

**IGF Meeting – 2010
Vilnius, Lithuania
14-17 September 2010**

ICANN Open Forum Proposal

Proponent

Internet Corporation for Assigned Names and Numbers (ICANN): An internationally organized, non-profit corporation that has responsibility for Internet Protocol (IP) address space allocation, protocol identifier assignment, generic (gTLD) and country code (ccTLD) Top-Level Domain name system management, and root server system management functions. As a private-public partnership, ICANN is dedicated to preserving the operational stability of the Internet; to promoting competition; to achieving broad representation of global Internet communities; and to developing policy appropriate to its mission through bottom-up, consensus-based processes. As a multistakeholder organization ICANN attaches particular importance to the similar constitution of the Internet Governance Forum and will set its contribution firmly in that context.

Purpose

The purpose of the open forum is to report on progress made with regard ICANN's work, and to highlight recent developments in areas such as new gTLDs and IDN (Internationalized Domain Names) ccTLD Fast Track, as well as other technical issues of interest to the community.

Participants

Representatives from a diverse range of stakeholder groups will participate in the open forum, with attention given to ensuring individuals also come from different regions. This will include but will not be limited to: those running country-code and generic top-level domains, governments, Internet service providers, Internet end-users, and technical experts.

Among the panelists will be ICANN senior executives, Board Directors, and members of ICANN Supporting Organizations and Advisory Committees.

Background Paper

ICANN Open Forum

IGF Meeting, 2010 Vilnius, Lithuania

This Open Forum is organized by the Internet Corporation for Assigned Names and Numbers – ICANN. ICANN is an internationally organized, non-profit corporation that has responsibility for IP address space allocation, protocol identifier assignment, domain name and root server system management functions. As a private-public partnership, ICANN is dedicated to preserving the operational stability of the Internet; to promoting competition; to achieving broad representation of global Internet communities; and to developing policy appropriate to its mission through bottom-up, consensus-based processes [1].

The purpose of this session is to update IGF participants on ICANN's recent work, and progress made in areas pertaining to its mission, particularly in relation to:

- Affirmation of Commitments - Reviews
- New gTLDs
- IDN ccTLD Fast Track Process
- DNSSEC

The following sections will provide background information on each of the abovementioned areas.

Affirmation of Commitments - Reviews

The Affirmation of Commitments (AoC) is an unending agreement signed 30 September 2009 between ICANN and the U.S. Department of Commerce. It completes a transition that started 12 years ago to move the coordination of the Internet's unique identifiers to the private (non-government) sector through a not-for-profit organization where policies are developed from the bottom-up by members of the international Internet community. The AoC affirms the success of the ICANN model, commits ICANN to remaining a private, not-for-profit organization, reaffirms the role of the Government Advisory Committee, and declares that ICANN is independent and is not controlled by any one entity. A complete list of commitments made by ICANN in the AoC can be found on ICANN's website in eleven languages [2].

The AoC commits ICANN to periodic reviews performed by the community – a further recognition that the multi-stakeholder model is robust enough to review itself. These reviews, which will be performed at least every three years, provide a mechanism to assess and report on ICANN's progress toward four fundamental organizational objectives:

- Ensuring accountability, transparency and the interests of global Internet users;
- Preserving security, stability and resiliency of the DNS;
- Promoting competition, consumer trust and consumer choice; and
- WHOIS policy.

Resulting recommendations from each review team will be provided to ICANN's Board, posted for public comment, and considered for incorporation into ICANN's annual strategic and operational plans.

The Accountability and Transparency Review is underway [3], with a team of ICANN community volunteers assessing ICANN's commitment to "maintain and improve robust mechanisms for public input, accountability, and transparency so as to ensure that the outcomes of its decision-making will reflect the public interest and be accountable to all stakeholders." Specifically, the Accountability and Transparency Review Team is assessing ICANN's commitment to:

- Continually assessing and improving ICANN Board of Directors' governance;
- Assessing and improving the role and effectiveness of the GAC and its interaction with the Board;
- Continually assessing and improving the processes by which ICANN receives public input;
- Continually assessing the extent to which ICANN's decisions are embraced, supported and accepted by the public and the Internet community; and
- Assessing the policy development process to facilitate enhanced cross community deliberations, and effective and timely policy development.

The Accountability and Transparency Review Team members were appointed by ICANN's Board Chair and GAC Chair and were drawn from the ICANN community [4]. They currently are conducting research and gathering public input on three "case studies" involving new gTLDs (generic top level domains), .xxx (.xxx sponsored top level domain), and DNS CERT (DNS Community Emergency Response Team). They expect to issue a draft report for community consideration in October 2010 and their final report is due to be submitted to the ICANN Board by the end of this year.

Community volunteers and independent experts currently are being solicited to serve on the Security Stability and Resiliency of the DNS Review Team, and the WHOIS Policy Review Team [5]. ICANN's CEO and GAC Chair will appoint these review team members. Information on all AoC review teams' appointments, membership, activities, and recommendations are/will be publicly posted on ICANN's website.

