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Responsible and Editor/Author:	Organization:	Contributing WP:
Simon Muyal, Bernard Tuy	RENATER	WP1

Authors (organizations):

Simon Muyal (RENATER), Bernard Tuy (RENATER)

Abstract:

This deliverable presents a summary of the current dissemination material available at the beginning of 6DEPLOY-2 project, including training modules, "hands-on" exercises, the e-learning package, IPv6 labs, brochures, leaflets, posters, web-based publications, etc.

This dissemination material has been established within earlier projects timeframe such as 6DISS and 6DEPLOY.

Keywords: IPv6, Support, Training, Testbeds, Modules, 6DEPLOY, 6DEPLOY-2, IPv6 Labs, Hands-on exercises

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Executive Summary

One of the main activities in the 6DEPLOY-2 project is to produce and maintain a set of dissemination material for use in workshops to train the different Internet communities in various aspects of IPv6 deployment, configuration, and usage. This material is derived and updated from previous EC projects such as 6DISS and 6DEPLOY.

This document describes the set of pedagogical material that is currently available at the beginning of the project and that will be augmented, updated during the 6DEPLOY-2 lifetime[1].

At the time of issuing the first version of this deliverable, the main topics regarding the information / training material that the 6DEPLOY-2 project maintains and disseminates through its activities worldwide are:

- IPv6 Training Modules (Powerpoint slides)

- Hands-on exercises

- The e-learning package

- IPv6 Labs (locations, reservation process, management procedures, ...)

- Informational material (leaflets and flyers about the project)

- Deliverables from the previous version of the 6DEPLOY project (especially the following Deployment Case Studies, which are available from the link to "Publications" at: http://www.6deploy.eu/):
    - Greek School Network Deployment Use Case
    - School of Electronics and Computer Science (ECS) at the University of Southampton Campus Network Deployment Case Study
    - University of Plovdiv Network Deployment Case Study
    - IPv6 Deployment within an ISP in a Developing Region

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[1] *Therefore we strongly recommend trainers to download and use the latest versions of the material regularly uploaded onto the 6DEPLOY-2 website.*

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1. INTRODUCTION

This deliverable presents a summary of the dissemination material available at the beginning of the 6DEPLOY-2 project, including training modules, "hands-on" exercises, the e-learning package, IPv6 Labs, brochures, leaflets, posters, web-based publications, etc.

This current version of the document is an update of the 6DEPLOY deliverable D2.2.4, which was released at the end of the 6DEPLOY project in October 2010. Although there have been no significant changes, this deliverable allows the updating of the information to reflect the situation at the beginning of 6DEPLOY-2 project.

2. 6DEPLOY-2 TRAINING MODULES

The IPv6 knowledge from the project partners 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-2's website and can be found at: http://www.6deploy.eu/index.php?page=tutorials2.

Below is a list of the modules and the partner responsible for their maintenance. On the following pages, is a brief description of the content of each module.

2.1 Training Modules

Module No. [2]	Module Name	Responsible
001	6DEPLOY-2 Presentation	Martel
002	6DEPLOY-2 Workshop introduction	Martel
010	IPv6 Introduction	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
112 (formerly 110 + 111[3])	IPv6 Security	UCL
120	IPv6 Mobility	Cisco
130	IPv6 Coexistence with IPv4	Consulintel
131	IPv6 Deployment considerations	NIIFI

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

[3] *A combined version of these 2 modules was created for the 6DEPLOY Tbilisi workshop.*

140	IPv6 Applications	UCL
150	Equipment Configuration	Consulintel
160	IPv6 QoS	GRNET
210	"How to" Guide for Developers	UNINETT
220	IPv6 and 3G Cellular Network	GRNET
230	IPv6 and xDSL	GRNET
231	IPv6 and DSL – GSN Case Study	GRNET
250	IPv6 and Sensor Networks	UCL

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

2.1.1 Description of the Training Modules

- **001 - 6DEPLOY-2 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-2 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 – IPv6 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.

- **140 - Guide for Services & Applications**: This module describes the services and applications available for IPv6.

- **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-2 training modules used in workshops by the 6DEPLOY-2 partners need to be updated so that the attendees receive the most current information, the following process has been agreed upon by the 6DEPLOY-2 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-2 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 next 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. HANDS-ON MODULES

In addition to providing workshop participants with a theoretical basis of the IPv6 protocol, 6DEPLOY-2 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[4]. The full set (see list below) is available at:

http://www.6deploy.eu/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 PC services.

