



March 31, 2011

Fiona Alexander  
Associate Administrator, Office of International Affairs  
National Telecommunications and Information Administration  
1401 Constitution Avenue, NW  
Room 4701  
Washington, DC 20230  
Docket No. 110207099-1099-01

**Re: NTIA Notice of Inquiry, Request for Comments on the Internet Assigned Numbers Authority (IANA) Functions**

Google appreciates the opportunity to provide input to the U.S. Department of Commerce (DOC) National Telecommunications and Information Administration's (NTIA) Notice of Inquiry (NOI) on the Internet Assigned Numbers Authority (IANA) functions. The technical coordination of the Internet's unique identifier and parameter spaces is of critical importance to Google and we remain committed to the Internet's continued stability, protection, and evolution.

Google recognizes the importance of the stability and security of the IANA functions, and we applaud NTIA for seeking ways to enhance the performance of these functions and the contract governing their operation. We also recognize that the cooperation and coordination that the IANA functions require must take place among a variety of technical and policy groups and stakeholder communities. Seeking the best way to structure the IANA functions contract in order to ensure the continued security and stability of the DNS and additional Internet identifiers and parameters is critical to the continued innovation and growth of the Internet.

Google strongly believes that the Internet Corporation for Assigned Names and Numbers (ICANN) should remain the executor of the IANA functions. The bottom-up, multi-stakeholder model, which is accountable to all stakeholders and is embodied by ICANN, is both effective and necessary. Further, ICANN has proven its commitment to its role as a steward of this function to ensure the continued protection of the unique Internet governance processes.

Confidence and trust are important elements of the Internet governance environment, without which the Internet would cease to evolve. Because of this, we also believe that it is not only timely but also strategically important for NTIA to send a strong signal in support of the private-sector, multi-stakeholder Internet governance model. One way to achieve this goal is to revise the formal relationship between NTIA and ICANN through the use of a cooperative agreement rather than the present procurement contract. It is Google's understanding that the other main relationship

regarding the management of the domain name space, between NTIA and Verisign, Inc., is a cooperative agreement. The procurement contract format imposes an unnecessarily rigid management structure at this point in the history of ICANN's tenure. Improvements in the technical methods by which ICANN and Verisign exchange information regarding updating of the root zone were unnecessarily stymied by the argument that such changes would require contract re-negotiation, for example.

A contract consisting of a one-year base term and four one-year options to renew creates unnecessary and even potentially harmful instability in the process in addition to speculation that the IANA functions will be moved to another entity. The side-effects are visible in ICANN's internal processes and even more visible in domestic and international forums where other parties are motivated to advocate for the transfer of the IANA functions to parties beyond the reach of the present governance structure. Further, the one-year options unnecessarily highlight to an international audience the U.S. government's unique role in the Internet governance process. A longer-duration, cooperative agreement between ICANN and NTIA would more accurately express the important relationship between these two entities and highlight the U.S. government's continued commitment to the private-sector led governance model. Such a cooperative agreement could be structured to complement the Affirmation of Commitments and contain provisions for reconstitution of the operation of the IANA functions in the event that the incumbent was unable to continue in the role.

## 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.**

Yes. The IANA functions should still fall under the auspices of a single authority to enable the continuous and efficient management of the Internet's unique identifiers and parameters. While technically the individual pieces of the IANA functions – the coordination of the assignment of technical protocol parameters; the administrative functions associated with root zone management; and the allocation of Internet numbering resources – could be undertaken by different entities, from a policy perspective they should still be considered interdependent. Further, there are roles that ICANN currently undertakes and that are considered a part of the overarching IANA functions but whose authority does not come from NTIA. Specifically, [RFC 2860](#), which was published in 2000 and outlines a Memorandum of Understanding (MOU) between ICANN and the Internet Engineering Task Force (IETF) (through the Internet Architecture Board [IAB]), assigns responsibility to ICANN for recording and memorializing Internet protocol parameters and documenting the protocol parameters that are developed in the IETF process. Here, NTIA should respect the terms of RFC 2860 and the multi-stakeholder process already in place and not seek to unilaterally reassign this role to another party without the express agreement of the IAB.

The inverse address map, IN-ADDR, is an example of strong linkage between the assignment of domain names and the assignment of Internet addresses, and it is paramount that this linkage is maintained. It is impossible to predict whether and when new protocols will require linkage to management of both the domain name and Internet address space as well as other identifier spaces. The NAPTR function, for example, has been used to link telephone numbers and domain names and, ultimately, Internet addresses. Breaking these functions up will create boundary lines across which complex coordination would be required, which would decrease efficiency and potentially create delay and unnecessary risk. Unless there are compelling reasons to separate these functions, it is more efficient and less prone to error to have them managed by a single entity.

