Who is Job Snijders?

- NTT Communications - AS 2914 (Network Architecture, Automation)
- PeeringDB (Vice-President)
- NLNOG Foundation (Founder/Chair)
- IETF contributor (RFC 7999, 8092, 8093)
- Operational IPv6 experience
  - Started on the 6BONE 10+ years ago
  - Deployed IPv6 in 8283, 8954, 15562, 41552
- Certified IPv6 trainer
  - Main focus ISPs in the Middle-East

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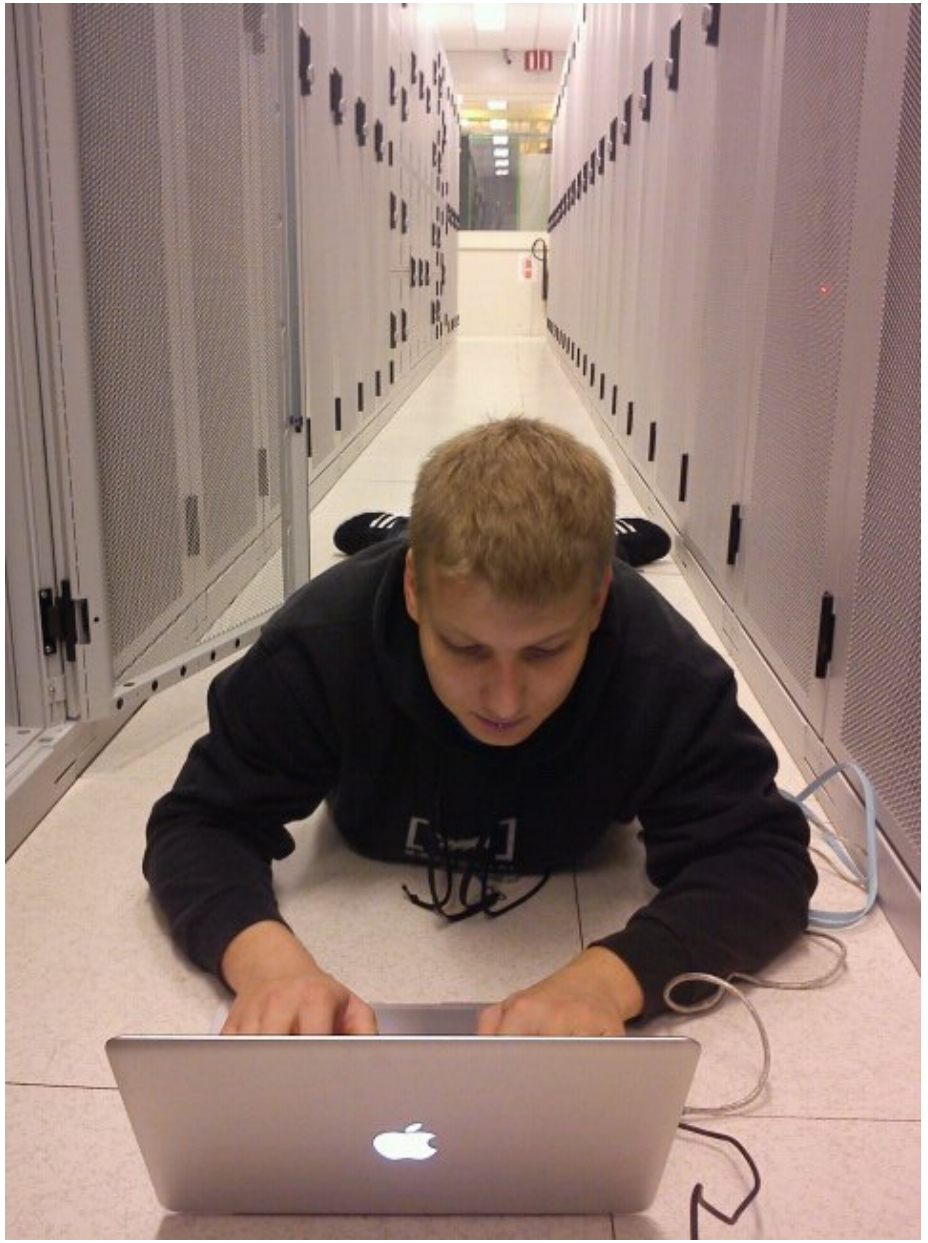

IPv4

(32 bit)

IPv6

(128-bit)

Plenty of addresses … plenty of problems

- Coming from IPv4, the RA/DHCPv6 distinction (**religious war**) is not helpful
- **ICMPv6 is routable**, this is not desirable for LLA resolution
- Solicited-node Multicast is a farce, might as well Unicast, Broadcast scales better (less state in the network)
- ND is very chatty, address registration might have been better
- Lack of CRC/Checksums makes it near **impossible to find faulty memory in line-cards**
- **IPv6 Extensions** with their non-fixed offset **are terrible** – are there even any compliant implementations?
- Extreme care needs to be taken to **avoid resource exhaustion attacks** (a /64 is too big)
- IPv4 and IPv6 DFZ are not congruent, **IPv6 DFZ is partitioned**
- Lack of immediate benefit for end-users, **nobody asks for IPv6**
- Extremely poor vendor behavior: **charging extra for IPv6** licenses
- Poor RIR/Policy Community behavior: Getting IPv6 PI was harder then IPv4 PI, TLA was not realistic to begin with
- **Lack of backwards compatibility** with IPv4 led to extreme fragmentation in transitional technologies
- Close to zero recycling of existing concepts: suddenly dealing with multiple addresses per host, ND < ARP, lack of NAT, colons
- 20 years into the game - **IPv6-only domains still not viable**: domain-verification breaks, google translate breaks, etc, etc
- **Absolute failure to deliver on innovation**: no mobility, no improved security, no other cool stuff
- **ecosystem still too immature** to ignore IPv4 (ElasticSearch, many other DBs have no native ipv6 data type)

IPv6 is might be one of IETF’s worst products.

If we accept poor choices were made,
is there still opportunity to repair IPv6?