

SAC069

SSAC Advisory on Maintaining the Security and Stability of the IANA Functions Through the Stewardship Transition



An Advisory from the ICANN Security and Stability Advisory Committee (SSAC)
10 December 2014

Preface

This is an Advisory to the ICANN Board, the ICANN community, and the Internet community more broadly from the ICANN Security and Stability Advisory Committee (SSAC) on **Maintaining the Security and Stability of the IANA Functions Through the Stewardship Transition**, as those functions move from the administrative control of an agency of the U.S. Government to some other yet-to-be-determined form.

The SSAC focuses on matters relating to the security and integrity of the Internet's naming and address allocation systems. This includes operational matters (e.g., pertaining to the correct and reliable operation of the root zone publication system), administrative matters (e.g., pertaining to address allocation and Internet number assignment), and registration matters (e.g., pertaining to registry and registrar services). SSAC engages in ongoing threat assessment and risk analysis of the Internet naming and address allocation services to assess where the principal threats to stability and security lie, and advises the ICANN community accordingly. The SSAC has no authority to regulate, enforce, or adjudicate. Those functions belong to others, and the advice offered here should be evaluated on its merits.

A list of the contributors to this Advisory, references to SSAC members' biographies and disclosures of interest, and individual SSAC members' withdrawals and dissents with respect to the findings or recommendations in this Advisory are at the end of this document.

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Executive Summary

Work on this document (SAC069) commenced in May 2014, early in the IANA stewardship transition proposal process. Since then, our initial input on the subject has been published as SAC067 and SAC068, and the operational communities have made substantial progress on their transition proposals to be submitted to the ICG.¹ As a result, some of the findings and recommendations in this report may have been overtaken by events. However, the SSAC believes that the general thrust of the report is accurate and beneficial to the public discourse on the transition of the stewardship of the IANA Functions.

In this Advisory, the SSAC considers issues that may affect the security and stability of the DNS both during and after the transition of the NTIA's stewardship role for the IANA Functions, and makes the following recommendations:

Recommendation 1: The operational communities (protocol parameters, names, and numbers) that have been invited to submit proposals should determine 1) whether or not the requirements and deliverables defined in the IANA Functions Contract should be retained, and if so which ones; 2) whether or not additional external controls are necessary for requirements that should be retained; and 3) if additional external controls are necessary, how and by whom they should be administered.

Recommendation 2a: Each of the communities should determine whether or not existing mechanisms outside of the IANA Functions Contract are sufficiently robust to hold the IANA Functions Operator accountable to the affected communities for the proper performance of the IANA Functions after the IANA Functions Contract expires; and if they are not, the communities should determine what additional accountability mechanisms will be needed.

Recommendation 2b: Each of the communities should review and (if necessary) enhance its policy development process to ensure that all of the instructions that it provides to the IANA Functions Operator are clear and implementable.

Recommendation 3: Each of the communities should investigate and clarify the process for handling the possibility of governmental sanctions and restrictions (e.g., the protocol for obtaining OFAC² licenses where U.S. sanctions might interfere with the ability to execute proper instructions to IANA) following the stewardship transition.

Recommendation 4: As part of the transition process, each of the affected communities should consider the extent to which the importance of transparency and freedom from

¹ The IANA Stewardship Transition Coordination Group. Information available at: <https://www.icann.org/stewardship/coordination-group>.

² See <http://www.treasury.gov/about/organizational-structure/offices/pages/office-of-foreign-assets-control.aspx>.

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improper influence in the performance of the IANA Functions might require additional mechanisms or other safeguards.

Recommendation 5: Noting the stability and efficiency of existing structures, processes, and mechanisms for the management of the root zone, the SSAC recommends that any proposal to replace NTIA's final authorization of root zone changes with an alternative be at least as reliable, resilient, and efficient as the current process.

Recommendation 6: Effective arrangements should be made for the reliable and timely performance of all aspects of the root zone management process post-transition, including inter-organization coordination if the post-transition RZM process involves more than one root zone management partner.

Recommendation 7: NTIA should clarify the processes and legal framework associated with the role of the Root Zone Maintainer after transition.

