Global IPv4 across IPv6-only Networks
IPv4 "Residual deployment" (4rd)

draft-despres-softwire-4rd-00
Rémi Després – RD-IPtech

IETF 79 - Intarea- November 11, 2010
Problem Statement

1. Use an **IPv6-only routing** network
2. Maintain across it **IPv4 Connectivity**
   - *Full addresses* for some sites
   - *Shared addresses* for most
3. **Upgradable Customer Equipment** (Host or CPE)
4. Desirable properties
   - Ease of operation
   - Scalability

$\rightarrow$ 1 & 2 reverse of 6rd - 3 & 4 same as 6rd
ISPs "intending to adopt" 4rd

- BBIX, Internet Multifeed, JPIX, IIJ-II
  e-mails from Satoru Matsushima:
  www.ietf.org/mail-archive/web/v4tov6transition/current/msg00157.html
  www.ietf.org/mail-archive/web/v4tov6transition/current/msg00269.html

- Expressed Motivations (vs. DS-lite)
  - IPv4 address sharing at optimized cost
  - Automatic configurations
  - Optimized routing paths
4rd Overview

IPv6-ONLY ROUTING NETWORK

IPv6-only CE

... IPv6-ONLY ROUTING NETWORK IPv6 Backbone

4rd-capable CE

... IPv4/IPv6

Stateless Address Mapping rule from G: \{D, P, x\}

IPv4/IPv6

Global IPv4 Service

4rd relay

4rd relay

G

P.Xa...

D...

P.Xb...

P.Xa...
Longer than /32 customer prefixes (IPv4r)

1. Use bits beyond /32 to algorithmically identify an exclusive port set
2. Fairness
   • Don't assign to anyone privileged ports 0-4095
   • Assign the same numbers of ports to all that have the same prefix length
3. Exhaustiveness
   • Assign all ports other than 0-4095
Port-Set derivation from Port-Set Identifiers

IPv4 prefix > /32

Global IPv4 address S: Port-set identifier

S: Port-set identifier

Main port range

Secondary port ranges
Example of CE internal architecture

IPv6

Global IPv4 (port set)

Private IPv4

AND/OR

NAT44 (port set)

IPv6

4rd Client
Conclusion:
How can IETF provide an agreed specification?

- To encourage IPv6-only network deployments
- Without unnecessary delay