technical and political context that surrounds the events within. **MAY 30** Jon Postel, then a graduate student at UCLA, proposes to allocate and manage socket numbers socket numbers for the emerging ARPANET network MARCH originally established by the US Department of Dr. Postel, taking his volunteer job as Internet Defense's Advanced Research Projects Agency numbers coordinator with him, joins the Information (DARPA). Although the ARPANET was small, some Sciences Institute at the University of Southern coordination was required to ensure uniqueness, so California, which became the home of IANA for the that various research groups weren't using the same next 22 years, until 1998. USC-ISI had been numbers for different things. In December 1972, with established 4 years before by Keith Uncapher at the agreement of the research community Postel USC.3,4 volunteers to be the central coordinator for assigning and keep track of identifiers. Over time, and with the agreement of the research community, he also becomes the RFC Editor and maintains the official list of host names and addresses.1 JANUARY TCP/IP becomes the new standard protocol suite for the ARPANET. Technical management of the JULY ARPANET had been vested in the Internet The NSFnet, created by the National Science Configuration Control Board (ICCB) established a few Foundation to link researchers and organizations year before by Vint Cerf, then at DARPA, who named supporting research (including universities, private Dave Clark at MIT the first chairman. In 1983, this is companies, and government bodies) now exceeds renamed the Internet Activities Board and given the size of the ARPANET. As the distinction between oversight over the Internet Engineering Task Force the different networks disappears and other (IETF) and Internet Research Task Force (IRTF). The networks, including research and education networks IANA function, newly important with the shift to in Europe and Australia, got interconnected, the term TCP/IP and growth of the network, operates under "Internet" becomes a common name for the linked the authority of the IAB. (The IAB is renamed Internet "network of networks." The military part of the Architecture Board in 1992). 5,6,7 ARPANET is separated from the research part, and by the end of 1990, the ARPANET itself is gone.8,9 The coordination of numbers, names, and addresses across the Internet began very early, as an obvious requirement to be sure that identifiers were globally unique and well known to all who might be using them. Maintaining this tight... Read more 3 DECEMBER The term IANA is coined during the transition from OCTOBER ARPANET to Internet, when DARPA grants USC-ISI an The NSF eliminates the ban on commercial Internet research contract, which, among other tasks, traffic—already quietly ignored by many—across the includes funding for USC-ISI to support the portions of the Internet funded by the NSF. This performance of the IANA function, which Jon had makes the Internet a safe place for commercial previously performed at UCLA. IANA is first referred traffic. In September, 1995, NSF allowed Network to in an RFC in RFC1083 ("IAB Official Protocol Solutions to begin charging for domain name Standards"), where Joyce Reynolds is named as the

registration services (which were free in the .COM, .NET, .ORG, .EDU, and .GOV domains up to that point).13,14,15 The culture of the time is highly technical, and policy discussions are a product of this background. The experiences of the most influential members of the community are firmly rooted in research, academia, and open sharing... Read more 3 JUNE Postel publishes an Internet Draft "New Registries and the Delegation of International Top Level Domains" that proposes the process for creation of new gTLDs (generic Top-Level Domains, similar to .COM). (Note: at the time, these were called "International TLDs" or iTLDs; the term gTLD has generally replaced iTLD.). This draft results, in November, 1996, in the formation of the

The IANA Timeline

An Extended Timeline with Citations and Commentary

Joel Snyder / jms@Opus1.com · Konstantinos Komaitis / komaitis@isoc.org · Andrei Robachevsky / robachevsky@isoc.org

This timeline presents the history of IANA, the Internet Assigned Numbers Authority, from its birth in 1972 to the

ICANN55 Meeting in March, 2016. In addition to highlighting key issues and important events, we have made an

attempt to provide unbiased commentary and related historical information to help the reader understand the

International Ad-Hoc Committee (IAHC) to refine and establish policy. In February, 1997, the IAHC The IAHC narrowly focused on gTLDs, leaving aside the existing country-specific TLDs and

produces a "gTLD MoU" (generic Top Level Domain Memorandum of Understanding) as its final report. policies regarding the control and operation of the root servers. The IAHC clearly attempts to separate the mechanics of IANA's operation... Read more ? JANUARY 28 Postel emails the operators of the non-US Government root servers and asks that they pull the authoritative root zone information from a server at IANA (dnsroot.iana.org) rather than the "A" root

server (a.root-servers.net) at Network Solutions. This effectively moved control of the DNS root from Network Solutions and immediately created a firestorm of controversy. On Feb 3, Postel requested that the change be backed out and that root updates should be taken from the "A" root server. While Jon explained the change as a technical experiment, the unexpected nature of the request and fact that it was initiated by one individual causes concern and serves as an accelerator to the process that would eventually lead to the formation of ICANN. 23,24,25,26 JUNE The Department of Commerce publishes a Statement of Policy titled "Management of Internet Names and Addresses" (also known as the "White Paper") that defines a path forward for management and administration of DNS, IP addresses, and protocol parameters. This is the result of a long process, beginning with the 1997 "Request for Comments,"21,22 continuing with a February 20, 1998 "A Proposal to Improve the Technical Management of Internet Names and Addresses"27. The White Paper was issued on June 5, 1998 and published in the Federal Register on June 10, 1998.1 The White Paper called for stakeholders to come together to create a private non-profit general governance document for the Internet. Rather, it

organization to undertake DNS management functions. The White Paper explicitly disclaims that it is not a sets forth a framework, based on public comment, for how names... Read more 🕙 **OCTOBER 16** Postel passes away from complications after heart surgery. (Cerf, 1998) (BBC, 1998) The establishment of ICANN was controversial, and a variety of groups had widely different ideas on how the organization should be constituted. In all, five different groups proposed structures for what would become ICANN, including IANA, the Boston Working Group, the Open... Read more € **NOVEMBER 25,** ICANN is designated by the NTIA as their partner in the "DNS Project" to begin the transfer of both policy and technical management of DNS, IP addresses, and protocol parameters to the private sector. In response to the new US policy, extensive discussions had begun amongst multiple groups on the form and structure of an organization to meet the requirements of the White Paper. ICANN emerged from these discussions, finalized its Bylaws on November 6, 1998, and immediately began operation under interim chair Esther Dyson. 28,29,30,31 SEPTEMBER

The original November, 1998 DNS Project "Memorandum of Understanding" expires, having survived seven amendments, a renaming as the "Joint Project Agreement" (in 2006) and significant changes in scope. 45,46,47,48 It is replaced by the "Affirmation of Commitments" which emphasizes the policy aspects of ICANN's job without specifically mentioning the technical IANA functions performed by ICANN.49 The "Affirmation of Commitments" is a significant event in the evolution of ICANN and Internet Governance. By allowing the Memorandum of Understanding to lapse (and be replaced by the "Affirmation of Commitments"), the Department of Commerce gave up a significant... Read more € **MAY 30** The US House and Senate jointly pass House Concurrent Resolution 127/Senate Concurrent Resolution 50 which instructs the Department of Commerce to "continue working to implement the position of the United States on Internet governance that clearly articulates the consistent and unequivocal policy of the United States to promote a global Internet free from government control and preserve and advance the successful multistakeholder model that governs the Internet today."54 A similar bill, House Resolution 1580, states "it is the policy of the US to preserve and advance the successful multistakeholder model that governs the Internet," is passed by the House in 2013. 55,56 The May Resolution by Congress acts as unequivocal instructions to the Department of Commerce: like all other stakeholders, governments have

a role to play, but cannot be in charge of Internet governance. The US Read more Đ **OCTOBER 7** At a meeting in Uruguay, the leaders of ICANN, the five Regional Internet Registries, the IAB, the ISOC, the IETF and the W3C all sign the "Montevideo Statement" calling for (among other things) an acceleration of the globalization of ICANN and IANA functions and an ongoing effort to address Internet governance challenges. The statement also expressed strong concern that the recent revelations of pervasive monitoring and surveillance will undermine global trust in the Internet. (These leaders of ICANN, RIRs, IAB, ISOC, and IETF are colloquially called the "I-*", I-stars.)62 The Montevideo Statement is considered to be highly political, and directly references the issues related to mass and pervasive surveillance. Many feel that the Montevideo Statement helped spur the NTIA into beginning the... Read more •

