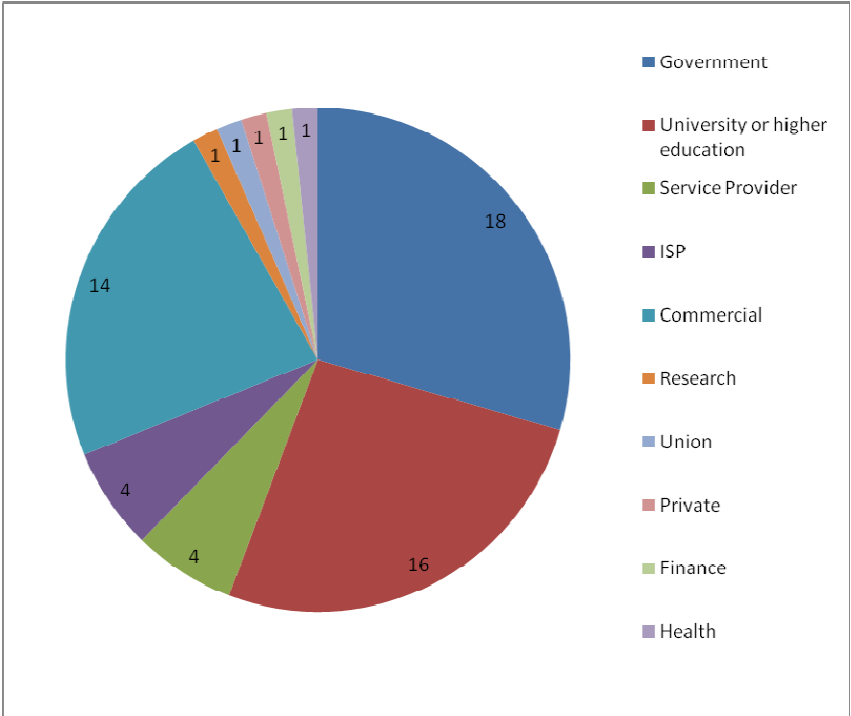


Figure 6-4: In which employment sector do you work?

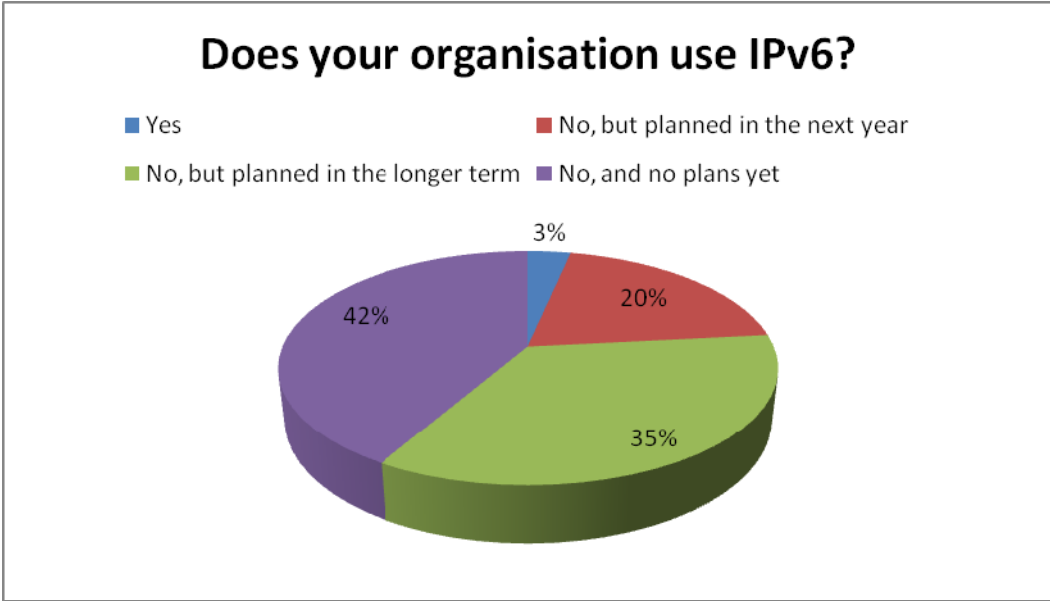


Figure 6-5: Does your organisation use IPv6?

Which of the following best describes your job function?

