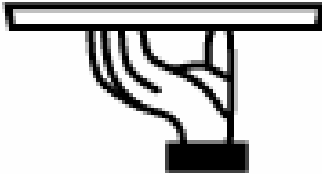




Information Society  
Technologies

# IPv6DISSemination and Exploitation



[www.6diss.org](http://www.6diss.org)

Martin Potts



*Euro-Africa Concertation Meeting, Brussels - 14th December, 2006*

IPv6DISSemination and Exploitation



# Programme

- |   |                                  |
|---|----------------------------------|
|   |                                  |
| 1 | Objectives and Approach          |
| 2 | Past and planned activities      |
| 3 | Involved African organisations   |
| 4 | Difficulties and lessons learned |
| 5 | Identified perspectives          |
| 6 | Conclusion                       |





# Programme

- |          |   |
|----------|---|
|          |   |
| <b>1</b> | <b>Objectives and Approach</b>          |
| <b>2</b> | <b>Past and planned activities</b>      |
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# Objectives

- To transfer knowledge on IPv6 deployment and operation from Europe to NRENs, Universities, commercial organisations, ISPs, governments and regulators in:
  - Southern Africa & Sub-Saharan Africa
  - SE Europe
  - Mediterranean Countries
  - South America, Central America & Caribbean
  - Asia Pacific Region
  - Newly-Independent States in Central Asia
  - India & China





# Objectives

## • Why IPv6 is important for Africa

### IPv4

$2^{32}$  addresses

..... **theoretically about 4 billion**

Africa	16 million
S. America	67 million
Asia-Pacific	268 million
Europe	319 million
US	386 million
Various	839 million
End-users	721 million
Available	1090 million

The US holds 60% of the IPv4 address space

### IPv6

$2^{128}$  addresses

..... **3.4 followed by 38 zeros!**





# Objectives

- To exchange best practices with communities and organisations in the regions
- Make European research and industrial concerns aware of the highly skilled personnel who can contribute to the urgently needed improvement of ICT infrastructures
- To integrate African organisations into future European projects





