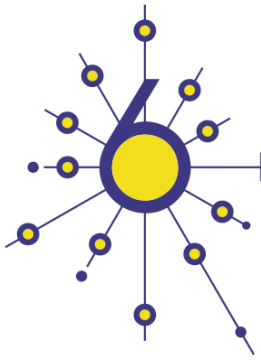
e-infrastructure



deploy

Title:	Document Version:
Deliverable D2.2.3 **Dissemination Material Status**	1.1

Project Number:	Project Acronym:	Project Title:
223794	6DEPLOY	IPv6 Deployment Support

Contractual Delivery Date:	Actual Delivery Date:	Deliverable Type* - Security**:
February 2010	April 2010	R – PU

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

Responsible and Editor/Author:	Organization:	Contributing WP:
Bernard Tuy & Simon Muyal	RENATER	WP2

Authors (organizations):

Bernard Tuy (RENATER), Simon Muyal (RENATER), Alicia Higa (Martel), Martin Potts (Martel)

Abstract:

This deliverable represents a summary of the current dissemination material available in the project, including training modules, “hands-on” exercises, the e-learning package, IPv6 labs, press releases, conference presentations, news bulletins, brochures, leaflets, posters, web-based publications, etc.

Keywords:

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

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Revision History

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

Revision	Date	Description	Author (Organization)
v0.1	March 2010	Update from RENATER	Bernard Tuy (RENATER) Simon Muyal (RENATER)
v1.0	April 2010	Reviewed	Alicia Higa (Martel Martin Potts (Martel)
v1.1	April 2010	Reviewed	Alvaro Vives Martinez

Executive Summary

One of the main activities in the 6DEPLOY project is to produce and maintain a set of dissemination material for use in workshops to train the different Internet communities in the areas of IPv6 deployment, configuration, and usage. This material is partly produced within 6DEPLOY, but also exploits previous project activities within and outside the Framework Programmes of the European Commission.

This document describes the set of dissemination material that is currently available. It is updated every 6 months.

In this revision, the main topics regarding the information / training material that the 6DEPLOY project maintains and disseminates through its activities worldwide are:

- IPv6 Modules
- Descriptions of “hands-on” exercises
- The e-learning package
- IPv6 Labs (locations, reservation process, management procedures, ...)
- Informational material (leaflets and flyers about the project

Deliverables (especially the following deployment use cases, which are available from the link to “Publications” at: http://www.6deploy.eu//index.php?page=home/):

  - D2.1.1: Greek School Network deployment use case
  - D2.1.2: School of Electronics and Computer Science (ECS) at the University of Southampton Campus Network deployment use case
  - D2.1.3: University of Plovdiv Network deployment use case

Table of Contents

Figure Index

Table Index

1. INTRODUCTION

This deliverable represents a summary of the dissemination material produced by the project, including training modules, “hands-on” exercises, the e-learning package, IPv6 Labs, press releases, conference presentations, news bulletins, brochures, leaflets, posters, web-based publications, etc.

This current version is an update of deliverable D2.2.2, released in August 2009. Two important changes are highlighted; the first of which involves a process to update and review the 6DEPLOY IPv6 modules. These IPv6 modules are maintained up-to-date and used by project partners to present IPv6 concepts in their workshops as well as for other purposes. The second change relates to 6DEPLOY partners’ access to the increasing number of remote testbeds from the various training locations. New testbeds have been installed since the beginning of the project and coordination between the respective managers has been effective in ensuring that every testbed has a similar configuration, good availability and accessibility, and offers similar services. In addition, a “one stop-shop” web interface has been established allowing people to book one or several testbeds according to the number of trainees they are expecting and/or the experiment to be shown. The testbed managers can access this interface and accept/reject incoming reservation requests.

2. 6DEPLOY TRAINING MODULES

The IPv6 knowledge from the project has been split into the following individual training modules, so that workshops can be tailored to the specific requirements of a particular audience. All of these modules are posted on 6DEPLOY's website and can be found at: http://www.6deploy.org/index.php?page=tutorials.

Below is a list of the modules and the partner responsible for their maintenance. All of the existing modules have been checked for accuracy and several new modules have been added. On the following pages, is a brief description of the content of each module.

2.1 Training Modules

Module No.[1]	Module Name	Responsible
001	6DEPLOY Presentation	Martel
002	6DEPLOY Workshop introduction	Martel
010	IPv6 Introduction	RIPE_NCC/RENATER
020	IPv6 Protocols	RENATER
030	IPv6 Addressing	Consulintel
031	Addressing case studies	NIIFI
040	IPv6 associated protocols	GRNET
060	IPv6 network management	RENATER
070	IPv6 Multicast + M6Bone	UNINETT
080	IPv6 Autoconfiguration	UCL
090	IPv6 DNS	LACNIC
100	IPv6 Routing	FCCN
101	RPSLng	FCCN
110 + 111[2]	IPv6 Security	UCL
120	IPv6 Mobility	Cisco
130	IPv6 Coexistence with IPv4	Soton-ECS
131	IPv6 Deployment considerations	NIIFI
140	IPv6 Applications	UCL
150	Equipment Configuration	Consulintel

[1] *Module numbers prior to 200 are inherited from 6DISS project.*

[2] *A combined version of these 2 modules as created for the Tbilisi workshop, will lead to a single module for IPv6 security and numbered as 112*

160	IPv6 QoS	GRNET
210 (new)	“How to” Guide for Developers	UNINETT
220 (new)	IPv6 and 3G Cellular Network	GRNET
230 (new)	IPv6 and xDSL	GRNET
231 (new)	IPv6 and DSL – GSN Case Study	GRNET
250 (new)	IPv6 and Sensor Networks	UCL

Table 2-1: The set of 6DEPLOY training modules

2.1.1 Description of the Training Modules

- **001 - 6DEPLOY Presentation**: This module introduces the background and objectives of the 6DEPLOY project, the services offered, the partners and the tools at their disposal.
- **002 - 6DEPLOY Workshop Introduction**: This module is a template for introducing the programme and organisational aspects for a particular Workshop.
- **010 - IPv6 Introduction**: This module explains why a new version for IP (i.e. IPv6) has been developed. A brief history of IPv6, its motivation and benefits are given.
- **020 - IPv6 Protocols**: This module describes the IPv6 protocol: IPv6 packet header, extension headers and the differences from IPv4 headers. Packet size issues and upper layer considerations are also explained.
- **030 - IPv6 Addressing**: 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.
- **031 - Addressing case studies**: This module describes 2 addressing case studies:
  - RENATER backbone addressing plan, and
  - NIIFI backbone and site addressing plans.
- **040 - IPv6 associated protocols**: This module describes new protocols associated with IPv6: e.g. Neighbor Discovery Protocol, SEND, ICMPv6, MLD, etc.
- **060 - IPv6 network management**: This module explains how to manage an IPv6 network. The different ways to retrieve management information are described (MIBs, IPv6 flows) and IPv6 management tools and platforms are presented.
- **070 - IPv6 Multicast + M6Bone**: After presenting some multicast concepts

the following topics are covered: multicast addresses, Multicast Listener Discovery (MLD) protocol, multicast routing, PIM-ASM and PIM-SSM. Some practical issues are included and applications running on top of IPv6 multicast transport are presented as examples.

