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DNS46 for the IPv4/IPv6 Stateless Translator
draft-xli-behave-dns46-for-stateless-03

Abstract

The stateless translator can support IPv6-initiated communications as well as IPv4-initiated communications for IPv6 hosts using IPv4-translatable addresses. DNS support for the IPv6-initiated communication is defined in the DNS64 specification. This document defines the DNS46 function for the stateless translator.

Status of this Memo

This Internet-Draft is submitted to IETF in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on February 18, 2011.

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1. Introduction

DNS mechanism is one of the functions model for the IPv4/IPv6 transition [I-D.ietf-behave-v6v4-framework]. DNS64 allows IPv6 hosts to resolve names of IPv4 hosts whereas DNS46 allows IPv4 hosts to resolve names of IPv6 hosts.

General DNS46 is considered harmful, as NAT-PT was deprecated by IETF [RFC4966]. However, stateless translators can support IPv6-initiated communications (scenario 1 and 3) which requires the DNS64 support, as well as IPv4-initiated communications (scenario 2 and 4) which requires the DNS46 support [I-D.ietf-behave-v6v4-framework] [I-D.ietf-behave-v6v4-xlate].

DNS64 is used for both stateful and stateless translators and it is defined in [I-D.ietf-behave-dns64]. DNS46 is only used for the stateless translators and it is defines in this document.

2. Notational Conventions

The key words MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD, SHOULD NOT, RECOMMENDED, MAY, and OPTIONAL, when they appear in this document, are to be interpreted as described in [RFC2119].

3. DNS46 for the IPv4/IPv6 Stateless Translator

The DNS46 for stateless IPv4/IPv6 translation is for the following scenarios:

- Scenario 2: The IPv4 Internet to an IPv6 network.
- Scenario 6: An IPv4 network to an IPv6 network.

3.1. Authoritative DNS server

Since the destination is "an IPv6 network", DNS46 can be deployed as an authoritative DNS server [RFC1035] in an IPv6 network.

3.1.1. Static AAAA record

This is very similar to the authoritative DNS configuration of dual-stack hosts. The only difference is that in the dual-stack case, the A record and AAAA record are independent, while in stateless translation case, the hosts are typically IPv6 single stack (or for some reason incapable of using IPv4 on a particular network) using IPv4-translatable addresses and the A record MUST be derived from the

AAAA record based on the algorithm and the PREFIX information [I-D.ietf-behave-address-format].

3.1.2. Varying AAAA record

If an IPv6 host has a varying AAAA record (that is, it could change due to the IPv6-only host changing its IPv6 address and registering its new address via, for example, DNS Dynamic Updates [RFC2316]), then the dynamic DNS46 function is required. However, it is still the authoritative DNS. When the authoritative DNS receives a dynamic update containing AAAA record, it MUST synthesize corresponding A record before signing the zone, which can be derived based on the algorithm and the PREFIX information [I-D.ietf-behave-address-format].

3.2. DNS resolver

For scenario 2 (the IPv4 Internet to an IPv6 network) the implementation of DNS46 resolver is impossible, since the IPv4 hosts are in the IPv4 Internet.

3.2.1. DNS resolver for scenario 6

However, for scenario 6 (an IPv4 network to IPv6 network) [I-D.ietf-behave-v6v4-framework], it is possible to use DNS resolver in an IPv4 network to synthesize A records from the AAAA records based on the algorithm and the PREFIX information [I-D.ietf-behave-address-format].

4. Security Considerations

When DNS46 function is provided by authoritative DNS server, DNS46 can support DNSSEC without problem.

When DNS46 function is provided by authoritative DNS server, the reverse DNS is also under the same network operator's control which may provide additional validation function for the IPv4-translatable IPv6 addresses.

5. IANA Considerations

This memo adds no new IANA considerations.

Note to RFC Editor: This section will have served its purpose if it correctly tells IANA that no new assignments or registries are required, or if those assignments or registries are created during

the RFC publication process. From the author's perspective, it may therefore be removed upon publication as an RFC at the RFC Editor's discretion.

6. Acknowledgments

The authors would like to acknowledge the following contributors of this document: Dan Wing and Kevin Yin.

7. Normative References

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