

RSSAC026v2: RSSAC Lexicon

An Advisory from the ICANN Root Server System Advisory Committee
(RSSAC)

DD March 2020

Preface

This is an Advisory to the Internet Corporation for Assigned Names and Numbers (ICANN) Board of Directors and the Internet community more broadly from the ICANN Root Server System Advisory Committee (RSSAC). In this Advisory, the RSSAC defines terms related to root server operations for the ICANN Community.

The RSSAC seeks to advise the ICANN community and Board on matters relating to the operation, administration, security and integrity of the Internet's Root Server System. This includes communicating on matters relating to the operation of the Root Servers and their multiple instances with the technical and ICANN community, gathering and articulating requirements to offer to those engaged in technical revisions of the protocols and best common practices related to the operational of DNS servers, engaging in ongoing threat assessment and risk analysis of the Root Server System and recommend any necessary audit activity to assess the current status of root servers and root zone. The RSSAC has no authority to regulate, enforce, or adjudicate. Those functions belong to others, and the advice offered here should be evaluated on its merits.

The RSSAC has relied on the RSSAC Caucus, a group of DNS experts who have an interest in the Root Server System to perform research and produce this publication.

A list of the contributors to this Advisory, references to RSSAC Caucus members' statement of interest, and RSSAC members' objections to the findings or recommendations in this Report are at the end of this document.

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1 Introduction

The precise technical language often found in Internet Engineering Task Force (IETF) Request for Comments (RFCs), while often providing consistency and clarity to technical communities, can sometimes be incomprehensible or misleading when used in a non-technical setting. The purpose of this document is to increase the understanding of terms used commonly when discussing the root server system to the broader ICANN community. It is not to redefine or provide guidance to any technical communities on the correct use of these terms.

This document and its terms should be useful to anyone discussing the DNS root server system. This includes the ICANN community, ICANN staff, RSSAC Caucus members and the RSSAC itself. It will be updated by the RSSAC as the vocabulary used to discuss the root server system evolves. Definitions for other DNS terms can be found in RFC 8499, *DNS Terminology*.¹

The DNS **root zone** is served by the **root server system** from **root servers**, which are run by **root server operators**. The **root zone** is distributed via the **root zone distribution system** and is published by the **root zone maintainer** from data managed by the **root zone administrator**. These and other terms are defined in Section 2.

The relationship of some of these terms is described in *Figure 1* below. The numbers presented in *Figure 1* were accurate at the time this document was published.

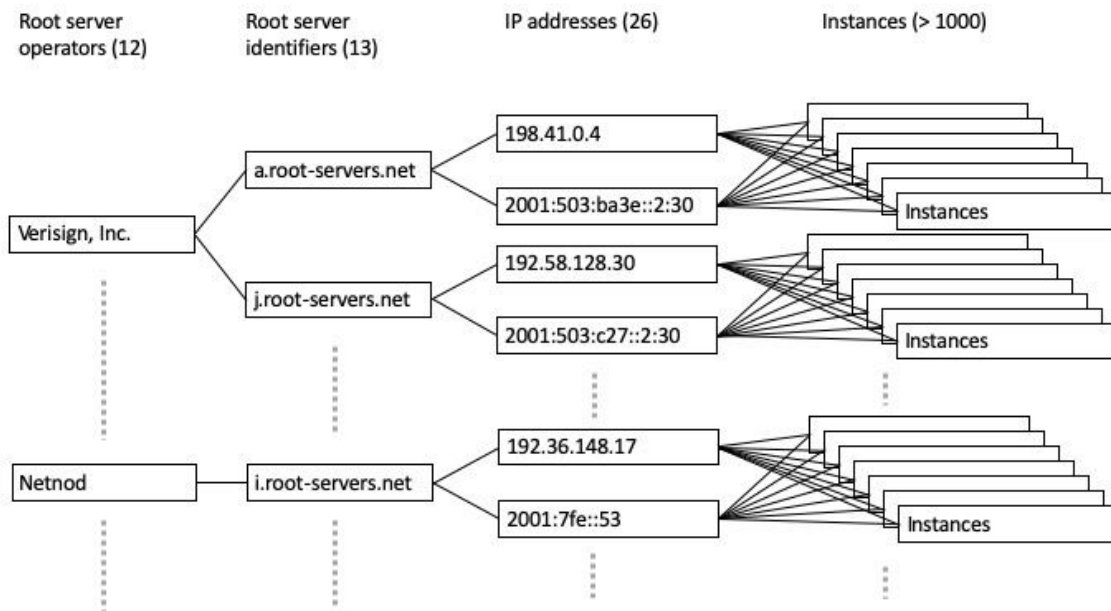


Figure 1: Root Server System Terms

¹ See <https://datatracker.ietf.org/doc/rfc8499/>

2 Terms

instance (anycast instance)

An **instance**, or an **anycast² instance**, is the portion of a root server operator's infrastructure that serves root data at one site (i.e., topological location on the Internet) using an IP address associated with a root server identifier.

root server

A **root server** is the infrastructure maintained by a root server operator to provide the root service at the IP addresses associated with a root server identifier.

root server identifier

A **root server identifier** is the DNS name associated with a root server operator that appears in the root zone and root hints file. For example, c.root-servers.net is the root server identifier associated with the root server managed by Cogent at the time this document was published.

root server operator

A **root server operator** is an organization responsible for managing the root service on IP addresses specified in the root zone and the root hints file. This term is often abbreviated as “RSO”.

root service

The **root service** refers to the collective services provided by all the server instances managed by all of the root server operators. These instances respond to DNS queries about the root zone. It doesn't matter which instance responds to a query. All root servers and their instances provide equivalent answers from the root zone.

root server system

The **root server system** is the set of root servers that collectively implements the root service. This term is often abbreviated as “RSS”.

root zone (aka DNS root)

The DNS is a hierarchy; the **root zone** is the zone that has no parent, as it stands at the top of the DNS hierarchy (aka inverted tree). The root zone contains all the information needed to find top-level domains. Each version of the **root zone** has a unique serial number, and every root server is expected to have (and serve queries about) the current version of the **root zone**.

