

IPv6 deployment at Netnod

(Nurani streaming Kurtis - but slower and without an Åland accent...)

- Who is Netnod?
 - IXP in Sweden, operator of i.root-servers.net, provider of TLD anycast services
- What did we want to do?
 - Deploy IPv6 and make it work just like IPv4
 - Production service
 - Same user experience, monitoring, stats etc
 - Three types of services
 - IX LANs, IX services, i.root-servers.net & TLD anycast

IX LANs

- /64 per VLAN (two VLANs per site)
- V6 on same infrastructure as v4
- Each ISP gets a static /64
 - e.g. 2001:7f8:d:ff::73/64
 - Last “chunk” matches the v4 address

Netnod services

- /32 from the RIPE NCC
 - /48 per location (binary chop)
- 1. Enabled IPv6 on infrastructure
 - Loopback interfaces, P2P Links, LANs
 - Established iBGP sessions and set up OSPFv3
- 2. Enabled IPv6 on office LAN and some servers
 - Services given static addresses. (i.e 2a01:3f0:1:3::101)
 - Office LAN given addresses via RA
 - DNS resolving done over IPv4 (no DHCPv6 client)
 - Added AAAA for public names, i.e www, mail, etc
- 3. Monitoring
 - Nagios is used for monitoring using 2.10

Problems

- Routing - it's a jungle out there!
 - Still seeing really weird routing issues.
 - Significant effort spent on debugging routing
 - It's hard to be alone!
 - Challenge to get transit providers to treat this as production service
- Vendors
 - Checking the “IPv6 ready” box for US DoD contracts
 - Only assures the box forwards packets with IPv6 headers
 - We still lack those 20 years experience that turned RFCs into workable software
 - A lot of re-learning ahead

In summary

- It's not hard, BUT...
 - it requires planning and it takes longer than you think
- IX side pretty straightforward
 - (But better debugging would have been nice)
- Treat IPv6 the same way as IPv4
 - 18 members have IPv6 IX addresses
 - Get transit providers to consider this production services
- Yet to do
 - Upgrade kernels on Quagga machines
 - Activate IPv6 for i.root-servers.net
 - (already running for Unicast DNS zones)
 - Training, documentation etc
 - <http://www.6diss.org/e-learning/>