



IPv6 via IPv4 SP Networks - "6rd"

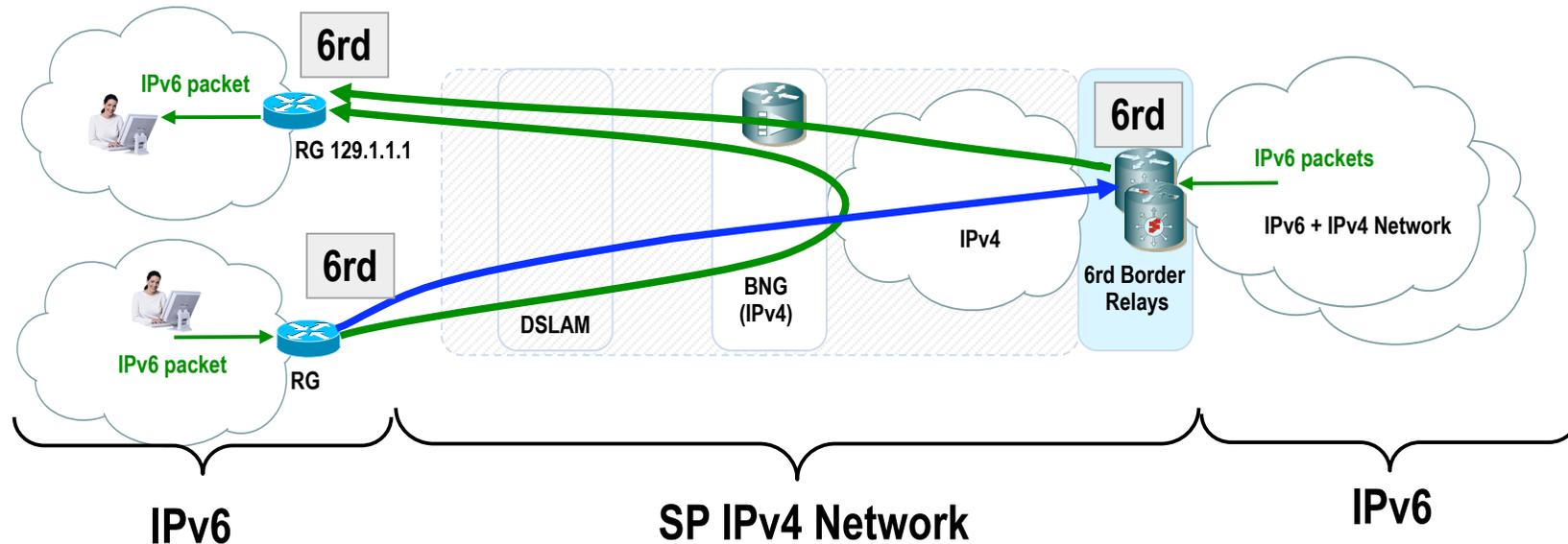


draft-townsley-ipv6-6rd-01.txt
(also RFC 5569 from Remi Despres)

IPv6 via IPv4 Service Provider Networks

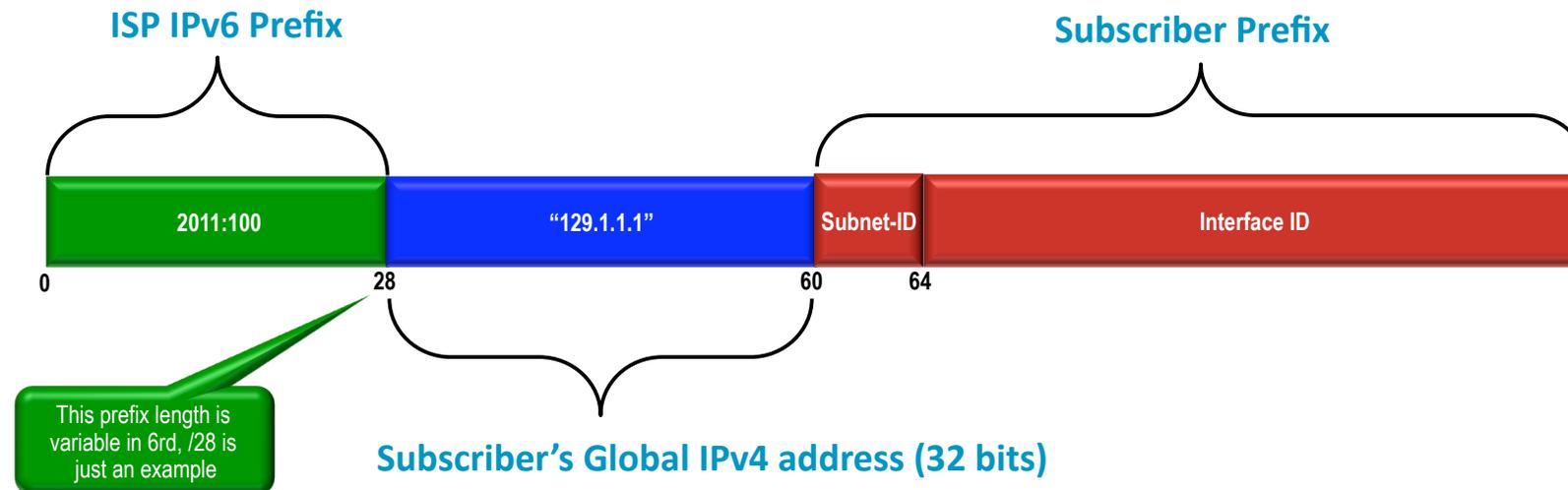
- 6to4 (RFC3056) was designed to offer IPv6 connectivity for sites who could not obtain IPv6 from their Service Provider
- 6rd adapts 6to4 for Service Providers to deliver IPv6 via their IPv4 Network

