

A New Cooperation and Governance Model for the Root Server System

Concept Paper on a Community-Driven Process to Develop a Final Model Based on RSSAC037

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Executive Summary

This is a concept paper prepared by the ICANN organization (ICANN org), under the oversight of the ICANN Board Technical Committee, for a community-driven process to develop a new cooperation and governance model for the Root Server System (RSS).

Evolving the RSS would enable direct interaction between the ICANN community and the Root Server Operators (RSOs). The inclusion of the RSOs in the ICANN community paired with the evolution of the RSS will ensure that global root service remains accountable and sustainable into the future. Nothing in this Concept Paper presumes that any RSO intends to give up the responsibilities of root service in any way without consideration.

The model proposed in this Concept Paper, henceforth called the “Concept Model”, would establish three new groups: The Root Server System Governance Board (RGB), the Root Server System Standing Committee (RSC), and the Root Server Operator Review Panel (RRP). In addition to these groups, ICANN org would manage Financial and Secretariat Functions.

The community-driven process to develop a final model for the RSS has three phases: Design, Consultation, and Implementation. During the implementation phase, there are two tracks. The Root Server System Governance Working Group (GWG) would lead the Structural Track to develop a final model, and ICANN org would lead the Administrative Track to plan for implementation of a final model.

The Concept Model builds on “RSSAC037: A Proposed Governance Model for the DNS Root Server System” (RSSAC037). Following the Internet Assigned Numbers Authority (IANA) stewardship transition, the Root Server System Advisory Committee (RSSAC) set out to develop an initial framework to evolve the RSS. In June 2018, RSSAC presented its proposed governance model to the ICANN Board and ICANN community.

The model described in RSSAC037, henceforth called the “RSSAC037 Model”, was developed in response to the exponential growth of the Internet. The number of hosts on the Internet is thousands of times larger than when the RSS was initially designed. The network has evolved to billions of hosts, billions of users, new governance structures, and new business models. These developments place new strains and expectations on the RSS. The Internet is constantly evolving; therefore, governance of the Internet's infrastructure cannot remain static and must be reviewed regularly.

The RSS, being part of the core infrastructure of the Internet, has largely maintained the same organizational structure throughout its history. It has scaled and adapted to the growth of the network and continues to provide resilient service. However, the time has come for the RSS to adopt new cooperation, governance, and business models to meet the more rigorous requirements of governance, accountability, and transparency.

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1 Introduction

The ICANN Board is overseeing the development of this Concept Paper as part of the preparation of information for its consideration of RSSAC037 and “RSSAC038: RSSAC Advisory on a Proposed Governance Model for the DNS Root Server System” (RSSAC038). The proposal further develops the functions originally conceived by the RSSAC in RSSAC037. This Concept Paper acknowledges the important role and continued commitment of the RSOs to the overall security, stability, and resiliency of the RSS.

2 The Concept Model

The Concept Model establishes three new groups: The Root Server System Governance Board (RGB), the Root Server System Standing Committee (RSC), and the Root Server Operator Review Panel (RRP). In addition to these groups, ICANN org could manage Financial and Secretariat Functions. Each new group and their function would be reviewed periodically per the practices and processes established in the ICANN Bylaws.

2.1 The Root Server System Governance Board

The purpose of the RGB is to develop policies for the RSS in the interest of its stakeholders as identified in Section 4 of RSSAC037. This includes strategy, architecture, and technical evolution, building on the Strategy, Architecture, and Policy Function of RSSAC037. The RGB will also establish, modify, or revoke policies that may affect expected Service Level Expectations (SLEs) for the RSOs that are accepting funding. RSOs that accept funding and RSOs that forego funding must still meet the same service requirements and report on them using the same metrics. The RGB should start with existing RSSAC documents and IETF RFCs as a foundation for service expectations.