1 Introduction

On 14 March 2014, the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce (DoC) announced³ its intention to transition out of its current role with respect to the Internet Assigned Numbers Authority (IANA) Functions. In that announcement, NTIA called upon the Internet Corporation for Assigned Names and Numbers (ICANN) to “convene global stakeholders to develop a proposal to transition the current role played by NTIA in the coordination of the Internet’s domain name system (DNS).”

The NTIA specified a set of criteria that must be met by the proposal. The criteria include four main principles:

- support and enhance the multistakeholder model;
- maintain the security, stability, and resiliency of the Internet DNS;
- meet the needs and expectation of the global customers and partners of the IANA services; and
- maintain the openness of the Internet.

During this process, as the stakeholder communities discuss and formulate their expectations and proposals for a post–NTIA IANA Functions arrangement, it will be important to understand how the current (pre-transition) arrangement contributes to the security and stability of the performance of the IANA Functions, and what the security and stability consequences of a transition to a different arrangement might be.

It is also important to emphasize that the stewardship transition is being undertaken solely to allow the U.S. Government to withdraw from its current administrative oversight role with respect to the IANA Functions. The important objective is therefore to preserve the security, stability, and resiliency of the IANA Functions activities through (and beyond) the transition.

This Advisory complements SAC067,⁴ “Overview and History of the IANA Functions,” and SAC068,⁵ “Report on the IANA Functions Contract,” and assumes familiarity with the information contained in those two Reports. Section 2 describes the way in which NTIA’s role in the current IANA Functions arrangement contributes to the security, stability, and resiliency of the IANA Functions activities. Section 3 presents questions and issues that must be addressed by the Internet community in order to preserve the security, stability, and resiliency of the IANA Functions activities through (and beyond) the transition. Section 3 also contains specific SSAC recommendations.

³ See <http://www.ntia.doc.gov/press-release/2014/ntia-announces-intent-transition-key-internet-domain-name-functions>.

⁴ See <https://www.icann.org/en/system/files/files/sac-067-en.pdf>.

⁵ See <https://www.icann.org/en/system/files/files/sac-068-en.pdf>.

Work on this document (SAC069) commenced in May 2014, early in the IANA stewardship transition proposal process. Since then, our initial input on the subject has been published as SAC067 and SAC068, and the operational communities have made substantial progress on their transition proposals to be submitted to the ICG.⁶ As a result, some of the findings and recommendations in this report may have been overtaken by events. However, the SSAC believes that the general thrust of the report is accurate and beneficial to the public discourse on the transition of the stewardship of the IANA Functions.

2 NTIA’s Contribution to the Security and Stability of the IANA Functions

NTIA contributes to the security and stability of the IANA Functions (1) in the role of the contracting party, with ICANN as the contractor, to the IANA Functions Contract⁷ (the “contractual steward” role) and (2) as the agent that fulfills the Administrator role in the operational activities associated with DNS root zone management. These contributions are described separately below.

Some aspects of NTIA’s contribution arise explicitly from the provisions of the IANA Functions Contract and U.S. Government contracting law; these are identified as “explicit” in the following Section. Other aspects are implied services or benefits that arise from the special circumstances under which IANA Functions activities are performed because the NTIA (as a U.S. Government agency) is the contracting party or Administrator role agent; these are identified as “implicit.”

2.1 Contractual Stewardship

As the contractual steward of the IANA Functions Contract, the NTIA defines the IANA Functions requirements and deliverables; imposes accountability requirements on the IANA Functions Operator (ICANN); facilitates the processing of requests from the IANA Functions Operator for waivers for entities subject to U.S. Government sanctions; and shields the IANA Functions Operator from improper influence.

2.1.1 Defining IANA Functions Contract Requirements and Deliverables (Explicit)

As described in SAC068, the Contract specifies what the contractor should and should not do, as well as a set of seventeen deliverables (see Appendix A) ranging from user instructional manuals to a plan for transition to a successor contractor.

⁶ The IANA Stewardship Transition Coordination Group. Information available at: <https://www.icann.org/stewardship/coordination-group>.

⁷ National Telecommunications & Information Administration, United States Department of Commerce (2012) IANA Functions Contract Award (Contract No. SA1301-12-CN-0035), including Amendments. See SAC068 for complete references.

