A Proposed Governance Model for the DNS Root Server System
A Few Acronyms

RSS
• Root Server System

RS
• Root Server

RSO
• Root Server Operator

SF
• Secretariat Function

SAPF
• Strategy, Architecture, and Policy Function

DRF
• Designation and Removal Function

PMMF
• Performance Monitoring and Measurement Function

FF
• Financial Function
Setting the Context and Expectations

3-year Effort

- New work with RSSAC focus only

An initial draft model

- RSSAC is providing a starting point
Our Initial Impetus

2014: IANA Stewardship Transition Work Begins

2015: RSSAC recognizes the need to address some important issues

Global Engagement
Multistakeholder Approach

Accountability – Who is holding the RSOs accountable and for what?
Continuity – How are we assuring continuity of service?
Who are the stakeholders of the RSS and RSOs?

Sept 2015: RSSAC embarks on the journey of answering these questions
Workshop Timeline and What Happened

RSSAC Workshop1
Sep 23-24 2015
University of Maryland
- Evolution
- Accountability
- Continuity

RSSAC Workshop2
May 11-12 2016
Verisign
- Evolution
- Architecture
- Re-inventing RSSAC
- Early version of the mind map is created

RSSAC Workshop3
Oct 11-13 2016
University of Maryland
- Evolution
- How Tall?

RSSAC Workshop4
May 2-4 2017
Verisign
- Who are we accountable to and for what?
- What are the measurements of accountability?

RSSAC Workshop5
Oct 10-12 2017
University of Maryland
Mind Map Concept Papers
- SAPF
- DRF
- PMMF
- SF
- FF

RSSAC Workshop6
May 1-3 2018
Verisign
The proposed governance model comes together.
Global DNS Root Service

1000+ DNS root server instances in the global DNS root cloud

1. Cogent Communications
2. ICANN
3. Internet Systems Consortium
4. NASA Ames Research Center
5. Netnod
6. Réseaux IP Européens Network Coordination Centre
7. University of Maryland
8. University of Southern California, Information Sciences Institute
9. U.S. Department of Defense Network Information Center
10. U.S. Army Research Laboratory
11. Verisign, Inc.
12. WIDE Project and Japan Registry Services
To remain a global network, the Internet requires a globally unique public namespace.

Principle 1

IANA is the source of DNS root data.

Principle 2

The RSS must be a stable, reliable, and resilient platform for the DNS service to all users.

Principle 3

Diversity of the root server operations is a strength of the overall system.

Principle 4

Architectural changes should result from technical evolution and demonstrated technical need.

Principle 5

The IETF defines technical operation of the DNS protocol.

Principle 6

RSOs must operate with integrity and an ethos demonstrating a commitment to the common good of the Internet.

Principle 7

RSOs must be transparent.

Principle 8

RSOs must collaborate and engage with the stakeholder community.

Principle 9

RSOs must be autonomous and independent.

Principle 10

RSOs must be neutral and impartial.

Principle 11
Scope of Proposed Model

ROOT ZONE PROVISIONING, DISTRIBUTION, AND RESOLUTION

Change Requests → IANA Function → Root Zone Maintainer

Provisioning

Resolution

TLD OPERATIONS

Queries → Operators → Responses

Distribution servers → Anycast sites

DNS RESOLVERS
Model Design Principles

The Model

- Avoidance of Conflicts of Interest
- Separation of Functions
- Transparency and Auditability
Stakeholders

ICANN Community

RSS

IETF/IAB

RSOs
Governance: An Interplay of Three Constructs Operating in Parallel
Governance: A Balance and Interplay of Separate Functions

- SAPF
- SF
- FF
- DRF
- PMMF
Perform secretariat functions to coordinate and support RSO operational meetings.

Hold common RSO assets.

A conduit for the Internet community to interact with RSOs.

Other…
Strategy

Coordinating with other stakeholders a strategic vision for the RSS. Examples of such groups include the ICANN Board, IETF/IAB, SSAC, and RZERC.

Strategizing about how to incorporate emerging technologies and how to sunset those technologies that are becoming obsolete.

…and many other responsibilities.

Architecture

Ensuring that the guiding principles of the RSS and RSOs remain embedded in technical and operational architectures.

Defining system-wide, externally verifiable metrics to demonstrate that the RSS as a whole is online.

…and many other responsibilities.

Policy

Operationalizing the minimum levels of performance developed in the SAPF architecture stream, and communicating this information to the PMMF.

Articulating policy on handling any grievances concerning an RSO or the RSS.

…and many other responsibilities.
Designation and Removal Function (DRF)

Designations + Removals = Set of Operators
Performance Monitoring and Measurements Function (PMMF)

A sample of what could be measured and monitored

RSO Technical Metrics
- System Capacity
- Bandwidth
- Queries processed

Non-technical Parameters
- Ethos
- Financials

Overall Health of the RSS

RSS Metrics
Financial Function (FF)

The option to receive funding should exist coupled with Service Level Expectations.

Funding should be sourced from stakeholders and related parties.

Funding should support RSS operations, RSS emergencies, R&D and model implementation.
Financial Function (FF)

- Emergencies $$$
- RSS Operations $$$$$
- Model Implementation Costs $$
- Research and Development $$
- The cost of getting here! $
Introducing BPQ – A Proposed RSS Capacity Indicator

Bandwidth (B) + Packets per second (P) + Queries per second (Q) = BPQ
Determining the Cost for the Value of BPQ

Costed using industry standard cost determination methodologies

Cost for the value of BPQ
Estimated Cost of the Model

Cost for the value of BPQ + Cost of Risk = Estimated Cost of the Model
Manifesting the Model: A Set of Three Recommendations
RSSAC038 Recommendations

Recommendation 1
• The RSSAC recommends that the ICANN Board initiate a community process to produce a final version of the Model for implementation.

Recommendation 2
• Use the provided methodology (or a similar one) to cost out the implementation and operations of the Model.

Recommendation 3
• Implement the Model based upon the principles of accountability, transparency, sustainability, and service integrity.
Scenarios – Testing the Model

1. Designation
2. Voluntary Resignation
3. Poor Performance
4. Catastrophic Shutdown
5. Rogue Operator
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Thank you.

Questions?