² See RFC 4786, <https://datatracker.ietf.org/doc/rfc4786/>

root zone administrator

The **root zone administrator** manages the data contained within the root zone, which involves assigning the operators of top-level domains, such as .uk and .com, and maintaining their technical and administrative details.

root zone maintainer

The **root zone maintainer** is responsible for accepting service data from the root zone administrator, formatting it into zone file format, cryptographically signing it using the Zone Signing Key (ZSK) for the root zone, and putting it into the root zone distribution system.

root zone distribution system

Root servers must have a reliable and tamper-proof means of acquiring the latest version of the root zone. The **root zone distribution system** is the collection of systems and procedures by which root servers acquire it.

The terms *master* and *hidden master* are deprecated in the context of the root zone distribution system and we recommend that they not be used. We speak of the root zone distribution system, not root zone distribution master, as it more accurately defines the technology used to provide the root zone to the root server operators. Other deprecated terms include *primary*, *secondary*, *slave*, *stealth master*, *stealth distribution* and *Secondary Name Server* (SNS).

publish, serve

The words **publish** and **serve** have very different meanings that are often conflated. **Publishing** the root zone is the activity performed by the root zone maintainer when preparing a new version of the root zone and entering it into the root zone distribution system. **Serving** the root zone is the activity performed by the root server system using the acquired information.

Day in the Life of the Internet (DITL)

Day in the Life of the Internet (DITL) refers to a series of collections of DNS data.

Collections are coordinated and archived by the Domain Name System Operations Analysis and Research Center (DNS-OARC). The root server operators and other DNS service providers contribute data, generally in the form of packet capture files.

Collections happen on an annual basis, with additional collections around specific events such as the introduction of DNSSEC to the root zone in 2010 and the KSK rollover in 2018.

Root-Ops

Root-Ops is an informal community of all the RSOs. It has no affiliation with other organizations, such as ICANN or the IETF. More information about Root-Ops can be found in RSSAC033.³

Root Server System Advisory Committee (RSSAC)

The **Root Server System Advisory Committee (RSSAC)** is an advisory committee, and a formal body within ICANN. More information about RSSAC can be found in RSSAC033.⁴

³ See RSSAC033: RSSAC Statement on the Distinction Between RSSAC and Root-Ops, <https://www.icann.org/en/system/files/files/rssac-033-24apr18-en.pdf>

⁴ See RSSAC033: RSSAC Statement on the Distinction Between RSSAC and Root-Ops, <https://www.icann.org/en/system/files/files/rssac-033-24apr18-en.pdf>

3 Acknowledgments, Disclosures of Interest, Dissents, and Withdrawals

In the interest of transparency, these sections provide the reader with information about four aspects of the RSSAC process. The Acknowledgments section lists the RSSAC caucus members, outside experts, and ICANN staff who contributed directly to this particular document. The Statement of Interest section points to the biographies of all RSSAC caucus members. The Dissents section provides a place for individual members to describe any disagreement that they may have with the content of this document or the process for preparing it. The Withdrawals section identifies individual members who have recused themselves from discussion of the topic with which this Advisory is concerned. Except for members listed in the Dissents and Withdrawals sections, this document has the consensus approval of the RSSAC.

3.1 Acknowledgments

RSSAC thanks the following members for their time, contributions, and review in producing this Report.

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3.2 Statements of Interest

RSSAC Caucus member biographical information and Statements of Interests are available at: <https://community.icann.org/display/RSI/RSSAC+Caucus+Statements+of+Interest>.

3.3 Dissents

There were no dissents.

3.4 Withdrawals

There were no withdrawals.

4. Revision History

Version 1

Version 1 of RSSAC026 was published on 14 March 2017, and is available at:
<https://www.icann.org/en/system/files/files/rssac-026-14mar17-en.pdf>

Version 2

RSSAC026v2 includes the following changes from v1:

- Section 1 was amended to include a reference to RFC 8499, *DNS Terminology*.
- Section 1 was amended to include a description paragraph and illustration relating the following terms: *root zone*, *root server system*, *root servers*, *root server operators*, *root zone distribution system*, *root zone maintainer*, *root zone administrator*.
- Indentation was added to all of the definitions in Section 2.
- The following definitions have been updated in v2:
 - The terms **instance** and **anycast instance** were merged into a single entry in the lexicon.
 - The definition for **root server** was amended to clarify the relationship between a **root server**, **root server identifier**, and the associated IP addresses.
 - The definition of **root server operator** was amended to include the abbreviation..
 - The order of **root service** and **root server system** was switched.
 - The definition of **root service** was amended to provide clarity.
 - The definition of **root server system** was amended to include the abbreviation.
- The following terms have been added to v2:
 - root server identifier
 - day in the life of the internet (DITL)
 - root-ops
 - root server system advisory committee (RSSAC)