The RGB would perform the responsibilities contemplated in Section 5.2 of RSSAC037:

- Coordinating with other stakeholders concerned with the RSS and the root zone in developing a strategic vision for the RSS. Examples of such groups include the ICANN Board, IETF/IAB, SSAC, and RZERC.
- Making recommendations for the appropriate number of RSOs.
- Predicting performance envelopes, such as maximum size of the root zone and rate of change from an RSS system-level perspective.
- Strategizing about how to incorporate emerging technologies and how to sunset those technologies that are becoming obsolete.
- Administration and oversight of all processes enacted in the delivery of the Concept Model.
- Ensuring that the guiding principles of the RSS and RSOs remain embedded in technical and operational architectures.
- Defining measurements to ensure that RSOs are meeting a minimum level of performance. Once defined, communicating these measurements to the RSC.
- Defining system-wide, externally verifiable metrics to demonstrate that the RSS as a whole is online, serving correct and timely responses to end users. Once defined, communicating these measurements to the RSC.
- Providing guidance and developing best practices for root server operations based on industry-accepted best practices for the design, capacity, and availability of root servers. This guidance and best practices support the availability, performance, scalability, and security of the RSS.
- Defining and articulating policies concerning the RSS. Examples of such policies include; RSS expectations, impacts of significant changes to functionality that the RSS is expected to support, impacts of a significant expansion of the root zone data, and emerging technologies that may impact the functioning of the RSS.

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- Gathering input from stakeholders and valued contributors on policy and best practices. This may include handling any grievances concerning an RSO or the RSS.
 - Developing evaluation procedures to test the readiness of RSOs and root server instances in cases of outage or overload scenarios.
 - Operationalizing the minimum levels of performance developed in the RGB and communicating this information to the RSC.
 - Operationalizing the system-wide RSS metrics, and collaborating with the RSC to assess whether the system as a whole meets the defined policy requirements for the RSS.
 - Communicating with stakeholders about strategic, architectural, and policy decisions.

The RGB would comprise representatives of the RSS stakeholders, identified in Section 4 of RSSAC037, “ensuring that the resulting membership contains the breadth and balance of skills needed, including technical, policy and governance expertise.”¹ Furthermore, the RGB “should include subject matter experts on Internet technologies (with an emphasis on DNS root technology), security, technology architecture, service operations, and policy.”²

Some of the work to be conducted by the RGB is currently performed by the RSSAC and RSSAC Caucus. Therefore, the existing RSSAC and RSSAC Caucus may evolve as part of the implementation of the Concept Model. The exact functions of the RGB and its structure would be determined by the community-driven process.

2.2 The Root Server System Standing Committee

The purpose of the RSC would be to monitor the performance of the RSS and RSOs against the SLEs, including technical and nontechnical attributes identified in Section 5.4.1 of RSSAC037. The RSC is critical to the accountability of the RSOs. This builds on the Performance Monitoring and Measurement Function of RSSAC037.

The RSC would perform the responsibilities contemplated in Section 5.4 of RSSAC037:

- Monitoring and measuring RSOs and the RSS against technical and nontechnical standards and expectations that the RGB develops.
- Evaluating candidate RSOs for the RRP against technical and nontechnical service expectations that the RGB has developed.
- Reporting if the RSOs are appropriately using the funds they receive from the Financial Function.

The RSC would comprise appointed representatives from the Country Code Names Supporting Organization (ccNSO), the Internet Engineering Task Force (IETF)/Internet Architecture Board (IAB), RSOs, and the Registries Stakeholder Group (RySG) due to their relevant subject matter expertise. The RSC would include and liaisons from IANA and the Root Zone Maintainer (RZM) due to their operational roles in the RSS.

¹ RSSAC037, p. 22

² RSSAC037, p. 21

2.3 The Root Server Operator Review Panel

The purpose of the RRP would be to conduct reviews of RSOs for the purposes of a designation, remediation, or removal process. This builds on the Designation and Removal Function of RSSAC037.

Though the RRP is a standing community group, it can only be activated by the RGB for a designation, remediation, or removal process. The RRP does not have regular work, though it should review its operating procedures annually to ensure preparedness and feasibility should it be activated by the RGB.