This supports DNS and Internet security, stability, and resiliency by assuring the accuracy, clarity, and predictability with which the IANA Functions are performed. Clients of the IANA Functions, and their users, know that the documented activities will be performed according to the expectations in the Contract, including those pertaining to the overall quality of the operation, resources to be maintained by the contractor, and other defined standards.

2.1.2 Holding the IANA Functions Operator Accountable (Explicit)

The IANA Functions Contract provides a mechanism by which the IANA Functions Operator can be held accountable in the event that it fails to perform the IANA Functions in accordance with the requirements specified in the Contract. Specifically, if ICANN were to fail in its performance of the IANA Functions, the NTIA could in principle terminate the IANA Functions Contract and relocate those services to another entity.

2.1.3 Facilitating Requests for Governmental Sanction Waivers (Implicit)

As an organization operating legally within the U.S., ICANN is required by law to abide by sanctions imposed by the U.S. Government against a variety of entities.⁸ Legitimate requests through processes specified in the IANA Functions Contract may require ICANN to interact with individuals or organizations subject to U.S. legal sanction. The existence of a contract between the NTIA and ICANN for the provision of the IANA Functions may be seen by the U.S. Treasury Department's Office of Foreign Assets Control (OFAC) as a positive factor in granting licenses that allow ICANN to perform IANA Functions that involve entities subject to U.S. legal sanction.

The chance of delay or rejection of such requests is very difficult to derive from public data, so the impact (if any) of NTIA's contractual stewardship on the ability of the IANA Functions Operator to perform its duties in a timely and predictable manner is unknown.

2.1.4 Shielding IANA From Improper Influence (Implicit)

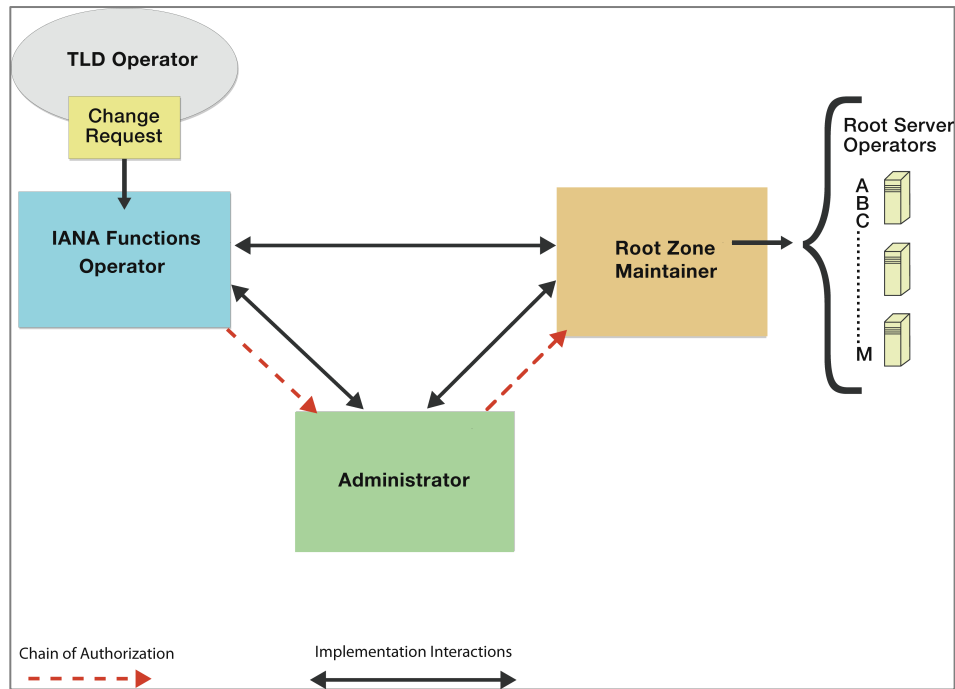
Even the perception that the IANA Functions Operator might be subject to influences acting outside of the transparent context of the IANA Functions Contract would be destabilizing with respect to the confidence and trust of the communities that rely on it. NTIA's stewardship of the IANA Functions Contract may discourage political or economic interests (in any part of the world) from attempting to influence the IANA Functions Operator outside of documented processes and oversight in its performance of the IANA Functions, simply by invoking the implied shield of U.S. Government authority and resources.