# Approach

To take the knowledge gained and the documented results from the EU projects

6NET: <http://www.6net.org>

Euro6IX: <http://www.euro6ix.org>

GÉANT: <http://www.geant.net>

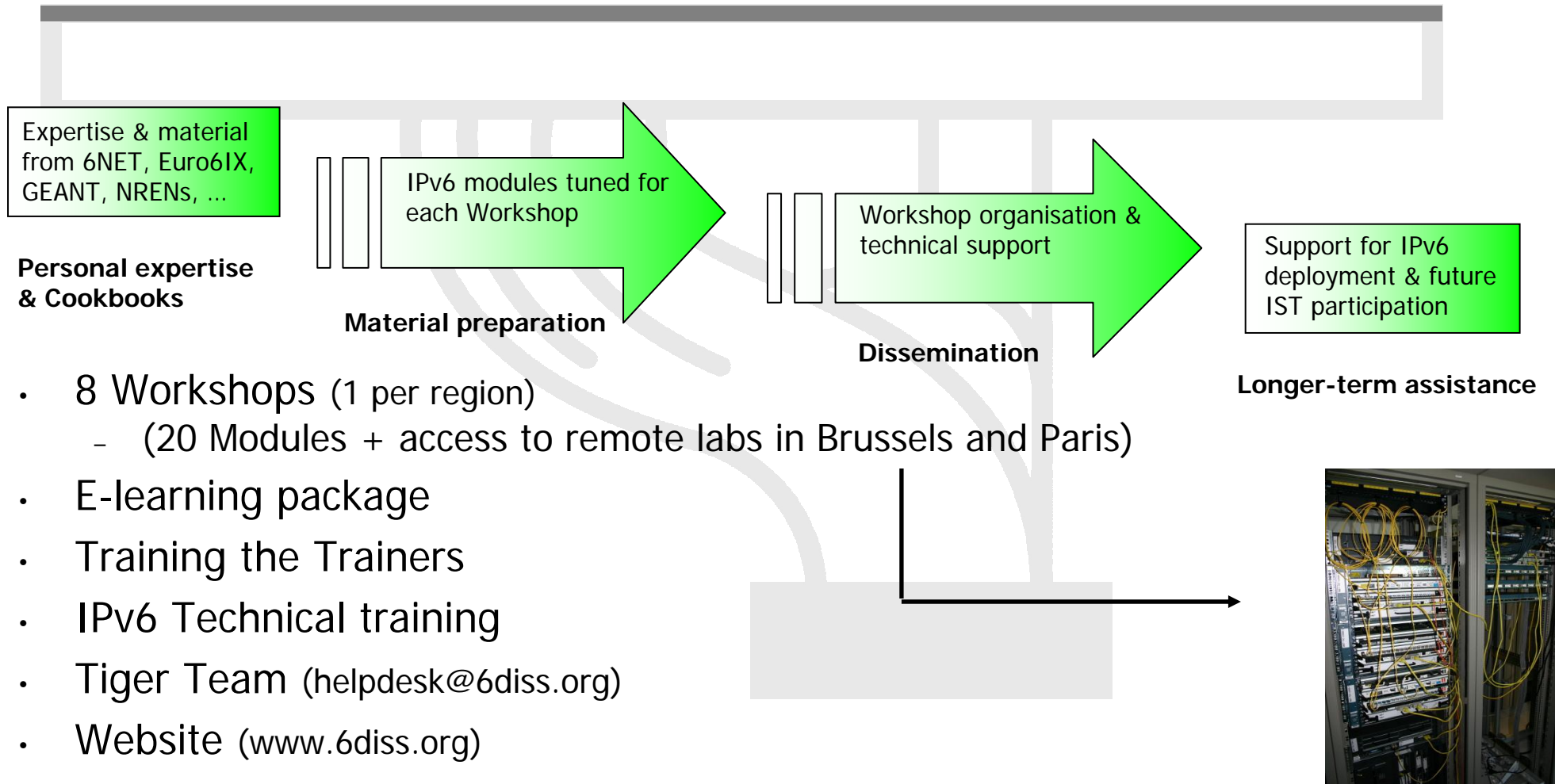


... and build a new (small) project, focused on sharing the experience in a practical way





# Approach







# Key Data

- 10 Partners:

**Martel**



**FCCN**

Fundação para a Computação Científica Nacional

**Renater**



University  
of Southampton

- Start date:

1st April 2005

- End date:

30th September 2007





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# Past and Planned Activities

## *Workshops held so far:*

- Asia-Pacific Region: Taipei, Taiwan (IPv6 Summit, 08/2005)
- Southern Africa: Port Elizabeth (TENET IPv6 workshop, 09/2005)
- S-E Europe: Serbia/Montenegro (03/2006)
- Mediterranean Countries: Malta (04/2006)
- South & Central America: Ecuador (07/2006)
- Sub-Saharan Africa: Senegal (10/2006)



## *"Hands-on" practical sessions supported at:*

- AfriNIC-3: Cairo, Egypt (12/2005)
- AfriNIC-4: Nairobi, Kenya 05/2006)

