DNS Root Name Service Protocol and Deployment Requirements
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Abstract

The DNS Root Name service is a critical part of the Internet architecture. The protocol and deployment requirements expected to be implemented for the DNS root name service are defined in this document. Operational requirements are out of scope.

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1. Introduction

[RFC2870] discusses protocol and operational requirements for root name servers for Internet’s domain name system (DNS) protocol [RFC1035]. Since its publication, both protocol and operational requirements have evolved. It makes more sense now to separate the two sets of requirements into two separate documents. The operational requirements are defined in [RSSAC-001]. This document defines the protocol requirements and some deployment requirements.

The root servers are authoritative servers of the unique [RFC2826] root zone (".")[ROOTZONE]. They currently also serve the root-servers.net zone. Some also serve the zone for the .arpa top-level domain [ARPAZONE]. This document describes the external interface of the root name servers from a protocol viewpoint of the service. It specifies basic requirements for the Internet that DNS clients meet when interacting with a root name service over the public Internet.

The keywords 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 BCP 14, [RFC2119].

1.1. RFC 2870 as Historic

This document obsoletes and reclassifies [RFC2870] as Historic.

This document and [RSSAC-001] together functionally replace [RFC2870].

2. Protocol Requirements

This section describes the minimum high-level protocol requirements. Operative details are documented in [RSSAC-001] and implementation is left to the operators of the root name service.

The root name service:
MUST implement core DNS [RFC1035] and clarifications to the DNS [RFC2181].


MUST support UDP[RFC0768] and TCP[RFC0793] transport of DNS queries and responses.

MUST generate checksums when sending UDP datagrams and MUST verify checksums when receiving UDP datagrams containing a non-zero checksum.

MUST implement DNSSEC[RFC4035], as an authoritative name service.

MUST implement EDNS(0)[RFC6891].

3. Deployment Requirements

The root name service:

MUST answer queries from any entity conforming to [RFC1122] with a valid IP address.

MUST serve the unique [RFC2826] root zone[ROOTZONE].

4. Security Considerations

This document does not specify a new protocol. However, the root name service is a key component of the Internet architecture and play a key role into the overall security of the Internet[RFC2826]. Specific security considerations on the DNS protocols are discussed in their respective specifications. The security considerations on the operational side of the root name servers are discussed in [RSSAC-001].

5. IANA Considerations

This document has no action for IANA.

6. Acknowledgements

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7. Informative References


[ROOTZONE] "Root Zone", <ftp://rs.internic.net/domain/root.zone>.


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