

Enabling IPv6 on your network

Belnet – Nicolas Loriau

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dedicated connectivity

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Your action plan

- **Raise awareness**
- **Equipment inventory**
- **Get your assignment**
- **Prepare your address plan**
- **Get IPv6 on your DMZ**
- **Get IPv6 on your LAN**



Raise awareness

- **Your ICT colleagues**

- Internal knowledge of IPv6
- Awareness of network changes

- **End users**

- Migration should be transparent to them
- Only warn when deployed on LAN and/or Wi-Fi
- Via Intranets?



Equipment inventory

- **Routers and firewalls**

- Does it support IPv6?
- At full performance?

- **Server & Desktop OS**

- Should be no-brainer for recent OSes



Equipment inventory

- **Application software**

- Does it depend on hard coded IPv4 addresses/ranges?
- If built on Apache or IIS no other problems expected...

- **Other networked gear**

- Printers?
- Switches? RA guard, PACL; RA snooping...



Get your assignment

- <http://ipv6.belnet.be>

Ce qu'il faut savoir sur IPv6 ▶

Activez vos adresses IPv6 ▶

Consultez notre documentation ▶

Meest gestelde vragen over IPv6 ▶

Activeer uw IPv6 blok ▶

Lees de laatste documentatie ▶

Prepare your address plan

2001:6a8:3c80:8004:ca2a:14ff:fe15:9cb6

Belnet
/32

Customer
/48

65536 assignable
/64 ranges

Host address

8 0 0 4
L V A A
1000 0000 0000 0100

Prepare your address plan

- **Use location / VLAN id / type of service...**
 - 2001:6a8:1234:<location><vlan>::/64
 - e.g. 2001:6a8:1234:0165::/64 (site 0, vlan 165)
 - 16 bits to play with
- **Map your IPv4 address plan into your IPv6 prefix**
 - 10.50.60.0/24 -> 2001:6a8:1234:5060::/64
 - Easy, but not always a good idea
 - Large networks need a decent IPv6 address plan
- **Documentation in your folders + exercices**

Get IPv6 on your DMZ

- **Requirement: firewall support!**
 - Use a separate zone if you want to test in advance
 - Use firewall policies similar to IPv4 policies
 - ICMP!
- **Enable IPv6 on your public servers**
 - OS + Applications
 - Publish AAAA records in your DNS for IPv6-enabled services

Get IPv6 on your servers

● Web servers

- IIS and Apache: no problem
- Application-specific, legacy, unknown,...
- Use reverse-proxy
- HTTPS: One domain per IP

● DNS servers

- Windows 2008's DNS, BIND: no problem
- Windows 2003: support very limited
- But IPv6 DNS server not mandatory to serve AAAA records



Get IPv6 on your servers

- **Mail servers**

- Very few MTA supported
- Even less antispam software
- IPv6 blacklisting still experimental

- **Our advise : do not port MTA now**

- **Belnet Antispam Pro (Fully IPv6 compliant) !**



Get IPv6 on your LAN

- **Use a separate zone if you want to test in advance**
 - One LAN at a time
 - admin, students, guests, eduroam, ...
 - Use firewall policies similar to IPv4 policies
 - Do not forget inbound connections as there is no more NAT!
 - Filtering inbound ports <1024 is good practice
 - Filter everything incoming if you want a perfect match between policies
- **Warn your power users about network changes**
 - You want to know if something is no longer working...

Get IPv6 on your LAN

● Distribution of IPv6 addresses

– Router advertisement

- Widely supported
- Limited autoconfiguration options (only DNS server, if at all)
- Perfect for dual stack

– DHCPv6

- Not widely supported yet
- Can coexist with router advertisement (DNS servers etc)

Our advice : go DHCPv4 + RA

Transitioning technologies

● Tunneling technologies

– Tunnel broker

- Belnet hosts a SiXXs.net PoP server
- Native addresses
- Specific software on routers/stations