- **080 - IPv6 Autoconfiguration**: This module describes stateful (DHCPv6) and stateless (Router Solicitation/Router Advertisement) autoconfiguration mechanisms.
- **090 - IPv6 DNS**: This module describes new Resource Records for IPv6 DNS, the availability of IPv6 in the root servers zone, CC-TLDs, etc.
- **100 - IPv6 Routing**: This module describes the differences between IPv4 and IPv6 routing protocols for (mainly) OSPFv3, RIPng, BGP4+ and ISIS.
    - 101 - RPSLng: This module describes the Routing Policy Specification Language for IPv6 to register routing policies into the RIR databases. Some examples are provided for a better understanding.
- **110 - IPv6 Security**: Several issues are covered such as IPsec, privacy extensions, ND threats, IPv4 vs IPv6 threat analysis, IPv6 security issues, practical IPv6 security issues and firewalling IPv6. The distributed security model is also introduced. Security issues from the point of view of transition and coexistence are also provided. (Module 110 is the longer version of this course, while 111 is an abridged version).
- **112 - IPv6 Security** (under construction): This module will be a combined version of 110 and 111.
- **120 - IPv6 Mobility**: This module describes IPv6 mobility and the new features compared to IPv4 mobility.
- **130 - IPv6 Coexistence with IPv4**: This module explains different approaches to deploy IPv6 in an IPv4 environment. “Transition” concepts are introduced and several transition mechanisms are covered: Dual Stack, tunnels, tunnel broker, 6to4, Teredo and translation (at various layers).
- **131** - IPv6 Deployment considerations: This module proposes a way to start deploying IPv6 in both campuses and ISP networks. Detailed examples illustrate the way to proceed.
- **150 - Equipment Configuration**: This module lists some examples of IPv6 configurations for different operating systems (Windows, Linux, etc.) and routers (Cisco, Juniper).
- **160 - IPv6 QoS**: This module describes how to implement IPv6 QoS with Classes of Service (configuration examples, performance tests) and discusses the

use of the IPv6 Flow Label.

- **210 - "How-to" Guide for Developers**: This module addresses developers' concerns on how to migrate an IPv4 application to IPv6 (porting issues, etc.)
- **220 - IPv6 and 3G Cellular Network:** This module provides a short overview of the different kinds of cellular networks (GSM, GPRS, 3G) and the IPv6 services that can be deployed within them. Specific issues such as IPv6 address allocation using GPRS, transitioning scenarios related to Mobile Stations (MS), transitioning scenarios related to IP Multimedia Subsystem (IMS), and IPv6 MS implementation issues are presented in detail.
- **230 - IPv6 and xDSL**: This module describes how IPv6 can be deployed among the different entities that are present in xDSL environments. Implementation details are provided for Ethernet Bridging over ATM, PPP over AAL5 (PPPoA), PPP over Ethernet (PPPoE), IPv6 and Radius, and IPv6 configuration in the End User terminal.
- **231 - IPv6 and DSL – GSN Case Study**: This module provides a short overview of the Greek Schools Network (GSN), www.sch.gr and details about the deployment phases of IPv6 services in the GSN. IPv6 Deployment strategies in the core network, access networks, infrastructure servers, and school PC labs, address allocation in school gateways and IPv6 experiences are presented in detail.
- **250 – IPv6 and Sensor Networks:** This module explains the 6LoWPAN protocol and shows some examples of IPv6 sensor networks.

2.1.2 Module update process

Due to the fact that IPv6 standardisation is still evolving –mainly in the area of transition mechanisms- and the 6DEPLOY training modules used in workshops by the 6DEPLOY partners need to be updated so that the attendees receive the most current information, the following process has been agreed upon by the 6DEPLOY partners to achieve this goal:

- As seen in the previous table, each IPv6 module has an owner responsible for its content. It is up to the owner to decide which modification is needed or not within the module content. 6DEPLOY partners using the IPv6 modules for their training sessions must check the content and determine if any updates are needed. In the case that they make updates for their training session, they are requested to send all modifications they have performed in the module to the

respective owner.

- The following very important step consists of reviewing the modified modules. Currently, every module has at least one (usually, two) reviewer. The reviewer's role is to check the consistency of the module and to ensure that the updates are correct.

- Finally, when a module has been updated and reviewed, it is tagged and notated as such in the summary table where the status of all the modules is recorded[3].

[3] *This table is accessible on-line for the project partners at:*
http://www.6deploy.org/_temp/6fb31545b5755b0cb811caf97cb8108f/000-modules-owners_v1_3.pdf.zip

3. HANDS-ON MODULES

In addition to providing workshop participants with a theoretical basis of the IPv6 protocol, 6DEPLOY also has ready-to-use practical "hands-on" exercises. These can be used by the trainers for a specific session and targeted community as a basis for their exercises, thereby avoiding the necessity for them to reinvent everything from scratch. The ones used in the Marrakesh workshop (April 2009) are available at: http://www.renater.fr/IMG/zip/6DEPLOY_IPV6_MARRAKECH-PDFs_TP_ FINAL.zip. The full set (see list below) is available at: http://www.6deploy.org/index.php?page=hands-on.

