Modified NAT-PT

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

v6ops, IETF-71, March 11, 2008
Φιλαδέλφεια, PA, US

Iljitsch van Beijnum

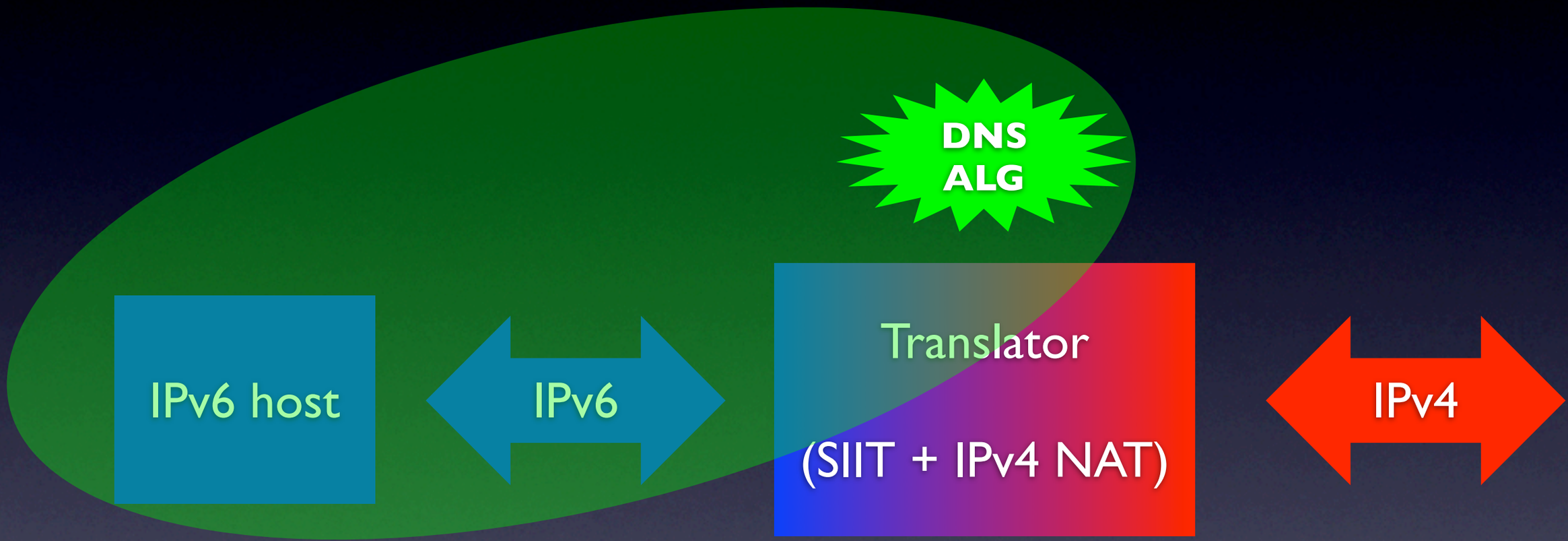
New in this version

- 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



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 → IPv4 translators remain the same
- Adds a number of options to get around original NAT-PT limitations/problems
- Adds IPv4 → IPv6 translation

