Modified NAT-PT

draft-van-beijnum-v6ops-mnat-pt-00

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New in this version

• New name

• (or it would be a -03 now)

• New co-author: Brian Carpenter

• Removed some stuff

• specifically: IPv4-IPv6-IPv4, this can go in a separate document later
Huh?

- NAT-PT (RFC 2766):
  - IPv6 host gets to talk to IPv4 services
  - stateless protocol translator + IPv4 NAT
  - DNS ALG creates AAAA records from A record + 96 bits that go to translator
  - deprecated in RFC 4966
RFC 2766

IPv6 host  IPv6  Translator  (SIIT + IPv4 NAT)  IPv4

DNS ALG
Problems with NAT-PT

- See RFC 4966 for details
- Highlights:
  - Fake AAAA records could escape
  - How do you mix IPv6-only + dual stack?
  - Only works with IPv6-aware applications
  - NAT in IPv6
  - Only works IPv6 → IPv4
Modified NAT-PT

- IPv6 $\rightarrow$ IPv4 translators remain the same
- Adds a number of options to get around original NAT-PT limitations/problems
- Adds IPv4 $\rightarrow$ IPv6 translation
DNS ALG

• Add EDNS0 "poison pill" so fake AAAA records don't escape in the wild

• Recommend:
  1. moving DNS ALG very close to hosts
  2. moving DNS ALG to resolver library
  3. use A records, add missing bits at IP layer
AAAA vs A

- Using A records helps with:
  - mixing IPv6-only and dual stack hosts
  - ability to use IPv4-only applications
  - referrals
- But: need a way to discover extra 96 bits
  - yet another DHCPv6 option...
EDNS0 "poison pill"

IPv6 host → IPv6

Translator (SIIT + IPv4 NAT)

DNS ALG

IPv4
MNAT-PT (I)
MNAT-PT (2)

IPv6 host

IPv6

Translator
(SIIT + IPv4 NAT)

IPv4

DNS
ALG
MNAT-PT (3)

NO DNS ALG! ✔
IPv4 $\rightarrow$ IPv6

- IPv6 $\rightarrow$ IPv4 is easy: IPv4 address fits in IPv6 address
- IPv4 $\rightarrow$ IPv6: not so much...
- Solve: map individual ports to IPv6 services
  - end of well known ports!
  - some trickery for "route optimization"
Translation vs tunneling

- Tunnel needs:
  - to be implemented!
  - address provisioning
  - state per endpoint and NAT state

- Translation:
  - can be done without host changes
  - no state except for NAT
Remember...

- Unlike IPv4 NAT:
  - NAT-PT doesn't have to be all things to all people
- You also have IPv6 connectivity!
- (M)NAT-PT only has to solve the "mass market" apps such web and mail
- VPNs etc can be done more easily over v6