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[4] *It is highly recommended to the trainers not to underestimate the needed time to understand and achieve the hands-on exercises by themselves provided 'solutions' or 'answers' to the exercises and questions asked to the trainees are not provided in the documentation.*

A further set of hands-on exercises is also available from Consulintel[5]:

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

- Basic Configuration, Stateless/Stateful Autoconfiguration, Privacy, Static Routes

- Transition Mechanisms Configuration[6]

- 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.

An effort to merge both contents will be done during 6DEPLOY-2 in order to facilitate the training preparation for the trainers.

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

[6] *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 initiated within the 6DISS project has been updated to the 6DEPLOY style at http://www.6deploy.eu/index.php?page=e-learning2. It can be either followed on-line or downloaded. The Portuguese subtitles were also changed to match the updated text and voice-over.

Subtitles will be added in French and Spanish during the project.

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

5. IPv6 LABS

5.1 Locations

Since the beginning of the 6DEPLOY-2 project, more IPv6 Labs have been put into operation or are in the process of being installed or ordered. Discussions have been established within different regions in the world to install more IPv6 Labs to be used to disseminate IPv6 knowledge and know-how. The status of the labs at the beginning of the project is shown below:

Region	Country	City	Organisation	Status
Europe	France	Paris	RENATER	Operational
Europe	Bulgaria	Sofia	BREN	Operational
Europe	Slovenia	Ljubljana	go6	Installed
Europe	Spain	Madrid	Consulintel	On order
Europe	Czech Republic	Prague	CESNET	Being installed
Europe	Slovakia	Kosice	Technical University	Being discussed
Europe	Hungary	Budapest	Technical University	Being discussed
Africa	Mauritius	Ebene	AfriNIC	Operational
Africa	Ghana	Accra	AITI	Ready to be shipped
Africa	Kenya	Nairobi	KENIC	Installed
Africa	Rwanda			Being discussed
Africa	Cameroon			Being discussed
Central Asia	Kyrgyzstan	Bishkek	CGEIT	Installed
Central Asia	Georgia	Tbilisi	GRENA	Installed
Central Asia	Kazakhstan	Almaty		Being discussed
Asia	India	Bangalore	CEDT/IISc	Installed
Latin America	Colombia	Bogota		Being discussed
Latin America	Argentina	Buenos Aires		Being discussed
Caribbean	Dominican Republic			Being discussed

Table 5-1: List of IPv6 labs

These labs can be configured remotely for "hands-on" exercises such as addressing and routing. They may be reserved by priority for the 6DEPLOY-2 training workshops. The labs may then be used for other activities/projects according to their availability. The composition of each lab is topologically similar and the configurations will be further harmonised in 6DEPLOY-2. Thus, it is possible to use more than one remote lab during a workshop having the same exercises for all the trainees.

The Sofia lab is shown below as an example[7]:
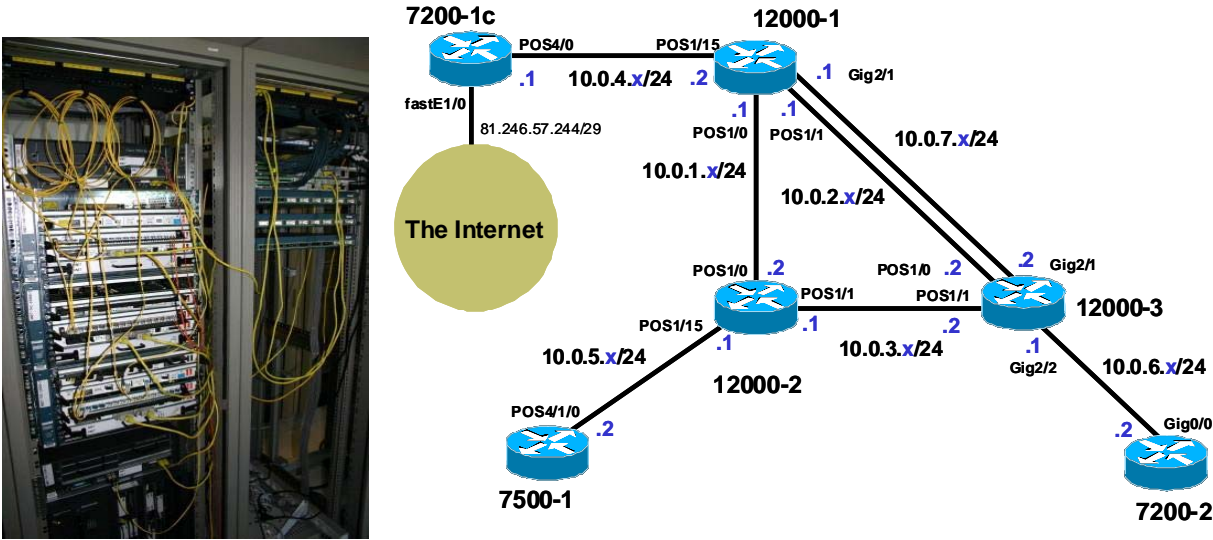
Figure 5-1: The initial configuration of the 6DEPLOY IPv6 Lab at BREN in Sophia

