Using /64 from Customer Prefix for the Inter-Router Link

draft-palet-v6ops-p2p-from-customer-prefix-01

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History and Goal

- Work started in 2006
  - Got many inputs
  - However, was not considered useful enough
- Now, many networks use it (31%)
- Since 2012, a DHCPv6-PD option supports this
  - "Prefix Exclude Option for DHCPv6-based Prefix Delegation" (RFC6603)
- Goal: Formally specify this (not documented elsewhere), so people know is a good thing

/64 for p2p

- RFC6164 describes /127, using a dedicated pool for p2p links
  - Doesn't preclude other options
  - In fact a big % of market uses /64 (62%)

- Simplify addressing plans and troubleshooting

- Routing the shorter aggregated prefix into the p2p link

IPv6 Deployment Survey

IP version of Survey Responder
- IPv6 466 31%
- IPv4 1046 69%

RIR
- AfriNIC 75 5%
- APNIC 464 31%
- ARIN 191 12%
- LACNIC 379 25%
- RIPE NCC 403 27%

Technology
- 2G/3G/4G with CPE 15 2%
- Cable/DOCSIS 138 19%
- xDSL 164 23%
- Wireless (WiFi, LMDS, WiMax, ...) 70 10%
- Other 79 11%
- FTTH 256 35%

WAN Prefix Size
- /112 9 2%
- /126 11 2%
- /127 34 7%
- unnumbered 63 13%
- Other 69 14%
- /64 299 62%
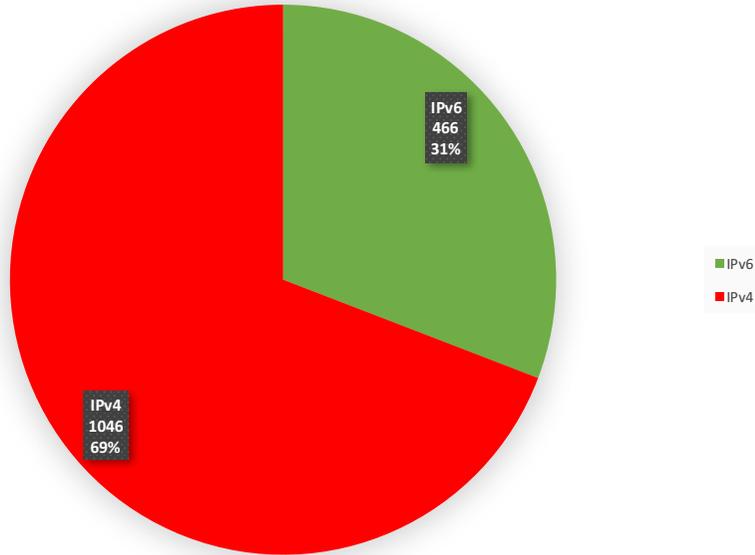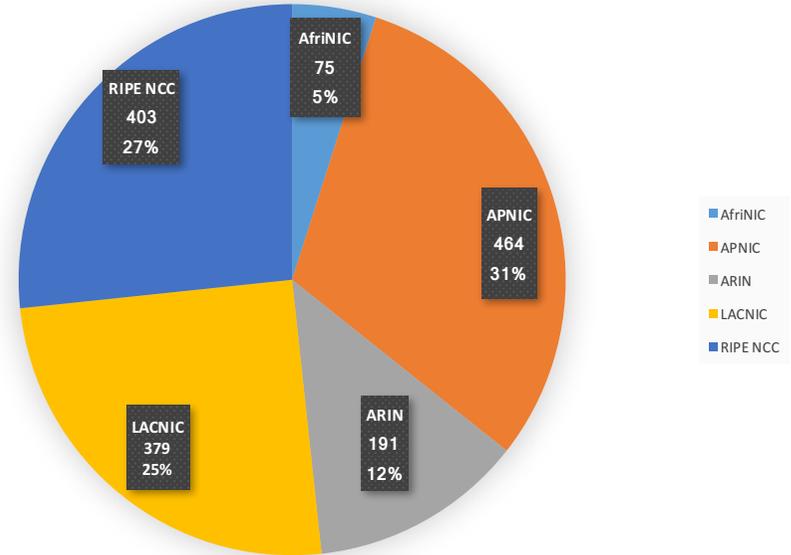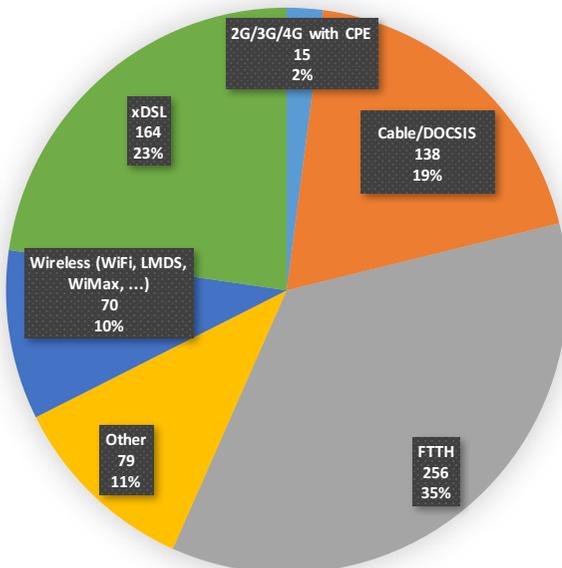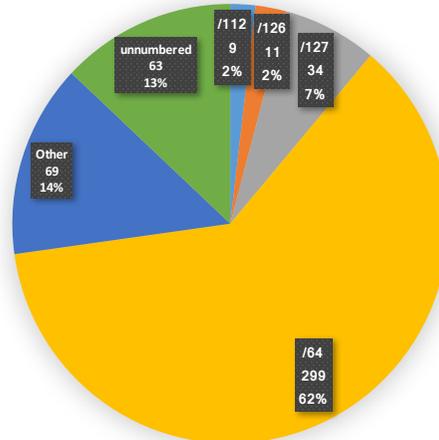
WAN from same pool as customer prefixes
- No 124 58%
- Yes 90 42%