6rd in one slide



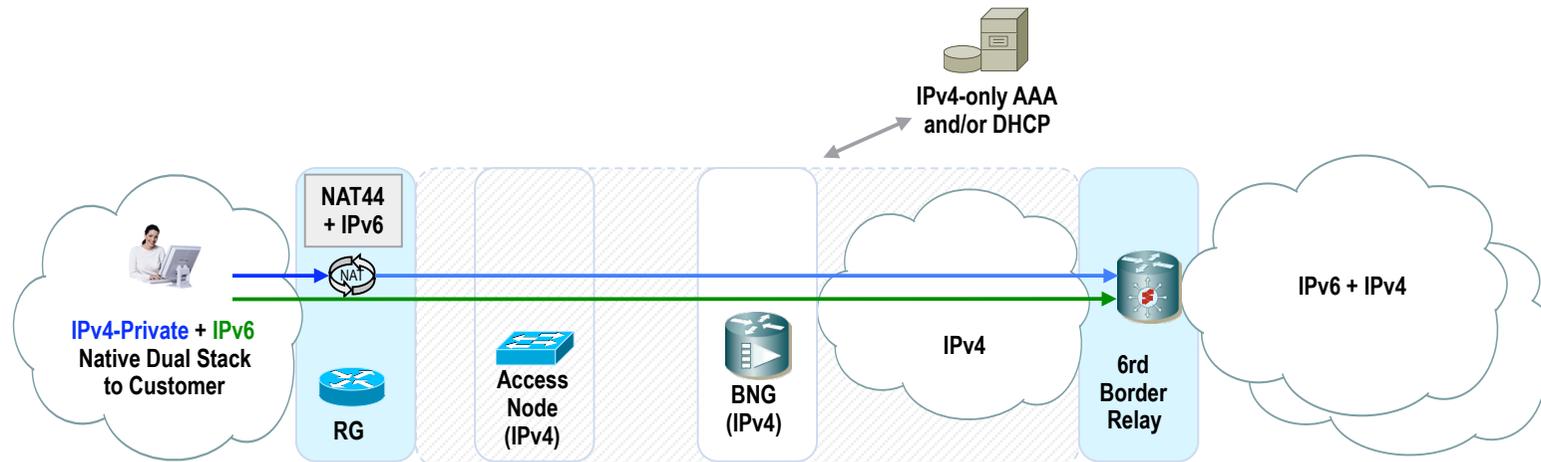
- IPv6 service in the home is essentially identical to native IPv6 service
- IPv6 Packets Follow IPv4 routing
- 6rd Border Relay traversed only when exiting or entering a 6rd Domain
- 6rd Border Relays are fully stateless, no limit on “number of subscribers” supported
- Border Relays may be placed in multiple locations, addressed via anycast.

6rd Prefix Delegation (From a Global IPv4 address)