At the ICANN 49 meeting in Singapore, the process of developing a proposal kicks off. ICANN launches a multistakeholder process and discussion to gather community views and input on the principles and mechanisms for the transitioning of NTIA's stewardship of the IANA functions. Discussion leads to agreement on the respective roles of ICANN, of the IANA Stewardship Coordination Group (ICG) and the operational communities as the conveners of their own proposal development processes. APRIL 10 US House of Representatives Subcommittee on Courts, Intellectual Property and the Internet of the Committee on the Judiciary holds hearings on "Should the Department of Commerce Relinquish Direct Oversight over ICANN?" Although the hearings don't result in anything specific, the testimony from both sides reflects deeply held beliefs and misconceptions about the relationship between the US Government and ICANN. This same pattern of confusion and chaos is repeated over and over again over the next 18 months. 65,67 **APRIL 24**

A first global, multistakeholder meeting, the

global Internet governance ecosystem. At this

NETmundial's goal is to bring together to develop a

meeting, the Netmundial Multistakeholder Statement

is published which includes specific reference to the

guaranteeing the transparency and accountability of

ends has to take place through an open process with

[the IANA functions] after the US Government role

NETmundial,80 is held in São Paulo, Brazil.

"[T]he discussion about mechanisms for

IANA transition:81

MARCH 26

the participation of all stakeholders extending beyond the ICANN community. The IANA functions are currently performed under policies developed in processes hosted by several organizations and forums. Any adopted mechanism should protect the bottom up, open and participatory nature of those policy development processes and ensure the stability and resilience of the Internet." **JULY 18** The IANA Stewardship Coordination Group (ICG) holds its first meeting in London and begins work on its charter. In this first meeting, the ICG develops a proposed charter and scope for its future work in support of the community's development of a proposal on the IANA functions stewardship transition. **JULY 18** The IANA Stewardship Coordination Group (ICG) holds its first meeting in London and begins work on its charter. In this first meeting, the ICG develops a proposed charter and scope for its future work in support of the community's development of a proposal on the IANA functions stewardship transition. **SEPTEMBER** The ICG publishes a **Timeline** and a **Request for** Proposals is created and each of the communities most directly affected is invited to respond. The ICG sets a deadline of January 15, 2015.68 **NOVEMBER 3** The ICANN Accountability and Governance Cross Community Working Group (CCGW) finalizes its charter (after considerable heated discussion) and Work Streams. Work Stream 1 is "focused on mechanisms enhancing ICANN accountability that

begins operation. The CCGW divides its work into two must be in place or committed to within the time frame of the IANA Stewardship Transition;" leaving Work Stream 2 to everything else, presumably important but not important enough to delay the IANA Stewardship Transition.84 JANUARY 6 The IETF, in agreement with the IAB, submits their response for the Protocol Parameters part of the IANA transition, beating the ICG deadline. The IETF does not suggest substantive changes to the status quo: "No new organizations or structures are required. Over the years since the creation of ICANN, the IETF, ICANN, and IAB have together created a system of agreements, policies, and oversight mechanisms that already cover what is needed. This system has worked well without any operational involvement from the NTIA. IANA protocol parameters registry updates will continue to function day-to-day, as they have been doing for the last decade or more. The IETF community is very satisfied with the current arrangement with ICANN. RFC 2860 remains in force and has served the IETF community very well. RFC 6220 has laid out an appropriate service description and requirements."85 JANUARY The Names Group (CWG, or "Cross Community Working Group to Develop an IANA Stewardship Transition Proposal on Naming Related Functions") decides to explicitly link the work of the two groups so that the IANA Transition Proposal cannot go forward until the Enhancing ICANN Accountability group completes some critical steps.88,89,90 JUNE 25 The Names Group (CWG) completes their work and submits their proposal to the ICG at ICANN53 in

Buenos Aires.91 This proposal is complete, but makes a very explicit link to the Enhancing ICANN Accountability (CCWG) group: "The CWG-Stewardship proposal is significantly dependent and expressly conditioned on the implementation of ICANN-level accountability mechanisms by the Cross Community Working Group on Enhancing ICANN Accountability (CCWG-Accountability) as described below.... ICANN Budget/IANA Budget; Community Empowerment Mechanisms; IFR; CSC; Separation Process; Appeal Mechanism; Fundamental Bylaws" ENLARGE GRAPHIC ** **ICANN** board Source: US Government Accountability Office. (2015, August) Internet Management: Structured Evaluation Could Help Assess Proposed Transition of Key Domain Name and Other Technical Functions (GAO-15-642)

SEPTEMBER 17 Aware that some of the accountability dependencies identified by the CCWG are not near completion, the NTIA extends the IANA Functions Contract with ICANN for another year, to September 2016.94 **NOVEMBER 30** The Enhancing ICANN Accountability Group (CCWG) publishes their third draft proposal and opens up a 3-week comment period. The third draft is a final draft.99 The report is made up of a main body and twelve major annexes, one for each of the recommendations made by the CCWG, in all nearly 250 pages, plus an additional 50 pages of ten appendices. Each part of the third draft will go through multiple group readings and comment periods, legal review, and a final consolidation before being published. The CCWG sets an ambitious schedule to complete the comment periods by the middle of February, 2016. Producing the final report by the Enhancing ICANN Accountability Group was a significant effort: it counted 28 members and 175 participants, 209

public meetings taking over 400 hours and 16,500 person-hours of time in meetings... Read more ? JANUARY The IANA trademark and domain name (iana.org) are currently held by ICANN. Following the recommendation by the CRISP team in their submission to the ICG, all three operational communities agreed that this was not appropriate, and this was reflected in the finalized ICG proposal in October 2015. In January 2016, all three operational communities agreed to move these to the IETF Trust as the "simplest, fastest and least expensive approach [that is] more than adequate to meet the needs of all parties.101

Acknowledgements

For Further Reading

Office, 2000.

unofficial archive copy.)

for Assigned Names and Numbers

О О О О О

О 2015 О

The ICG finalizes its charter in August, 2014. The ICG has a single deliverable: the proposal to NTIA regarding the IANA functions. ICG decides to break the proposal out into three separate groups, one each for the IANA functions of names, IP addresses, and protocol parameters (along with the .ARPA zone).66 Three groups are set up by the three operational communities to respond to the ICANN Stewardship Transition Coordination Group Request:69 - for IP addresses, the Numbering Resource Organization (NRO) establishes the CRISP (Coordinated RIR IANA Stewardship Proposal) Team, with a home page. This group also includes the 5 Regional Internet Registries (AFRINIC, APNIC, ARIN, LACNIC, and RIPE-NCC).