ICANN's execution of its plan to enhance the operational stability, reliability, resiliency, security, and global interoperability of the DNS will be the focus of the Security Stability and Resiliency of the DNS Review. This review team is to pay

particular attention to: (a) security, stability and resiliency matters, both physical and network, relating to the secure and stable coordination of the Internet DNS; (b) ensuring appropriate contingency planning; and (c) maintaining clear processes.

The WHOIS Policy Review will assess ICANN's enforcement of its existing policy relating to WHOIS (subject to applicable laws). The AoC notes that existing policy requires that ICANN implement measures to maintain timely, unrestricted and public access to accurate and complete WHOIS information, including registrant, technical, billing, and administrative contact information.

The fourth review committed to in the AoC – promoting competition, consumer trust, and consumer choice – will be undertaken one year after new gTLDs are in operation. This review will examine the extent to which the introduction or expansion of gTLDs has promoted competition, consumer trust and consumer choice, as well as effectiveness of (a) the application and evaluation process, and (b) safeguards put in place to mitigate issues involved in the introduction or expansion. This review is to be repeated two years after the first review, and then no less frequently than every four years.

ICANN welcomes these reviews as part of the organization's ongoing commitment to assessment and improvement. Efforts underway at ICANN are building upon significant progress in all of these critical areas and these reviews are expected to help ICANN excel.

New gTLDs

gTLD stands for generic top-level domain. It is what Internet users see as an Internet extensions such as .com, .info or .org, and they are part of the structure of the Internet's domain name system.

The decision to introduce new gTLDs followed a carefully deliberated policy development process by the ICANN community. In October 2007, the GNSO formally completed its policy development work on new gTLDs and approved a set of 19 policy recommendations. Representatives from a wide variety of stakeholder groups including governments, business and intellectual property constituencies, civil society, individuals, academia, and the technical community, were engaged in discussions for more than 18 months on such questions as the demand, benefits and risks of new gTLDs, the selection criteria that should be applied, how gTLDs should be allocated, and the contractual conditions required for new gTLD registries going forward. The culmination of this policy development process was a decision by the ICANN Board of Directors in June 2008 to adopt the new gTLDs policy, and to direct ICANN staff to work on its implementation.

For the past two years, work has been focused on implementation. This involves creating an application and evaluation process for new gTLDs that is aligned with the policy recommendations and provides a clear roadmap for entities that plan to apply for a new gTLD. This implementation work has so far been reflected in four different drafts of the applicant guidebook that have been released for public comment, and in the explanatory papers giving insight into rationale behind some of

the conclusions reached on specific topics. Meaningful community input has led to revisions of the draft applicant guidebook, the 4th version of which was issued in May 2010.

The applicant guidebook addresses a wide range of details pertaining to procedures for application, evaluation, objection and dispute resolution, as well as transition and delegation. Several explanatory papers have been produced on a variety of technical, legal, business, financial, economical, as well as geographical issues. ICANN continues to work with the global community on finalizing the applicant guidebook and moving forward with the launching of the new gTLDs program. More details on the new gTLD program are available on ICANN's website [6].

IDN ccTLD Fast Track Process

IDNs stands for Internationalized Domain Names and are essentially domain names with at a minimum one character that is not included in the basic Latin script (a,b,c...z), the digits (0,1,2,...9) or the dash “-”.

In 2003 the first standard implementations took place as the IETF published the IDNA technical protocol that, when implemented in software, enables the use of IDNs for end-users in for example web-browsers. At the same time, leading IDN registries and ICANN published the IDN Guidelines that together with the IDNA protocol supports both domain name registration policies and resolution solutions for IDNs.

Work on introducing IDNs at the top-level of the DNS took place at all levels and involved all stakeholder groups and participants in the ICANN community, as follows:

Technical focus: While the technical work is apparent across all of the below policy and process working areas, the primary technical focus started out with a revision of the IDNA protocol. This was initiated by an informal design team that evaluated experience gained in the implementation of IDNA since its introduction in 2003, and identified several key areas that would benefit from modification. The IETF recently, in 2010, released the revision of IDNA in RFCs 5890, 5891, 5892, and 5894.

Policy Process focus: The policy process focus took place concurrent with the technical initiatives in relation to the IDNA revision. All policy groups within the ICANN community including ALAC, ccNSO, GNSO, and the governments via the GAC have been working on the following processes related to IDNs:

- IDN ccTLD Fast Track Process (launched November 2009)
- New gTLDs, including IDN gTLDs (under implementation)
- IDN ccTLDs, long-term process that caters for all (under policy development)
- Policy concerning variant IDN TLD management (under policy and technical development)

IDN ccTLD Fast Track Process: A process for the introduction of country and territory names or acronyms as IDN ccTLDs. Limitations in the process are related

to country and territory participation where official languages are based on non-Latin scripts only and the number of IDN ccTLDs per country or territory is not to exceed one per language or script. The long-term process for IDN ccTLDs that cater for all are under policy development in the ccNSO and is anticipated to take several years, while the Fast Track Process was developed, implemented and launched in the matter of a couple of years. The Fast Track Process was developed by a joint group with representatives from the ccNSO, GAC, GNSO, ALAC and technical community. Through deliberations in conference calls, face-to-face meetings, public comment periods, the policy recommendation was developed after which it was implemented by ICANN staff in consultation with the community.