The RRP would perform the responsibilities contemplated in Section 5.3 of RSSAC037:

- Receiving applications from organizations willing to be designated as RSOs. In general, the first step is to identify the need to designate a new operator. The RRP will receive applications *only* after establishing a need – to prevent unnecessary work that may never result in a designation.
- Requesting the RSC to evaluate new RSO candidates on technical and nontechnical merits. Candidates must be evaluated by the RSC as a prerequisite to being designated as an RSO.
- Reviewing RSC evaluations of candidate RSOs.
- Recommending to the ICANN Board the designation of an RSO from a pool of candidates based on the evaluation.
- Handling removal cases where an RSO should no longer operate the root service, subject to ICANN Board oversight.
- Participating in accountability efforts by evaluating existing operators for compliance with policies and metrics. The RRP will use information that the RSC provides to recommend whether to remove or replace any existing RSOs.

The RRP would comprise representatives identified in Section 5.3.1 of RSSAC037.

2.4 Financial Function

The primary purpose of the Financial Function is to receive funds and distribute them to RSOs. The Concept Model requires sustainable funding because, “sound and healthy funding is critical for robust service design, delivery, and operations.”³ Moreover, the Financial Function “should preserve [RSOs] autonomy and independence in architecting and operating the service, while requiring adherence to standards and service expectations.”⁴

Per Section 5.5.2 in RSSAC037, the Financial Function would include these key elements:

- Service Level Expectations (SLEs) should exist between the stakeholders that provide funding and RSOs that receive that funding. SLEs are expectations between a service provider and another party. Minimum standards of service levels and expectations will be codified by the RGB (e.g., RSSAC001).

³ RSSAC037, p. 27

⁴ Ibid.

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- Operators that are financially self-sufficient and choose to opt-out of general funding will establish the integrity of their continued funding by providing information to the RSC.
 - An RSS fund should be created by sourcing funds from numerous entities, including the stakeholders and the ICANN community.
 - For funds received, the RSOs will be subject to audits to ensure financial accountability for RSO service delivery.
 - An appropriate process needs to be developed to distribute funding, coupled with a selection committee whose composition includes stakeholders and other relevant entities. Funds could be requested for three reasons: operations, emergencies, and research and development.

ICANN org would be responsible for performing the Financial Function with the oversight of the ICANN Board. While details of the Concept Model will emerge as the process continues, it is important to remember the new services that the RSOs offer to ICANN and others constitute incremental effort. They also represent a change to the traditional independence of the RSOs. As such, it is expected that there will be funding for existing capital assets and services, in addition to ongoing operations that will be funded at some level for those RSOs that request it.

2.5 Secretariat Function

As part of the Concept Model, ICANN org would assume the Secretariat Function proposed in RSSAC037. ICANN org would, “assist RSOs with certain administrative functions and to create a platform for engagement” providing, “an official platform from which [the RSOs] can address RSO-related technical issues in an accountable and transparent manner.”⁵ ICANN org would be the “interface for the Internet community to contact the RSOs.”⁶

Specifically, ICANN org would perform the responsibilities contemplated in Section 5.1 of RSSAC037:

- Performing secretariat and administrative functions to coordinate, facilitate, and support RSO operations and meetings.
- Registering and owning common RSO assets.
- Facilitating and communicating practices related to the RSS.
- Engaging in outreach functions as defined by ICANN and the Internet community.
- Providing a conduit for the Internet community to interact with RSOs.
- Coordinating and providing transparency to the operationalization of appropriate standards (e.g., RSSAC publications and IETF RFCs).
- Assuming new coordination roles that could be defined in the future.

ICANN org would be responsible for determining the appropriate level of resourcing and support to provide the Secretariat Function in the Concept Model.

⁵ RSSAC037, p. 19

⁶ Ibid.

3 Community-Driven Process to Develop a Final Model

The community-driven process to develop a final model for the RSS has three phases: Design, Consultation, and Implementation. During the implementation phase, there are two tracks. The Root Server System Governance Working Group (GWG) will lead the Structural Track to develop a final model, and ICANN org will lead the Administrative Track to plan for implementation of a final model.

3.1 Root Server System Governance Working Group

The establishment of an RSS Governance Working Group (GWG) is the core of this community-driven process. The GWG shall develop a final model (henceforth called the “GWG Model”) for the RSS. The GWG shall refer to RSSAC037 and the Concept Paper as source documents, as well as feedback from Public Comment.

