

IPv6 implementation in a multi-vendor network.

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Agenda

- motivation.
- first experience.
- backbone deployment.
- addressing.
- routing.
- multi-vendor environment.
- conclusion / next steps.
- useful documentation.

Motivation:

- Ipv4 exhaustion
- new IP/MPLS backbone to be deployed with HW and SW with native Ipv6 support from start.
- DNS registry services for local ccTLD.
- experience gained with initial allocation.
- business plan?
- why not?

First Experiences:

- first experience: 2002-Setting a GRE tunnel to RNET, /48 allocated from 6bone space. Only one router. Did not take off.
- IPv6 Tour: In 2005 we got a PI /32 allocation from LACNIC. One Border router and one core router running RIP NG. Also, one development lane/w two servers and two customers. IPv6 on DSL experience.
- this experience only stopped running when substituted by current deployment in 2007.

Multi-vendor Backbone Project: how did we started?

- a good inventory of our current services and operations.
- include item in existing WG.
- talk to vendors and your services providers (native connection promised by 4Q2007).
- study of the impact of developing Ipv6. Avoid service interruptions.
- do you need IPv6 everywhere?. Keep it simple.

Addressing

- we had our initial /32 allocation.
- three levels of aggregation:
 Access/POP/International.
- /48 for network infrastructure for each POP, /128 for loops and /126 for point-to-point.
- customers will get /48 and up for business and /56 for residential.

Addressing

- ¿which is the size for the Ipv6 minimum de-aggregation? /32?? /48??. ¿how many customers represents a /32? ¿what kind of customers? ¿how much “transit” traffic will a /32 represent?
- mobile operations/NGVN.
- we concluded that the initial allocation was not enough for the size of our network if we wanted to start with a good planned network.

Addressing Servers LANs:

- IPv4 LAN: 200.40.102.0/24
- IPv6 LAN: 2800:a0:2:102::/64
- IPv4 Server: 200.40.102.123
- IPv6 Server: 2800:a0:2:102::123

no IPPLAN support for IPv6 yet.

Routing

- we started from the core to the edges. Not need to Ipv6 everywhere.
- as an IP/MPLS network, we configured 6PE to transport customer's prefixes/traffic. We do it to save BGP sessions, what do we gain with native Ipv6 BGP sessions?

Routing

- we also configured IPv6 in Core routers interfaces (why not?) and transport these routes through ISIS.
- what about Internal infrastructure allocations or RFC 4193?
- we are running ISIS with multi-topology (when possible). Multi-topology allows saving possible black holes.

Multi-vendor environment.

- in our network we have routers from:
 - *Cisco.*
 - *Alcatel.*
 - *RedBack.*

One of the main problem is the lack of knowledge of Ipv6 from the equipment reps.

Multi-vendor environment

- some problems (Routers):
 - *Cisco: for CPE equipment we need memory updates and several equipment upgrades. Good Ipv6 support.*
 - *Alcatel: does not implement 6PE and multi-topology until release 5.0 (march 07).*
 - *RedBack: No Ipv6 support until 6.0.3.3 (June 07) and several features until 6.0.5.1 (Q307).*

Multi-vendor environment

- more problems:
 - *Problems increases if we get higher in the protocol stack. Specially with appliances:*
 - *Servers Load balancers from Nortel (Alteon) and Cisco do not support Ipv6.*
 - *¿where you want to extend ipv6?...is a work in progress. Keep it simple.*

Multi-vendor environment

- what if I want to buy new Ipv6 ready equipment?, what should I demand vendors?
- Ipv6 Ready Logo is a certification initiative (similar to WiFi).
- it has two phases:
 - *phase I is a silver logo.*
 - *phase II a gold logo. Four categories: Core, IPSec, MIP and NEMO.*

Multi-vendor environment

- the problem is that the Core requirements only test “basics” (particularly ICMPv6).
- another option, ask for [RFC 4294], IPv6 Node Requirements and add your own set of standard requirements (that is what we did).
- third-party reports (ex. UNH-IOL).

Next Steps

- improve our internal training.
- move deployment to the access/servers.
setting up more trial customers.
- tunnel broker. 6to4 gateway.
- better understanding of security issues.
- reverse dns for DSL customers?
- study CPEs.
- get involved with community: local ipv6tf?

Conclusions

- take advantage of changes in your network to get into Ipv6.
- check 6pe and 6vpe if you have a mpls/l2tpv3 infrastructure.
- try to avoid deployments in “stand-alone” equipments.

References

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