

Request for Comments on the Internet Assigned Numbers Authority (IANA) Functions

Docket # 110207099-1099-01

March 31st, 2011

Fiona M. Alexander,
Associate Administrator,
Office of International Affairs, National
Telecommunications and Information
Administration, 1401 Constitution
Avenue, NW., Room 4701, Washington,
DC 20230.

Dear Ms. Alexander:

With regard to the subject matter, I'm offering these comments in my private capacity.

I have been an active participant within the Internet Corporation for Assigned Names and Numbers (ICANN) process since 2004 as a software product developer interested in security and stability issues. My professional contributions to the Internet have been in the areas of network management, IETF Desktop Management Task Force, cable modem Internet protocol and server design. I thank the NTIA for the opportunity to comment on the IANA contract renewal terms and look forward to the NTIA and IANA continuing their efforts to improve the Internet.

I direct my comments in response to questions 4 and 5 of the NOI:

Q4. Broad performance metrics and reporting are currently required under the contract. Are the current metrics and reporting requirements sufficient?

Q5. 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?

Executive Summary:

IANA's current contractual reporting metrics should be expanded to include the report on the status of these important new technologies:

1. DNSSEC deployment
2. IPv6 deployment

to the global Internet community, by monthly publication of the data, collection methods and summaries on the IANA web site.

Background:

Two major initiatives: the operational deployment of DNSSEC and the beginning of the transition from IPv4 to IPv6 addresses, affecting the security and stability of the Internet are in process at ICANN/IANA. Both initiatives have been worked on for more than a decade and both are now moving from experimental into deployment as critical Internet infrastructure. IANA's functions of address allocation and root zone management are central to both initiatives.

IANA did an admirable job of keeping the Internet community informed about the impending exhaustion of IPv4 addresses. And, at ICANN40 in San Francisco, to no one's surprise, a brief ceremony to hand out the final allocation of IPv4 address space took place – ending the allocations of IPv4 to the RIRs. Now that IANA has completed its mission to warn the Internet community about the end of free IPv4 address blocks, IANA should turn to its replacement technology, and begin reporting on the adoption of IPv6.

The transition from IPv4 to IPv6 addressing will take years. The first steps have already in place- most hosts [PCs and servers running Windows, OS10 or Linux] are already dual-stack [capable of running IPv4 and IPv6]. The Internet's primary network directory service – DNS – needs also to become IPv4 and IPv6 accessible.

The DNS infrastructure is a good place to begin measuring the adoption of IPv6. DNS infrastructure providers should be encouraged to become an early IPv6 adopter . Today approximately 50% of the TLD ANS servers are IPv6 addressable. A far smaller percentage of the estimated three million DNS resolvers are IPv6 addressable, and only a tiny fraction of overall Internet traffic is IPv6 addressed.

Authoritative measurement of the rate of IPv6 adoption will go a long way toward encouraging network equipment providers and network operators to plan for and adopt IPv6.

DNSSEC is the initiative to cryptographically sign all DNS zone name resolutions. DNSSEC fixes a long standing security hole in DNS Internet protocol which allows simple man-in-the-middle attacks to redirect Internet browsers to fraudulent copies of secure sites like banks and PayPal, where unsuspecting users log on – give away their valuable user-ids, credit card numbers and passwords. Criminals which operate these fraudulent sites, use the collected data to transfer money and buy goods with the stolen identities. Implementing DNSSEC is very important to the immediate financial health of Internet users and business, and longer term may also be used to secure and speed the distribution of PKI certificates.

DNSSEC has been in development by the IETF for more than fifteen years and is finally being deployed, but that deployment is fragmented by thousands of organizations plans to adopt the new technology across millions of DNS systems and access networks . While DNSSEC adoption is clearly gaining

momentum, a lot of work remains to be done over the next five years to make DNSSEC a ubiquitous function of the Internet.

in June 2010 the root zone file was signed, and over the past nine months several large TLDs [.NET and .ORG] and many smaller TLDs have signed their zones. Unfortunately no organization has undertaken the task of tracking DNSSEC deployment and reporting the status of TLD zone signing to the Internet community.

Recommendations:

I recommend that NTIA amend the IANA contract to include reporting the status of DNSSEC deployment and IPv6 deployment to the global Internet community. All statistics gathered should be presented in graphical form on the IANA web site and should be freely available for global viewing by the Internet community.

Reporting of the status of DNSSEC adoption in TLDs could minimally be done with a table or spreadsheet similar to the one developed by the dnssec-deployment.org. Unfortunately this table is not being maintained, and the proper authority to take on the role is IANA. Furthermore, the deployment of DNSSEC needs to be tracked down to the user level resolvers in order to create an accurate picture of the effectiveness of the overall DNSSEC initiative. The user level tracking {reporting the % of signed name resolutions vs. unsigned name resolutions} of DNSSEC will require data gathering across the global Internet community and would need to be presented by geographic locations. No one at this time is collecting and publishing this type of statistics, which are in the final analysis how we will all gauge the effectiveness of the DNSSEC initiative.

Similar reporting needs to be done to track the deployment of IPv6 addressability. IANA should report on the status of IPv6 across the DNS infrastructure – from the root servers, authorities name servers and the DNS resolvers. And as with the DNSSEC initiative, meaningful user-level statistics are needed to encourage the entire Internet community to plan for and adopt IPv6 addressing.

Respectfully Submitted,

Robert C. Hutchinson

Dynamic Ventures

I provide the following as reference for how the existing contract could be amended to include statistics on DNSSEC and IPv6 adoption:

IANA contract metrics tables – copied from page 32.

IPv4 Multicast Assignments			
Request Submitted	Request Completed	Duration	Registry

IPv6 Unicast Address Blocks Allocations				
Request Submitted	Request Completed	Duration	Registry	Request

IPv6 Multicast Assignments			
Request Submitted	Request Completed	Duration	Addresses

Autonomous System (AS) Number Assignments				
Request Submitted	Request Completed	Duration	Registry	Blocks

Suggested additions for DNSSEC adoption metrics reporting tables:

DNSSEC TLD zones				
TLD zone	Signed for test date	Signed for production date	Last Zone Key Roll Date	Domains in zone

DNSSEC Name Resolver Statistics			
Resolver IP Address	Days reporting	Signed requests Served	Unsigned requests Served

Suggested additions for IPv6 adoption metrics:

Authoritative Name Servers IPv6				
TLD zone	IPv4 Address	IPv6 Address		

Hosts reporting IPv6 connectivity			
IPv4 Address	IPv6 Address		

Reference notes:

http://en.wikipedia.org/wiki/Distributed_Management_Task_Force

https://www.dnssec-deployment.org/wp-content/uploads/2010/08/TLD-deployment-Table-8_30_10.pdf

http://www.circleid.com/posts/20100629_dnssec_deployment_among_isps_the_why_how_and_what/

<http://www.iol.unh.edu/services/testing/ipv6/>

http://en.wikipedia.org/wiki/IPv6_deployment