The GWG would be comprised of nine invited representatives from the ccNSO (2), IETF/IAB (2), RSOs (3), and RySG (2) due to their subject matter expertise and three liaisons—one liaison each from the ICANN Board, IANA, and the RZM. These representatives and liaisons would provide input that informs GWG discussions and decisions.

It is important to note that representation on the GWG will not be the only source of stakeholder participation. Rather, the GWG is expected to undertake proactive engagement and consultation with the wider community as part of its process.

The At-Large Advisory Committee (ALAC), Address Supporting Organization (ASO), Governmental Advisory Committee (GAC), Security and Stability Advisory Committee (SSAC), broader Generic Names Supporting Organization (GNSO) community, and global Internet community will be invited to provide input on the outcomes of the GWG via Public Comment.

Furthermore, the GWG should:

- Thoroughly understand its mandate and limitations.
- Commit to a timeline with clear milestones for deliverables.
- Work openly and transparently.
- Seek informed contributions when necessary.
- Embrace the principles outlined in RSSAC037.
- Carefully consider the RSSAC037 Model and Concept Model.
- Regularly report to the ICANN Board and ICANN community on its progress.
- Effectively leverage the resources of ICANN org, including aligning any meetings with existing events already supported by ICANN org.

The GWG Model will inform the discussions and deliberations of the ICANN Board in responding to RSSAC037 and determining next steps in the evolution of the RSS, in conjunction with the RSSAC and RSS stakeholders.

ICANN org will develop three foundational documents (“GWG documents”) for the GWG:

1. Charter
2. Operating procedures (including a working definition of consensus)
3. Work plan

The charter includes a statement of work to ensure the GWG addresses questions raised and issues identified by the RSSAC about this Concept Paper during the Design Phase. The charter also keeps the GWG within scope when developing the initial set of SLEs and respects the independence of the RSOs. To clarify the scope of the GWG, RSSAC would develop and publish a statement defining RSO independence.

The operating procedures for the GWG should uphold the value of transparency, focus the GWG on its task, provide efficient and nimble administration, and embrace consensus-based decision making. ICANN org would refer to the various operating procedures in the ICANN community for guidance. The work plan for the GWG would keep it on track to meet predetermined milestones within the allocated resources and support of the ICANN org. The GWG would dissolve after RSSAC, ICANN Board, IETF/IAB, and RSOs approve its work.

3.2 Design Phase

The Design Phase is currently underway. During this phase, ICANN org is reviewing and evaluating RSSAC037 at the direction of the ICANN Board. This Concept Paper, and any further interactions, will be developed under ICANN Board oversight and presented to the ICANN Board for approval. ICANN org is also assessing the feasibility of RSSAC038, ultimately making recommendations for the ICANN Board to consider as part of this process.

3.2.1 Steps

1. After the ICANN Board Technical Committee approves, ICANN org presents Concept Paper to RSSAC. ICANN org captures the feedback from RSSAC.
2. ICANN org presents draft GWG documents to the ICANN Board and RSSAC for consideration and feedback. ICANN org captures the feedback from the ICANN Board and RSSAC.
3. ICANN org revises the Concept Paper and GWG documents.
4. The ICANN Board considers and approves resolution and directs ICANN org to publish RSSAC037, revised Concept Paper, and revised GWG documents for Public Comment.

3.3 Consultation Phase

During this phase, RSSAC037, a revised version of this Concept Paper, and revised GWG documents are available for Public Comment. ICANN org will work with RSSAC to ensure the Public Comment proceeding is broadly shared across the ICANN and global Internet communities and thoroughly considered by the RSS stakeholders. This may include webinars, briefings, and presentations at relevant community gatherings including ICANN and IETF meetings.

3.3.1 Steps

1. ICANN org publishes RSSAC037, revised Concept Paper, and GWG documents for Public Comment.
 - a. ICANN org and RSSAC conduct outreach and engagement.
 - b. Public Comment ends.
2. ICANN org summarizes and analyzes feedback captured during Public Comment.
3. With input from Public Comment, ICANN Board directs finalization of Concept Paper and GWG documents.
4. ICANN org presents final GWG documents to ICANN Board for approval.
5. ICANN Board approves resolution directing ICANN org to convene the GWG.