⁸ It is important to note that because other countries also impose sanctions this legal burden would exist regardless of where ICANN operated.

2.2 Root Zone Management Process Administration

Figure 1, reproduced from SAC068, illustrates the interaction and authorization relationships among the Root Zone Management Partners that implement the Root Zone Management Process. NTIA fulfills the Administrator role in that process.

Figure 1: Implementation Interactions and Chain of Authorization in DNS Root Zone Management



2.2.1 Final Authorization Authority

As described in SAC068 Section 3.2, the NTIA’s active role in the root zone management process is that of “Final Authorization Authority” for changes to content and contact information.

2.2.2 Oversight of Root Zone Management Partners

In addition to overseeing the IANA Functions Operator, the NTIA oversees the performance of Verisign’s activities as the Root Zone Maintainer via the Cooperative Agreement between the NTIA and Verisign.

3 Questions and Issues

This Section identifies and describes the questions and issues that the SSAC believes must be addressed by the Internet community in order to preserve the security, stability,

and resiliency of the IANA Functions through the stewardship transition. Where appropriate, it also contains specific SSAC recommendations.

3.1 Contractual Stewardship Issues

3.1.1 Contract Requirements and Deliverables

Issue 1: After the IANA stewardship transition, which (if any) of the specific requirements and deliverables defined in the current IANA Functions Contract should be retained? Is external monitoring necessary for requirements that are retained? If so, how and by whom should it be performed?

The IANA Functions Contract defines requirements and deliverables (listed in Appendix A) for the performance of the IANA Functions by the IANA Functions Operator. These deliverables provide basic guidelines for the performance of the IANA Functions, promote transparency, and provide valuable information to the affected and interested parties as well as to the general Internet community regarding the performance of the IANA Functions. They also provide information that enables researchers and third parties to perform their own analysis.

Recommendation 1: The operational communities (protocol parameters, names, and numbers) that have been invited to submit proposals should determine 1) whether or not the requirements and deliverables defined in the IANA Functions Contract should be retained, and if so which ones; 2) whether or not additional external controls are necessary for requirements that should be retained; and 3) if additional external controls are necessary, how and by whom they should be administered.

3.1.2 Accountability Mechanisms

Issue 2: Are existing mechanisms (other than the IANA Functions Contract) for holding ICANN accountable for the proper performance of the IANA Functions adequate? If not, what additional accountability mechanisms would be needed after the IANA Functions transition?

As the current IANA Functions Operator, ICANN could fail to properly perform the IANA Functions in at least the following three ways:

- fail to meet the service levels specified by the IANA Functions Contract;
- fail to follow procedures specified by the Contract; or
- improperly interpret policies provided by the parties responsible for each of the IANA Functions.

Currently, a Memorandum of Understanding (MoU) between ICANN and the IETF specifies the proper performance of the protocol parameter management aspects of the IANA Functions, and an MoU between ICANN and the Regional Internet Registries specifies the proper performance of the number resource management aspects; the IANA

Functions Contract itself specifies the proper performance of the names management aspects. Each of the responsible communities should make appropriate post-transition arrangements for the performance of the IANA Functions aspects that lie within its domain of responsibility, and in doing so should ensure that the associated resource management policies—particularly what constitutes “proper performance”—are clear and unambiguous, and require no additional interpretation by the IANA Functions Operator.

Recommendation 2a: Each of the communities should determine whether or not existing mechanisms outside of the IANA Functions Contract are sufficiently robust to hold the IANA Functions Operator accountable to the affected communities for the proper performance of the IANA Functions after the IANA Functions Contract expires; and if they are not, the communities should determine what additional accountability mechanisms will be needed.

Recommendation 2b: Each of the communities should review and (if necessary) enhance its policy development process to ensure that all of the instructions that it provides to the IANA Functions Operator are clear and implementable.

3.1.3 Governmental Sanction Waivers

Issue 3: In the absence of NTIA involvement after the stewardship transition, would it be more difficult for the IANA Functions Operator to obtain waivers or licenses in order to legally interact with entities subject to governmental sanction?

