
2.4 DNS Stability Evaluation

2.4.1 Introduction

The DNS Stability evaluation was designed to ensure that applied-for gTLD strings complied with technical, IDN, and policy requirements, and to ensure that a string did not cause significant security or stability issues.

2.4.2 Relevant Guidance

The following guidance is relevant to the topic of the DNS Stability evaluation and will be discussed in further detail in Sections 2.4.3 and 2.4.4 of this report:

- GNSO Principle B: “Some new generic top-level domains should be internationalised domain names (IDNs) subject to the approval of IDNs being available in the root.”⁸⁵
- GNSO Recommendation 1:

ICANN must implement a process that allows the introduction of new top-level domains. The evaluation and selection procedure for new gTLD registries should respect the principles of fairness, transparency and non-discrimination. All applicants for a new gTLD registry should therefore be evaluated against transparent and predictable criteria, fully available to the applicants prior to the initiation of the process. Normally, therefore, no subsequent additional selection criteria should be used in the selection process.

- GNSO Recommendation 4: “Strings must not cause any technical instability.”
- GNSO Recommendation 9: “There must be a clear and pre-published application process using objective and measurable criteria.”
- Applicant Guidebook, Module 1: Introduction to the gTLD Application Process⁸⁶
- Applicant Guidebook, Section 2.2.1.3: DNS Stability Review
- Applicant Guidebook, Section 2.4: Parties Involved in Evaluation
- Applicant Guidebook, Attachment to Module 2: Evaluation Questions and Criteria
- ICANN Board New gTLD Program Committee Resolution 2014.07.30.NG01 - 2014.07.30.NG04 (30 July 2014): Name Collision Occurrence Management Framework⁸⁷

⁸⁵ ICANN. (8 August 2007) ICANN Generic Names Supporting Organization Final Report Introduction of New Generic Top-Level Domains, Part A. Retrieved from <http://gnso.icann.org/en/issues/new-gtlds/pdp-dec05-fr-parta-08aug07.htm>

⁸⁶ ICANN. (4 June 2012) gTLD Applicant Guidebook Version 2012-06-04. Retrieved from <http://newgtlds.icann.org/en/applicants/agb/guidebook-full-04jun12-en.pdf>

⁸⁷ ICANN. (30 July 2014) Approved Resolutions | Meeting of the New gTLD Program Committee. Retrieved from <https://www.icann.org/resources/board-material/resolutions-new-gtld-2014-07-30-en>

2.4.3 Background

The AGB anticipated that Initial Evaluation (IE) (see Section 2.1: Initial and Extended Evaluation of this report) would take five months to complete, all IE results would be published at the conclusion of IE, and the Contracting process would commence at the end of IE. This would allow applicants that passed IE to move expeditiously toward signing an RA if there were no other issues that the application must resolve (i.e., contention resolution, dispute resolution).

The DNS Stability evaluation criteria were designed to identify labels that did not meet minimum technical criteria for TLD labels and as a result, might cause technical instability in the DNS. The AGB criteria were developed in support of GNSO Principle D and GNSO Recommendation 4, and public comment was solicited for the DNS Stability paper published in February 2008 and updated in October 2008.^{88,89} The SAC045 report, published in November 2010 for community and ICANN Board review, was also considered and incorporated into the development of the AGB and the DNS Stability Evaluation.⁹⁰ ICANN engaged an independent third-party service provider, Interisle Consulting Group, to act as the DNS Stability panel. For more information about the panel, see Section 8.2: Service Provider Coordination of this report.

The DNS Stability evaluation was performed as part of Initial Evaluation (IE). IE processes are described in detail in Section 2.1: Initial and Extended Evaluation of this report.

Section 2.2.1.3.1 of the AGB stated,

During the Initial Evaluation Period, ICANN [would] conduct a preliminary review on the set of applied-for gTLD strings to:

- *ensure that applied-for gTLD strings comply with the requirements provided in section 2.2.1.3.2, and*
- *determine whether any strings raise significant security or stability issues that may require further review.*

Section 2.2.1.3.2 of the AGB defined the syntactical requirements for strings.

- Part I, the Technical Requirements for all Strings, required that the ASCII label be valid (as specified in RFC 1035 and RFC 2181), and that the ASCII label be a valid host name (as specified in RFC 952, RFC 1123, RFC 3696, and RFCs 5890-5894). These requirements included the following syntactical rules: 63-character limit, identical treatment of upper- and lowercase letters, only alphabetic characters A-Z, and valid IDNA A-labels only.