The list of available "hands-on" modules is described below:

- **Host configuration**: Two exercises illustrate how IPv6 works on Linux and Windows XP operating systems. Some aspects of the IPv6 protocol are analysed in depth: Neighbor Discovery, Autoconfiguration, etc.
- **Stateful autoconfiguration**: In this exercise, the trainees are requested to install a DHCPv6 client (Dibbler) and make a basic configuration.
- **Routing**: In this exercise, IPv6 routing protocols are configured by the trainees on the testbed routers. Internal Gateway Protocols (RIPng, OSPF and ISIS) and the External Gateway Protocol (BGP) are tested.
- **DNS**: In this exercise, the trainees have to manipulate IPv6 resource records (AAAA, PTR) in a DNS server. It is performed on Linux OS.
- **Services/Applications**: In this exercise, the trainees install IPv6 services such as web servers (with virtual hosts) and FTP servers. This exercise is performed on Linux OS. The other trainees check that the configured services are available from their machine using IPv6 web/ftp clients (on Linux or Windows).
- **Management**: After having tested the services, the trainees are requested to install a management application (Argus) to supervise the routers, PCs and configured IPv6 services (web, ftp, etc.).
- **Security**: In this exercise, the trainees are required to add filters on the routers (ACL) and on the PCs (ip6tables) to allow/deny some PCs/services.

A further set of hands-on exercises is also available from Consulintel[4]:

- IPv6 setup in several Platforms (Windows 2K/XP/2003/Vista, Linux, BSD)

[4] *They can be retrieved from the same URL as previously mentioned:http://www.6deploy.org/index.php?page=hands-on*

- Basic Configuration, Stateless/Stateful Autoconfiguration, Privacy, Static Routes
- Transition Mechanisms Configuration[5]
- Examples of Applications
- IPv6 DNS
- IPv6 and PPP
- IPv6 Firewall
- Enabling IPv6 on Cisco Routers and IPv6 ACLs
- SNMP over IPv6

Depending on the requirements provided in advance by the workshop organizers, the trainers decide which set of hands-on exercises will be used. A mix of both contents can also be used.

[5] *In this hands-on exercise configuration of different transition mechanisms examples are given for different platforms, like Linux and Windows. The main focus is on tunnelling mechanisms.*

4. E-LEARNING PACKAGE

The e-learning package developed within the 6DISS project remains available at http://www.6deploy.eu/index.php?page=e-learning . It can be either followed on-line or downloaded. It has been converted to the 6DEPLOY style and a few pages were updated. The Portuguese subtitles were also changed to match the updated text and voice-over.

Figure 4-1: The introduction page to the e-learning package

5. IPv6 Labs

5.1 Locations

Seven 6DEPLOY testbeds are currently installed and supported, in: Paris (RENATER), Sofia (BREN), Slovenia (go6), Mauritius (AfriNIC), Central Asia (Tbilisi and Bishkek) and India (Bangalore). 2 further labs are also under construction in Africa (Kenya and Ghana). Two other locations (Latin America and Turkey) are under discussion whether an IPv6 training facility would be feasible.

These labs can be configured remotely for "hands-on" exercises such as addressing and routing. They may be reserved during the 6DEPLOY training workshops and also outside of these times (according to availability). The composition of each testbed is topologically similar. Thus, it is possible to use more than one of them during a workshop having the same exercises for all the trainees.
The Sofia lab is shown below as an example[6]:

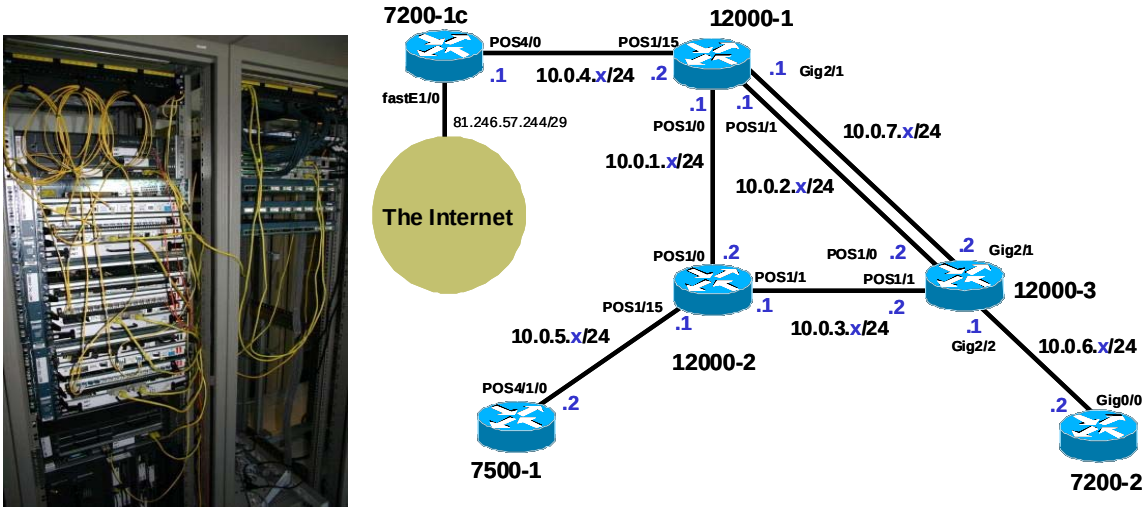


Figure 5-1: The initial configuration of the RENATER and BREN labs

Some efforts have been made to improve the existing labs. In the RENATER and BREN labs, 2 desktop servers have been installed in each testbed. Several virtual machines can be installed on these servers and Windows or Linux operating systems can run on these virtual machines. With this configuration, it is possible to run all kind of "hands-on" exercises (DNS, applications, ...) remotely. The advantage is the time saving during workshop preparations, since configurations do not have to be done locally. The only

[6] Note that the testbeds are only configured initially with IPv4 addresses, so it is up to the trainees to perform all the necessary actions to have it running over IPv6 and connected to the IPv6 Internet.

requirement is to have an Internet connection to the labs.