The IANA Functions Contract serves as a favorable context for requests made by the IANA Functions Operator to the U.S. Treasury Department’s Office of Foreign Assets Control (OFAC) for waivers (licenses) with respect to the performance of IANA Functions involving entities subject to U.S. Government sanctions. Currently, the Contract provides a framework within which the purpose and benefits of the services and resources provided by the IANA Functions Operator to a sanctioned entity may be understood, which may facilitate the timely issuance of legally required OFAC licenses. The IANA Functions Operator might or might not encounter greater delay or other difficulty in obtaining OFAC licenses without that framework.

Recommendation 3: Each of the communities should investigate and clarify the process for handling the possibility of governmental sanctions and restrictions (e.g., the protocol for obtaining OFAC⁹ licenses where US sanctions might interfere with the ability to execute proper instructions to IANA) following the stewardship transition.

⁹ See <http://www.treasury.gov/about/organizational-structure/offices/pages/office-of-foreign-assets-control.aspx>.

3.1.4 Improper Influence Deterrence

Issue 4: After the stewardship transition, how can the community discourage outside political or economic interests from attempting to improperly influence the IANA Functions Operator in the performance of the IANA Functions?

Although they are not usually controversial, the IANA Functions can at times be the focus and target of non-trivial political and/or economic interests. The addition of or change to a politically sensitive country code or generic top-level domain, for example, might draw the attention of parties with a perceived interest in the outcome and a desire to influence it, possibly in unwelcome or improper ways outside of both the community policies that direct IANA and the oversight constituted to assure compliance in implementing those policies.

While ICANN policy development processes have often been subjected to political and economic pressure, it can be said today that no direct pressure has evidently been applied to the IANA Functions Operator. The fact that the IANA Functions have been performed within the context of a U.S. Government contract, and that NTIA has actively overseen that contract, may have been at least partly responsible for shielding the IANA Functions Operator from interference by otherwise influential state and non-state interests.

Recommendation 4: As part of the transition process, each of the affected communities should consider the extent to which the importance of transparency and freedom from improper influence in the performance of the IANA Functions might require additional mechanisms or other safeguards.

3.2 Root Zone Management issues

3.2.1 Root Zone Management Process

Issue 5: Is there a need for a Final Authorization Authority for changes to the root zone following NTIA's withdrawal from this role? If so, how should that Authority be structured and exercised?

NTIA's role as the Root Zone Management Administrator could be described as the "Final Authorization Authority" for changes to the root zone content and contact information. Because it is a specific artifact of the current Root Zone Management arrangement, in which NTIA is both the contracting party with respect to the IANA Functions Contract and the agent that fulfills the Administrator role in the Root Zone Management Process, a post-transition Root Zone Management arrangement may or may not require a "Final Authorization Authority." If it does, the process by which the "final authorization" function will be performed and the organizational entity that will perform it must be clearly defined. Other functions that should be performed by that entity must also be defined.

As described in greater detail in SAC067, the NTIA's active involvement in the Root

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Zone Management Process is limited to the performance of two specific functions with respect to a root zone change request:

- NTIA verifies that ICANN (as the IANA Functions Operator) has followed established policies and procedures in processing the request; and
- NTIA gives the final authorization to the Root Zone Maintainer to update the contents of the root zone to implement the change request.

The NTIA does *not* determine the contents of the root zone. Those are determined by the implementation of policies that have been defined by the ICANN policy development process, in which the NTIA plays no role; and although the NTIA gives the final “OK” for root zone changes, it is not an intermediary with respect to the direct channel of data exchange between the IANA Functions Operator and the Root Zone Maintainer. That direct channel ensures that all data changes stay consistent from user submission to ultimate inclusion in the root zone, and minimizes the opportunities for error at both ends.

From a technical and operational perspective, either eliminating the NTIA authorization step entirely or replacing it with an equally efficient process performed by another entity may suffice to preserve the current stability of root zone change request processing. The SSAC notes that a viable alternative to an explicit “final authorization” step for each change request might be a regular independent audit to demonstrate that due process has been followed. For example, the IETF does not explicitly authorize each change (creation, addition, or deletion) to each protocol parameter registry (of which there are over a thousand, some of which are updated fairly frequently). Instead, it takes care to ensure that the instructions given to the IANA Functions Operator in each RFC are clear and unambiguous, and it conducts an audit every month of the agreed upon time frames for processing these requests. The RIRs have made explicit the conditions for authorizing allocations through their global number resource policies. Standardized announcements of allocations provide information for verifying that ICANN and the receiving RIR have both met the necessary conditions.