— 6to4

- ~~Built-in in Windows, OSX, Apple Airport & other home routers~~

– Teredo

- Built-in in Windows

– Miredo

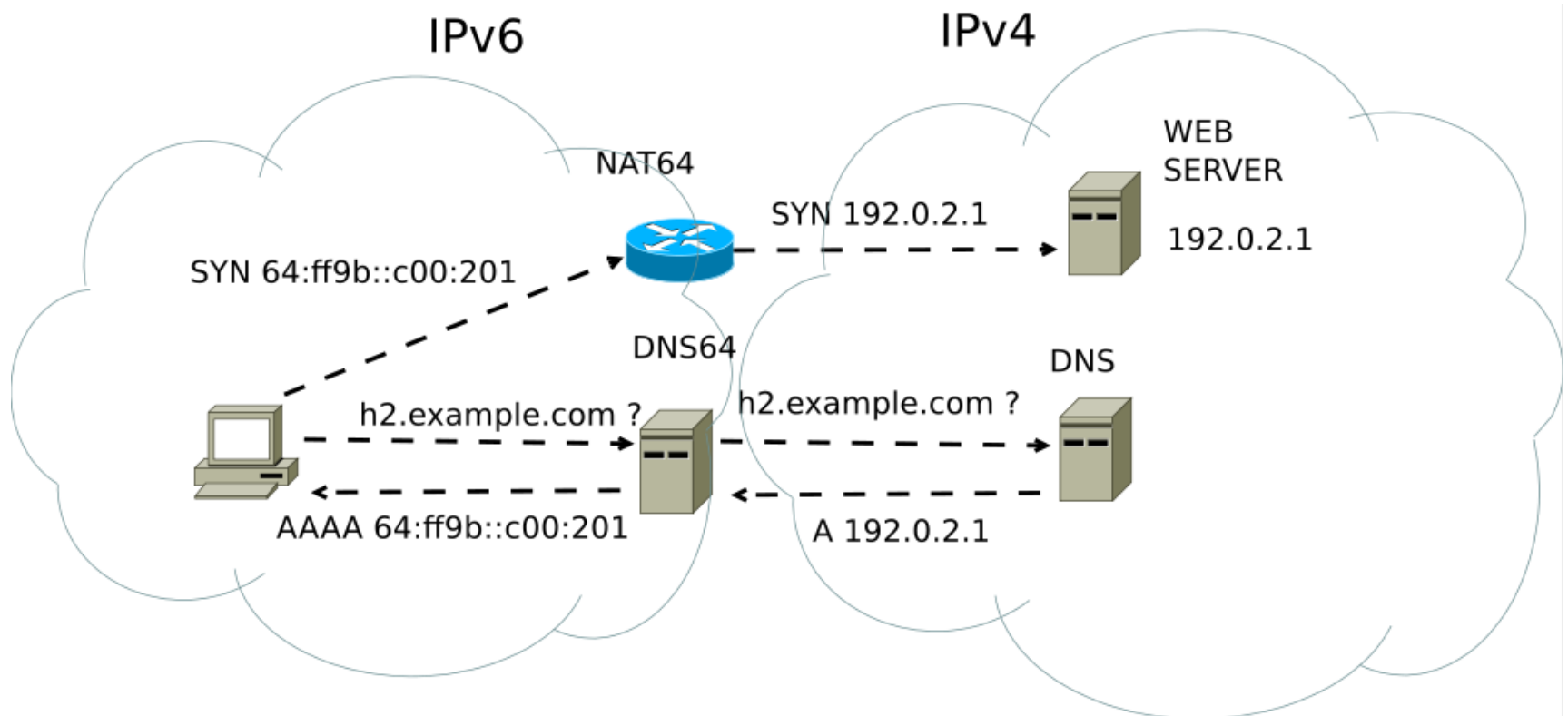
- Teredo port for Unix/Linux

● Our advise: for test purposes ONLY!



Transitioning technologies

- NAT64 & DNS64



Transitioning technologies

- **Dual stack**

- IPv6 and IPv4 on same wire/lan/frames

- **Advantages**

- Easier to put on desktops, routers
- Control/inspect your traffic
- Stability, ISP support

Our advice : go dual stack

In summary

- **Follow the steps**
 - Inventory
 - Awareness
 - Network plan
 - DMZ + LAN
- **Go Dual stack**
 - On the WAN
 - On the LAN
- **Belnet is a partner**
- **Ask us questions !**

Happy IPv6 implementation !

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