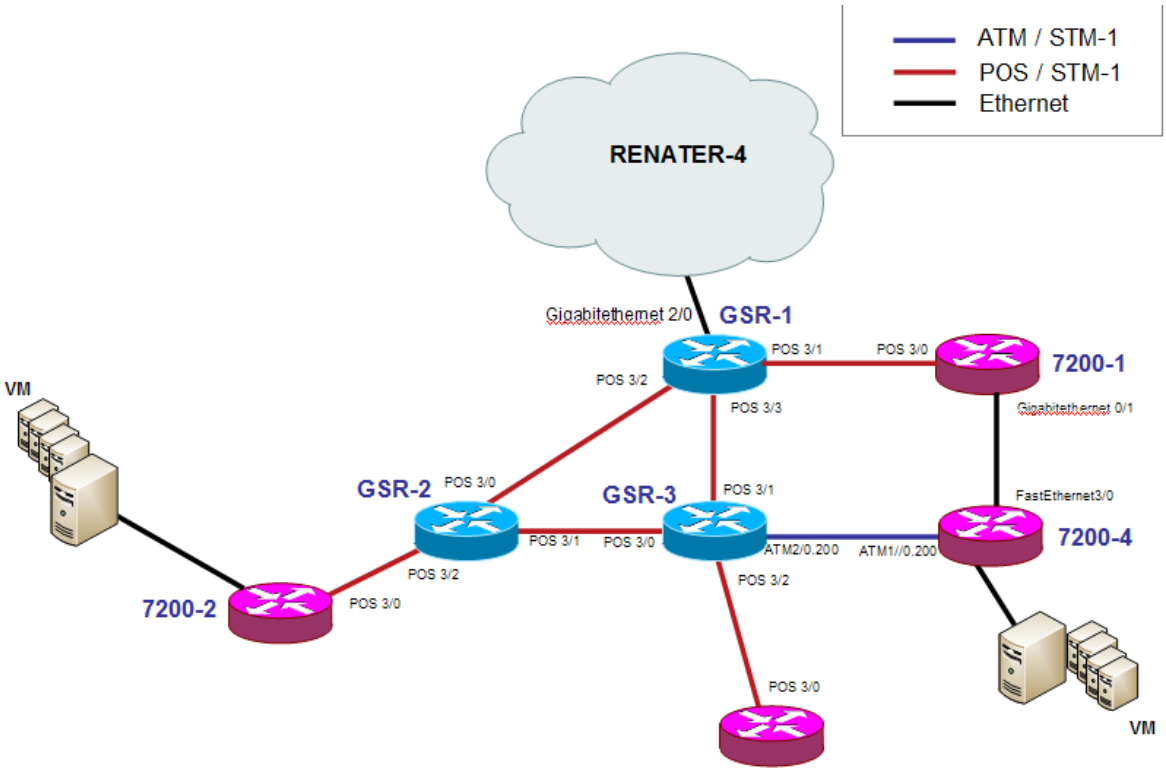


Figure 5-2: The placement of the Virtual Machines in the RENATER and BREN labs

5.2 Testbeds and training material usage

The trainers for 6DEPLOY or any other project related to IPv6 training can use the 6DEPLOY material, perform the same “hands-on” exercises and join the 6DEPLOY human-network community.

5.3 Testbed managers coordination and activities

Since the number of testbed locations (and number of persons in charge of their management and maintenance) is growing (150% in 2009), the way that the testbeds provide services must be coordinated, so that every IPv6 lab works uniformly. In this way, a workshop trainer can use a testbed from any location without noticing any difference. 6DEPLOY organises specific training workshops for existing - and future - testbed managers. The first one was held in September 2008 at RENATER, and the second one in Amsterdam, in May, 2009. The next one is scheduled to take place in conjunction with the project meeting in July 2010 in Brussels.

In order to manage the different labs, it was decided to create a specific activity. The goals of this activity are to:

- Share experience between the testbed managers
- Coordinate the work to improve the labs
- Have the same level of facilities in the labs
- Manage the reservations via a one-stop-shop web interface

Some achievements have been made during the last months regarding this activity:

- **Central reservation interface:** Since February 2009, a one-stop-shop web interface has been established, allowing a workshop organizer to book the set of testbeds he/she will need for a dedicated event. The organizer simply needs to go to http://www.6deploy.org/index.php?page=testbed to perform this reservation. A mailing list has been created to inform testbed managers when a reservation has been requested. The testbed managers also have a management interface where it is possible to accept or reject a reservation. Generally, some discussions will have taken place previously on the testbed manager mailing list, in order to determine which lab(s) - and how many - will be used for a given training session. The decision to use one lab or another depends also on the location (time zone) where the workshop is to take place.

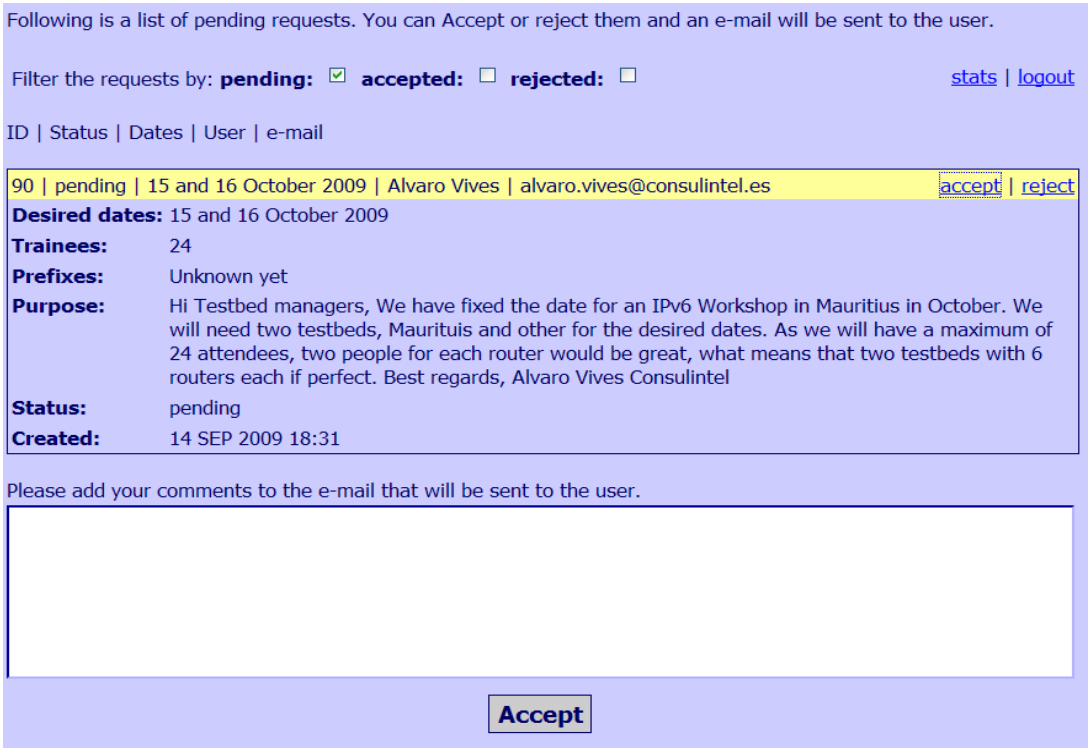


Figure 5-3: A reservation request to lab managers

- **Reset the configuration of a lab:** In order to automate the management of the labs, scripts have been produced by RENATER. These scripts are available via a web page and allow the restoration of various configurations - i.e. restore initial configurations - made during a training session. In this way, the lab can be prepared for a new training session within a few minutes. This system is currently only available for the RENATER lab, but deployment is being planned for other testbeds. Another new feature is the possibility of saving easily the router's configuration through a web interface. This operation can be useful at the end of a training session, for example, if the trainer or the trainees want to have a backup of the exercises done.