⁸⁸ ICANN. (6 February 2008) Announcement: Public Comments Requested on DNS Stability: The Effect of New gTLDs on the Internet Domain Name System. Retrieved from <https://www.icann.org/news/announcement-2008-02-06-en>

⁸⁹ ICANN. (22 October 2008) New gTLD Program Explanatory Memorandum: Update to DNS Stability Paper. Retrieved from <http://archive.icann.org/en/topics/new-gtlds/update-dns-stability-22oct08-en.pdf>

⁹⁰ ICANN. (15 November 2010) ICANN Security and Stability Advisory Committee Report on Invalid Top Level Domain Queries at the Root Level of the Domain Name System. Retrieved from <https://www.icann.org/en/system/files/files/sac-045-en.pdf>.

- Part II, the Requirements for Internationalized Domain Names, required that for IDN labels, labels must be A-labels converted from a U-label consistent with the definition in IDNA and must meet the relevant criteria of the ICANN Guidelines for the Implementation of Internationalised Domain Names.⁹¹
- Part III, Policy Requirements for Generic Top-Level Domains, required that applied-for ASCII strings must be three or more characters, and that applied-for IDN strings must be two or more characters.

Should unanticipated issues have arisen beyond the defined requirements of AGB Section 2.2.1.3.2, the AGB provided for an extended review by the DNS Stability panel during IE. However, each string was reviewed against the AGB criteria in accordance with the panel’s procedures, and none of the applied-for strings required the extended review.

Results of the DNS Stability review were included in the IE reports. Applications that did not pass the DNS Stability Review were not eligible for Extended Evaluation (EE). However, all applications passed the DNS Stability Review in IE.

2.4.4 Assessment

The implementation of the DNS Stability review brought to light one issue with interpretation and scope of the review, referred to as “name collision.” The AGB contemplated the potential for collisions as discussed in the SAC045 report, which stated that “potential problems [...] may arise should a new TLD applicant use a string that has been seen with measurable (and meaningful) frequency in a query for resolution by the root system and the root system has previously generated a response.”⁹² The report recommended that “ICANN promote a general awareness of the potential problems that may occur when a query for a TLD string that has historically resulted in a negative response begins to resolve to a new TLD.” These findings and recommendations were considered during the development of the AGB, which discussed the issue as a problem that a potential registry operator must prepare for from a query load perspective:

Any new TLD registry operator may experience unanticipated queries, and some TLDs may experience a non-trivial load of unanticipated queries. [. .]

ICANN will take steps to alert applicants of the issues raised in SAC045, and encourage the applicant to prepare to minimize the possibility of operational difficulties that would pose a stability or availability problem for its registrants and users. However, this notice is merely an advisory to applicants and is not part of the evaluation, unless the string raises significant security or stability issues as described in the following section.⁹³

⁹¹ ICANN. IDN Implementation Guidelines. Retrieved from <https://www.icann.org/resources/pages/implementation-guidelines-2012-02-25-en>

⁹² ICANN. (15 November 2010) ICANN Security and Stability Advisory Committee Report on Invalid Top Level Domain Queries at the Root Level of the Domain Name System. Retrieved from <https://www.icann.org/en/system/files/files/sac-045-en.pdf>

⁹³ ICANN. (4 June 2012) gTLD Applicant Guidebook Version 2012-06-04. Section 2.2.1.3: DNS Stability Review. Retrieved from <http://newgtlds.icann.org/en/applicants/agb/guidebook-full-04jun12-en.pdf>

The DNS Stability evaluation panel completed its work in January 2013 and determined no strings should be ineligible for delegation based on its review.

In March 2013, ICANN’s Security and Stability Advisory Committee (SSAC) issued a report SAC 057: SSAC Advisory on Internal Name Certificates, wherein the SSAC referred to the issue of “name collision” and provided the ICANN Board with steps for mitigating the issue.⁹⁴ To formulate a plan to address the issue, ICANN enlisted broad community participation in the development of a solution, to further study the impact on applied-for strings (the SSAC’s list was not exhaustive).

Over the next year, ICANN worked with the community and the SSAC on a mitigation plan. The work included a study of the historical query traffic,⁹⁵ a mitigation development effort, and the development of educational materials for IT administrators. On 17 November 2013, ICANN began implementing an interim mitigation approach,⁹⁶ termed the “alternate path to delegation” as described in the New gTLD Name Collision Occurrence Management Plan,⁹⁷ which allowed most strings to move ahead to delegation with a set of restrictions for second-level names, while the final mitigation plan was further developed by ICANN and the community. On 30 July 2014, the ICANN Board New gTLD Program Committee (NGPC) adopted a resolution directing staff to defer delegation of the high-risk strings (i.e., HOME, CORP, MAIL) indefinitely, and outlined procedures for Controlled Interruption for new gTLDs.⁹⁸ On 30 July 2014, ICANN published the Name Collision Management Framework.⁹⁹ In the Framework, ICANN described its interest in “providing a good notification measure for those parties that may be leaking queries intended for private namespaces to the public DNS” and required that registry operators implement a period of 90 days of continuous controlled interruption to mitigate risk.

