



New gTLD Program Explanatory Memorandum Update to DNS Stability Paper

Additional Technical Criteria Requirements, Including IDNs

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Background – New gTLD Program

Since ICANN was founded ten years ago as a not-for-profit, multi-stakeholder organization dedicated to coordinating the Internet's addressing system, one of its foundational principles, recognized by the United States and other governments, has been to promote competition in the domain-name marketplace while ensuring Internet security and stability. The expansion will allow for more innovation, choice and change to the Internet's addressing system, now constrained by only 21 generic top-level domain names. In a world with 1.5 billion Internet users—and growing—diversity, choice and competition are key to the continued success and reach of the global network.

The decision to launch these coming new gTLD application rounds followed a detailed and lengthy consultation process with all constituencies of the global Internet community. Representatives from a wide variety of stakeholders—governments, individuals, civil society, business and intellectual property constituencies, and the technology community—were engaged in discussions for more than 18 months. In October 2007, the Generic Names Supporting Organization (GNSO)—one of the groups that coordinate global Internet policy at ICANN—completed its policy development work on new gTLDs and approved a set of recommendations. Contributing to this policy work were ICANN's Governmental Advisory Committee (GAC), At-Large Advisory Committee (ALAC), Country Code Names Supporting Organization (ccNSO) and Security and Stability Advisory Committee (SSAC). The culmination of this policy development process was a decision by the ICANN Board of Directors to adopt the community-developed policy in June 2008 at the ICANN meeting in Paris. A thorough brief to the policy process and outcomes can be found at <http://gnso.icann.org/issues/new-gtlds/>.

This paper is part of a series of papers that will serve as explanatory memoranda published by ICANN to assist the Internet community to better understand the Request for Proposal (RFP), also known as *applicant guidebook*. A public comment period for the RFP will allow for detailed review and input to be made by the Internet community. Those comments will then be used to revise the documents in preparation of a final RFP. ICANN will release the final RFP in the first half of 2009. For current information, timelines and activities related to the New gTLD Program, please go to <http://www.icann.org/en/topics/new-gtld-program.htm>.

Please note that this is a discussion draft only. Potential applicants should not rely on any of the proposed details of the new gTLD program as the program remains subject to further consultation and revision.

Summary of Key Points in this Paper

- Amongst other things, a label must have no more than 63 characters and upper and lower case characters are treated as identical. It must not consist entirely of letters, digits and hyphens, must not start or end with a hyphen or a digit, must not be able to be confused with an IP address and must not be wholly comprised of digits between 0 and 9.
- All applied-for TLD ASCII strings must meet the technical requirements in *Names: Implementation and Specification* (RFC 1035), and *Clarifications to the DNS Specification* (RFC 2181).
- All applied-for non-ASCII strings (Internationalized Domain Name TLDs) must meet the technical requirements in *Internationalizing Domain Names in Applications* (RFC 3490).
- The applied-for IDN TLD string also must meet the relevant criteria of the *ICANN Guidelines for the Implementation of Internationalized Domain Names*.
- The IDNA protocol used for IDN TLDs is undergoing revision through the Internet standardization process. Thus, additional requirements may be specified or requirements here may change or be removed as the protocol revision is being completed.

Introduction

This document provides additional technical requirements to the paper titled *DNS Stability: The Effect of New Generic Top Level Domains on the Internet Domain Name System*, published by ICANN for Public Comments on 6 February 2008 (see <http://www.icann.org/en/topics/dns-stability-draft-paper-06feb08.pdf>). The present document contains additional technical specifications for new generic top-level domain name (gTLD) applicants.

The requirements specified in this document are intended to identify top-level domain name labels that do not meet minimum technical criteria and therefore might cause technical instability in the DNS. Meeting all the requirements in this document does not guarantee acceptance of a prospective top-level domain as this document does not provide an exhaustive list of all requirements or restrictions, nor does it include disqualifications relating to reserved words (including reserved words for technical reasons, e.g., "localhost"), or other policy related reasons.



Important Information Regarding IDN Requirements

The IDNA protocol used for internationalized labels is currently under revision through the Internet standardization process. As such, additional requirements may be specified or requirements specified here may change or be removed as the protocol revision is being completed. The current status of the protocol revision is documented at <http://tools.ietf.org/wg/idnabis/> and additionally updated standards will be referenced at <http://www.icann.org/en/topics/idn/rfcs.htm>.

Technical Requirements

1. General Requirements for All Labels

- 1.1 The ASCII label (i.e., the label as transmitted on the wire) must be valid as specified in technical standards Domain Names: Implementation and Specification (RFC 1035); and Clarifications to the DNS Specification (RFC 2181). This includes the following:
 - 1.1.1 The label must have no more than 63 characters.
 - 1.1.2 Upper and lower case characters are treated as identical.
- 1.2 The ASCII label must be a valid host name, as specified in technical standard DOD Internet Host Table Specification (RFC 952); Requirements for Internet Hosts — Application and Support (RFC 1123); and Application Techniques for Checking and Transformation of Names (RFC 3696). This includes the following:
 - 1.2.1 The label must consist entirely of letters, digits and hyphens.
 - 1.2.2 The label must not start or end with a hyphen.
- 1.3 There must be no possibility for confusing an ASCII label with an IP address or other numerical identifier. For example, representations such as “255”, “o377” (255 in octal) or “0xff” (255 in hexadecimal) as the top-level domain can be interpreted as IP addresses. As such, labels:
 - 1.3.1 Must not be wholly comprised of digits between “0” and “9”.
 - 1.3.2 Must not commence with “0x” or “x”, and have the remainder of the label wholly comprised of hexadecimal digits, “0” to “9” and “a” through “f”.
 - 1.3.3 Must not commence with “0o” or “o”, and have the remainder of the label wholly comprised of digits between “0” and “7”.
- 1.4 The ASCII label may only include hyphens in the third and fourth position if it represents a valid internationalized domain name in its A-label form (ASCII encoding as described in Section 2).
- 1.5 The presentation format of the domain (i.e. either the label for ASCII domains, or the Unicode label for Internationalised Domain Names) must not begin or end with a digit.

2. Requirements for Internationalized Top-Level Labels

These requirements apply only to prospective top-level domains that use non-ASCII characters. Applicants for these internationalized top-level domain labels are expected to be familiar with the IETF IDNA standards, Unicode standards, and the terminology associated with Internationalized Domain Names.

- 2.1 The label must be a valid internationalized domain name, as specified in *Internationalizing Domain Names in Applications* (RFC 3490). This includes the following, non-exhaustive, list of limitations:
 - 2.1.1 Must only contain Unicode code points that are defined as “Valid” in *The Unicode Codepoints and IDNA* (Internet Draft “draft-faltstrom-idnabis-

tables"), and be accompanied by unambiguous contextual rules where necessary.

- 2.1.2 Must be fully compliant with Normalization Form C, as described in *Unicode Standard Annex #15: Unicode Normalization Forms*. See also examples in <http://unicode.org/faq/normalization.html>
 - 2.1.3 The label must consist entirely of characters with the same directional property.
- 2.2 The label must meet the relevant criteria of the ICANN *Guidelines for the Implementation of Internationalized Domain Names*. This includes the following, non-exhaustive, list of limitations:
- 2.2.1 All code points in a single label must be taken from the same script as determined by the *Unicode Standard Annex #24: Unicode Script Property*.
 - 2.2.2 Exceptions to 2.2.1 are permissible for languages with established orthographies and conventions that require the commingled use of multiple scripts. However, even with this exception, visually confusable characters from different scripts will not be allowed to co-exist in a single set of permissible code points unless a corresponding policy and character table is clearly defined.