3.4 Implementation Phase

This is the third phase of developing a final model for the RSS. The implementation phase has two tracks: The Structural Track to finalize the GWG Model and the Administrative Track to plan for implementation of the GWG Model.

3.4.1 Steps: The Structural Track – Developing the GWG Model

The GWG leads the Structural Track working through its work plan to develop a final model.

1. GWG develops a final model.
 - a. GWG reviews RSSAC037, Concept Paper, and Public Comment feedback.
2. ICANN org reviews potential conflicts of interest concerns related to its role as an RSO and performing the Finance Function
 - a. GWG produces an assessment report of the ICANN org conflicts of interest review.
3. GWG develops initial set of SLEs.
4. GWG finalizes charters of any new groups.
5. GWG presents SLEs and charters to RSSAC, the ICANN Board, IETF/IAB, and RSOs.
 - a. ICANN org provides input on funding considerations and the budget process raised through SLEs and charters.
 - b. RSSAC, the ICANN Board, IETF/IAB, and RSOs consider. The ICANN Board's consideration of the SLEs is related to the budgetary impacts.
 - c. GWG captures feedback.
6. If needed, GWG revises SLEs and charters.
7. If needed, GWG presents revised SLEs and charters to RSSAC, the ICANN Board, IETF/IAB, and RSOs for consideration.
8. The ICANN Board approves resolution directing ICANN org to publish revised SLEs and charters for Public Comment.
9. ICANN org publishes revised SLEs and charters for Public Comment.

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- a. ICANN org conducts outreach and engagement.
 - b. Public Comment ends.
 10. ICANN org summarizes and analyzes feedback captured during Public Comment.
 11. (GWG remains available for consultation on GWG Model, SLEs, and charters.)
 12. ICANN org finalizes SLEs and charters.
 13. ICANN org presents final SLEs and charters to RSSAC, the ICANN Board, IETF/IAB, and RSOs for approval.
 14. The ICANN Board approves resolution of final SLEs and charters and directs ICANN org to document SLEs and identify appropriate resourcing for GWG Model.
 15. GWG dissolves.
 16. New groups established; GWG Model takes effect.

3.4.2 Steps: The Administrative Track – Planning for Implementation

ICANN org leads the Administrative Track working to estimate the costs of the RSS and GWG Model per Section 5.3.3 in RSSAC037, and prepares the necessary bylaw amendments, budgets, and other documentation to constitute and substantiate it.

Any budgetary and financial implications would be handled through ICANN processes that ensure accountability and transparency.

1. ICANN org develops proposed methodology for cost estimates and reviews with GWG and the ICANN Board.
2. ICANN org creates cost estimates for the current RSS.
3. ICANN org creates cost estimates of the GWG Model and conducts a risk analysis of it, identifying appropriate mitigation strategies.
4. ICANN org produces redline and clean versions of bylaw amendments, initial budgets, and other documentation developed by GWG and ICANN org.
5. ICANN org presents redline and clean versions of bylaw amendments, initial budgets, and other documentation.
 - a. The ICANN Board considers.
 - b. ICANN org captures feedback.
6. ICANN org revises bylaw amendments, budgets, and other documentation.
7. ICANN org presents revised bylaw amendments, budgets, and other documentation to the ICANN Board for approval.
8. The ICANN Board approves resolution directing ICANN org to publish revised bylaw amendments, budgets, and other documentation for Public Comment.
9. ICANN org publishes revised bylaw amendments, budgets, and other documentation developed by GWG and ICANN org for Public Comment.
 - a. ICANN org conducts outreach and engagement.
 - b. Public Comment ends.
10. ICANN org summarizes and analyzes feedback captured during Public Comment.
11. ICANN org finalizes bylaw amendments, budgets, and other documentation.

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12. ICANN org presents final bylaw amendments, budgets, and other documentation to the ICANN Board for approval.
 13. The ICANN Board approves resolution of final bylaw amendments and directs ICANN org to execute adopt budgets, and effect other documentation.
 - a. ICANN Secretary notifies Empowered Community of final bylaw amendments, budgets, and other documentation.
 14. Empowered Community Action process occurs as applicable.
 - a. Empowered Community delivers Notice.