  The picture below shows the web interface allowing the configurations to be reset:

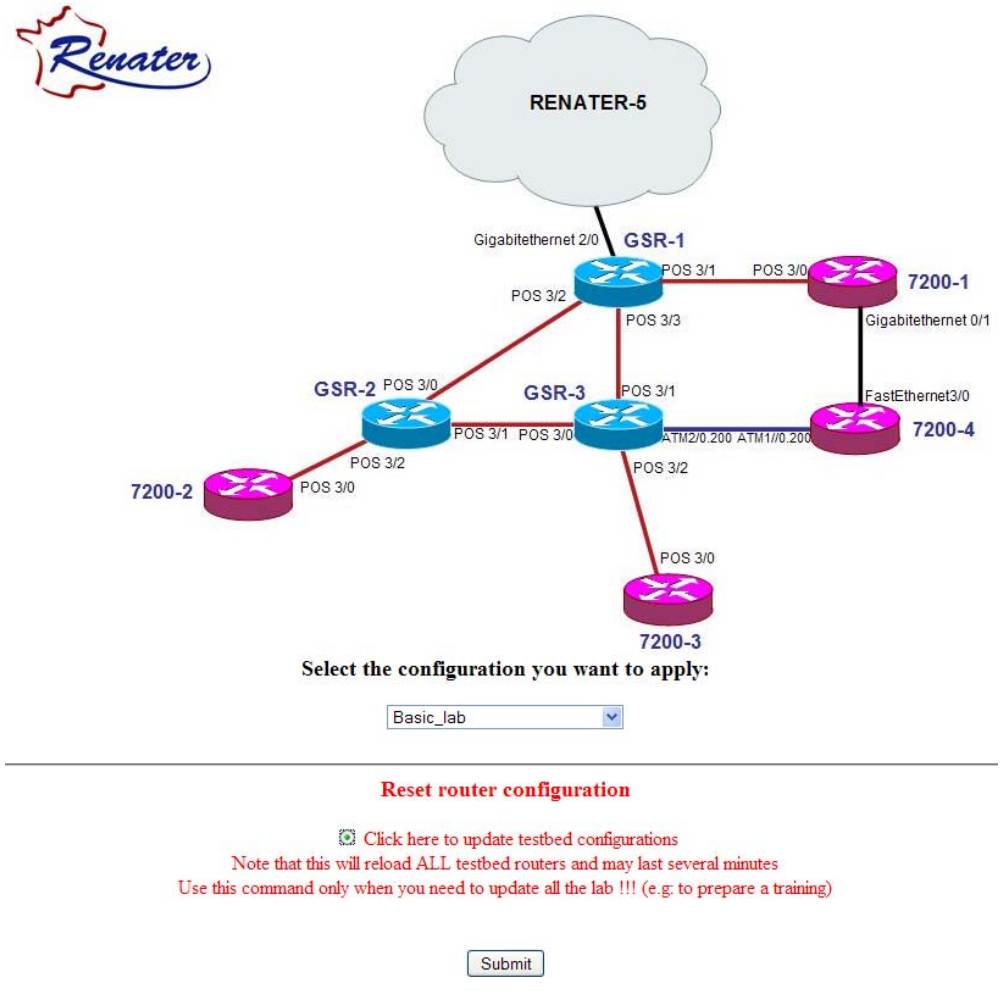


Figure 5-4: Interface for resetting labs to their default configuration

6. PRESS RELEASES

The following Press Release was produced at the start of the project:

6DEPLOY team to become the centre of European expertise regarding IPv6 deployment

The 6DEPLOY project within the European Commission's 7th Framework Programme for Research and Technological Development started on 1st May 2008 and has duration of 30 months.

The purpose of 6DEPLOY is to support the deployment of IPv6 in (i) e-Infrastructure environments, thereby improving the use of existing research infrastructures for all fields of science and technology, (ii) other projects in the 7th Framework Programme, (iii) developing countries (Africa, Latin America, Asia and Eastern Europe), and (iv) commercial environments, especially in Europe.

6DEPLOY exploits the expertise and high quality training material collected from previous European projects, including presentations, a professional e-learning course and 2 testbeds that can be accessed remotely. Whilst offering tailor-made training to organisations throughout the world, it also plans to multiply its training effectiveness through courses which educate other trainers about the basics of IPv6, so that they can teach others ("training trainers"). Partners are also willing to give support for real IPv6 deployments.

The **outreach to European industries and researchers** and **giving practical support for deployments** are the 2 key new services offered by 6DEPLOY. Developing regions (in Europe and abroad) are often the *early adopters* of IPv6, given that they have less legacy IPv4 networks installed. Case Studies will be published about real deployments and used to help deployers working in similar areas. **The 6DEPLOY team will become the centre of European expertise regarding IPv6 deployment**.

This expertise will also be used to support more-commercial deployments in Europe, in industry branches such as Emergency Services, Health, Broadcast, Transport, Schools, Environment, Gaming, etc. These sectors will be reached through contacts with other EC projects, the IPv6 Forum and National IPv6 Task Forces.

The 6DEPLOY Consortium comprises six European National Research and Education Networks (RENATER (France), GRnet (Greece), NIIFI (Hungary), UNINETT (Norway), FCCN (Portugal) and BREN (Bulgaria)), Cisco, the University College London and Southampton University (both in the UK), 2 SMEs (Consulintel and Martel) and the Regional Internet Registries AfriNIC (Africa) and LACNIC (Latin America). Consulintel is an active player in dissemination and training in all the topics and regions covered by 6DEPLOY, and Martel has much experience of project co-ordination. The other three Regional Internet Registries in the world (RIPE-NCC, in Europe, ARIN in North America, and APNIC in the Asia-Pacific Region are associated with the project.

Further information is available from the 6DEPLOY website at www.6deploy.org

7. CONFERENCE PRESENTATIONS

7.1 Conference Presentations made

The material that is presented at the 2-3 day 6DEPLOY IPv6 training workshops is always available on the 6DEPLOY Website. In addition, the following related presentations, or tutorials have been made by partners between March 2008 and April 2010, for which the dissemination material is also available from the 6DEPLOY Website or the corresponding conference proceedings.

