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: 70 (11%)
- FTTH: 256 (35%)

**WAN Prefix Size**
- /112: 69 (10%)
- /128: 299 (46%)
- /127: 64 (10%)
- /126: 1 (0%)
- /112 to /127: 128 (21%)
- /127 to /128: 128 (21%)
- Other: 63 (10%)

**WAN from same pool as customer prefixes**
- Yes: 90 (43%)
- No: 124 (58%)

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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?