MARCH issues caused by the changing historical relationship with the United States, including for example, by stress testing against internal or external captures or takeovers, and safeguards against capture at all levels, which is a pre-condition of the IANA Stewardship Transition. Statements made by the NTIA [...] clarify that this process is limited to ensuring ICANN remains accountable in the absence of its contractual relationship with the USG. "75 Rep. John Shimkus (Illinois) introduces House Resolution 4342, the "DOTCOM (Domain Openness Through Continued Oversight Matters) Act of 2014," which requires that GAO prepare a report on whatever... Read more 3 AUGUST

transition plan: services; and, Read more • ICANN writes:

resiliency of the DNS; organization solution."63,64

Functions Contract on September 30, 2015. The NTIA sets out four key requirements of the 1. It must support and enhance the multistakeholder model; 2. it must maintain the security, stability, and 3. it must meet the needs and expectations of the global customers and partners of the IANA 4. it must maintain the openness of the Internet. The NTIA also explicitly forbids ICANN from forwarding a proposal that "replaces the NTIA role with a government-led or inter-governmental Not everyone agrees how much US Government oversight the IANA Functions contract brings with it. The Department of Commerce maintains that the role of the government is clerical... At the ICANN 49 Singapore meeting, ICANN also launches an Accountability self-assessment. (ICANN inventories their existing accountability efforts and internal infrastructure at70). These are not coincidental efforts, but are linked together. As the NTIA notes in a report on the transition, "These two multistakeholder processes [...] are directly linked, and [...] both issues must be addressed before any transition takes place." [71] The effort leads to the establishment of the "ICANN Accountability and Governance Cross Community Working Group (CCWG)," and the scope of the CCWG expands far beyond the IANA transition requirements to a general ICANN reform.72,73,74

The IANA Functions Contract is renewed in February 2000, and then extended through a In early 2012, preparations for the UN International Telecommunications Union (ITU) World Conference on International Telecommunications (WCIT) in December 2012 are fully underway and some proposals by Member States are clearly aimed at bringing the Internet under the jurisdiction of the International... Read more • MARCH 14 "NTIA Announces Intent to Transition Key Internet Domain Name Functions" reads the press release headline. The announcement notes that ICANN is the current IANA functions operator, and therefore is being charged with convening the multistakeholder process to develop a transition plan for continuing the IANA functions after the expiry of the IANA

In December, 1996, a US government working group (under the leadership of Vice President Gore) publishes the first draft of "A Framework For Global authoritarian regimes however do not accept this model and seek to move Internet governance issues, including the DNS, into the United Nations system in order to exert influence and control over the Internet. This played out during the 2012 World Conference on International Telecommunications in Dubai where the world split on fundamental issues of Internet governance." (Asst. Secretary of Commerce Strickling)57,58,59,60,61

DNS." The Internet has grown in importance, and the monopoly of Network Solutions in the lucrative .COM domain registration leads to calls for competition. The leadership of the IETF and IANA seeks to move to a more open operation style, and RFC 1591 offers the first statement of policy regarding domain names. An informational document, RFC 1591 didn't lay new territory, but was a way to put down on paper some of the procedures and policies that had been followed informally by Jon Postel for years.16 At the time, new gTLDs were not envisioned (RFC 1591 says "It is extremely unlikely that other TLDs will be created"), but country-code TLDs (ccTLDs) were not only in operation but the subject of contention in some countries. RFC 1591 helped to codify the policy for handling arguments and disputes regarding ccTLDs. RFC 1591 will be cited for the next 20 years as a basis for policy for DNS management.17 JULY 2 The IAHC's gTLD MoU incites significant global discussion and criticism, and their proposed changes to the DNS and DNS management are never implemented. As part of the response, and building on the Clinton administration's "Framework" directives, the US Department of Commerce publishes a "Request for Comments on the Registration and Administration of Internet Domain Names," effectively asserting their own control over the DNS in preference to the IAHC. The Department of Commerce receives over 430 comments, including some supportive of the work of the IAHC.21,22,15 Electronic Commerce" that... Read more Đ **FEBRUARY** The National Telecommunications and Information Administration (NTIA) of the US Department of Commerce issues "A Proposal to Improve the Technical Management of Internet Names and Addresses" (often called the "Green Paper"), which formalizes a series of principles to guide DNS management and proposes that a private, not-for-profit corporation should manage the coordinating functions. The Green Paper also indicates that the U.S. government's "unique role in the Internet DNS should end as soon as is practical"27. The Department of Commerce receives over 650 comments from around the world by the end of March, 1998, and uses these to develop the final US policy. OCTOBER 2 Jon Postel (still at IANA, but under his own name) submits the first draft of a possible ICANN structure to NTIA. (Postel, Letter to William Daley (Secretary of Commerce) Regarding Management of Internet Names and Addresses, 1998) **DECEMBER 24** ICANN formally takes over the IANA functions from USC.35,36 In all, NTIA would create three significant agreements with ICANN within the first two years: (1) the original November, 1998, memorandum of understanding ("DNS Project", although the scope includes all of IANA's functions, later called the "Joint Project Agreement"), (2) a Root Server Study Agreement, to collaborate on a study and process for making the management of the root server system more "robust and secure,"37 and (3) the IANA Functions sole source contract. All three agreements originally are set to terminate in September 2000.32 However, NTIA maintains final policy authority over the DNS root zone. This is made clear in November, 1999, when NTIA approves a package of five agreements with ICANN and Network Solutions, including Amendment 11 to the Cooperative Agreement. The latter gives Network Solutions the authority "to function as the administrator for the primary root server for the root server system and as a root zone administrator". The package also opens up registry competition and gives ICANN policy control over the DNS, subject to Department of Commerce oversight.38 SEPTEMBER

contact point for IANA and Jon Postel is both "Deputy

Internet Architect" and "RFC Editor." The services are

continued under the umbrella of the Tera-node

Network Technology contract with USC-ISI until

RFC 1591 "Domain Name System Structure and

Delegation" is published by the Internet Engineering

Task Force (IETF), noting that the IANA is "responsible

for the overall coordination and management of the

1998,10,11,12

MARCH

0

0

0

О

2011

0

О

2014

0

0

meets in Rio de Janeiro and creates a discussion document on Internet governance as input to the IBSA Summit in Tshwane in October. The discussion document recommends creation of a new global Internet Governance body within the UN that would, among other things, "Integrate and oversee the bodies responsible for technical and operational functioning of the Internet, including global standards setting." At the Summit, the leaders fall short of outright endorsement of the recommendations, but the prospect of a significant UN involvement in Internet Governance becomes a

long series of new contracts in 2001, 2003, 2006, and 2012. Although the contracts become... Read more 3 The India-Brazil-South Africa (IBSA) Dialogue Forum hot topic in the Internet community. The IBSA never holds another summit or ministerial meeting.51,52,53 DECEMBER The WCIT meets in Dubai. Although the meeting was meant to have a narrow-focus, covering topics such as how to charge for international long distance and how to call an ambulance, many countries used the negotiations to press for binding international, intergovernmental regulation for the Internet. Fifty-five nations refuse to sign the International Telecommunication Regulations (ITR) Treaty. The US Department of Commerce viewpoint on the negotiations is profoundly negative: "Some

The rationale for the establishment of the CCWG is based on specific concerns from the ICANN community about the withdrawal of the US Government from its direct involvement with ICANN, specifically related to accountability regarding domain name policies. In the process document, "The proposed process defined the scope as ensuring ICANN remains accountable in the absence of its historical contractual relationship with the U.S. Government (USG), and the perceived backstop with regard to ICANN's organization-wide accountability provided by that role, such as the renewal process of the IANA functions contract. It called for an examination, from an organizational perspective, of how ICANN's broader accountability mechanisms should be strengthened to address the absence of its historical contractual relationship with the USG, including looking at strengthening existing accountability mechanisms (e.g., the ICANN Bylaws and the Affirmation of Commitments). [...]The process is intended to deal with focused systemic

- for Protocol Parameters, the IETF established a working group called IANAPLAN, with a home page. - for Domain Names, the community developed the "Cross Community Working Group (CWG) to Develop an IANA Stewardship Transition Proposal on Naming Related Functions" with a home page. **JANUARY 15** The CRISP (Coordinated RIR IANA Stewardship Numbering Services Operator: "... and considering the