Publications; Journal papers and Conference papers	Journal/Conference	Author(s) /Company	Date
IPv6 – The New Generation Internet Protocol Sofia, Bulgaria	BREN IPv6 lab launch	K. Simonski, S. Kostov / BREN	12th March, 2008
Planning for the IPv6 Integration	BREN IPv6 lab launch	P. Grossetete / Cisco	12th March, 2008
RENATER Testbed	BREN IPv6 lab launch	F. Simon / RENATER	12th March, 2008
GRNET IPv6 Activities in South East Europe	BREN IPv6 lab launch	T. Chiotis / GRNET	12th March, 2008
6DISS and 6DEPLOY	BREN IPv6 lab launch	M. Potts / Martel	12th March, 2008
6DEPLOY: IPv6 Deployment Support	IST-Africa, Namibia	M. Potts / Martel	7th - 9th May, 2008
Presentation: "Security Impact of Business and Residential Broadband Traffic on IPv6 ISP Backbones"	MYNIC Seminar – Internet and DNS Security, Kuala Lumpur (Malaysia)	J. Palet / Consulintel	21st May, 2008
6DEPLOY: IPv6 Deployment Support	IPv6 Launch Day	M. Potts / Martel	30th May, 2008
Presentation on IPv6 (for slides, see: http://www.uknof.org.uk/uknof10/)	UK Network Operators' Forum (UKNOF) at Wolverhampton	T. Chown / Soton-ECS	May 21st, 2008
Presentation of IPv6 (for program and slides, see: http://www.ja.net/services/events/2008/ipv6/programme.html)	JANET IPv6 Briefing Event, Coventry	T. Chown / Soton-ECS	June 11th, 2008
IPv6 Workshop	Montevideo, UY	LACNIC, Consulintel	July 7th-8th, 2008
IPv6 Workshop	Curacao, AN	LACNIC, Consulintel	July 21st-22nd, 2008
Presentation of I-D based on operation feedback on issues with use of IPv6 router advertisements in enterprise deployments	v6Ops WG at IETF72	T. Chown / Soton-ECS and S. Venaas / UNINETT	July 27th - August 1st, 2008
Project Presentation	ITU IPv6 workshop,	M. Potts / Martel	September

	Geneva, Switzerland		4th-5th, 2008
IPV6 Workshop	Barcelona, Spain	RIPE, Consulintel	September 15th, 2008
IPv6 Tutorial	13th International Telecommunications Network Strategy and Planning Symposium, Budapest, Hungary	J. Mohacsi / NIIFI	September 28th – October 2nd, 2008
IPv6 tutorial	UK NOF, London	Soton-ECS	September 8th, 2008
IPV6 Tutorial	Montpellier, France	RENATER, BREN	October 6th-9th, 2008
IPV6 Workshop	Kampala, Uganda	AfriNIC	November 10th, 2008
Project Presentation	ICT2008: "Easing IPv6 Deployment", Lyon	Martel	November 27th, 2008
Project Presentation	ICT2008 International Village, Lyon	Martel	November 25th - 27th, 2008
Project Presentation	IGF, Hyderabad	Martel	December 3rd - 5th, 2008
IPv6 Tutorial	Montpellier, France	RENATER, BREN	December 8th-11th, 2008
IPv6 Workshop	Costa Rica	LACNIC	December 9th - 10th, 2008
IPv6 Tutorial	Norway	UNINETT	January 14th – 15th. 2009
Project Presentation	Indian Symposium, New Delhi	UCL	January 28th - 29th, 2009
IPv6 training for the IRMA project	Brussels	RENATER, UNINETT, Cisco	February 24th – 25th, 2009
Project Presentation	Google IPv6 Implementer's Conference, California	LACNIC	March 19th - 20th, 2009
Project Presentation	Internet Governance Forum (IGF), Sharm el Sheikh	Martel	November 16th - 18th, 2009
2x IPv6 Tutorial for Alcatel-Lucent	Budapest, Hungary	NIIFI	November 13th and 27th, 2009
IPv6 Routing Workshop at the Spanish Network Operator Group (GORE 4) Meeting	Barcelona, Spain	Consulintel	November 24th, 2009
A half-day IPv6 training session	Debrecen, Hungary.	NIIFI	April 6th, 2010
Project Presentation	IPv6 Workshop: Upgrade for Europe, Brussels	Martel	April 26th , 2010

8. NEWS BULLETINS

A list of news bulletins is issued weekly by Consulintel to a wide mailing list. The IPv6 Portal, containing IPv6 news, a new IPv6 deployment guide written in conjunction with ISOC, and an IPv6 newsletter, are linked from the 6DEPLOY Website.

9. BROCHURES

A project description was made and summarized in Deliverable D0.1.

Summary: The purpose of the 6DEPLOY project is to support the deployment of IPv6 in (i) e-Infrastructure environments, (ii) FP7 projects, (iii) developing countries (Africa, Latin America, Asia and Eastern Europe), and (iv) industrial environments in Europe. Partners offer basic training to organisations in Europe and developing countries, and support real IPv6 deployments.
Case studies of installations will be used to gain valuable practical experience which will help the **6DEPLOY team to become the centre of European expertise regarding IPv6 deployment**.

This expertise will be used to support deployments in Europe, in industry branches such as Emergency Services, Health, Broadcast, Transport, (Primary & Secondary) Education, Environment, Gaming, etc.

Objectives: IPv6 will become an integral part of improved multi-disciplinary e-Infrastructures during the timeframe of FP7. Continuing the 6DISS successes, 6DEPLOY aims to encourage the coordination between National and pan-European e-Infrastructure initiatives, by offering its services of IPv6 training and supporting IPv6 deployment.

6DEPLOY will organize workshops on the benefits of IPv6 for e-Infrastructures, and will give practical advice and hands-on support for deploying it in their environments. Several developed regions of the world (e.g. Korea, Japan) have already deployed IPv6 e-Infrastructures more densely than in Europe, and developing regions already recognise the benefit in terms of the availability of addresses, which are no longer available for them with IPv4. Therefore, a majority of the world with which European researchers want to communicate will be based on - or moving to - IPv6 e-Infrastructures. For synergy and efficient international interoperation, more IPv6 deployment in Europe is necessary. 6DEPLOY will work in parallel on deployments in Europe and in developing countries; exchanging experiences and best practices.

