

# IPv6 na Administração Pública



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Vasco.lagarto@tice.pt

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- 6NET (2002-2005), which initiated the IPv6 deployment in the NREN networks. There is still a lot of good material at: [www.6net.org](http://www.6net.org)
- EURO6IX (2002-2005), which was similar to 6NET, but aimed at industrial deployments and focused on Internet Exchanges
- 6DISS (2007-2009), produced much IPv6 training material, including an e-learning course, which is still alive, best practices, deployment guides, etc.
- 6CHOICE (2008-2010), set up to promote IPv6 adoption in India

- 6DEPLOY (and 6DEPLOY-2), gave training courses globally to participants from a wide variety of organisations, kept the training material from 6DISS up-to-date, set up a training lab that could be accessed remotely, etc.
- ECIAO ([www.euchina-fire.eu](http://www.euchina-fire.eu)) - just finished. For example deliverable D3.6: IPv6 Pilots Results at: [http://www.euchina-fire.eu/wp-content/uploads/2015/09/ECIAO\\_D3-6\\_IPv6\\_Pilots\\_Results.pdf](http://www.euchina-fire.eu/wp-content/uploads/2015/09/ECIAO_D3-6_IPv6_Pilots_Results.pdf)
- IoT6 ([www.iot6.eu](http://www.iot6.eu)) - just finished. Dealt with IPv6 and IoT

- why IPv6 is not in place ...
  - While the adoption of IPv6 goes much slower than initially planned, the transition **is** taking place. More importantly, the transition is **gaining momentum**. Google keeps statistics on the percentage of users that access Google over IPv6. As of today it is at 11% and increasing pretty fast
  - Some people say that **we don't need IPv6**
    - Even if there are billions of new items connecting to the internet, the vast majority of systems sit behind a network address translation (NAT) wall.
    - alongside the lack of unique IPv4 address problem, NAT is also used for security purposes: a NAT firewall is a point of aggregation where IP traffic can be inspected and security applied. If everything is connected to everything else directly; then this is actually seen as a security issue

- Some people say that it is expensive to move to IPv6
  - To avoid additional costs, companies and ISPs will not specifically purchase new equipment that is IPv6-capable, but rather replace routers and switches according to their scheduled maintenance cycle. The networks will therefore gradually become IPv6-enabled, but it will take longer
  - For the edge network, there are still many old home gateways, print servers, ... unaware of and incompatible with the IPv6 protocol.
- IPv6 is not compatible with IPv4
  - During the design of the IPv6 protocol, backward compatibility was not on the requirements list
  - this lack of compatibility with the current IPv4 protocol was the single critical failure

- The main Weaknesses of IPv6 are :
  - IPv6 is not absolutely needed yet (there is no "killer app", NATs can keep IPv4 running)
  - IPv6 is not compatible with IPv4,
    - It is expensive to have to buy new devices (outside the normal replacement interval),
    - IPv6 addresses look harder to manage (needs new staff, new skills).

- Its Strengths are:

- Inexhaustible addressing range
- IPv4 was designed for a simpler world where trust was taken as a given. IPv6 was designed for a more grown-up, corporate world. It can have security built-in, through its design for supporting IPSec. It does, however, need setting up correctly,
- IPv6 is more efficient in how it deals with data packets, making the whole Internet more efficient,
- IPv6 uses multicast services, rather than broadcast, and therefore preserves bandwidth and enables streamed services to operate in a more optimized manner,
- Auto-configuration,
- Neighbour discovery,
- IPv6 simplifies the task of ISPs to track and record Internet connection history (mandatory in some countries),
- IPv6 was designed with mobility in mind,
- NATs are not free and increase network management effort; IPv6 obviates NATs.

- Opportunities:
  - Education, training, new jobs,
  - Developing new products,
  - Opportunities for new players to enter the market,
  - P2P games,
  - IoT
    - Due to the lack of IPv4 addresses, some parts of developing regions such as China, Africa, S. America, India (and developed regions such as Japan and Korea), may be IPv6-only. Being IPv6-enabled will be vital for forming partnerships and doing business.

- Threats:
  - The introduction of IPv6 requires making changes in the network. The system might break - it requires careful planning and expertise,
  - The introduction of IPv6 requires making changes in the models for the management and control of the network,
  - The introduction of IPv6 might imply new business models for some companies.
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- impact of IoT and Industry 4.0...
  - There are several articles on this subject, eg.:
    - <http://www.link-labs.com/why-ipv6-is-important-for-internet-of-things/>
    - [http://iot6.eu/ipv6 advantages for iot](http://iot6.eu/ipv6_advantages_for_iot)
    - <http://iot.ieee.org/newsletter/july-2015/the-case-for-ipv6-as-an-enabler-of-the-internet-of-things.html>
    - <http://www.networkworld.com/article/3016666/internet-of-things/what-you-need-to-know-about-ipv6-in-2016.html>
  - The main advantages are:
    - security,
    - scalability,
    - auto-configuration,
    - mobility,
    - removal of NATs