

IPv4/IPv6 coexistence/ transition and NAT-PT requirements

draft-ietf-v6ops-nat64-pb-statement-req-00

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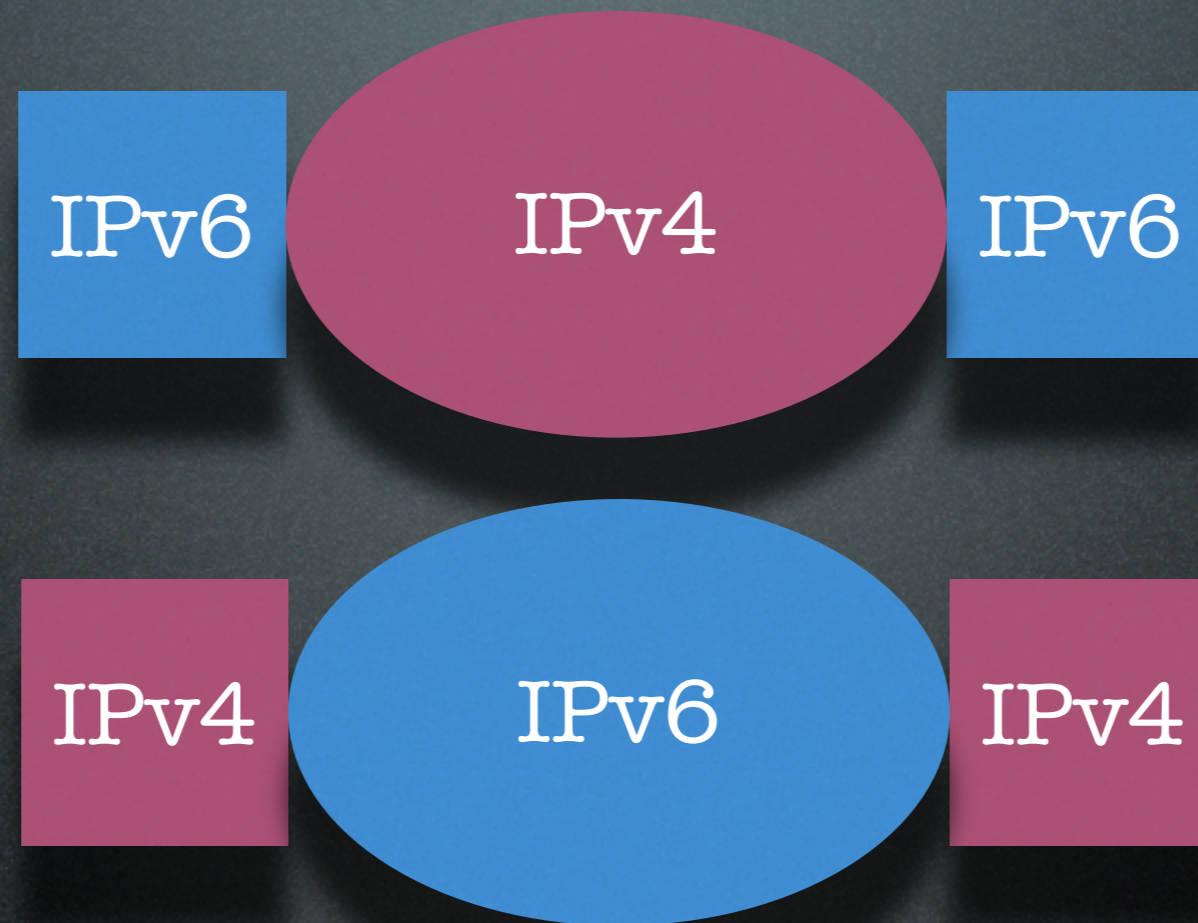
Terminology

- NAT-PT: Network Address Translation - Protocol Translation
 - defines IPv6-to-IPv4 and IPv4-to-IPv6
- NAT64: NAT from IPv6 clients towards IPv4 servers
- Other possibilities: NAT44, NAT46, NAT66 and NAT464