Action plan: The *outreach to European industries and researchers* and *giving support for deployments* are the 2 key new services offered by 6DEPLOY. Developing regions (in Europe and abroad) are often the early adopters of IPv6, given that they have less legacy IPv4 networks installed. These test cases will be used to gain valuable practical experience which will be brought back to support deployments within EC e-Infrastructure projects and industrial environments.

We reassert our support for open, bottom-up and consensus-based decision making, but we also call upon the leading senior and expert members of this community to provide strong leadership in the support of a global transition to IPv6.

Project acronym:

6DEPLOY

Contract n°: 223794

Project type: SA

Start date:

March 1st 2008

Duration: 30 months

Total budget:

€1,284,776

Funding from the EC:

€1,000,000

Total funded effort in person-month:

123

Web site:

www.6deploy.org

Contact person:

Martin Potts
Email: martin.potts@martel-consulting.ch
tel.: + 41319942525
fax.: +41319942529

Project participants:

Martel	CH
Cisco	NL
Renater	F
GRNET	GR
FCCN	P
NIIFI	HU
Consulintel	ES
UCL	UK
Soton-ECS	UK
UNINETT	N
AfriNIC	MU
LACNIC	UY
BREN	BG

Keywords:
IPv6, deployment, e-infrastructures, training

Collaboration with other EC funded projects:
6CHOICE, Global, GEANT

European Commission
Information Society and Media

Support activities: These include the collection and maintenance of material for the training sessions, and the tailoring of programmes in conjunction with the requesting organisation. “Hands-on” IPv6 training courses will be offered to FP7 projects, developing regions (focusing more on *training trainers*, so that the effect of the courses can be multiplied) and European industries. A professional and popular e-learning course is available which will be supplemented with additional topics related to IPv6 and improved with sub-titles in other languages.
A further support activity is the practical on-site assistance for making IPv6 deployments in FP7 projects, the targeted regions (Africa, Latin America, Asia and Eastern Europe) and European industries.

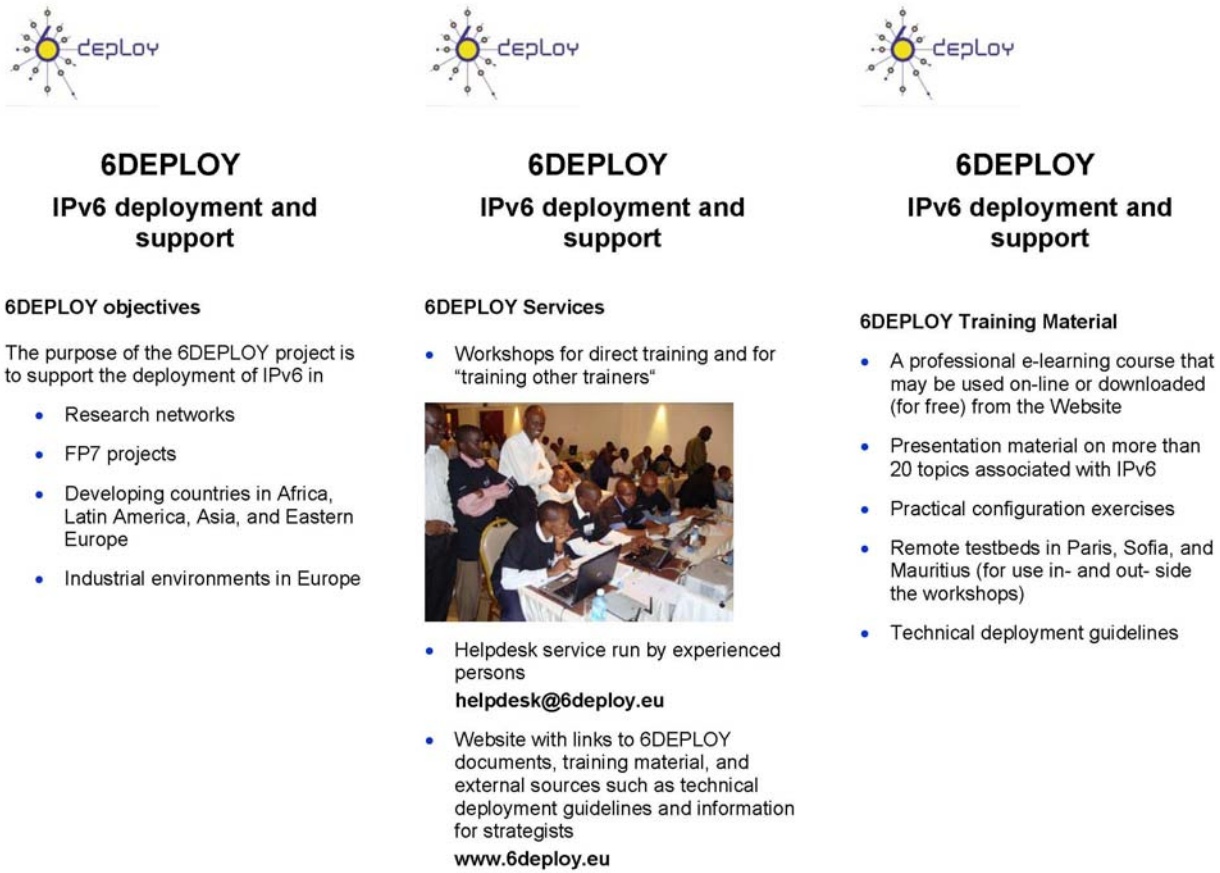
Partners will also give assistance for the development of a strategic plan (“roadmap”) for the deployment and will advise on practical aspects such as equipment ordering specifications, routing plans, etc. An IPv6 Deployment Guide will be maintained, and supplemented with examples of case studies. A less-technical “How to Deploy” guide will also be produced for administrators.

User communities: e-Infrastructures are important for developing new research environments, building upon the ICT capabilities of existing and evolving infrastructures. Since these infrastructures are currently being made IPv6 capable, there is a huge potential benefit to be achieved if users share their deployment experiences. Since the Internet has become the fundamental resource for modern communications, *“users”* in this respect may be network operators and administrators from both the research community and commercial companies. Sharing the information between such user communities requires the emergence of "communities of practice" comprising commercial users, scientific users and computing and communication technologists. e-Infrastructures foster the emergence of new working methods, based on the shared use of resources across different disciplines and technology domains.
As an e-Infrastructure project, 6DEPLOY supports the further development and evolution of high-capacity and high-performance communication (GÉANT) and grid empowered infrastructures, including the reinforcement of world class distributed supercomputing facilities, data storage and advanced visualisation facilities. This activity aims at fostering the adoption of e-Infrastructures by user communities where appropriate, enhancing their global relevance and increasing the level of trust and confidence from their users.