It is, however, important to note that root zone changes may have a timeliness requirement much tighter than that normally seen for IETF or RIR transactions, and that inaccurate or tardy execution of root zone changes may have significant operational impact. Any new processes for audit or oversight must take this into account in determining what transparency and accountability requirements should be imposed with respect to the performance of the IANA Functions.

Recommendation 5: Noting the stability and efficiency of existing structures, processes, and mechanisms for the management of the root zone, the SSAC recommends that any proposal to replace NTIA’s final authorization of root zone changes with an alternative be at least as reliable, resilient, and efficient as the current process.

3.2.2 Root Zone Management Accountability

Issue 6: What arrangements should be made for post-transition implementation of the Root Zone Management Process?

Currently, the NTIA oversees the Root Zone Management Partners through two separate legal agreements: one that pertains to ICANN as the IANA Functions Operator through the IANA Functions Contract, and another that pertains to Verisign as the Root Zone Maintainer as articulated in a Cooperative Agreement between NTIA and Verisign. Should disagreements, ambiguities, or disputes arise between Verisign (as the Root Zone Maintainer) and ICANN (as the IANA Functions Operator) in the performance of root zone management functions, the NTIA currently has the authority and ability to intervene and resolve the conflict.

As part of the stewardship transition, alternative arrangements for conflict resolution that do not depend on the NTIA must be made. The responsibility for examining the alternatives and planning changes, if any, lies with the community responsible for the naming functions and with ICANN as the current IANA Functions Operator. Potential post-transition arrangements include a formal agreement between the IANA Functions Operator and the Root Zone Maintainer; an instrument defining the accountability of the IANA Functions Operator and the Root Zone Maintainer to the Internet community; or the elimination of the Root Zone Maintainer role as a function separate from that of the IANA Functions Operator.

Recommendation 6: Effective arrangements should be made for the reliable and timely performance of all aspects of the root zone management process post-transition, including inter-organization coordination if the post-transition RZM process involves more than one root zone management partner.

Issue 7: How will the role of Root Zone Maintainer be performed in the absence of a cooperative agreement with NTIA?

In its IANA Functions and Related Root Zone Management Transition Questions and Answers,¹⁰ NTIA states that

“Aspects of the IANA functions contract are inextricably intertwined with the VeriSign cooperative agreement (i.e., authoritative root zone file management), which would require that NTIA coordinate a related and parallel transition in these responsibilities.”

Recommendation 6 proposes that effective arrangements be made among the root zone management partners (if the post-transition RZM process involves more than one organization) to provide an accountability framework for the resolution of disagreements, ambiguities, and disputes that does not depend on the NTIA. However, the legal and

¹⁰ <http://www.ntia.doc.gov/other-publication/2014/iana-functions-and-related-root-zone-management-transition-questions-and-answ>.

operational relationships within which the root zone management partners have operated pre-transition will change when NTIA no longer fulfills the Administrator role. Defining these post-transition relationships will depend on NTIA's transition arrangements for oversight of the Root Zone Maintainer functions currently performed by Verisign.

Recommendation 7: NTIA should clarify the processes and legal framework associated with the role of the Root Zone Maintainer after transition.

4 Acknowledgments, Disclosures of Interest, Dissents, and Withdrawals

In the interest of transparency, these sections provide the reader with information about four aspects of the SSAC process. The Acknowledgments section lists the SSAC members, outside experts, and ICANN staff who contributed directly to this particular document. The Disclosures of Interest section points to the biographies of all SSAC members, which disclose any interests that might represent a conflict—real, apparent, or potential—with a member's participation in the preparation of this Report. 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 Report is concerned. Except for members listed in the Dissents and Withdrawals sections, this document has the consensus approval of all of the members of SSAC.

4.1 Acknowledgments

The committee wishes to thank the following SSAC members and external experts for their time, contributions, and review in producing this Advisory.

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4.2 Disclosures of Interest

SSAC member biographical information and Disclosures of Interest are available at:
<https://www.icann.org/resources/pages/biographies-2014-10-08-en>.