ICANN took numerous steps to minimize the potential impact of name collision. A mitigation plan was implemented for this round, and the NGPC has directed ICANN to “work with the GNSO to consider whether policy work on developing a long-term plan to manage gTLD name collision issues should be undertaken.”¹⁰⁰

Much of the work performed during the DNS Stability evaluation related to IDNs. Since the DNS Stability evaluation during IE, considerable work has been conducted on establishing Root Zone Label Generation Rules, which are procedures for creating and maintaining the label generation

⁹⁴ ICANN Security and Stability Advisory. (15 March 2013) SAC057: SSAC Advisory on Internal Name Certificates. Retrieved from <https://www.icann.org/en/system/files/files/sac-057-en.pdf>

⁹⁵ Interisle Consulting Group, LLC. (2 August 2013). Name Collision in the DNS. Retrieved from <https://www.icann.org/en/system/files/files/name-collision-02aug13-en.pdf>

⁹⁶ ICANN. (17 November 2013) Announcement: Reports for Alternate Path to Delegation Published. Retrieved from <http://newgtlds.icann.org/en/announcements-and-media/announcement-2-17nov13-en>

⁹⁷ ICANN. New gTLD Collision Occurrence Management. Retrieved from <https://www.icann.org/en/system/files/files/resolutions-new-gtld-annex-1-07oct13-en.pdf>

⁹⁸ ICANN. (30 July 2014) Approved Resolutions | Meeting of the New gTLD Program Committee. Retrieved from <https://www.icann.org/resources/board-material/resolutions-new-gtld-2014-07-30-en#1.a>

⁹⁹ ICANN. (30 July 2014). Name Collision Occurrence Management Framework. Retrieved from <https://www.icann.org/en/system/files/files/name-collision-framework-30jul14-en.pdf>

¹⁰⁰ ICANN. (30 July 2014). Approved Resolution | Meeting of the New gTLD Program Committee. Retrieved from <https://www.icann.org/resources/board-material/resolutions-new-gtld-2014-07-30-en#1.a>

rules with respect to IDN labels for the root.^{101,102} Any future instances of the DNS Stability review should incorporate or ensure compliance with such rules.

2.4.5 Conclusion

The DNS Stability evaluation was performed in alignment with the AGB. The review was able to assess many different potential issues, and narrower criteria could limit its ability to identify as many concerns that relate to a particular string.

In this application round, most of the processes in the DNS Stability evaluation related to IDNs. Once the Root Zone Label Generation Rules for IDNs are established, this will reduce the amount of review required for IDNs. Once the Root Zone Label Generation Rules for IDNs are adopted, the DNS Stability Review should leverage these rules and incorporate checks to ensure that the Root Label Generation Rules for IDNs are adhered to.

The Name Collision Occurrence Management Framework provided a plan for registry operators to mitigate the risk of name collision through the use of controlled interruption periods at the time of TLD introduction to the root zone. The NGPC has directed ICANN to “work with the GNSO to consider whether policy work on developing a long-term plan to manage gTLD name collision issues should be undertaken.”¹⁰³

In summary:

2.4.a As directed in the NGPC’s 30 July 2014 resolution, “work with the GNSO to consider whether policy work on developing a long-term plan to manage gTLD name collision issues should be undertaken.”¹⁰⁴

2.4.b Based on the outcome of the GNSO’s work, consider inclusion of the Name Collision Management Framework in the next application round prior to accepting applications¹⁰⁵

2.4.c Leverage the Root Zone Label Generation Rules for IDNs in the DNS Stability evaluation

¹⁰¹ICANN. (27 April 2015) Guidelines for Designing Script-Specific Label Generation Rules for the Root Zone. Retrieved from <https://www.icann.org/news/announcement-3-2015-04-27-en>

¹⁰² ICANN. (2013 March 20) Procedure to Develop and Maintain the Label Generation Rules for the Root Zone in Respect of IDNA Labels. Retrieved from <https://www.icann.org/en/system/files/files/lgr-procedure-20mar13-en.pdf>

¹⁰³ ICANN (30 July 2014). Approved Resolution | Meeting of the New gTLD Program Committee. Retrieved from <https://www.icann.org/resources/board-material/resolutions-new-gtld-2014-07-30-en#1.a>

¹⁰⁴ ICANN (30 July 2014). Approved Resolution | Meeting of the New gTLD Program Committee. Retrieved from <https://www.icann.org/resources/board-material/resolutions-new-gtld-2014-07-30-en#1.a>

¹⁰⁵ ICANN. (30 July 2014). Name Collision Occurrence Management Framework. Retrieved from <https://www.icann.org/en/system/files/files/name-collision-framework-30jul14-en.pdf>