The problem statement

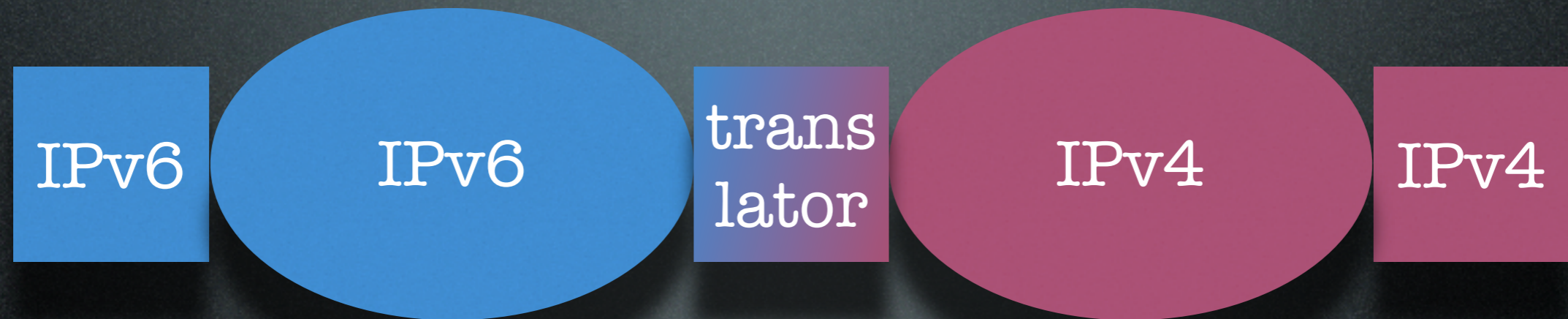
- IPv4/IPv6 coexistence and transition where dual stack is not the norm
- So IPv6-only hosts must talk to IPv4-only hosts
- Original assumption that IPv4+IPv6 dual stack would be deployed before IPv4 depletion was incorrect

Tunnels vs NAT



- Same version on both ends, other version in the middle: tunnels are preferred

Tunnels vs NAT



- If the two ends use different IP versions, translation is necessary

Assumptions

1. Support coexistence, turning off IPv4 should be a business decision
2. Some operators may want to delay deploying IPv6
3. Some operators may want to turn off IPv4 as soon as possible

Assumptions

4. Dual stack, tunneling and translation are all valid options
5. But translation between "semi-connected islands" (i.e., from A to B to A) is not a good model
6. Names must be translated
7. Minimize configuration

Modifications

- Modifying IPv4 side not realistic
- Modifying IPv6 side possible
 - but makes deployment harder
- Ideal: no modifications (like old NAT-PT)
 - but this creates broken assumptions, especially on the IPv6 side (for instance, synthetic AAAA records break DNSSEC)

Specific requirements

3. NAT64 must not get in the way of dual stack operation
4. "Not violate DNS semantics"
5. IPv4 routing must not impact IPv6
6. Must support TCP, UDP, ICMP and TLS

Specific requirements

7. Conform to BEHAVE requirements
8. Fragments must be handled correctly
9. DNSSEC must not be prevented
10. IPsec over UDP must be supported

How many users per IPv4 address?

- BEHAVE working group requires "endpoint independent mapping"
 - each session uses up a port on the IPv4 side
 - so max 64000 concurrent sessions per public IPv4 addresses
 - web uses 5 - 30 sessions per page
- Is this workable?
 - alternative: more sessions, no P2P

Questions, remarks?

- <http://www.ietf.org/internet-drafts/draft-ietf-v6ops-nat64-pb-statement-req-00.txt>
 - Marcelo Bagnulo, Fred Baker, Iljitsch van Beijnum
- Remarks and questions:
 - come talk to me!
 - send email to the authors or IETF v6ops mailinglist