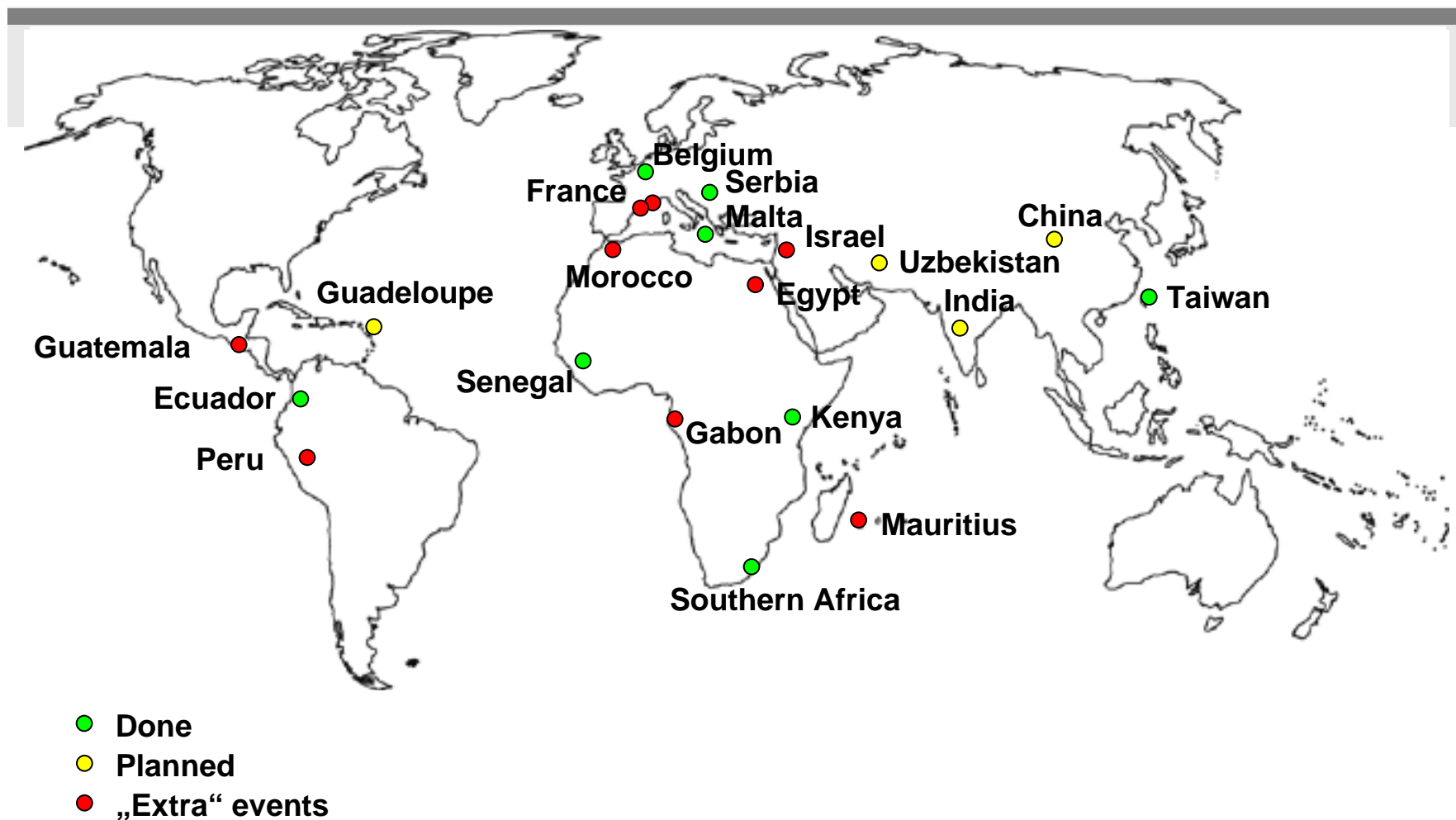


## *"IPv6 Trainers' session" in Belgium (10/2006)*





# Past and Planned Activities





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# Involved African Organisations

**TENET:** Tertiary Education  
Network (S. Africa)

**Meraka Institute/CSIR:**  
(S. Africa)

**AfriNIC:** African Network  
Information Centre

**AfNOG:** Africa Network  
Operators Group

**ISOC:** Internet Society

**IPv6 Task Forces** and **IPv6 Forum**



# Involvement with TENET

The 6DISS Workshop for Southern Africa was held in conjunction with DITCHE: *Development of IT Capacity in Higher Education*

The DITCHE programme is operated by TENET (a research and education network for S. Africa)



The 23 attendees represented mainly network administrators from South African Higher Education institutions (but also Telkom) that had been either granted an IPv6 address space assignment or intended to apply for such an assignment in the next 6 months

# Involvement with Meraka Institute/CSIR

## **CSIR: Council for Scientific and Industrial Research**

6DISS was presented at the IST-Africa Conference held at CSIR, Pretoria in May 2006



African Advanced Institute for Information  
& Communication Technology

The Meraka Institute is supported by the Departments of Communication and of Science and Technology, and managed by the CSIR

Interest was expressed in the IST-Africa Conference for collaboration with EC RTD projects, but no joint project has been defined yet with 6DISS partners





# AfriNIC

AfriNIC is the Regional Internet Registry for Africa



AfriNIC's mission is:

- to provide the professional and efficient distribution of Internet number resources to the African Internet community
- to support Internet technology usage and development across the continent
- to strengthen self Internet governance in Africa by encouraging a participative policy development





# AfNOG

The Africa Network Operators Group (AfNOG) is a forum for the exchange of technical information. It aims to promote discussion of implementation issues that require community cooperation through coordination and cooperation among network service providers to ensure the stability of service to end users



The goal of AfNOG is to share experience of technical challenges in setting up, building and running IP networks on the African continent