Proposal) Team, established by the Internet Number Community through the Regional Internet Registries, submits their response for the Number part of the IANA transition. They express confidence in continuing with ICANN as the executor of the IANA Internet Number Community's strong desire for stability and a minimum of operational change, the Internet Number Community believes that ICANN should remain in the role of the IANA Numbering Services Operator [...]." After 13 months of discussion in each of the five regional registries, the Number Community still manages to meet the ICG deadline.86,87 → ICANN Contractual Organisational **BEFORE AFTER**

ICANN Organisationa Five Contractual accountability accountability RIRs Review Committee The issue of accountability is particularly Both the Protocol Parameters and Numbering Resource groups see ICANN/IANA as a contractor that could be... Read more 2

important for the DNS and naming community. **JULY 31** The ICG makes a preliminary combination of all three proposals and opens a 40-day public comment period on July 31, ending September 8th, 2015.92,93

AUGUST 3 The Enhancing ICANN Accountability Group (CCWG) publishes the second draft of their proposal. Comments are open until September 12, 2015.95 AUGUST The US Government Accountability Office publishes "Internet Management: Structured Evaluation Could Help Assess Proposed Transition of Key Domain Name and Other Functions," a report on the IANA transition driven by the DOTCOM Act of 2014 (HR 4342). The GAO report provides an excellent overview of the IANA transition process and current status of ICANN, as well as a discussion of some of the risks associated with a transition away from the NTIA/IANA

contracting environment.77 **OCTOBER 29** The IANA Stewardship Transition Coordination Group (ICG) combines the three proposals from the three communities into a single document, along with

О

О

2016

О

The authors offer thanks to Karl Auerbach, Scott Bradner, Dave Clark, Leslie Daigle, John Klensin, Olaf Kolkman, John Levine, Izumi Okutani,

Readers interested in learning more about the history of IANA may find the following reference documents (listed in alphabetical order) very

1998.

Dave Piscitello, Karen Rose, Jan Trumbo, and Sally Wentworth for their help in putting this document together.

helpful in providing summaries of events and overview information:

Department of Commerce: Relationship with the Internet Corporation

Lennard G. Kruger, Congressional Research Service, 2014. (Note that

CRS is not allowed to provide on-line copies of reports and this is an

Almost Free: An Analysis of ICANN's 'Affirmation of Commitments

A. Michael Froomkin, University of Miami School of Law), 2011.

Robert P. Murphy as General Counsel of US General Accounting

Internet Domain Names: Background and Policy Issues

some feedback from the public comments period. However, because the Names Group (CWG) has The Enhancing ICANN Accountability Group (CCWG) makes a significant step forward at

conditioned their proposal on the work of Enhancing ICANN Accountability (CCWG) group (as described above), the ICG says that they will hold onto the proposal before sending it to NTIA until the Domain

Names group (CWG) has agreed that the Enhancing ICANN Accountability Group has met the CWG's requirements.97,98 ICANN 54 in Dublin (October, 2015) when the ICANN board and the CCWG agree on an enforcement mechanism for... Read more •

DECEMBER 14 The US Congress passes the US budget, the "Consolidated Appropriations Act of 2016," which makes a specific prohibition on NTIA relinquishing responsibility for Internet DNS functions until September 30, 2016.100

MARCH 10 submits the combined proposal for the IANA

The ICG, with the approval of the ICANN board, transition to the NTIA. With the Names Group's (CWG) agreement on February 25 that the Enhancing ICANN Accountability (CCWG) Group's work had met their requirements, there were no more community barriers to forwarding the combined proposal. View Footnotes

Launching the DNS War: DOT-COM Privatization and the Rise of

Craig Lyle Simon, PhD Dissertation, University of Miami, 2006.

ICANN Security and Stability Advisory Committee publication

Name Space of the Internet Domain Name System

Overview and History of the IANA Functions

Memorandum of Understanding on the Generic Top-Level Domain

Heather N. Mewes, Berkeley Technology Law Journal, Vol 13, No. 1,

Global Internet Governance



The coordination of numbers, names, and addresses across the Internet began very early, as an obvious requirement to be sure that identifiers were globally unique and well known to all who might be using them. Maintaining this tight coordination remains to date a clear priority for the Internet technical community as a fundamental requirement for a functioning Internet.



The culture of the time is highly technical, and policy discussions are a product of this background. The experiences of the most influential members of the community are firmly rooted in research, academia, and open sharing of ideas. Tension grows between commercial and national interests and the history and viewpoints of the Internet's leaders. In RFC 1591, Postel writes: "The designated manager is the trustee of the top-level domain for both the nation, in the case of a country code, and the global Internet community. Concerns about "rights" and "ownership" of domains are inappropriate. It is appropriate to be concerned about "responsibilities" and "service" to the community."



The IAHC narrowly focused on gTLDs, leaving aside the existing country-specific TLDs and policies regarding the control and operation of the root servers. The IAHC clearly attempts to separate the mechanics of IANA's operation from the policy-making associated with the DNS. The IAHC proposed a policy framework with a Policy Oversight Committee containing representatives from ISOC, IANA, IAB, UN ITU, the World Intellectual Property Organization (WIPO), the International Trademark Association (INTA), and "CORE," the Council of Registrars made up of all gTLD registrars, incorporated and housed in Switzerland. Although there is substantial support for the IAHC approach, there is also substantial opposition, for a variety of reasons.



In December, 1996, a US government working group (under the leadership of Vice President Gore) publishes the first draft of "A Framework For Global Electronic Commerce" that outlines the principles for policy development, provides positions on key issues, and gives a road map for future work. When the Framework is finalized on July 1, 1997, the US President will specifically direct the Department of Commerce to "make the governance of the domain name system private and competitive and to create a contractually based self-regulatory regime that deals with potential conflicts between domain name usage and trademark laws on a global basis." ^{26,27}



The White Paper called for stakeholders to come together to create a private non-profit organization to undertake DNS management functions. The White Paper explicitly disclaims that it is not a general governance document for the Internet. Rather, it sets forth a framework, based on public comment, for how names and numbers should be managed and administered in the future. (Irving, 1997)

The publication of the White Paper ignited several discussions amongst stakeholders that eventually informed the management and governance structure of "a new private, not-for-profit corporation responsible for coordinating specific DNS functions for the benefit of the Internet as a whole." [White Paper]

Incorporated and headquartered in the US—this eventually became ICANN, the Internet Corporation for Assigned Names and Numbers. This single organization would take over four parts of Internet administration and management (including all of the IANA functions), specifically:

- setting policy regarding IP numbering;
- overseeing operations of the root name servers;
- overseeing policy for new gTLDs in the DNS;
- coordinating the assignment of other technical parameters (such as protocol numbers);

The White Paper also anticipated that the US Government involvement in this new organization would end before September, 2000. Having explicitly forbidden the new organization to be controlled by a governmental or intergovernmental organization, such as the United Nations, the US Government wanted to hand over these policy-making and administrative functions to the Internet itself.^{27,1}



The establishment of ICANN was controversial, and a variety of groups had widely different ideas on how the organization should be constituted. In all, five different groups proposed structures for what would become ICANN, including IANA, the Boston Working Group, the Open Root Server Coalition, Ronda and Michael Hauben, and Jeffrey Williams on behalf of the fictitious Information Network Engineering Group32. Readers may wish to review extensive resources on the formation of ICANN and International Forum for the White Paper at 33 and 34.