The existing labs continue to be improved. 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 kinds 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 requirement is to have an IPv4 Internet connection to the labs.

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[7] Note that the labs are configured initially with only IPv4 addresses, so it is up to the trainees to perform all the necessary actions to have them running over IPv6 and connected to the IPv6 Internet.
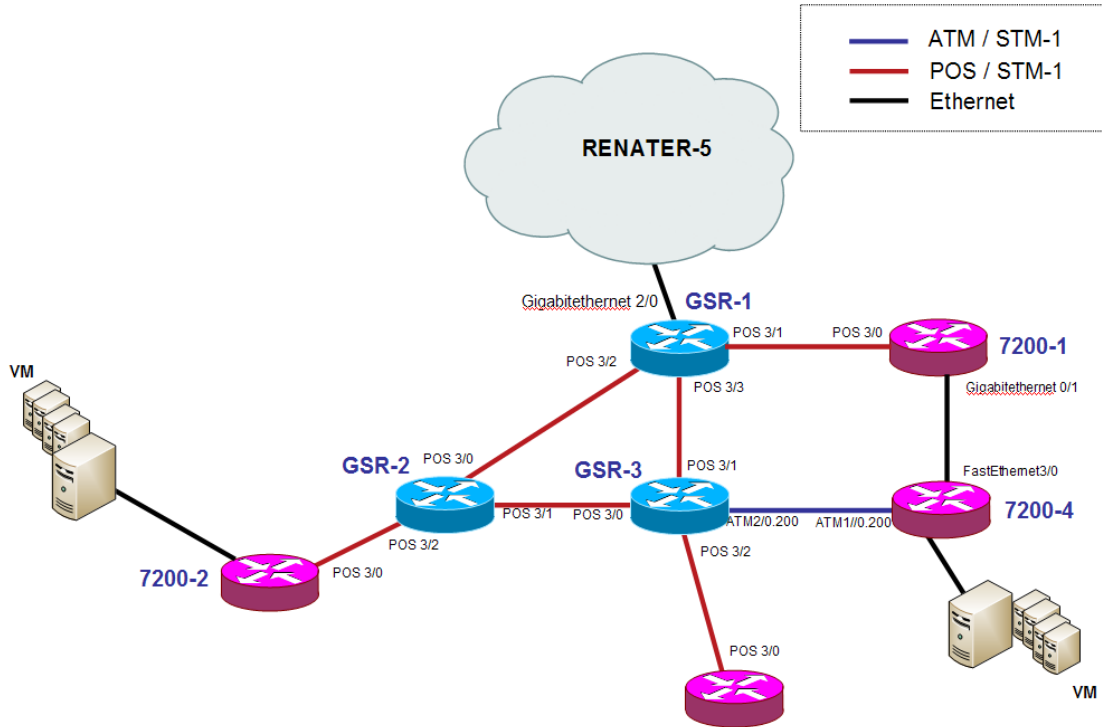
Figure 5-2: The placement of the Virtual Machines in the RENATER and BREN Labs

5.2 Training material usage

The trainers for 6DEPLOY-2 - or any other project related to IPv6 training - can use the 6DEPLOY-2 material, perform the same "hands-on" exercises and join the 6DEPLOY-2 human-network community.

5.3 Lab managers coordination and activities

Since the number of lab locations (and the number of persons in charge of their management and maintenance) is growing, the way the lab managers provide services for the IPv6 workshops must be coordinated, so that every IPv6 Lab works uniformly. In this way, a workshop trainer can use a lab from any location without noticing any difference. Some specific training workshops for existing - and future - lab managers have been organised during 6DEPLOY.

