

IPv6-only capable resolver utilising NAT64

draft-momoka-v6ops-ipv6-only-resolver

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Motivation

- IPv6-only iterative resolvers are currently unusable 😞😞😞
- Because there are IPv4-only authoritative servers
- All other applications can use DNS64, but a resolver can't because it's the resolver.

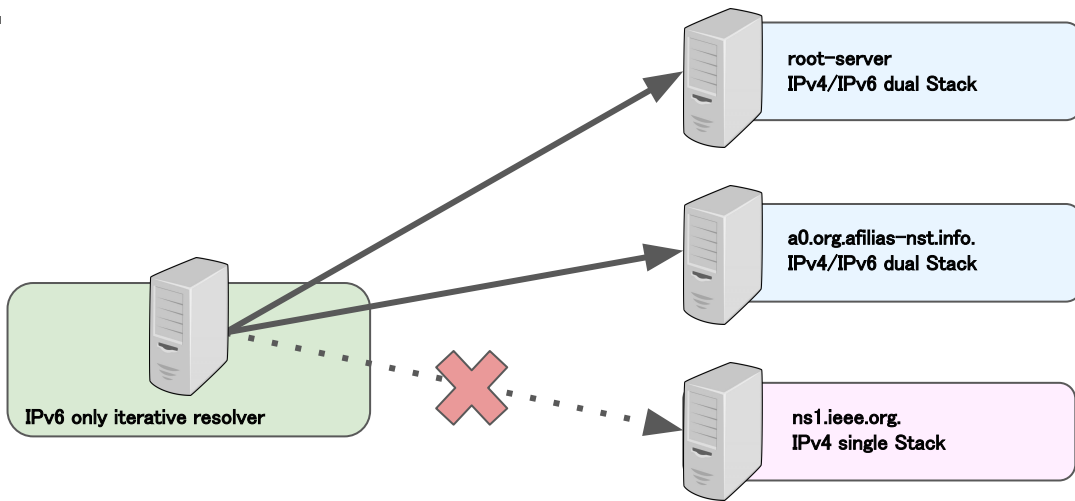
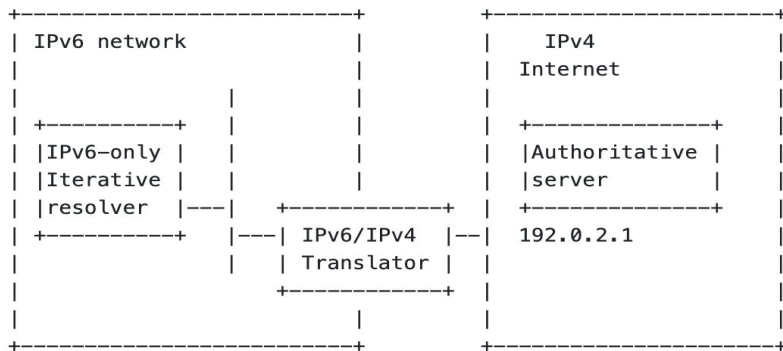


Figure 3: Network example referenced in this document with an IPv6-only iterative resolver

How IPv6-only capable resolver works

When there is only a A record for an authoritative server, the resolver perform address synthesis to the IPv4 address and make it IPv6

- Apply the Pref64::- This way the IPv6 packet will be translated to an IPv4 packet at the NAT64.

Let's take away IPv4 from resolvers

- This draft is aimed to servers that do not have a CLAT.
- Deploying IPv4 as a service is tricky.
Deploying DNS64/NAT64 is easy.
- Most applications can reach IPv4 Internet via
DNS64/NAT64.
- The resolver will not need to have an IPv4 address with
this implementation.

Implementations

Not yet merged, but popular DNS software are implementing these features.

BIND

https://gitlab.isc.org/isc-projects/bind9/-/merge_requests/6334/commits

Unbound

<https://github.com/NLnetLabs/unbound/pull/722>

Is this worth documenting?

WG Adoption?

How to obtain the Pref64::/n of the NAT64

- Either static configuration or
- Discovery mechanisms. (The Port Control Protocol [RFC7225] or Router Advertisements [RFC8781].
- Using the mechanisms described in [RFC7050] or [draft-hunek-v6ops-nat64-srv] may not function because these need a resolver to work.)

Reference RFC3901 BCP91

4. DNS IPv6 Transport recommended Guidelines

In order to preserve namespace continuity, the following administrative policies are recommended:

- **every recursive name server SHOULD be either IPv4-only or dual stack,**

This rules out IPv6-only recursive servers. However, one might design configurations where a chain of IPv6-only name server forward queries to a set of dual stack recursive name server actually performing those recursive queries.

- **every DNS zone SHOULD be served by at least one IPv4-reachable authoritative name server.**

This rules out DNS zones served only by IPv6-only authoritative name servers.