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S. Cheshire
D. Schinazi
Apple Inc.
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Special Use Domain Name 'ipv4only.arpa'
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Abstract

The document "Discovery of the IPv6 Prefix Used for IPv6 Address Synthesis" [[RFC7050](#)] specifies the Special Use Domain Name 'ipv4only.arpa', with certain precise special properties, but neglected to include a Domain Name Reservation Considerations section [[RFC6761](#)] formalizing those special properties. This document updates [RFC 7050](#) and formally specifies the Special Use Domain Name rules for ipv4only.arpa.

Status of this Memo

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1. Introduction

The document "Discovery of the IPv6 Prefix Used for IPv6 Address Synthesis" [[RFC7050](#)] specifies the Special Use Domain Name 'ipv4only.arpa', with certain precise special properties, but neglected to include a Domain Name Reservation Considerations section [[RFC6761](#)] formally stating those special properties.

As a result of the name 'ipv4only.arpa' not being formally declared to have special properties, there was no mandate for software to treat this name specially. Queries for this name are handled normally, and result in queries to the 'arpa' name servers. At times, for reasons that are as yet unclear, the 'arpa' name servers have been observed to be slow or unresponsive. The failures of these 'ipv4only.arpa' queries result in failures of software that depends on them for NAT64 address synthesis. Also, having millions of devices around the world depend on these answers generates pointless additional load on the 'arpa' name servers, which is completely unnecessary when this name is defined, by Internet Standard, to have only two address records, 192.0.0.170 and 192.0.0.171, and no other records.

To remedy this situation, this document updates [RFC 7050](#) and specifies the formal Special Use Domain Name rules for ipv4only.arpa.

2. Conventions and Terminology Used in this Document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in "Key words for use in RFCs to Indicate Requirement Levels" [[RFC2119](#)].

3. Security Considerations

Hard-coding the answers for ipv4only.arpa queries avoids the risk of malicious devices intercepting those queries and returning incorrect answers.

4. IANA Considerations

[Once published, this should say] IANA has recorded the name 'ipv4only.arpa' in the Special-Use Domain Names registry [[SUDN](#)].

4.1. Domain Name Reservation Considerations

The name 'ipv4only.arpa' is special [[RFC6761](#)] in the following ways:

1. Users should never have reason to encounter the ipv4only.arpa domain name. If they do, queries for ipv4only.arpa should result in the answers specified in [RFC 7050](#). Users have no need to know that ipv4only.arpa is special.
2. Application software may explicitly use the name ipv4only.arpa for NAT64 address synthesis, and expect to get the answers specified in [RFC 7050](#). If application software encounters the name ipv4only.arpa as user input, the application software should resolve that name as usual and need not treat it in any special way.
3. Name resolution APIs and libraries SHOULD NOT recognize ipv4only.arpa as special and SHOULD NOT treat it differently. Name resolution APIs SHOULD send queries for this name to their configured recursive/caching DNS server(s).
4. Recursive/caching DNS servers SHOULD recognize ipv4only.arpa as special and SHOULD NOT, by default, attempt to look up NS records for it, or otherwise query authoritative DNS servers in an attempt to resolve this name. Instead, recursive/caching DNS servers SHOULD, by default, act as authoritative and generate immediate responses for all such queries. Traditional recursive/caching DNS servers that act as authoritative for this name MUST generate only the 192.0.0.170 and 192.0.0.171 responses for these queries, and no others. DNS64 recursive/caching DNS servers MUST generate the 192.0.0.170 and 192.0.0.171 address record responses for these queries, and MUST generate the appropriate synthesized IPv6 address record responses for all AAAA queries. This is to avoid unnecessary load on the 'arpa' name servers.
5. Traditional authoritative DNS servers SHOULD recognize ipv4only.arpa as special and SHOULD, by default, generate immediate negative responses for all such queries, unless explicitly configured otherwise by the administrator (which only applies to the administrators of the 'arpa' namespace).
6. DNS server operators MUST understand that ipv4only.arpa is a special name, with answers specified by Internet Standard.

7. DNS Registries/Registrars MUST understand that ipv4only.arpa is a special name, with answers specified by Internet Standard.

5. References

5.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/[RFC2119](#), March 1997, <<http://www.rfc-editor.org/info/rfc2119>>.
- [RFC6761] Cheshire, S. and M. Krochmal, "Special-Use Domain Names", [RFC 6761](#), DOI 10.17487/RFC6761, February 2013, <<http://www.rfc-editor.org/info/rfc6761>>.
- [RFC7050] Savolainen, T., Korhonen, J., and D. Wing, "Discovery of the IPv6 Prefix Used for IPv6 Address Synthesis", [RFC 7050](#), DOI 10.17487/RFC7050, November 2013, <<http://www.rfc-editor.org/info/rfc7050>>.

5.2. Informative References

- [SUDN] "Special-Use Domain Names Registry", <<http://www.iana.org/assignments/special-use-domain-names/>>.

Authors' Addresses

Stuart Cheshire
Apple Inc.
1 Infinite Loop
Cupertino, California 95014
USA

Phone: +1 408 974 3207
Email: cheshire@apple.com

David Schinazi
Apple Inc.
1 Infinite Loop
Cupertino, California 95014
USA

Phone: +1 669 227 9921
Email: dschinazi@apple.com