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Internet Architecture Board Response to the
National Telecommunications and Information Administration
[Docket No. 110207099–1099–01] RIN 0660–XA23
Request for Comments on the Internet Assigned Numbers Authority (IANA) Functions

Dear Ms Alexander,

The Internet Architecture Board (IAB) appreciates the opportunity to provide our view on the future IANA functions contract and answer your specific questions. We would welcome the opportunity to discuss any of these responses further, or to provide any clarification you may require.

The IAB is chartered both as a committee of the Internet Engineering Task Force (IETF) and as an advisory body of the Internet Society (ISOC). Its responsibilities include architectural oversight of IETF activities, Internet Standards Process oversight and appeal, and the appointment of the RFC Editor. The IAB is also responsible for the management of the IETF protocol parameter registries. We answer from the perspective of our responsibilities outlined in RFC2850 [1]: as the body that approves the entity that serves as IANA for the IETF. At the same time we are taking a broader view on IANA functions and related stability and interoperability issues for the Internet. We start with a general overview and answer specific questions in the NOI after that.

IANA evolution

One of the important components of each of the three main IANA functions (the coordination of the assignment of technical Internet protocol parameters, including services related to the management of the .ARPA top-level domain; the administration of certain responsibilities associated with Internet DNS root zone management; and the allocation of Internet numbering resources) is maintaining a registry, or a database, where various parameters are assigned and recorded (e.g., operation codes, character set codes, port numbers, object identifiers, protocol numbers, IP addresses, Autonomous System Numbers and DNS domain names).

Transparency, continuity and predictability of allocation, assignment, and publication of the protocol element values are important requirements for stability of the Internet. The use of a registry is ultimately the choice of users and developers of Internet protocols, and this choice is made based on stability and

trust, not on mandates and policing. This trust is a result of successful cooperation among the Internet technical community.

While preserving stability, IANA should continue to evolve to respond to the changing environment and the needs of its users, as should the IANA functions. It is important that the future IANA functions contract doesn't restrict this evolution, but is rather flexible enough to accommodate this natural development. That means that definition of the IANA functions should be high-level and avoid detailed prescription.

We believe that the IANA functions should evolve together. There exists synergy and interdependencies between the functions, and having them performed by a single operator facilitates coordination among registries, even those that are not obviously related. It also makes it easier to have consistency of formats and registry structure, which aids users of the registries and assists with quality control. Additionally, it facilitates cooperation and coordination among different communities and organizations participating in policy setting and using IANA services, thus contributing to the overall stability of the IANA.

Multi-stakeholder governance model

The policies that IANA implements are the result of multi-stakeholder, bottom-up, open policy development processes (specifically: ICANN, IETF, and RIR community-driven). These policies actually define how and when the content of a registry is changed, or new registries are created. The above-mentioned communities and supporting organizations assume the policy role in this model. These processes and related community work are beyond what is described in the Statement of Work of the IANA contract.

The IANA registries are created for specific protocols. Development of specifications of these protocols is part of the overall architectural role, which the IAB/IETF assumed when it was established more than two decades ago. The architectural role may also set the standards for the methods by which the content of a registry is made available.

The NTIA statement seems to be consistent with these observations: "Applicable to each of these functions and their performance are relevant policies, technical standards, and procedures developed and administered outside the purview of the IANA functions contract". We agree with this statement and appreciate its inclusion in the NOI.

Indeed, the IANA functions contract only addresses the registry maintenance role. That role is limited to the allocation or assignment of values in the registries and publishing those accordingly.

The maintenance role is mechanical and IANA implements, but doesn’t define or develop a policy. At the same time this role requires understanding of the

complex architectural and procedural relations that need to be taken into account during the assessment of allocation or registration requests against the policies. Having the maintenance of the registries performed by a single operator facilitates transparency and allows the IANA to centrally manage the requests and information flows.

The preceding overview shows that the governance structure around IANA is complex, but is well established and working, and should be permitted to continue without adding any additional functions or expanding the scope of the contract. To be clear, we believe that the future arrangement should remain limited to the maintenance role, and should avoid putting constraints on the future development of this governance structure and its decision making process.

IANA performance

It is very important that IANA performance meets the requirements and expectations of different interested and affected parties. The current contract requires broad performance metrics and reporting although some of these reports are not publicly available. We would like to see more transparency in IANA's performance of its functions. We believe that the performance metrics should be defined by relevant technical groups and communities using a process that contains public review and comment as an element. The related reporting should be publicly available rather than having complete reports available only to a select list of parties.

Specific Questions

1. The IANA functions have been viewed historically as a set of interdependent technical functions and accordingly performed together by a single entity. In light of technology changes and market developments, should the IANA functions continue to be treated as interdependent? For example, does the coordination of the assignment of technical protocol parameters need to be done by the same entity that administers certain responsibilities associated with root zone management? Please provide specific information to support why or why not, taking into account security and stability issues.

Although the IANA functions could theoretically be separated, as we indicated in the overview provided above, all registries related to these functions and maintained by IANA have a common architectural ancestry. And since the underlying protocols evolve there will always be a requirement from the IETF to be able to reserve or assign certain values in the context of that evolution.

A few examples provided below intend to illustrate that the IETF's standards development continues to interact with the IANA functions beyond just the protocol parameters function.

The IPv6 address space is currently divided in different blocks. One of these blocks is used for Global Unicast addresses and IANA is distributing addresses from this pool to the Regional Internet Registries for allocation and assignment under regional policies. There are additional blocks reserved for usage as specified in the registry, while the remaining blocks have been '*Reserved by the IETF*'. This allows the protocols that use the IPv6 address format to evolve and currently unforeseen applications to emerge.