The IANA Functions Contract is renewed in February 2000, and then extended through a long series of new contracts in 2001, 2003, 2006, and 2012. Although the contracts become more detailed and specific, the most significant recent additions make it clear that the IANA Functions do not include policy development. In fact, IANA is prohibited from changing policies without permission, and IANA functions staff are not allowed to "initiate, advance, or advocate" any policy related to IANA.^{39,40,41,42,43} At the same time, ICANN and IETF establish annual Memorandum of Understanding detailing the execution and service level agreements for some (but not all) of the IANA functions in the NTIA contract. Specifically excluded from the IETF MOUs are operation of the DNS and IP address assignments.⁴⁴



The "Affirmation of Commitments" is a significant event in the evolution of ICANN and Internet Governance. By allowing the Memorandum of Understanding to lapse (and be replaced by the "Affirmation of Commitments"), the Department of Commerce gave up a significant supervisory role over ICANN, including the ability to "fire" ICANN. Although the Affirmation, like almost every other action involving ICANN, was the subject of heated criticism, it changed the governance function within ICANN. The US Department of Commerce "surrendered the most formal and visible legal control [it] had over ICANN."50

Notwithstanding the US Government's role in the management of ICANN by virtue; of its participation in the Government Advisory Committee (GAC), which the Affirmation of Commitments increased in power, the only remaining direct relationship is the IANA Functions Contract between ICANN and US Department of Commerce. This contract43 lists four specific IANA functions that ICANN provides under a zero-dollar contract:

1. the coordination of the assignment of technical Internet protocol parameters;

- 2. the administration of certain responsibilities associated with the Internet DNS root zone management;
- 3. the allocation of Internet numbering resources; and
- 4. other services related to the management of the ARPA and INT toplevel domains (TLDs).



The May Resolution by Congress acts as unequivocal instructions to the Department of Commerce: like all other stakeholders, governments have a role to play, but cannot be in charge of Internet governance. The US Government will insist on a multistakeholder model. Although IANA and Internet governance are not the same thing, Congress' support of the multistakeholder model will be a key influence on the IANA stewardship discussions.



The Montevideo Statement is considered to be highly political, and directly references the issues related to mass and pervasive surveillance. Many feel that the Montevideo Statement helped spur the NTIA into beginning the IANA transition process.



In early 2012, preparations for the UN International Telecommunications Union (ITU) World Conference on International Telecommunications (WCIT) in December 2012 are fully underway and some proposals by Member States are clearly aimed at bringing the Internet under the jurisdiction of the International Telecommunication Regulations (IRTs). Although the role that the NTIA has in the IANA Functions contract is clerical, the contract itself is symbolic to many as US Government control over the operation of the Internet.

The prospect of the UN and the ITU trying to assert their own control inspires discussion and action, and the House Committee on Energy and Commerce, Subcommittee on Communications and Technology hold hearings in May, 2012 on "International Proposals to Regulate the Internet."



The Montevideo Statement is considered to be highly political, and directly references the issues related to mass and pervasive surveillance. Many feel that the Montevideo Statement helped spur the NTIA into beginning the IANA transition process.



Not everyone agrees how much US Government oversight the IANA Functions contract brings with it. The Department of Commerce maintains that the role of the government is clerical.

For example, when Larry Strickling, Assistant Secretary for Communications and Information at NTIA is questioned by Texas Representative Blake Farenthold at an official hearing65 on the IANA transition, Strickling is adamant:

"Mr. FARENTHOLD. We basically invented [the Internet], you know.

Our tax dollars funded DARPA which became the Internet. I would argue, it may be the only successful computing project this government has actually ever undertaken. So, you know, I am concerned about giving up our leadership role. Finally, I—

Mr. STRICKLING. Sir, please, I must push back on you. We are not giving up our leadership role. We are stepping out of a clerical function that we

currently perform, but [...] we are not giving up our leadership role in this space."

However, there is a "last resort option" that does represent leverage that NTIA holds over ICANN: because the IANA functions are performed under a contract, the NTIA does have the ability to terminate the IANA functions contract or award it to another organization if they feel that ICANN has not performed adequately or fairly.

In the end, the plan to do away with the contract is called the "transition plan of NTIA's stewardship of IANA functions," leaving open the argument whether "oversight" and "stewardship" are synonyms.



Rep. John Shimkus (Illinois) introduces House Resolution 4342, the "DOTCOM (Domain Openness Through Continued Oversight Matters) Act of 2014," which requires that GAO prepare a report on whatever transition plan is received by NTIA before NTIA can act. 56,76 (The requested GAO report is available as77.) On April 2, Rep. Mike Kelly (Pennsylvania) introduces House Resolution 4367, the "Internet Stewardship Act of 2014." On April 4, Sep. Sean Duffy (Wisconsin) introduces House Resolution 4398, the "GIF (Global Internet Freedom) Act of 2014." 78,79 Both bills prohibit NTIA from moving forward. None of the bills are passed.



The issue of accountability is particularly important for the DNS and naming community.

Both the Protocol Parameters and Numbering Resource groups see ICANN/IANA as a contractor that could be, if necessary, replaced with another organization at their discretion. Thus, they would determine whether ICANN/IANA is acting in their best interests.

The DNS and naming community doesn't have the same option to establish a contract because the name community is represented by ICANN, and the IANA functions operator would be ICANN as well. ICANN would be contracting with itself.

Thus, the community seeks very strong accountability within ICANN and proposes the creation of "Post-Transition IANA," a wholly-owned subsidiary of ICANN that would execute the IANA Functions, while oversight and accountability would be maintained within ICANN.

The linkage between the Names Group (CWG) and Enhancing ICANN Accountability Group (CCWG) calls for the seven specific accountability additions (proposed on June 25) to

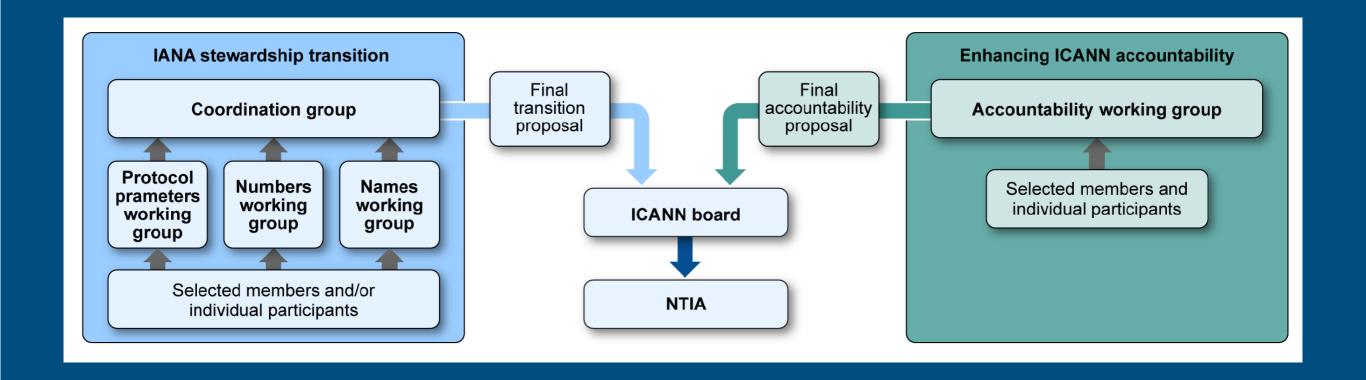


The Enhancing ICANN Accountability Group (CCWG) makes a significant step forward at ICANN 54 in Dublin (October, 2015) when the ICANN board and the CCWG agree on an enforcement mechanism for new governance model. This is a complicated and contentious issue, not only because it codifies how the powers of the community will be enforced within ICANN, but also because it requires a structure that can fit within normal corporate law. The main accomplishment of the second draft and its ensuing discussion was the resolution of this major issue.

Now that governance enforcement is agreed, other undecided issues within the CCWG discussions, such as human rights, mission and scope of ICANN, and the role of governments (the famous "Stress Test 18") in ICANN begin to be discussed in earnest and are the focus of the third draft.⁹⁶



Producing the final report by the Enhancing ICANN Accountability Group was a significant effort: it counted 28 members and 175 participants, 209 public meetings taking over 400 hours and 16,500 person-hours of time in meetings, and something close to 14,432 email messages across 14 mailing lists, delivering a 335 page document.



