IPv6 – How hard can it be?

How Telstra is transitioning fixed broadband services from IPv4 to IPv6

The Story So Far…

Why bother with IPv6?

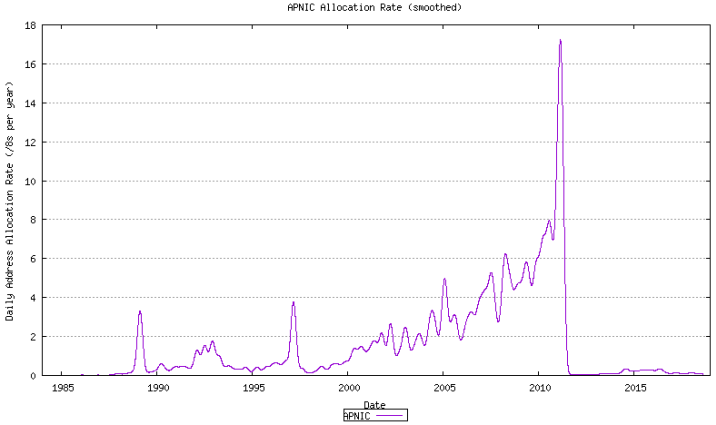
- For the first 16 years, minimal interest
- Until in January 2011 IANA exhausted the global IPv4 pool
- By April APNIC was exhausted as well.

OK, you've got our attention

- Fast forward to 2013 and NBN services are dual stack.
- By 2015 ADSL services are dual stack

But we still are using IPv4 addresses

- When are we going single stack IPv6?
- And then the 'smart Modem' arrived.



IPv6 impact on Residential Gateway design

A residential gateway as a router.

- SLAAC or DHCPv6?
  - LAN
    - Historically SLAAC was mandatory on the LAN due to O/S support.
    - ICMPv6 extensions such as RDNSS can eliminate the need for a mixed SLAAC/ DHCPv6 network.
  - WAN
    - On the LAN we need a /64 per network. So if multiple networks are supported (ie guest Wi-Fi) IA_PD rather than SLAAC must be supported on the WAN.

- IPv6 demands an effective firewall.
  - When should firewalls holes be allowed?

IPv6 impact on Residential Gateway design

A residential gateway as a service consumer.

- Once a residential gateway becomes the source of IPv6 traffic, a globally scope address is needed.
  - Do we use SLAAC or DHCPv6 IA_NA?

- For services such as DNS, NTP, TR-069 and VoIP, we need to ask the following questions:
  - Should IPv6 be preferred?
  - Under what circumstances can we fall back to IPv4?
  - When is it OK to return to IPv6?

IPv6 impact on Residential Gateway design

Life after IPv4

- Sooner or later we have to go single stack IPv6.
- When we do, how will legacy IPv4 usage be supported?
  - There are two scenarios – IPv4 only hosts and IPv4 only servers.
  - Lots of options such as CGNAT, DS-Lite, MAP-T and so on.
  - Ultimately 464XLAT won the day.

The internet is broken – let's blame IPv6

Sad, but true. Let's look at why this is so.

- Solution maturity
- IPv6 is not zero impact
  - BNG impact with twice the sessions.
  - DNS traffic effectively doubles
- IPv6 does not inflow events any better
  - BNGs sensitive to authentication requests
- IPv4 and IPv6 often do not have the same network elements.

What's next?

Complete the migration to single stack IPv6

- So far single stack IPv6 is only used in failover mode.
- Fixed broadband is still dual stack.
  - VoIP traffic currently under migration to IPv6 preferred
  - DNS and TR-069 ready to go.

Thanks – Any questions?

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