This activity will become more important in 6DEPLOY-2 since the number of labs to manage will increase.

The main goals of this activity are the following:

- Share experiences between the lab managers
- Coordinate the work to improve the labs

- Maintain the same level of configurations and facilities in the labs

- Manage the reservations via a one-stop-shop web interface

Some achievements were already made prior to the end of the 6DEPLOY project regarding these activities:

- **Central reservation interface:** a one-stop-shop web interface has been established, allowing a workshop organizer to book the set of labs he/she will need for a dedicated event. The organizer simply needs to go to http://www.6deploy.eu/index.php?page=testbed_reservation2 to perform this reservation. A mailing list has been created to inform lab managers when a reservation has been requested. The lab 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 lab 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.

Following is a list of pending requests. You can Accept or reject them and an e-mail will be sent to the user.

Filter the requests by: **pending:** ☑ **accepted:** ☐ **rejected:** ☐   stats | logout

ID | Status | Dates | User | e-mail

90 | pending | 15 and 16 October 2009 | Alvaro Vives | alvaro.vives@consulintel.es   accept | reject

Desired dates: 15 and 16 October 2009

Trainees: 24

Prefixes: Unknown yet

Purpose: Hi Testbed managers, We have fixed the date for an IPv6 Workshop in Mauritius in October. We will need two testbeds, Maurituis and other for the desired dates. As we will have a maximum of 24 attendees, two people for each router would be great, what means that two testbeds with 6 routers each if perfect. Best regards, Alvaro Vives Consulintel

Status: pending

Created: 14 SEP 2009 18:31

Please add your comments to the e-mail that will be sent to the user.

Accept

Figure 5-3: A reservation request to the 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 labs. 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 performed.

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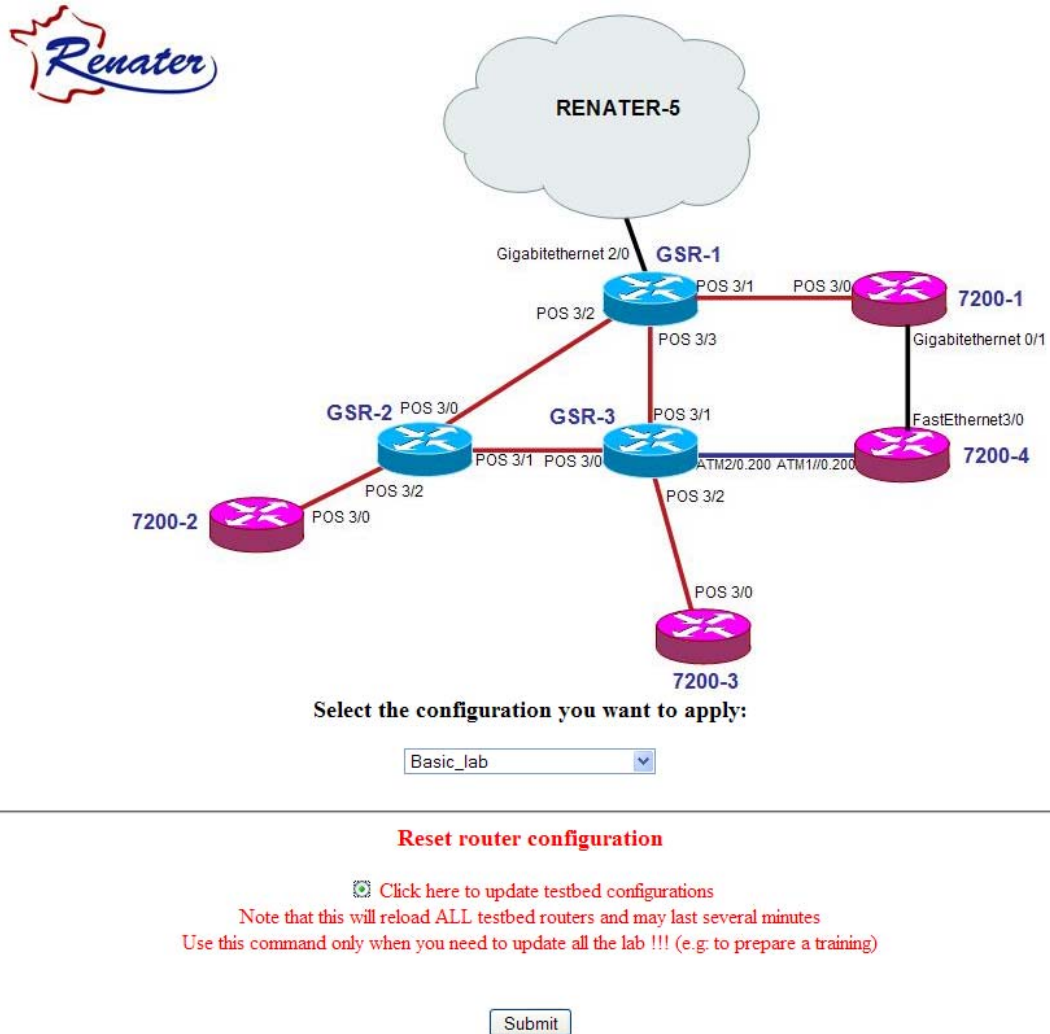