- Senior Manager
- IT Manager
- System administrator
- Network administrator
- Undergraduated
- Engineer
- Government advisor

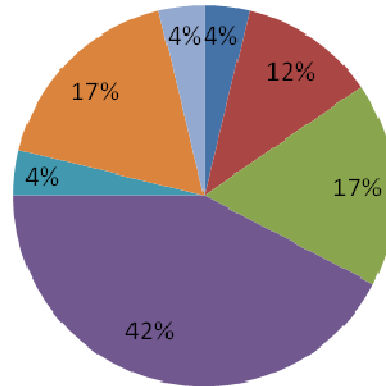


Figure 6-6: Which of the following best describes your job function?

Do you use IPv6 yourself?

- Yes
- No

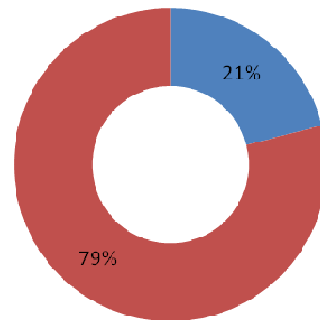


Figure 6-7: Do you use IPv6 yourself?

How useful did you find the presentations?

Very Useful Useful Slightly Useful Not Useful

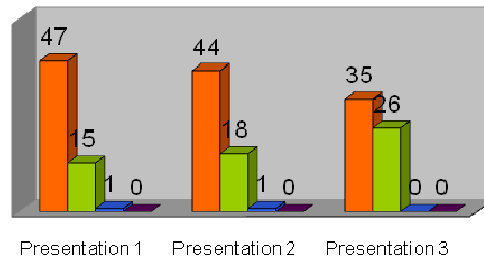


Figure 6-8: How useful did you find the presentations?

How well were the sessions presented?

Excellent Good Average Poor

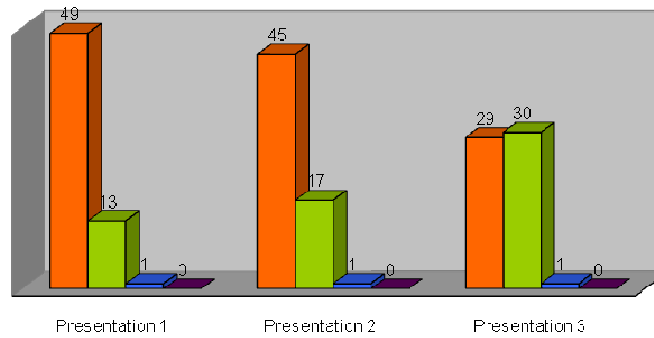


Figure 6-9: How well were the sessions presented?

How much of the workshop material was already familiar?

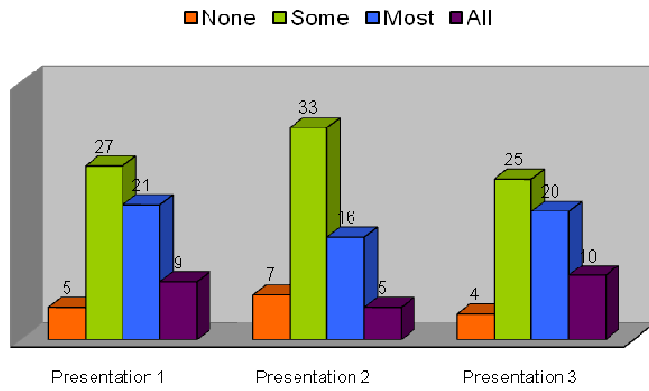


Figure 6-10: How much of the workshop material was already familiar?

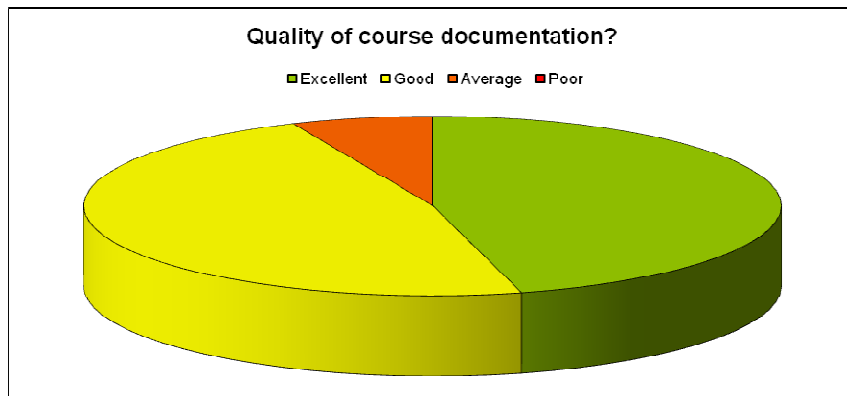


Figure 6-11: Quality of course documentation?

