Implementing IPv6 in Red.es

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Presentation (I)

- The ***Entidad Pública Empresarial Red.es*** is attached to the ***Ministry of Science and Technology through the State Department of Telecommunications and of the Information Society***
- **OBJECTIVE**: Contribute to the development of the telecommunications and the information society in our country.

Presentation (II)

- **FUNCTIONS**
  - The management of the Internet domain names Registry under the country code corresponding to Spain (".es").
  - Promotion and development of the Information Society.
  - Observatory of the Telecommunications and of the Information Society.
  - Counseling the State General Administration in all areas related to the Telecommunications and to the Information Society.

IPv6 in Red.es: Why?

- We are responsible for the DNS service of the ".es" zone. It is a critical service which will increase its importance with IPv6.
- One of our main functions is the "promotion and development of the information society".
- Implementation of IPv6 for the own benefit of Red.es.

IPv6 in Red.es: Objectives

- Short term
  - Obtain basic knowledge and experience in IPv6.
  - Set up a DNS services lab and web with IPv6 connectivity.
  - Start up actions with the aim to support and broadcast IPv6.
- Long term
  - Progressive addition of IPv6 in our networks and services.
  - Carry on supporting IPv6 with initiatives contributing to the promotion and introduction in Spain.

Work Plan
First steps

- Looking for basic documents in Internet.
  - There are a lot of documents which cover a variety of aspects about IPv6.
  - But they are all scattered and they are sometimes difficult to find.
- Lab Trials.
  - Installation and configuration in GNU/Linux and Windows, auto-configuration, routing, tunnels…
- We have established a collaboration with Consulintel in order to make easier the step from the theory to the practice.

Work Plan
Walking *(I)*

- To determine the IPv6 support in the devices used at present.
  - Good for DNS machines: GNU/Linux + BIND 9. and also for Web: Apache.
  - Faulty IPv6 Support in our network hardware (routers, firewalls, switches…)
  - Since many months, we have been demanding in our contracts the adjustment of equipment and hardware to IPv6.
- IPv6 Connectivity
  - Many alternatives: tunnel 6-o-4, native connection with Consulintel, native connection with an ISP...
  - As a first step a tunnel 6-o-4 will be used towards Consulintel.

Work Plan
Walking (II)

- Resources reservation.
  - A Cisco router 7500 in order to provide external connectivity.
  - An IBM xSeries 335 with GNU/Linux SuSe for the server functions.
  - Machines (PC's) in order to undertake trial.

Work Plan
Where are we

- We have acquired a basic knowledge in IPv6: trials with hosts, self configuration, IP addresses, connectivity, tunnels, Web and DNS services. Consulintel has transferred to us part of their know-how.
- We have an initial network infrastructure with IPv6 support.
- We have installed at present a DNS server on trial with public access.
- We are at present installing an Apache server with IPv6 connectivity.

Work Plan
The way yet to be done

- Full progressive implementation of IPv6 in Red.es based on the experience acquired.
- To adapt the management tools to the new addresses.
- Study of new or improved services in IPv6 which could be interesting (i.e.: security with DNSSec)
- Continue promoting IPv6 through the web http://www.ipv6.es and other initiatives.

Conclusions (I)

- First experience with IPv6: positive.
  - We are at the point of having DNS and web over IPv6 with not many problems.
- DNS
  - A difference between transport and content must be done.
  - The IPv6 support is simple: BIND.
  - The management tools must be adapted
- Web
  - There is IPv6 support on servers: Apache.

Conclusions (II)

- But… there are pending items
  - IPv6 support in the DNS root servers.
  - IPv6 support by manufacturers (hardware and software) is not comparable to the IPv4 one.
  - Few ISPs support IPv6.
- We support and push IPv6
  - We hope that our example encourages other domains to adopt IPv6 shortly.
  - Our web will facilitate the introduction to IPv6.
  - We will carry on supporting the implementation of IPv6 in the information society.

Thanks for your attention!

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