FOOTNOTES:

- Department of Commerce National Telecommunications and Information Administration, "Management of Internet Names and Addresses (Statement of Policy)," Management of Internet Names and Addresses (Statement of Policy), vol. 63, no. 111, pp. 31741-31751, June 1998, https://www.gpo.gov/fdsys/pkg/FR-1998-06-10/html/98-15392.htm.
- ²BBC. (1998, October) God of the Internet is Dead. [Online]. http://news.bbc.co.uk/2/hi/science/nature/196487.stm
- ³Gary Malkin. (1992, May) RFC 1336 Who's Who in the Internet: Biographies of IAB, IESG, and IRSG Members. [Online]. https://tools.ietf.org/html/rfc1336
- ⁴University of Southern California Information Sciences Institute. (2016, Jan) History of the Information Sciences Institute. [Online]. http://www.isi.edu/about/history/overview/
- ⁵Corporation for National Research Initiatives, "Proceedings of the Fourteenth Internet Engineering Task Force, July 25-28, 1989, Stanford University, California," in IETF-14, Reston, VA, 1989, pp. 1-344.
- ⁶Internet Activities Board. (1990, June) Minutes of IAB Meeting June 28-29, 1990. [Online]. https://www.iab.org/documents/minutes/minutes-1990/iab-minutes-1990-06-28/
- ⁷Internet Activities Board. (1992, June) Meeting Minutes of IAB, June 18-19, 1992 (Kobe, Japan, INET '92 Meeting). [Online]. https://www.iab.org/documents/minutes/minutes-1992/iab-minutes-1992-06-18/
- ⁸ Internet Engineering Task Force, "Proceedings of the July 27-29, 1987 Meeting," in IETF-7, McLean, 1987, pp. 1-323.
- ⁹Internet Engineering Task Force, "Proceedings of the 13th Meeting, April 11-14, 1989, Cocoa Beach, Florida," in IETF-13, Cocoa Beach, 1989, pp. 1-378.
- 10 Internet Activities Board. (1988, December) RFC 1083 IAB Official Protocol Standards. [Online]. https://tools.ietf.org/html/rfc1083
- "Joe Bannister and Jon Postel. (2000, March) Tera-node Network Technology (TASK 4) Network Infrastructure Activities final report. [Online]. http://www.osti.gov/scitech/biblio/802104
- ¹² ICANN Security and Stability Advisory Committee. (2014, August) Overview and History of the IANA Functions (SAC067). [Online]. https://www.icann.org/en/system/files/files/sac-067-en.pdf
- ¹³ US Senate. (1991, May) S. 1146 Scientific and Advanced Technology Act of 1992. [Online]. https://www.congress.gov/bill/102nd-congress/senate-bill/1146
- ¹⁴ US Code. (1992, Nov) 42 US Code Chapter 16 Section 1862 Functions of the National Science Foundation. [Online]. https://www.law.cornell.edu/uscode/text/42/1862
- ¹⁵ National Science Foundation. (1995, Sept) NSF Cooperative Agreement No. NCR-9218742, Amendment 4. [Online]. http://www.cavebear.com/nsf-dns/laws.htm
- 16 John Klensin, Email discussion between the author and Klensin, February 2016, (Klensin is one of the contributors to RFC 1591).
- 17 Jon Postel. (1994, March) RFC 1591 Domain Name System Structure and Delegation. [Online]. https://tools.ietf.org/html/rfc1591
- 18 Jon Postel. (1996, June) New Registries and the Delegation of International Top Level Domains. [Online]. https://tools.ietf.org/html/draft-postel-iana-itld-admin-01
- ¹⁹ International Ad-Hoc Committee. (1997, Feb) Final Report of the IAHC: Recommendations for Administration and Management of gTLDs. [Online]. https://web.archive.org/web/20040602185016/http://www.gtld-mou.org/draft-iahc-recommend-oo.html
- ²⁰ ISOC. (1996, Nov) Formation of International Ad-Hoc Committee (IAHC). [Online]. https://www.internetsociety.org/history-timeline/formation-international-ad-hoc-committee-iahc
- ²¹ Department of Commerce National Telecommunications and Information Administration. (1997, July) Request for Comments on the Registration and Administration of Internet Domain Names. [Online]. https://www.gpo.gov/fdsys/pkg/FR-1997-07-02/pdf/97-17215.pdf
- ²² Department of Commerce National Telecommunications and Information Administration. (1997, Aug) Registration and Administration of Internet Domain Names Summary of Comments (Docket No. 97061337-7137-01). [Online]. https://www.ntia.doc.gov/other-publication/1997/registration-and-administration-internet-domain-names-summary-comments-docket
- ²³ John Levine, Email discussion between the author and Levine, Feb 2016.
- ²⁴ Craig Simon and Joe Touch. (2002, Nov) [ih] Re: anyone remember when the root servers were hi-jacked? fwd). [Online]. http://mailman.postel.org/pipermail/internet-history/2002-November/000123.html
- ²⁵ Rajiv Chandrasekaran. (1998, Jan) Internet Reconfiguration Concerns Federal Officials. [Online]. http://songbird.com/pab/mail/0472.html
- ²⁶ Craig Lyle Simon, Launching the DNS War: DOT-COM Privatization and the Rise of Global Internet Governance. Coral Gables, Florida, USA: University of Miami, 2006, (PhD Dissertation submitted December, 2006).