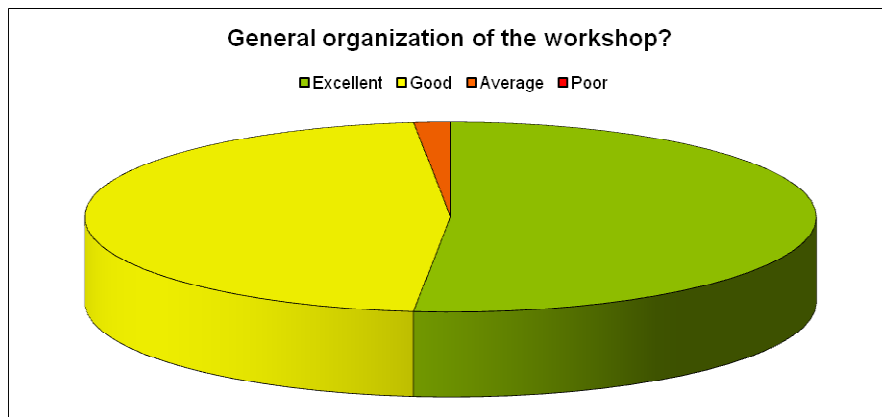


Figure 6-12: General organization of the workshop?



Figure 6-13: Would you recommend the workshop to your colleagues?

6.6.4 Participant 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. It is also worth mentioning that a few attendees remarked that the sessions were too short, and that they would have been happy to work much later in the evening on more "hands-on" exercises.

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 (indicated by the number in parentheses).

Here are some comments provided by the trainees:

== Begin of the excerpts

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

- *(8) Planning IPv6*
- *(8) Implementation*
- *(5) Examples of implementation*
- *(5) Configuration*
- *(3) Transition from IPv4 to IPv6*
- *(2) End users with IPv6*
- *(2) Security with IPv6*
- *Troubleshooting*

- *Introduction to IPv6 and its functionality*
- *BGP*
- *IPv6 on videoconference equipment*
- *Multicast IPv6*
- *Support services with IPv6*
- *How to get an IP address if my ISP is not ready for IPv6 change*
- *Routing*
- *Tunnels*
- *IPv6 deployment for ISPs*
- *Mobility on IPv6*
- *Practical handbook*
- *What other countries do when facing IPv4 exhaustion*
- *Applications that will benefit from IPv6 and how.*
- *Test lab and practices*
- *IPv6 addresses*

What topics would you have liked to hear less about?

- *(7) IPv4 exhaustion*
- *(3) Acronyms*
- *(1) Antecedents*

Any other comments:

- *(2) Very good presentation*
- *All the presentations were excellent*
- *The workshop was excellent*
- *For a next workshop it should be more practical and less theory.*
- *Not convenient for the attendees present in this workshop. It could be for people who does not know about the protocol.*
- *If you want IPv6 to be fully implemented you have to: develop software that work only under IPv6, maintain this type of events, a local transparent solution for the user*
- *More documentation about IPv6*
- *I would like to receive the presentation before taking the course.*

End of the excerpts ==

7. 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.

8. 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.

Four 6DEPLOY workshops took place between late August 2008 and late January 2009. All of these workshops were coordinated by LACNIC, as a 6DEPLOY representative, with local authorities and collaboration with Consulintel. 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 included most of the issues of Internet deployment and evolution, especially IPv4-IPv6 transition/co-existence strategies, DNS, Autoconfiguration, Routing and Applications.

Approximately 230 network engineers, system administrators, and regulators participated in the workshops. The topics presented were selected according to the participants' requirements.

According to the evaluation forms and the comments from the participants of the workshop, it is clear that there is significant interest in the region for IPv6 technology. The participants offered positive comments regarding workshops' usefulness and organisation. They also requested that 6DEPLOY organise more workshops in the Caribbean region with more specific technical subjects. Furthermore, some of the attendees expressed interest in participating in any subsequent "Training the Trainers" courses.

Some new ideas have already been discussed to improve the existing material, such as adding more "applications-oriented" elements to the labs, which might be of interest for IPv6 deployments.

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

9. REFERENCES

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

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

Paris Testbed: <http://www.renater.fr/spip.php?article439&lang=en>

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/>