The IDN ccTLD Fast Track Process was launched in late 2009, and in early 2010 the first IDN ccTLDs were inserted in the DNS root zone, and following launched by UAE, Saudi-Arabia, Russia and Egypt. These have so far been followed by a total of 15 IDN ccTLDs, covering the following languages: Chinese, Arabic, Russian, Tamil, Sinhalese, and Thai. A total of 33 requests have been received to date, and correspondence from governments and ccTLD managers indicate over 50 requests to be received over the next year or so. More information on IDNs and the Fast Track Process is available on ICANN's website [7].

DNSSEC

DNS Security Extensions, or DNSSEC defeats DNS redirection and DNS man in the middle attacks by cryptographically protecting the contents of entries in the DNS with digital signatures and keys. Although only a relatively small number of such exploits have been seen thus far, the recent discovery of improved exploits [8] has greatly accelerated DNSSEC deployment efforts [9].

DNSSEC ensures that information returned from the DNS has not been modified while in transit from its authoritative source. It accomplishes this by incorporating digital signatures and associated keys into the existing DNS hierarchy. Unlike a regular DNS response, a DNSSEC response carries with it both the regular DNS record and a record containing a digital signature unique for this record, created using the domain name owner's key. Any modification to the original record causes a mismatch with the accompanying signature. Since the key is only known by the domain name owner, the signature cannot be correctly re-computed to match by anyone else.

In DNSSEC the public keys for each domain name are themselves published as records in that respective domain, and are signed by the keys of the domain the next level up in the DNS hierarchy. Following the chain of signatures to the top of this hierarchy leads to the public key in the root. So only a single public key is needed to validate any signature in DNSSEC by validating each signature starting with the one associated with the final DNS response and successively validating the signatures associated with intermediate keys until reaching the root key.

In the same bottom-up, cooperative fashion that created the Internet, the Internet community has developed and is aggressively deploying DNSSEC to address security

concerns. DNSSEC is the result of almost two decades of cooperative development in the IETF by networking, security and cryptographic experts from the Internet community. This combined with cooperative efforts with the broader IT and business communities have contributed greatly to the accelerated secure deployment of DNSSEC. The result is a secure and efficient protocol with support and buy-in from the community.

ICANN's efforts involving and drawing on the experience of the global Internet community removed the final obstacle to DNSSEC deployment on July 15, 2010 with a signed root [10]. This was a cooperative effort that incorporated direct involvement of the global Internet community in the management of the root key through regular key ceremonies [11] resulting in a system trusted by this same community.

With this step not only have efforts to secure the DNS flourished but more importantly developers have re-awoken to the value of a secure DNS infrastructure as an authentication source and a platform for a whole range of new products and innovative security solutions. This has been publicly recognized by various security researchers [12] and recounted by noted Internet experts as the biggest change to the Internet in 20 years [13].

References

- [1]: <http://www.icann.org/en/about/>
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- [3]: <http://www.icann.org/en/reviews/affirmation/review-1-en.htm>
- [4]: <http://www.icann.org/en/reviews/affirmation/composition-1-en.htm>
- [5]: <http://www.icann.org/en/announcements/announcement-29jul10-en.htm>
- [6]: <http://www.icann.org/en/topics/new-gtld-program.htm>
- [7]: <http://www.icann.org/en/topics/idn/>
- [8] http://news.cnet.com/8301-1009_3-10009827-83.html
- [9] TLDs signed as of 1 Sep 2010: .root .arpa .be .bg .biz .br .cat .ch .cl .cz .dk .edu .eu .fi .gov .info .kg .li .lk .museum .my .na .nl .nu .org .pm .pr .pt .se .tf .th .tm .uk .us .xn--fzc2c9e2c .xn--xkc2al3hye2a
- [10] <http://www.icann.org/en/news/releases/release-28jul10-en.pdf>
- [11] <http://www.root-dnssec.org/tcr/> Note: 18 of the 21 representatives are non-US
- [12] From 2010 Black Hat
<http://www.darkreading.com/securityservices/security/management/showArticle.jhtml?articleID=226300226>
- [13] Vint Cerf at the first key ceremony <http://www.youtube.com/watch?v=b9j-sfP9GUU>

Acronyms

ALAC: At-Large Advisory Committee

AoC: Affirmation of Commitments

ccNSO: Country Code Names Supporting Organization

ccTLD: Country Code Top Level Domain

DNS: Domain Name System

DNSSEC: DNS Security Extensions

GAC: Governmental Advisory Committee

gTLD: Generic Top Level Domain

GNSO: Generic Names Supporting Organization

ICANN: Internet Corporation for Assigned Names and Numbers

IDN: Internationalized Domain Name

IETF: Internet Engineering Task Force

IP: Internet Protocol

TLD: Top-Level Domain