For the DNS registry the same applies. A recent example is the development of international domain names. The Internationalized Domain Names in Applications (IDNA) architecture sets a number of boundary conditions for policy development and for evaluation of requests. The most trivial being that the IDN protocol suite prohibits the use of the 'xn--' code for registration in non-internationalized DNS, while more subtle boundary conditions have to do with allowed strings.

Another prominent example of this is the .ARPA domain. This domain is used to publish certain types of registrations in the DNS. The .ARPA domain itself is delegated from the root zone and contains a number of subdomains, some of which are pure “protocol parameter registries” such as URN.ARPA. On the other, hand the IP6.ARPA and IN-ADDR.ARPA domains are clearly linked to the Address Registration functions of IANA.

This supports our view that the IANA functions should evolve together performed by a single entity.

At the same time we would like to note that the IAB has, through RFC 2850 [1], the mandate from the technical community to approve the appointment of an organization to act as IANA on behalf of the IETF. Should any changes to the existing IANA Functions operator be proposed, the successor will have to meet the requirements of the IETF as documented in RFC 6220 [2] and stability and security of the continued operation must be assured. At the same time, the current operation of the protocol parameters space is working well, and there is no immediate or compelling need to make changes. Changes would inevitably be disruptive during a transition period, and any transition would have to be carefully planned and managed with strong support from the impacted parties.

2. The performance of the IANA functions often relies upon the policies and procedures developed by a variety of entities within the Internet technical community such as the IETF, the RIRs and ccTLD operators. Should the IANA functions contract include references to these entities, the policies they develop and instructions that the contractor follow the policies? Please provide specific information as to why or why not. If yes, please provide language you believe accurately captures these relationships.

As we stated before, a new contract should provide a high-level definition of the functions and not detail specific policies or procedures. At the same time, it is

desirable if the contract recognizes the distinction between the mechanical and policy setting roles for each high-level IANA function.

We do not have an opinion on whether the contract needs to reference the bodies specifically but if it does it can refer to RFC 2860[3] and RFC 6220 [2] for the relation between the IETF and the protocol parameters registry.

3. Cognizant of concerns previously raised by some governments and ccTLD operators and the need to ensure the stability of and security of the DNS, are there changes that could be made to how root zone management requests for ccTLDs are processed? Please provide specific information as to why or why not. If yes, please provide specific suggestions.

An increase in transparency of IANA operations with regard to this specific function would be a positive change. In particular, information about the review process, review criteria, response times as well as the status of each request should be publicly available.

4. Broad performance metrics and reporting are currently required under the contract. Are the current metrics and reporting requirements sufficient? Please provide specific information as to why or why not. If not, what specific changes should be made?

For the protocol parameter registries there is detailed reporting [4] against metrics that are set in an SLA between ICANN/IANA and the IETF [5]. In these reports distinctions are made between tasks that IANA has control over and tasks that are performed by external parties such as *expert review*. We note that all performance metrics and reporting related to this IANA function are publicly available. We believe this should be the case for the rest of IANA functions as well.

5. Can process improvements or performance enhancements be made to the IANA functions contract to better reflect the needs of users of the IANA functions to improve the overall customer experience? Should mechanisms be employed to provide formalized user input and/or feedback, outreach and coordination with the users of the IANA functions? Is additional information related to the performance and administration of the IANA functions needed in the interest of more transparency? Please provide specific information as to why or why not. If yes, please provide specific suggestions.

The IAB believes that process improvements or performance enhancements related to IANA functions should be introduced through a two-way engagement with respective communities. An example of a working arrangement is the existing MoU between the IETF and ICANN regarding the protocol parameter registry [3]. We think that agreements modeled on this MoU are better instruments for process improvements or performance enhancements than adding specific provision to the IANA functions contract.

6. Should additional security considerations and/or enhancements be factored into requirements for the performance of the IANA functions? Please provide specific information as to why or why not. If additional security considerations should be included, please provide specific suggestions.

We believe that at the minimum best practices in Information security should be used by the IANA Function Operator to ensure protection of the data. At the same time specific requirements with respect to the maintenance of a registry, including security considerations and/or enhancements, etc. should be community driven.

A contract should not go into the level of detail to describe security considerations and/or enhancements. Contracts should not be written in terms of specific technology but should allow the contractor to work with the community to implement measures in a timely manner without the possibility of (a perception of) a limitation in contracts.

The future arrangement should have the flexibility to allow appropriate evolutionary changes in the publication mechanisms of the registries and the security mechanisms related thereto.

References

[1] Carpenter, B., Ed., IAB, "Charter of the Internet Architecture Board (IAB), RFC 2850, May 2000.

[2] McPherson, D., Ed., IAB, "Defining the Role and Function of IETF Protocol Parameter Registry Operators", RFC 6220, April 2011.

[3] Carpenter, B., et.al., "Memorandum of Understanding Concerning the Technical Work of the Internet Assigned Numbers Authority", RFC 2860, <http://www.icann.org/en/general/ietf-icann-mou-01mar00.htm>, June 2000.

[4] "IANA Statistics for IETF-related Requests", <http://www.iana.org/about/performance/ietf-statistics/>

[5] "ICANN / IANA - IETF MoU Supplemental Agreement", <http://www.icann.org/en/general/ietf-iana-agreement-v8.htm>

Contact Information

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