Figure 5-4: Interface for resetting Labs to their default configuration

6. NEWS BULLETINS

Weekly news bulletins are issued 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, is linked from the 6DEPLOY-2 Website.

7. 6DEPLOY-2 PROJECT PRESENTATION

A project description was written and summarized in Deliverable D4.1.

6DEPLOY-2

Summary: The purpose of the 6DEPLOY-2 project is to (i) support the deployment of IPv6 in Europe and developing regions, sustain the wealth of 6DEPLOY training material (e-learning package with subtitles in national languages, presentation material, exercises, etc.), and (iii) create a catalyst of global IPv6 expertise through the installation of strategically-placed sustainable IPv6 training labs. These training labs will be used:

- in 6DEPLOY-2 training workshops (giving access to more test-beds for "hands-on" configuration exercises),

- to create centres of IPv6 competence in countries around the world,

- to form a sustainable human network of expertise to train others

6DEPLOY-2 will also lead the IPv6 Cluster, to inform FP7 projects and regional and/or industrial initiatives regarding IPv6 deployment, and encourage the exchange of best practices. 6DEPLOY-2 will offer both organisational support (Website, e-mail lists, etc.) and give advice regarding implementations.
Furthermore, 6DEPLOY-2 will describe step-by-step real practical deployment scenarios on its Website, as a visual aid to help potential deployers of IPv6 through the process.

Objectives: Training, establishing centres of IPv6 expertise and giving support for deployments are the key services offered by 6DEPLOY-2. Developing regions (in Europe and abroad) are often the early adopters of IPv6, given that they have less legacy IPv4 networks installed. Test cases from these regions will be used to gain valuable practical experience which will be brought back to support deployments within EC e-Infrastructure projects. The 6DEPLOY-2 team will become the centre of European expertise regarding IPv6 deployment.

This expertise will be used to support more deployments in Europe, in industry branches such as Emergency Services, Health, Broadcast, Transport, Schools, Environment, Gaming, etc. These sectors will be reached through our existing contacts with other EC projects, IPv6 Task Forces, the revival of the IPv6 Cluster and deployment examples described on the project's Website.

6DEPLOY-2 will exploit the expertise and high quality training material from 6DEPLOY, including presentations, the e-learning course and the available IPv6 Labs, and - whilst continuing to offer professional

Project acronym:
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83

Web site:
www.6deploy.eu

Contact person:
Martin Potts
email:
martin.potts@martel-consulting.ch
tel.: +41 31 994 25 25
fax.: +41 31 994 25 29

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

Keywords:
IPv6, deployment, e-infrastructures, training

Collaboration with other EC funded projects:
GN3

training to organisations in Europe and developing countries - focus on supporting real deployments. It will maintain and update the 6DEPLOY material and include new training media, and multiply its training effectiveness through courses which educate other trainers about the basics of IPv6, so that they can teach others ("training trainers"). It will describe examples of real deployments in several types of public and private environments on its Website.

The extension to global scale of the IPv6 Labs, and the achieving of critical mass, will bring several benefits. As well as making more sites available for use in 6DEPLOY-2 training courses, they enable more-complex and more-realistic experiments to be performed. They also become centres of IPv6 competence in countries around the world, forming a sustainable human network of expertise to train others. Sustainability is achieved initially through the careful selection of locations for the installations (e.g. within NRENs) where the connectivity, funding and qualified staff support are all secured.

6DEPLOY-2 will support the (human) networking between the Lab managers with regular (6-monthly) workshops.

