



# IPv6 IP MANAGEMENT DAY

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The Power of Network, the Sense of Service.



## What is IP?

- IP is short for "Internet Protocol".
- IP is a transport/connectivity protocol (OSI Layer-3).
- An IP Address can be compared with a "Telephone Number".
- IP Addresses are linked to MAC/Physical addresses.
- Most networks today are "IP-Only".
- IP is the most used protocol worldwide.



### IPv6 history

- Internet Protocol Version 6 (IPv6) is the successor of Internet Protocol Version 4 (IPv4).
- IPv6 is the second iteration of the Internet Protocol. The “in between” version 5 was never released and was an experimental addition to version 4. It was never implemented.
- IPv6 was developed to get rid of the shortcomings in IPv4.
  - The most used example is the number of available IP Addresses.
- There are 4 billion IPv4 addresses, of which all will be in use or deployed during 2011.
- The last block available already has been provisioned in February 2011.

### IPv6 sizing

- IPv4 addresses are 32 bits, IPv6 are 128 bits.
- IPv4 has  $4 \times 10^9$  (4,3 billion) addresses in total.
- IPv6 has  $3,4 \times 10^{38}$  (lots and lots of billions) addresses in total.
- IPv6 almost has an almost inexhaustible number of IP addresses in stock, roughly 50.000 quadrillion per earthling.
  - IPv4 has multiple earthlings per IP address. Not enough to serve the world as such.
- IP Usage will continue to grow and increase in exponential rates
  - Already has been true for IPv4 for years as well, will be more true for IPv6.

## IPv6 is “Awesome!”

Next to a larger address-range, IPv6 has other improvements more prone to be taken as value-add:

- **Better routing and network-autoconfig.**
  - Stateful and stateless networking
- **NAT becomes unnecessary.**
  - There are exceptions.
- **IPSEC Build-in.**
  - Not needed to be solved on application-level anymore.
- **Support for mobility/roaming nodes (Mobile-IP).**
- **Better usage of bandwidth, less overhead.**
  - Jumbo datagrams.

## IPv6 Conflicts and Complexities

- **Infrastructure complexity increases with IPv6.**
- **IPv4 will stay for a while (10 to 20 years).**
  - Next to IPv6, “Dual-Stack”.
- **IPv6 is incompatible with IPv4.**
- **Applications use IPv6 differently than with IPv4.**
- **IPv6 works/acts differently compared with IPv4 on infrastructures.**
  - Routing and routers will be more important, dependency is bigger.
- **Administration of IPv6 address-space more complex.**
  - IPv6 needs IP Address Management (IPAM).
- **Syntax of IPv6 addresses more complex.**

## IPv6 Conflicts and Complexities

IPv4 Address (Decimal, 32 bits):

**10.240.224.46**

IPv6 Address (Hexadecimal, 128 bits):

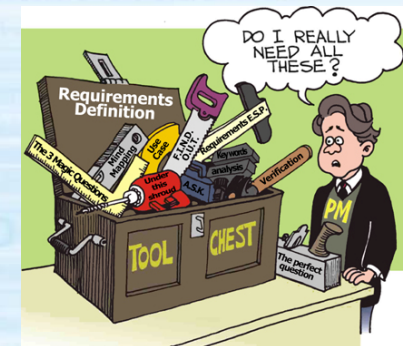
**2001:0db8:8888:4422:d69a:20ff:feff:3206**

**And somehow we need to “manage” and “operate” these TWO networks next to each other.**

## IPv6 Necessities/Requirements

- IPv6 shouts for IPAM.
- IPv6 shouts for Network Management.
- IPv6 shouts for High Level Knowledge.
- IPv6 shouts for Different Skills.
- Etc...

**In short: Impact will be bigger than Y2K!**



### IPv6 Observations

- IPv6 knowledge/skills very low available (customers AND vendors).
- IPv6 will touch everyone and everything in the end
  - It will TOUCH all components in a network-infrastructure.
- Plans need to be made.
  - Need to span multiple years, not only the “financial” or “budget” year.
- Need to invest into knowledge/skills/education NOW!
- Dual-Stack is a network and knowledge issue
  - Not a workstation/end-user one.
- Current/IPv4 networks need to be already fully managed and administered with discipline before starting with IPv6.

### Conclusion

- Gather IPv6 knowledge/skills is the key missing at this moment.
- Adoption-rate of IPv6 is (too) low.
- Not enough pioneers.
- Not enough business-cases (yet).
- Internet is not a good case to use for an Enterprise or regular business networks.
- Everyone will encounter IPv6 sooner or later.

## Conclusion

- Learn IPv6, while you still have time
- AXIANS Educational Service to the rescue!
- Test your knowledge during world IPv6 day



## Educational Services

Web: <http://www.axians.nl/training>

Email: [training@axians.nl](mailto:training@axians.nl)



### Educational Services

- Planned IPv6 trainings: Understanding IPv6
  - Wednesday 8 June 2011 and Thursday 9 June 2011
  - Thursday 15 September 2011 and Friday 16 September 2011
  - Both in the Netherlands / Utrecht
- For Belgium
  - Make your request for training in Belgium, we will plan!
- Make use of our promo :
  - As participant, you receive a **25 %** off when applying for training in June!
- Other Trainings: see our website.

### Questions





## Presentations

Presentations will be available on

[www.corenetworkservices.be](http://www.corenetworkservices.be)

[www.ipam.nl](http://www.ipam.nl) (IPv6 only !!!)

TRY TO USE IPv6



## Visit & Taste