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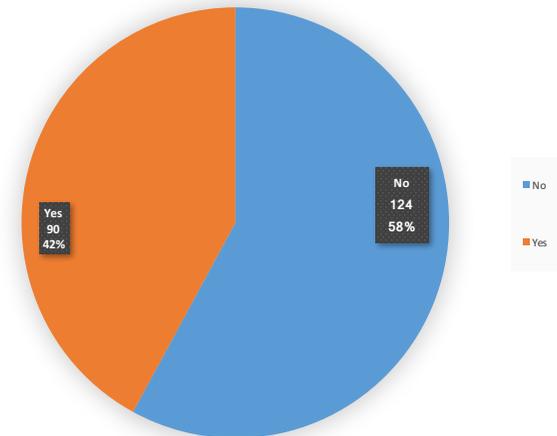
Practical Example

- Service provider prefix:

  2001:db8::/32

- Customer "a" prefix is:

  2001:db8:aaaa::/48

- p2p link is:

  2001:db8:aaaa::/64

- Provider side:

  2001:db8:aaaa::1/64

  or: 2001:db8:aaaa::1/48

- Customer side:

  2001:db8:aaaa::2/64

DHCPv6 Considerations

- RFC3633 (Pv6 Prefix Options for Dynamic Host Configuration Protocol (DHCP) version 6) originally avoided it

- RFC6603 (Prefix Exclude Option for DHCPv6-based Prefix Delegation) updated RFC3633 to allow it

- RFC3769 (Requirements for IPv6 Prefix Delegation) isn't conflicting with this

Router Considerations

- This is being used for p2p links in corporate and residential/SOHO customers
  - Routers must support RFC6603, if DHCPv6-PD is being used

- RFC7084 (Basic Requirements for IPv6 Customer Edge Routers), WPD-8 (Prefix Delegation Requirements) include RFC6603

p2p non-broadcast

- Clarification from the list:

This mechanism would not work in broadcast layer 2 media that rely on ND (as it will try ND for all the addresses within the shorter prefix being delegated thru the point-to-point link).

- Opened discussion in the list (going on):
  – Address resolution to be done only in links with L2 addresses

Next steps

- Questions ?

- Become a WG item ?

- Inputs ?