Action plan: The timing for establishing this new project is most appropriate, given the imminent approach of wide scale IPv6 deployment, encouraged by the following recent events:

- Release of the EC Action Plan in May 2008, which has been accepted by Member States as a good example to follow for their national IPv6 deployment.

- A survey commissioned by the European Commission and conducted by TNO and GNKS Consult in cooperation with the RIPE NCC, reveals that organisations in Europe, Middle East and parts of Central Asia have been slow to adopt IPv6, the next-generation of Internet addressing protocol.

- Studies have predicted the IPv4 address space exhaustion around 2011-2012.

Support activities: 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.

Support activities 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-2 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-2 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.

8. FLYERS

The following is a generic flyer which was used for the 6DEPLOY project. The partner names have been updated to align with 6DEPLOY-2.

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
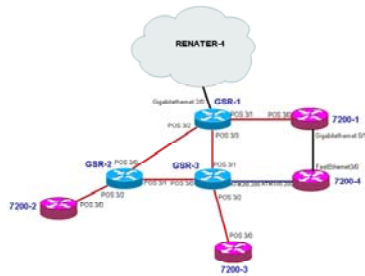 **www.6deploy.eu**

6DEPLOY
IPv6 deployment and support
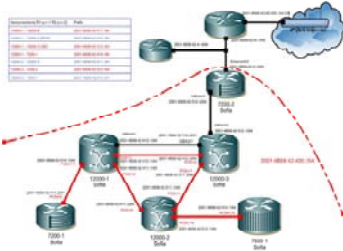
6DEPLOY Training Material

- 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

Partners of the project:

SMEs:

Industry:

NRENs:

6DEPLOY testbed in Sofia (Bulgaria)

Universities:

RIRS

9. POSTERS

The following three posters were originally made for ICT2008 in Lyon. These posters can be re-used in 6DEPLOY-2. The partners have been updated.

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 Workshops

6DEPLOY

IPv6 deployment and support

6DEPLOY objectives

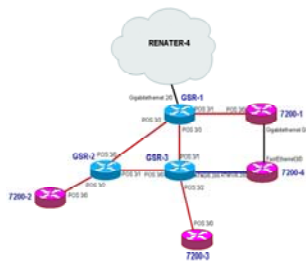The purpose of the 6DEPLOY project is to support the deployment of IPv6 in

- Research networks

- FP7 projects

- Developing countries in Africa, Latin America, Asia and Eastern Europe

- Industrial environments in Europe

6DEPLOY

IPv6 deployment and support
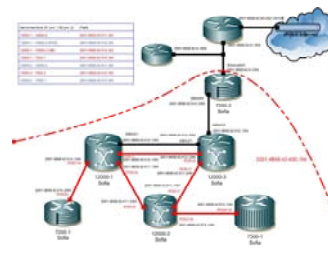
6DEPLOY Training Material

- 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

Testbed in Paris   *Testbed in Mauritius*   *Testbed in Sofia*

10. WEB-BASED PUBLICATIONS

The following is a selection of useful publications that are on the 6DISS, 6DEPLOY and 6DEPLOY-2 Websites.

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

4 Deployment case studies, available from the link to "Publications" at:
http://www.6deploy.eu/index.php?page=publications2

- 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.

- 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.

- IPv6 deployment in 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.

- A case study intended for ISPs in developing regions considering the deployment of IPv6. It is based on an actual case, but no details are disclosed that would compromise issues of security or confidentiality for the ISP.

"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/

11. CONCLUSION

The focus for 6DEPLOY-2 as a follow on project of 6DEPLOY is to enlarge the number of IPv6 testbeds around the globe. Moreover, the challenge will be to integrate all of these IPv6 platforms so they can be booked from a one-stop shop web portal and used the same way wherever they are physically located.

The other main activity in the 6DEPLOY-2 project is to maintain a set of dissemination material and use these modules in workshops to train the different Internet communities in the areas of IPv6 deployment, configuration, and usage. This material exploits previous project activities within and outside the Framework Programmes of the European Commission and will be updated and enriched in 6DEPLOY-2.

This document has described the set of dissemination material available at the beginning of the project, including training modules, "hands-on" exercises, the e-learning package, IPv6 labs, brochures, leaflets, posters, web-based publications, etc. This effort will continue through the training workshops, giving support for IPv6 deployment and the documenting of further case studies.

12. REFERENCES

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

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-learning2