**AfriNIC and AfNOG are running a series of IPv6 training courses throughout Africa, supported by Jordi Palet (Consulintel), Philip Smith (Cisco) and 6DISS**



# Involvement with AfriNIC/AfNOG IPv6 Training

AfriNIC-3 (Cairo: December, 2005):  
1-day „hands-on“ IPv6 Training Session

Participants were shown:

- how to enable IPv6 in their PCs
- how to interconnect IPv6 LANs using tunnels

There was much interest to have more information and more workshops



# Involvement with AfriNIC/AfNOG IPv6 Training

AfriNIC-4 (Nairobi: May, 2006):

1-day IPv6 Technical Training on:

- IPv6 details
- Installing and configuring IPv6 on clients and routers
- IPv6 routing protocols
- IPv6 addressing
- IPv6 transitioning with tunnels
- Multicast
- Security
- Management and monitoring tools

# Involvement with ISOC, IPv6 Forum and IPv6 Task Forces

Sub-Saharan Africa Workshop (Senegal, Oct. 2006) was held in conjunction with ISOC, the IPv6 Forum and the IPv6 Task Force

- 6DISS project presentation in the ISOC Conference
- 3-day „hands-on“ workshop covering:
  - IPv6 Protocol and Associated Protocols
  - Autoconfiguration
  - IPv6 Addressing (including IPv6 Addressing Case Study: RENATER)
  - Host Configuration (Practical)
  - IPv6 Routing Protocols
  - Routing Case Studies: Paris and Brussels Labs
  - IPv6 Routing (Practical)
  - IPv6 Transition and Co-existence
  - IPv6 support in the DNS
  - IPv6 Applications
  - IPv6 Network Management (Practical)
  - IPv6 Services (Practical)





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# (Difficulties and) Lessons Learned

- Much interest in IPv6 from Africa
- Europe has experiences that it can share
- More infrastructure is available outside of South Africa than one might think (Southern Africa Region Universities Association - SARUA - Fibre Initiative)
- National Research and Education Networks (NRENs) are beginning to emerge outside of South Africa
- AfriNIC is a well-organised, competent and useful single point of contact for 6DISS operations in Africa





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# Identified Perspectives - TENET

As a result of the Southern Africa Workshop, the TENET CTO met informally with 6DISS partners and EC representatives in Brussels in December 2005. Opportunities for further collaboration were discussed, in terms of:

- improving the connectivity between Europe and SA
- joint R&D on network services and applications within a future EC project

Furthermore, TENET has:

- set up an IPv6 link to GÉANT
- requested to GÉANT/RENATER for an IPv6 Multicast connection



# Identified Perspectives - AfriNIC/AfNOG

2 project proposals including AfriNIC and AfNOG were submitted in IST Call 6:

- 6DISS extension to support IPv6 Workshops at all AfriNIC/AfNOG meetings
- Investigation of connectivity in South-East Africa for enabling researchers to collaborate on the specific topics of Malaria, AIDS, Diabetes and Oceanography.  
Partners also included the various NGOs, and the emerging Ubuntunet Alliance of NRENs in the region

Neither proposal was successful (very limited budget in the last IST Call from FP6) - **we intend to try again in FP7**

# Identified Perspectives - AfriNIC/AfNOG

Following the AfriNIC-3 and AfriNIC-4 events and the Senegal Workshop, we have received requests for more “hands-on” Workshops in Africa:

- Morocco
- Gabon

A so-called “**6Mandela**” initiative was discussed in the AfriNIC-5 meeting



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# Conclusions

## 6DISS aims to:

- Assist those regions with less IPv6 experience to deploy the latest technology in the most efficient manner. Of all the regions visited, Africa is the most interesting for us for the future
- Build contacts to organisations in these regions to support and enable their subsequent participation in projects within the EU ICT Programme. The first proposal for an extension of 6DISS – including AfriNIC – was not successful, but we will try again
- Make European research and industrial concerns aware of the highly skilled personnel who can contribute to the urgently needed improvement of ICT infrastructures





# Conclusions

We have discovered lots of other related initiatives in Africa.

Cooperation, sharing information, ... is therefore a must

So, if you are planning an event that includes IPv6 information dissemination, training, etc., do not hesitate to get in a touch with us.

Contact us through our Website ([www.6diss.org](http://www.6diss.org)), or send a mail to [helpdesk@6diss.org](mailto:helpdesk@6diss.org)





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# Thank you for your attention



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