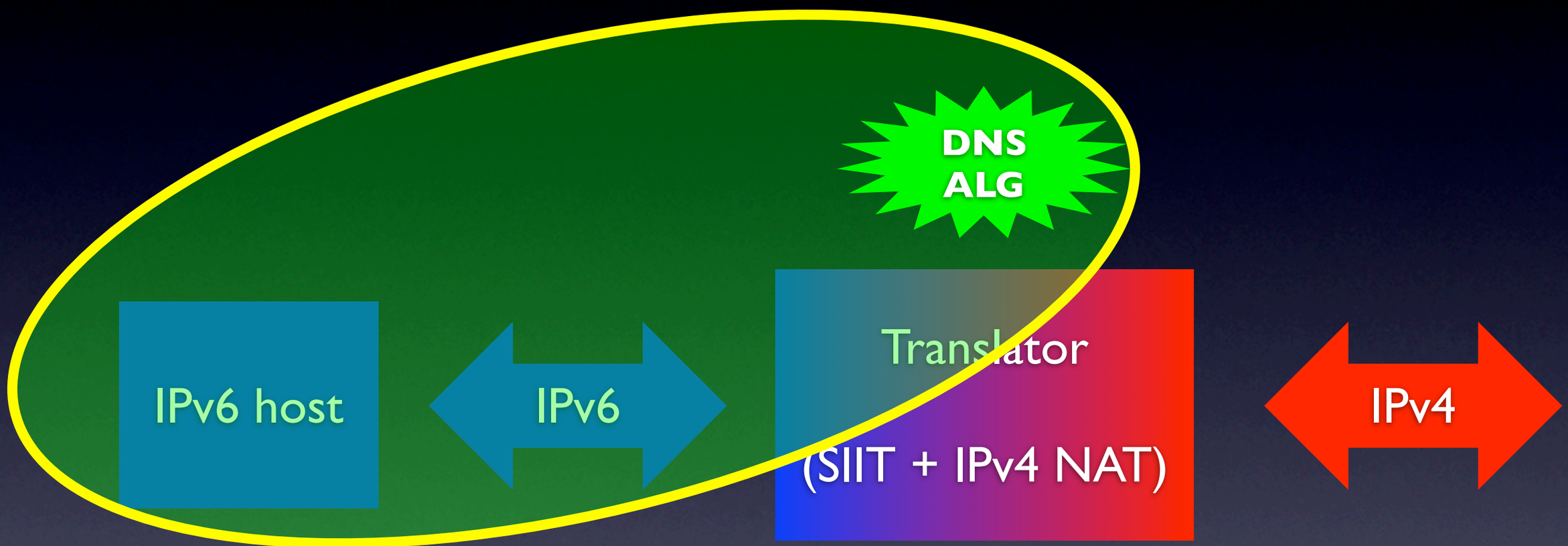
DNS ALG

- 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

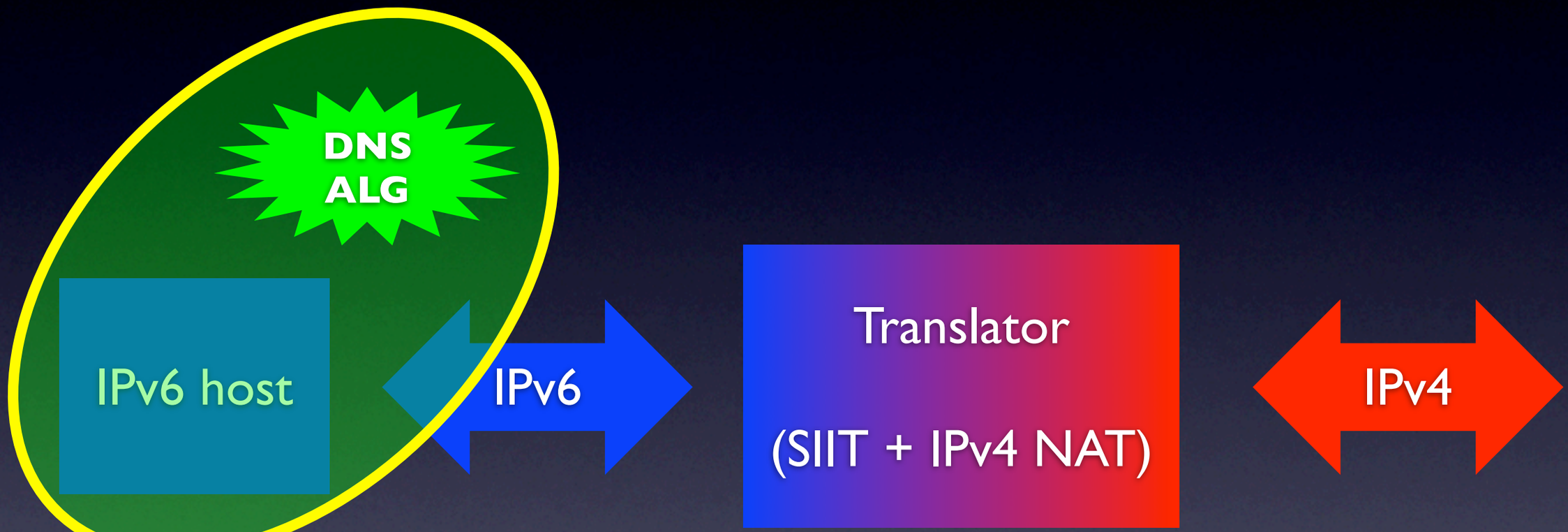
AAAA vs A

- 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...

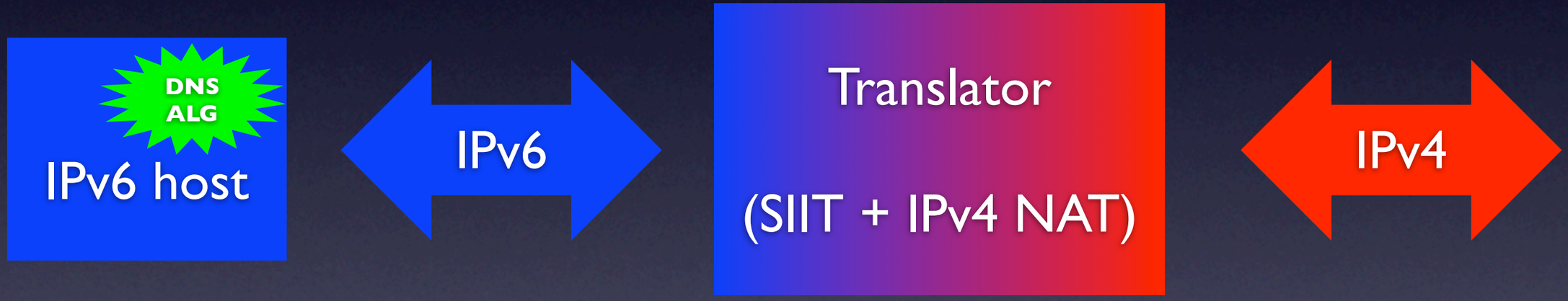
EDNS0 "poison pill"



MNAT-PT (1)



MNAT-PT (2)



MNAT-PT (3)

NO DNS ALG! ✔

IPv4 → IPv6

- IPv6 → IPv4 is easy: IPv4 address fits in IPv6 address
- IPv4 → 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