4.3 Dissents

There were no dissents.

4.4 Withdrawals

There were no withdrawals.

Appendix A: Deliverables Required by the IANA Functions Contract

Clause No.	Clause	Deliverable	Due Date
C.2.6	Transparency and Accountability	User instructional documentation including technical requirements	October 1, 2013
C.2.7	Responsibility and Respect for Stakeholders	Documenting the source of the policies and procedures	October 1, 2013
C.2.8	Performance Standards	Performance Standards	October 1, 2013
C.2.9.2e	Root zone Automation	Automated Root Zone	July 1, 2013
C.2.9.2g	Customer Service Complaint Resolution Process (CSCRCP)	Customer Compliant Process	October 1, 2013
C.3.4	Security Plan	Documenting Practices and configuration of all system	Annually (December 15 th)
C.4.2	Monthly Performance Progress Report includes DNSSEC	Report based on C.2	Monthly (15 days following the end of each month)
C.4.3	Root Zone Management Dashboard	Root Zone Management Dashboard	October 1, 2013
C.4.4	Performance Standards Reports	Performance Standards Report	October 1, 2013
C.4.5	Customer Service Survey	Customer Service Survey	Annual Report of Customer Survey (December 15 th). First Report due December 15, 2013.
C.4.6	Final Report	Final Report	Due 30-Days After Expiration of Contract
C.5.1.	Audit Data	Audit Report	Annually (By January 15 th). First Report due January 15, 2014.
C.5.2	Root Zone Management Audit Data	Root Zone Management Audit Report	October 1, 2013

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C.5.3	External Auditor	External Audit Report	Annually (February 15 th) First Report due February 15, 2014.
C.6.2.4	Conflicts of Interest Enforcement and Compliance Report	Enforcement and Compliance Report	Annually (January 5 th). First Report due January 5, 2014.
C.7.2	Contingency and Continuity of Operations Plan (The CCOP)	Consultation	October 1, 2013
C.7.3	Transition to Successor	Transition plan in case of successor contractor	April 14, 2014 Eighteen (18) months after start of the contract

Appendix B: Guiding Principles for the IANA Stewardship Transition

The SSAC has used the following set of principles, based on a security and stability perspective, in developing the recommendations included in this document. The community could also make use of these principles in two ways: firstly, for evaluating proposals related to the IANA Transition and secondly, as a general guide to how management of the IANA Functions should be maintained after Transition.

1. **Conservatism:** As a general rule, evolutionary change is preferable to revolutionary change in order to reduce risk of instability. As such, the number, scope, and impact of changes to existing structures, processes, and mechanisms should be restricted to those absolutely necessary to maintain the integrity of the performance of IANA Functions.
2. **Scalability:** IANA Functions structures and processes should be implemented in a scalable fashion to account for the growth and complexity of future requests.
3. **Severability of functions:** The organizational elements which perform the various IANA Functions should be treated as ultimately severable elements. The key areas of the IANA Functions as they relate to the DNS; root zone requests, Internet number resource requests, and protocol/parameter requests, should be regarded as severable from each other, with the policy development organizations being the ultimately responsible parties for their respective areas.
4. **Transferability of functions:** The IANA Functions, both as one or more severable elements or as a set of clearly defined processes, should be transferable to other entities should that be needed. ICANN should maintain the IANA Functions in such a manner that, should one or another of the policy development organizations for a specific IANA Function decide that another party would better perform that function on their behalf, the operational processes could be transferred to another entity.
5. **Separation of Roles:** There should be clear delineation between the entity or entities responsible for approving and verifying actions and those responsible for performing them.
6. **Openness:** All stakeholders should have the opportunity to provide input into structures, processes, and mechanisms in relation to the implementation of policies and see how that input has been acted upon or the rationales used for not acting upon that input.

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7. **Transparency:** All stakeholders should have visibility of the proper performance of the IANA Functions.
8. **Accountability:** There should be a clear chain of responsibility for all actions, and success or failure should have clear impact on those responsible.
9. **Measurability:** All actions should be measurable to enable recording, verification, tracking of outcomes and trend analysis.
10. **Auditability:** All actions should be able to be tracked and measured from beginning to end and the results of those actions should be publicly available and be independently verifiable.