International aspects: 6DEPLOY includes AfriNIC and LACNIC as partners and has close links to RIPE NCC, APNIC and ARIN. Through these Internet address registries, it will keep aware of IPv6 deployment activities and opportunities worldwide. The developing countries of Africa, Latin America, the Asia-Pacific region and Eastern Europe will likely be some of the first to commit to large-scale IPv6 deployment, and may lead their counterparts in the rest of the world. They will therefore provide excellent Case Studies for the project, which can be fed into industrial environments, in order to ensure success.

10. LEAFLETS

The following leaflet was prepared for ICT2008 in Lyon.



6DEPLOY

IPv6 deployment and support

6DEPLOY objectives

The purpose of the 6DEPLOY project is to support the deployment of IPv6 in

- Research networks
- FP7 projects
- Developing countries in Africa, Latin America, Asia, and Eastern Europe
- Industrial environments in Europe

6DEPLOY

IPv6 deployment and support

6DEPLOY Services

- Workshops for direct training and for "training other trainers"
- Helpdesk service run by experienced persons
  helpdesk@6deploy.eu
- Website with links to 6DEPLOY documents, training material, and external sources such as technical deployment guidelines and information for strategists
  www.6deploy.eu

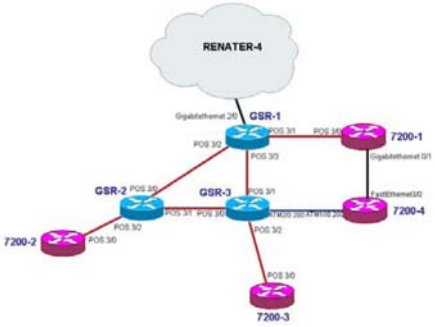
6DEPLOY

IPv6 deployment and support

6DEPLOY Training Material

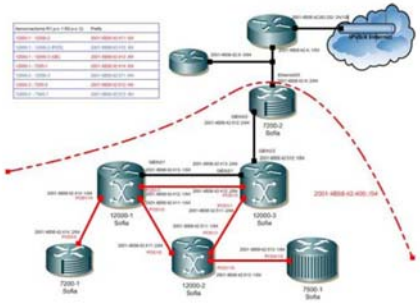
- A professional e-learning course that may be used on-line or downloaded (for free) from the Website
- Presentation material on more than 20 topics associated with IPv6
- Practical configuration exercises
- Remote testbeds in Paris, Sofia, and Mauritius (for use in- and out- side the workshops)
- Technical deployment guidelines

6DEPLOY testbed in Paris (France)



6DEPLOY testbed in Mauritius

6DEPLOY testbed in Sofia (Bulgaria)



Partners of the project:

SMEs:

Martel

ConsulinTel

Industry:

CISCO

NRENs:

Renater

grnet

FCCN Fundação para a Computação Científica Nacional

Bulgarian Research and Education Network

UNINETT

Universities:

UCL

University of Southampton

RIRs:

AfriNIC

LACNIC

11. POSTERS

Three posters were made for ICT2008 in Lyon.

6DEPLOY
IPv6 deployment and support

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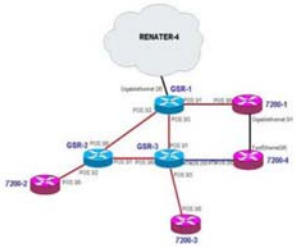
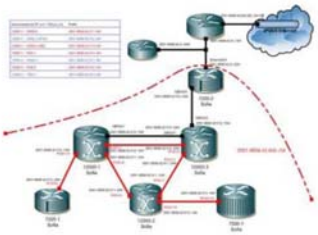


Testbed in Paris

Testbed in Mauritius



Testbed in Sofia

12. ABSTRACTS OF DEPLOYMENT USE CASES

12.1 Deliverable D2.1.1: Report of 1st deployment Case

This deliverable presents IPv6-related activities in the Greek School Network. It discusses the drivers for the deployment of IPv6 services and the operational experiences from the deployment of services based on IPv6 technology during the last 5 years.

12.2 Deliverable D2.1.2: Report of 2nd deployment Case

This report describes the IPv6 deployment within the School of Electronics and Computer Science (ECS) at the University of Southampton. It includes a description of the process of IPv6 deployment, including network, systems and applications aspects. The deployment is currently live and spans a network of up to 3,700 hosts and over 2,000 users.

12.3 Deliverable D2.1.3: Report of 3rd deployment Case

This deliverable reports on the process of IPv6 deployment of the campus network at the University of Plovdiv, Bulgaria. It describes the network planning and technical configurations, as well as the experiences gained during the deployment.

13. WEB-BASED PUBLICATIONS

The following is a selection of useful publications that are on the 6DISS and 6DEPLOY Websites.

A briefing paper on "IPv6 Deployment and Associated Risks" (for Strategists)
http://www.6diss.org/publications/papers/ipv6-deployment.pdf

"European IPv6 Roadmap 2006 Recommendations"
http://www.6diss.org/publications/papers/eipv6tf-roadmap.pdf

"6NET: An IPv6 Deployment Guide"
http://www.6diss.org/publications/info/deployment-guide.pdf

3 Deployment use cases, available from the link to "Publications" at: http://www.6deploy.eu//index.php?page=home/):

"IPv6 para todos" A new book on IPv6 deployment from ISOC and Consulintel (currently in Spanish, but being translated into English)
http://portalipv6.lacnic.net/en/aggregator/sources/7
http://www.isoc.org.ar/

14. CONCLUSION

One of the main activities in the 6DEPLOY project is to produce and maintain a set of dissemination material for use in workshops to train the different Internet communities in the areas of IPv6 deployment, configuration, and usage. This material is partly produced within 6DEPLOY, but also exploits previous project activities within and outside the Framework Programmes of the European Commission.

This document has described the set of dissemination material that is currently available, including training modules, “hands-on” exercises, the e-learning package, IPv6 labs, press releases, conference presentations, news bulletins, brochures, leaflets, posters, web-based publications, etc. It has been updated yearly to deliver the most accurate and updated information regarding IPv6 to our trainees. This effort will continue in the follow up project “6DEPLOY-2” currently under negotiation with the European Commission.

15. REFERENCES

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

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

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 on-line: http://www.6deploy.eu/index.php?page=e-learning

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