**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.**

Including references to other entities with which ICANN coordinates the IANA functions could be helpful since it expresses NTIA's recognition of the constellation of organizations that play roles in

the management of the Internet's unique identifier and parameter spaces. Reference to the IAB, the IETF, the Root Zone operators, the Regional Internet Registries (RIR), the Number Resource Organization (NRO), among others would be helpful. We believe, however, that such references should be explicitly illustrative but not dispositive. The Internet's technical operation and governance environment is constantly evolving and the IANA functions should not be accidentally the source of brittleness or friction as the incumbent IANA operator adapts to change.

**3. Cognizant of concerns previously raised by some governments and ccTLD operators and the need to ensure the stability 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.**

With the introduction of Internationalized Domain Names (IDN) into the top-level domain space, not only for country code top-level domains (ccTLD) but more generally for generic TLDs, there is increased latitude for the range of possible identifiers proposed for TLD assignment. With regard to ccTLDs, it has been the practice to remand to the related country authority considerable responsibility for the terms of operation and assignment of the associated domain space. Because generic top-level domains (gTLDs) are global in scope, there is a potential conflict between national preferences and practices that would otherwise be applied to ccTLDs. Resolution of such conflict, especially with regard to public policy issues arising from specific TLD proposals, should have the benefit of Governmental Advisory Committee (GAC) input.

In addition, the introduction of Domain Name System Security Extensions (DNSSEC) to improve the integrity of the root and lower zones offers an opportunity to increase the security of the zone signing process. See item (6) below for further elaboration of this opportunity.

**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?**

Yes. The current performance metrics and reporting mechanisms are sufficient. However, both NTIA and ICANN should seek to enhance transparency mechanisms to ensure that the Internet community is fully aware of reported performance, any potential problems, any changes to the process, and any on-going planning taking place. This will further shore up confidence within the international community that all parties involved in and dependent upon the IANA functions process are exercising due diligence. Such transparency will allow all interested parties to be fully aware of any performance effects resulting from changes to the Internet governance landscape. It may be timely to revise many of the reporting mechanisms from periodic written reports to continuously and publicly visible dashboard-style presentations. It is recognized that some functions, such as re-delegation of a ccTLD, may require confidentiality at least during the process, but in general, increased transparency in the NTIA and IANA relationship will promote confidence in the management of the unique identifiers and parameters necessary to the operation of the Internet.

**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.**

Several of the enumerated tasks contained within the IANA functions need no improvement. The MOU between ICANN and the IETF regarding protocol parameters works well and allows for adequate multi-stakeholder involvement in the process. This is also the case with the allocation of Internet numbering resources, which includes the allocation of Internet Protocol version 4 (IPv4) and version 6 (IPv6) address space and Autonomous System Number (ASN) space, and the delegation of IP address blocks to the RIRs. Specifically in the case of the RIRs, there is a formal, robust, and multi-stakeholder process through which performance is discussed and global policy is made and can be amended. The NRO and Address Supporting Organization (ASO) provide vehicles for coordination of Internet address policy through the ICANN policy development processes. Some improvements could be made to the TLD process. ICANN should have formal agreements with each TLD operator, but this has not been achieved with all ccTLD operators and with the expansion of both the gTLD and ccTLD spaces, individual negotiation of agreements may not scale. Some thought might be given as to how the community could help ICANN adapt this process to make it more efficient.

**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.**

Yes. With regard to the increase in the security and stability of the IANA functions, NTIA should strongly consider transferring root zone signing authority associated with DNSSEC deployment to the IANA functions operator, which in this case is ICANN. Specifically, the signing of the root zone file itself and the creation of the zone signing key, the signing of the zone signing keyset, the creation of the key signing key, and the publication of the public key information to be propagated throughout the rest of the Internet should be done by ICANN. By consolidating the key management functions in the one organization that is already responsible for determining what changes to make to the root zone, the integrity of these changes can be made more secure. As it is currently practiced, there is a potential for the updates requested by ICANN to be altered after receipt by Verisign. If ICANN generates the fully signed root zone and conveys it securely to Verisign for distribution, the integrity of the process would be increased. This change would increase the integrity of the update process and preserve the due diligence done by ICANN to determine changes to the root zone as well. Such a process would still allow visibility to NTIA and the general public since the root zone is not encrypted, only signed. It could be inspected, as

needed, prior to promulgation by Verisign.

Sincerely,

A handwritten signature in black ink, appearing to read "Vinton Cerf". The signature is written in a cursive style and is positioned above a horizontal line that extends to the right.

Vint Cerf  
*Chief Internet Evangelist*  
*Google Inc.*