- ²⁷ Department of Commerce National Telecommunications and Information Administration, "Improvement of Technical Management of Internet Names and Addresses (15 CFR C hapter XXIII Docket No 980212036-8036-01)," Improvement of Technical Management of Internet Names and Addresses (15 CFR C hapter XXIII Docket No 980212036-8036-01), vol. 63, no. 34, pp. 8826-8833, Feb 1998.[Online].
- ²⁸ ICANN. (1998, November) Bylaws of ICANN (First adopted set) Effective as of 6 November 1998. [Online]. https://www.icann.org/resources/unthemed-pages/bylaws-1998-11-06-en
- ²⁹ Becky Burr. (1998, October) Letter to ICANN of October 20, 1998. [Online]. https://www.ntia.doc.gov/legacy/ntiahome/press/icann102098.htm
- 3º Sallianne Fortunato. (1998, November) NTIA Reviewing ICANN Bylaws. [Online]. https://www.ntia.doc.gov/legacy/ntiahome/press/ICANN111098.
- 32 NTIA. (1998, November) Memorandum of Understanding between the U.S. Department of Commerce and the Internet Corporation for Assigned Names and Numbers. [Online]. https://www.ntia.doc.gov/page/1998/memorandum-understanding-between-us-department-commerce-and-internet-corporation-assigned-
- ³² United States General Accounting Office. (2000, July) Department of Commerce: Relationship with the Internet Corporation for Assigned Names and Numbers. [Online]. http://www.gao.gov/new.items/ogooo33r.pdf
- 33 Jeremy Malcolm. (2008, February) Multistakeholder Public Policy Governance and its Application to the Internet Governance Forum. [Online]. https://www.malcolm.id.au/thesis/
- 34 Ellen Rony and Peter Rony, The Domain Name Handbook: High Stakes and Strategies in Cyberspace. Lawrence, Kansas, USA: R&D Books, 1998, http://www.domainhandbook.com/ifwp.html.
- 35 Commerce Business Daily, Internet Assigned Numbers Authority Sole Source Contract, January 4, 1999, December 24, 1998 effective date.
 36 University of Southern California. (1999, December) USC/ICANN Transition Agreement. [Online]. https://www.icann.org/resources/unthemed-pages/usc-icann-transition-2012-02-25-en
- ³⁷ NIST. (1999, May) Cooperative Research and Development Agreement between ICANN and US Department of Commerce. [Online]. https://www.icann.org/resources/unthemed-pages/crada-2012-02-25-en
- 38 ICANN. (1999, September) Fact Sheet on Tentative Agreements among ICANN, the U.S. Department of Commerce, and Network Solutions, Inc. [Online]. http://archive.icann.org/en/nsi/factsheet.htm
- ³⁹ US Department of Commerce. (2000, February) IANA Functions Contract (February 9, 2000). [Online]. https://www.ntia.doc.gov/files/ntia/publications/ianacontract.pdf
- 40 US Department of Commerce. (2001, March) IANA Functions Contract (March 21, 2001). [Online]. https://www.ntia.doc.gov/files/ntia/publications/sb1335-01-w-0650.pdf
- 4 US Department of Commerce. (2003, March) IANA Functions Contract (March 13, 2003). [Online]. https://www.ntia.doc.gov/files/ntia/publications/ianaorder_03142003.pdf
- ⁴² US Department of Commerce. (2006, August) IANA Functions Contract (August 11, 2006). [Online]. https://www.ntia.doc.gov/files/ntia/publications/ianacontract_081406.pdf
- ⁴³ US Department of Commerce. (2012, July) IANA Functions Contract (July 2, 2012). [Online]. https://www.ntia.doc.gov/files/ntia/publications/sf_26_pg_1-2-final_award_and_sacs.pdf
- 44 IETF and iCANN. (2000, March) IETF-ICANN Memorandum of Understanding Concerning the Technical Work of the Internet Assigned Numbers Authority. [Online]. https://www.icann.org/en/about/agreements/ietf/ietf-icann-mou-o1maroo-en.htm
- ⁴⁵ US Department of Commerce. (2002, September) Amendment 5 to ICANN/DOC Memorandum of Understanding. [Online]. https://www.icann.org/resources/unthemed-pages/amend5-jpamou-2002-09-19-en
- ⁴⁶ ICANN. (2003, Jan) Fifth Status Report under ICANN/US Government Memorandum of Understanding. [Online]. https://www.icann.org/resources/unthemed-pages/status-report-2003-01-08-en
- ⁴⁷ US Department of Commerce. (2006, September) Joint Project Agreement between the US Department of Commerce and the Internet Corproration for Assigned Names and Numbers. [Online]. https://www.icann.org/en/system/files/jpa-29sepo6-en.pdf
- ⁴⁸ US Department of Commerce. (2003, September) Amendment 6 to ICANN/DOC Memorandum of Understanding. [Online]. https://www.icann.org/resources/unthemed-pages/amend6-jpamou-2003-09-17-en
- ⁴⁹ ICANN and US Department of Commerce. (2009, September) AFFIRMATION OF COMMITMENTS BY THE UNITED STATES DEPARTMENT OF COMMERCE AND THE INTERNET CORPORATION FOR ASSIGNED NAMES AND NUMBERS. [Online]. https://www.icann.org/resources/pages/affirmation-of-commitments-2009-09-30-en
- 5º A. Michael Froomkin. (2011, Jan) Almost Free: An Analysis of ICANN's "Affirmation of Commitments". [Online]. http://ssrn.com/abstract=1744086
- 51 India-Brazil-South Africa Dialogue Forum. (2013, June) About IBSA Background. [Online]. http://www.ibsa-trilateral.org/about-ibsa/background
- ⁵² India-Brazil-South Africa Dialogue Forum. (2011, October) IBSA Dialogue Forum Firth Summit of Heads of State and Government Tshwane Declaration. [Online]. http://www.ibsa-trilateral.org/images/stories/documents/declarations/FINAL_Tshwane_Declaration_18Oct_12h23.pdf

- 53 India-Brazil-South Africa Dialogue Forum. (2011, September) Recommendations of IBSA Multistakeholder meeting on Global Internet Governance (Sept 1-2, 2011 Rio de Janeiro, Brazil). [Online]. http://www.itforchange.net/sites/default/files/ITfC/rio_recommendations.pdf
 54 US Congress. (2012, May) House Concurrent Resolution 127 "Expressing the sense of Congress regarding actions to preserve and advance the multistakeholder governance model under which the Internet has thrived." [Online]. https://www.gpo.gov/fdsys/pkg/BILLS-112hconres127ih.pdf/BILLS-112hconres127ih.pdf
- 55 US House of Representatives. (2013, April) HR 1580 "To affirm the policy of the United States regarding Internet Governance". [Online]. https://www.congress.gov/bill/113th-congress/house-bill/1580
- 56 US House of Representatives. (2014, March) HR 4342 "DOTCOM Act of 2014". [Online]. https://www.congress.gov/bill/113th-congress/house-bill/4342
- ⁵⁷ UN International Telecommunications Union. (2012, Dec) Conference concludes in Dubai with 89 countries having signed the updated International Telecommunication Regulations. [Online]. http://www.itu.int/osg/wcit-12/highlights/dec13-14.html
- 58 UN International Telecommunications Union. (2012, December) Signatories of the Final Acts (89) of WCIT 2012. [Online]. http://www.itu.int/osg/wcit-12/highlights/signatories.html
- ⁵⁹ United States House of Representatives Judiciary Committee. (2014, April) Hearing: Should the Department of Commerce Relinquish Direct Oversight over ICANN (April 10, 2014). [Online]. http://judiciary.house.gov/index.cfm/2014/4/hearing-should-the-dept-of-commerce-relinquish-direct-oversight-over-icann
- 60 Paul Conneally. (2012, November) The Google Campaign an ITU View. [Online]. https://itu4u.wordpress.com/2012/11/23/the-google-campaign-an-itu-view/
- ⁶¹ Lynn St. Amour. (2012, December) Internet Society Disappointed over Fundamental Divides at World Conference on International Telecommunications. [Online]. http://www.internetsociety.org/news/internet-society-disappointed-over-fundamental-divides-world-conference-international
- ⁶² John Curran et al. (2013, Oct) Montevideo Statement on the Future of Internet Cooperation. [Online]. https://www.icann.org/news/announcement-2013-10-07-en
- 63 National Telecommunications & Information Administration. (2014, March) NTIA Announces Intent to Transition Key Internet Domain Name Function. [Online]. https://www.ntia.doc.gov/press-release/2014/ntia-announces-intent-transition-key-internet-domain-name-functions
- 64 National Telecommunications & Information Administration. (2014, March) IANA Functions and Related Root Zone Management Transition Questions and Answers. [Online]. https://www.ntia.doc.gov/other-publication/2014/iana-functions-and-related-root-zone-management-transition-questions-and-answ
- ⁶⁵ US House of Representatives, Subcommittee on Courts, Intellectual Property, and the Internet. (2014, April) Hearing: Should the Department of Commerce Relinquish Direct Oversight over ICANN? (April 10, 2014). [Online]. http://judiciary.house.gov/index.cfm/2014/4/hearing-should-the-dept-of-commerce-relinquish-direct-oversight-over-icann
- 66 IANA Stewardship Transition Coordination Group. (2014, August) Charter of the Group, v.10 (August 27, 2014). [Online]. https://www.icann.org/en/system/files/files/charter-icg-27aug14-en.pdf
- 67 ICANN. (2014, April) Call for Public Input: Draft Proposal, Based on Initial Community Feedback, of the Principles and Mechanisms and the Process to Develop a Proposal to Transition NTIA's Stewardship of the IANA Functions. [Online]. https://www.icann.org/resources/pages/draft-proposal-2014-04-08-en
- 68 ICANN. (2014, September) IANA Stewardship Transition Coordination Group Request for Proposals. [Online]. https://www.icann.org/en/system/files/files/rfp-iana-stewardship-o8sep14-en.pdf
- 69 ICANN Stewardship Transition Coordination Group. (2014, September) Communities Contributing to the ICG Request for Transition Proposals. [Online]. https://www.icann.org/en/stewardship/community
- ⁷⁰ ICANN. (2014, May) Enhancing ICANN Accountability: Opportunity for public dialogue and community feedback. [Online]. https://www.icann.org/resources/pages/enhancing-accountability-2014-05-06-en
- ⁷¹ National Telecommunications & Information Administration. (2015, January) Report on the Transition of the Stewardship of the IANA Functions. [Online]. https://www.ntia.doc.gov/files/ntia/publications/iana_report_013015.pdf
- ⁷² NETmundial. (2014, April) Live Transcript of NETmundial conference, Day 2 (23, 24/April/2014, São Paulo, Brazil). [Online]. https://prakash.im/text-netmundial-day2.html
- 73 Steve DelBianco. (2014, April) Parallel Processes: ICANN Accountability and the IANA Transition. [Online]. http://www.circleid.com/posts/20140429_parallel_processes_icann_accountability_and_the_iana_transition/
- ⁷⁴ICANN. (2014, March) ICANN Accountability Event report at ICANN 49 (24 March 2014) Singapore. [Online]. https://singapore49.icann.org/en/schedule/mon-icann-accountability
- 75 ICANN. (2014, October) Enhancing ICANN Accountability: Process and Next Steps. [Online]. https://www.icann.org/resources/pages/process-next-steps-2014-10-10-en
- ⁷⁶ US House of Representatives. (2014, December) House Report 113-715 from the Committee on Energy and Commerce to accompany H.R. 4342 (DOTCOM Act of 2014). [Online]. https://www.gpo.gov/fdsys/pkg/CRPT-113hrpt715/html/CRPT-113hrpt715.htm

