464 Customer-side Translator (CLAT)
Node Recommendations

Jen Linkova (Google), Tommy Jensen (Microsoft)

https://datatracker.ietf.org/doc/draft-link-v6ops-claton/
https://github.com/furry13/v6ops-464xlat-enable
Why CLAT recommendations?

• Document gotchas for implementors
  • Dealing with multihoming
  • Maximizing compatibility with upper-layer protocols who should not need to care about what CLAT is doing
  • Avoiding subtle security issues

• Encourage good practices among diverse implementations using latest standards (RFC 8781 published since RFC 8585)
Draft in a nutshell

• Use unique IPv6 addresses per interface to ensure stateless CLAT
  • With unique IPv4 from 192.0.0.0/29, max 8 CLAT instances on node
  • DAD required, use checksum-neutral addresses when using SLAAC

• Updates RFC 8585 to require RFC 8781 (PREF64 RA) support
  • Enables 464XLAT in absence of DNS64

• Defer to IPv4 when present, otherwise use CLAT as discoverable in this preference order: RFC 7225, RFC 8781, RFC 7050
Open Question: CLAT versus native IPv4

- Text currently says use native IPv4 if available with/before CLAT
  - But some admins may wish to use IPv6 even if IPv4 is available
  - What about IPv4 discovered after CLAT usage – MAY, SHOULD switch?

- DHCP Option 108 (RFC 8925) would enable this without disrupting IPv4 for hosts incapable of IPv6-mostly
  - Not helpful when IPv4 is statically configured, or host prefers IPv6 always whether the network permits IPv4 usage or not

- This would unfortunately open the door for spoofed PREF64 RA or DNS response to ipv4only.arpa to direct to attacker PLAT
Open Question: changes in available prefixes

• Host may receive multiple PIOs (multihoming or renumbering)
  • Native IPv6 handles this just fine (e.g. Rule 5.5) for using correct source address
  • But CLAT uses the first address it discovers without conscious reactions to additional network signals

• Less an open question about design, and more about phrasing we just have not issued yet
  • Warning implementors that they may run into “using the wrong source address” bugs without conscious effort to handle this case
Summary

• IETF 118: submitted a -00 to provide CLAT implementors with guidance on best practices for when to enable and disable

• IETF 119: revved to the current -02 from new discussion and implementation feedback

• Seeking WG adoption