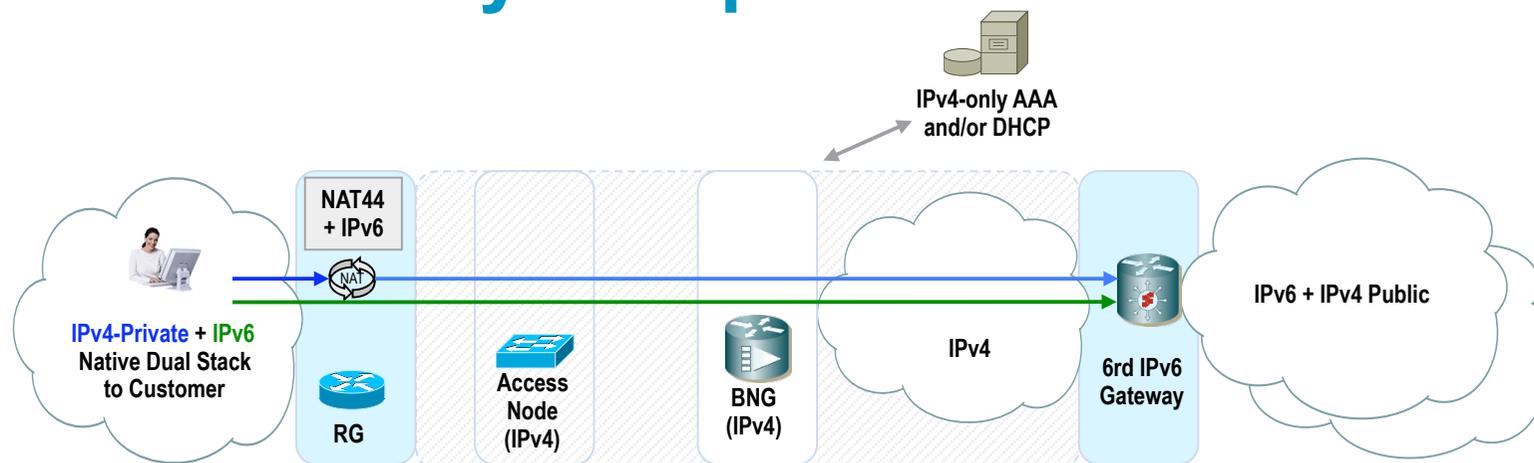
- Subscriber's IPv6 prefix is built based on subscriber's Global IPv4 address
- Treated by the RG exactly as if received from DHCPv6 PD
- Provisioning of 6rd Prefix, etc. to all RGs either manually, via DHCPv4, TR-69, etc.
- Subscriber's IPv4 prefix always able to be determined algorithmically from IPv6 prefix

6rd Border Relay IPv6 Relay Setup



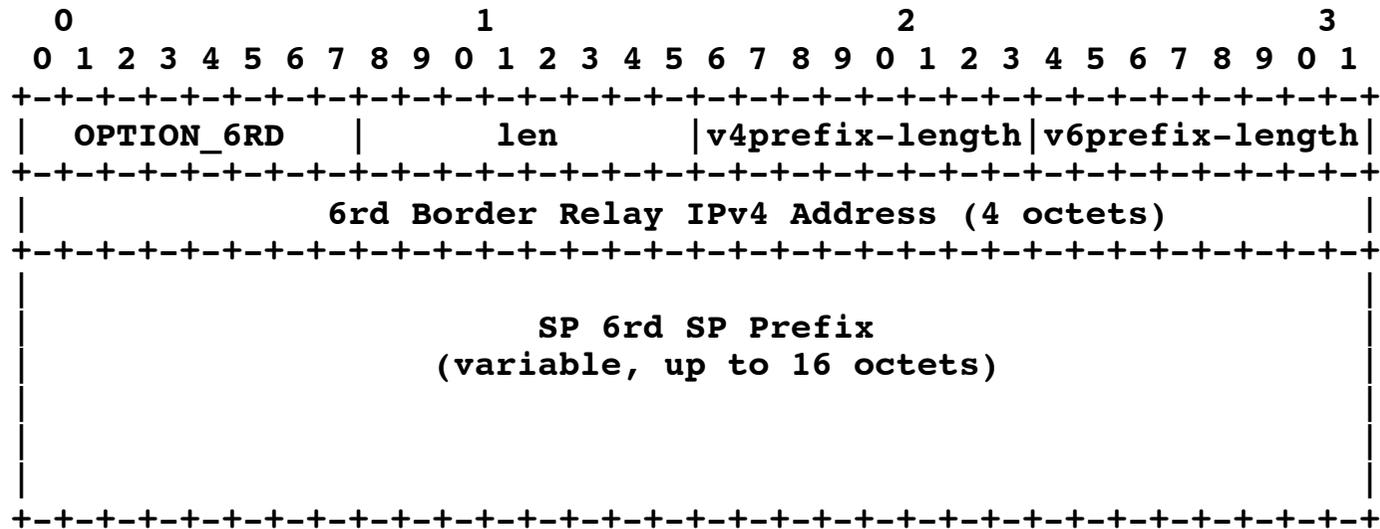
1. IPv6 reachability to the Internet by some means (Native, 6PE, GRE Tunnel, etc).
2. An access-network-facing IPv4 address (anycast)
3. Global 6rd ISP Prefix and Length

RG IPv6 Relay Setup



- RG configured with following new static items (via DHCPv4 or TR-69 mgmt interface)
 1. ISP 6rd IPv6 Prefix (includes domain ID)
 2. 6rd Relay IPv4 address
- “Home side” of RG configured exactly as would be for “native” IPv6, e.g., same as for a DHCPv6 delegated prefix

6rd DHCP option



- v4prefix-length** – common part of encoded IPv4 address in bits (1 octet)
- v6prefix-length** – length of the SP IPv6 prefix in bits (1 octet)
- 6rd BR IPv4 address** – IPv4 address of the 6rd Border relay (4 octets)
- SP 6rd SP Prefix** – IPv6 Prefix, zero padded to the nearest octet. Total length determined by “len” field (variable length)

Conclusion

- Standardised in software
- Operational considerations in v6ops
- DHCP option in dhcp
dhcp wg's blessing required