- ⁷⁷ US Government Accountability Office. (2015, August) Internet Management: Structured Evaluation Could Help Assess Proposed Transition of Key Domain Name and Other Technical Functions (GAO-15-642). [Online]. http://www.gao.gov/assets/680/672055.pdf
- 78 US House of Representatives. (2014, April) HR 4398 GIF Act of 2014. [Online]. https://www.congress.gov/bill/113th-congress/house-bill/4398
- ⁷⁹ US House of Representatives. (2014, April) HR 4367 Internet Stewardship Act of 2014. [Online]. https://www.congress.gov/bill/113th-congress/house-bill/4367
- 80 NETmundial Initiative. (2014, April) Home Page of NETmundial. [Online]. https://www.netmundial.org/
- 81 NETmundial. (2014, April) NETmundial Multistakeholder Statement of April 24, 2014 (São Paulo, Brazil). [Online]. http://netmundial.br/wpcontent/uploads/2014/04/NETmundial-Multistakeholder-Document.pdf
- 8º ICANN. (2014, August) Charter of the Cross Community Working Group to Develop an IANA Stewardship Transition Proposal on Naming Related Functions. [Online]. https://community.icann.org/download/attachments/48347144/CWG-DT%20Draft%20Charter%20-%2014%20August%20 2014%20Updated.doc?api=v2
- 83 CWG-Stewardship. (2015, Jan) Accountability Dependencies. [Online]. https://docs.google.com/document/d/1c4Eab_fZMCQeeYvhy8OcE6f_PqhGza2qW4-UgFn8Pvc/edit
- 84 ICANN. (2014, November) Proposed Charter for Enhancing ICANN Accountability Cross Community Working Group (CCWG) Submitted for Consideration. [Online]. https://www.icann.org/news/announcement-2014-11-05-en
- 85 Eliot Lear and Russ Housely. (2015, Jan) Draft Response to the Internet Coordination Group Request for Proposals on the IANA protocol parameters registries. [Online]. http://tools.ietf.org/html/draft-ietf-ianaplan-icg-response-09
- 86 Number Resource Organization (NRO). (2016, Jan) NRO and Internet Governance: IANA Stewardship Transition Home Page. [Online]. https://www.nro.net/nro-and-internet-governance/iana-oversight
- 87 Number Resource Organization (NRO). (2015, January) Response to the IANA Stewardship Transition Coordination Group Request for Proposals on the IANA from the Internet Number Community. [Online].
 https://www.nro.net/wp-content/uploads/ICG-RFP-Number-Resource-Proposal.pdf
- 88 CWG-Stewardship. (2015, Jan) IANA CWG Meeting #17 (11-January-2015) Report. [Online]. https://community.icann.org/pages/viewpage.action?pageId=51416954
- 89 Alan Greenberg. (2015, Jan) Accountability measures required by CWG Proposal(s) (submission to CWG-Stewardship mailing list). [Online]. http://mm.icann.org/pipermail/cwg-stewardship/2015-January/001390.html
- 90 Jonathan Robinson. (2015, Jan) Conditional Accountability Requirements (submission to CWG-Stewardship mailing list). [Online]. http://mm.icann. org/pipermail/cwg-stewardship/2015-January/001393.html
- 91 CWG-Stewardship. (2015, June) Response to the IANA Stewardship Transition Coordination Group Request for Proposals on the IANA Stewardship Transition from the Cross Community Working Group on Naming Related Functions. [Online]. https://community.icann.org/x/aJooAw
- 92 IANA Stewardship Transition Coordination Group. (2015, Sept) ICG Summary Report on Comments Received during the Public Comment Period on the Combined Transition Proposal. [Online]. https://www.ianacg.org/icg-files/documents/Public-Comment-Summary-final.pdf
- 93 IANA Stewardship Transition Coordination Group. (2015, July) IANA Stewardship Transition Proposal: Call for Public Comment. [Online]. https://www.ianacg.org/calls-for-input/combined-proposal-public-comment-period/
- ⁹⁴ US Department of Commerce. (2015, September) Amendment 4 to IANA Functions Contract Extending Period of Performance to September 30, 2016. [Online]. https://www.ntia.doc.gov/files/ntia/publications/iana_mod_option_1_exercised.pdf
- ⁹⁵ Enhancing ICANN Accountability CCWG. (2015, August) Cross Community Working Group on Enhancing ICANN Accountability 2nd Draft Report (Work Stream 1). [Online]. https://www.icann.org/public-comments/ccwg-accountability-2015-08-03-en
- % Kathryn Brown. (2015, October) We're Almost There. IANA Stewardship Transition (Blog entry). [Online]. https://www.internetsociety.org/blog/public-policy/2015/10/were-almost-there-iana-stewardship-transition
- ⁹⁷ IANA Stewardship Transition Coordination Group (ICG). (2015, October) Proposal to Transition the Stewardship of the Internet Assigned Numbers Authority (IANA) Functions from the U.S. Commerce Department's National Telecommunications and Information Administration (NTIA) to the Global Multistakeholder Community. [Online]. https://www.ianacg.org/icg-files/documents/IANA-transition-proposal-v9.pdf
- 98 ICANN. (2015, Nov) Overview and Timeline of NTIA IANA Functions' Stewardship Transition. [Online]. https://www.icann.org/en/stewardship
- 99 Enhancing ICANN Accountability CCWG. (2015, November) Third Draft Report (published on 30 November). [Online]. https://community.icann.org/pages/viewpage.action?pageId=56145016
- 100 US Congress. (2015, December) Consolidated Appropriations Act of 2016 (section 539). [Online]. https://www.gpo.gov/fdsys/pkg/BILLS-114hr2029enr/pdf/BILLS-114hr2029enr.pdf
- ¹⁰¹ Steve Crocker. (2016, Jan) [CWG-Stewardship] [client com] IPR Memo (posting to CWG-Stewardship mailing list). [Online]. http://mm.icann.org/pipermail/cwg-stewardship/2016-January/004597.html