

# Pre-Delegation Testing

## IDN Test Plan

Version C

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# Document control

## Document information and security

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## Revisions

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## 1. Introduction

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### 1.1 Scope

This document describes the IDN Level Test of the Pre-Delegation Test procedure. These tests are for zones that support IDN and are not applicable to zones that are ASCII only.

### 1.2 References

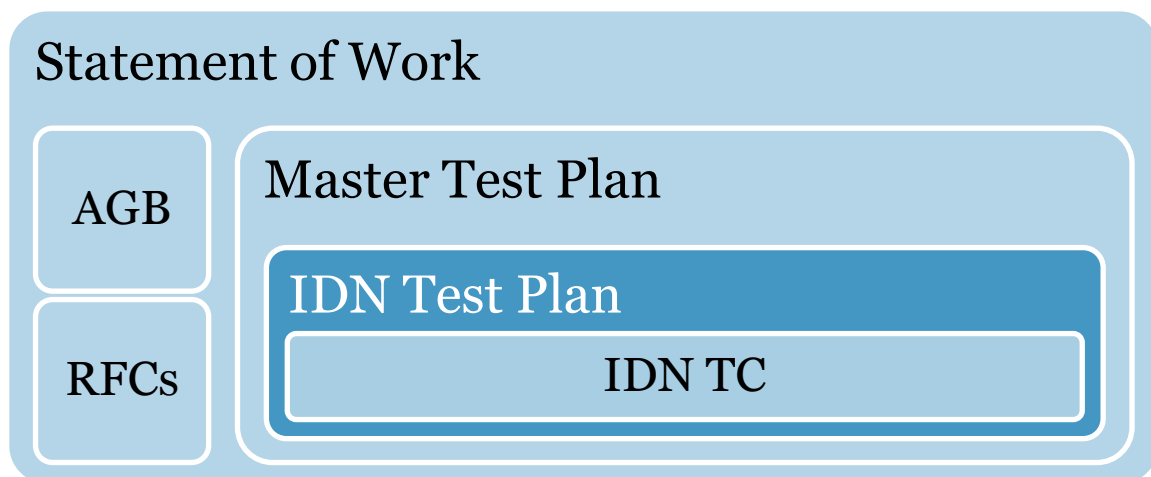
#### 1.2.1 External

- ICANN gTLD Applicant Guidebook, Version 2012-06-04
- ICANN Guidelines for the Implementation of Internationalized Domain Names, Version 3.0 (“IDN Guidelines”)
- IEEE 829-2008
- RFC 3743
- RFC 4290
- RFCs 5890 through 5894 (“IDNA”)
- The Unicode Standard (“Unicode”)

#### 1.2.2 Internal

- Pre-Delegation Testing, Statement of Work
- Pre-Delegation Testing, Master Test Plan

#### 1.2.3 Document Hierarchy



### 1.3 Level in the overall sequence

The IDN Level Test and the associated Test Cases can be run in parallel with the other Level Test Plans.

### 1.4 Test classes and overall test conditions

The IDN table format, the listed code points, the labels that can be assembled using them, and the associated rules and policies are validated against the requirements of the given standards and guidelines.

## 2. Details for this level of test plan

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### 2.1 Test items and their identifiers

#### 2.1.1 Statement of Work

The IDN attributes to be tested are specified in the Statement of Work:

- [R19]** Verify the complete IDN tables(s) used by the registry system for compliance with the Guidelines for the Implementation of Internationalized Domain Names.
- [R20]** Verify the format is such as the model format described in Section 5 of RFC 4290. The format used by RFC 3743 is an acceptable alternative. For variant generation algorithms that are more complex (such as those with contextual rules) and cannot be expressed using these table formats, an exception handling process, in which domains are to be tested manually, should be implemented.

The IDN Guidelines cited in [R19] make reference to the IDNA protocol and both documents make reference to the Unicode Standard. The specific evaluative criteria culled from them are included in the descriptions of the individual test cases.

Test cases that verify the status of individual code points and the way in which they can be strung together to form a label, are evaluated algorithmically and provide binary results. Test cases that verify the aggregate tabular format may be evaluated empirically. This is discussed further in section 2.5, below.

### 2.2 Test Traceability Matrix

This table associates each individual test case with the SoW requirement on which it is based.

Test ID	Description	Requirement Point
IDNvalid01	<b>IDN table validation</b> Verify that the format of each submitted code point table conforms to RFC 4920 or RFC 3743.	R20
IDNvalid02	<b>IDNA code point validation</b> Verify that each tabulated code point is PROTOCOL VALID or has the status CONTEXTUAL RULE REQUIRED, as defined in RFC 5892 when its algorithms are applied to the Unicode Standard, version 6.2.	R19
IDNvalid03	<b>IDNA Context Rule Validation</b> Verify that the contextual rules stated in RFC 5892 are included in the registry-specific policy statement for all tabulated code points with the status CONTEXTUAL RULE REQUIRED.	R19, R20

Test ID	Description	Requirement Point
IDNvalid04	<b>IDN script validation</b> Verify that the code point array in a single table is restricted to a single script as defined in the Unicode Standard Annex #24 and that code points with COMMON and INHERITED script properties are correctly associated with the designated script, or if multiple scripts are included in the same table, that they are clearly partitioned and the preceding criteria are met in each resulting segment.	R19
IDNvalid05	<b>IDN script-mixing rule validation</b> If a single table lists more than one script, verify that rules are provided either to prevent the mixing of scripts in individual labels, or to restrict such mixing as specified in the IDN Guidelines.	R19
IDNvalid06	<b>IDN language validation</b> If rules associated with a table are based on a language to which they apply, verify that this association is consistent with the script-based constraints in the preceding test cases, and that linguistic warrant is included in any policy statement permitting the comingled use of multiple scripts in individual labels.	R19
IDNvalid07	<b>IDN variant code point validation</b> Verify that variant relationships between listed code points are enforced according to the rules given for their processing.	R20
IDNvalid08	<b>IDN online registry response verification</b> This test verifies that test strings needed for preceding tests are correctly processed by the online registry.	R20

## 2.3 Features to be tested

The following features will be tested:

- IDN table format
- IDN code point validity
- IDN contextual rule enforcement
- IDN variant code point processing
- IDN label script integrity

## 2.4 Features not to be tested

IDN code point repertoires and the rules and policies attaching to their inclusion in labels will be assessed with regard to their quantitative sufficiency. Qualitative considerations are not addressed in the IDN Level Test.

## 2.5 Approach

### 2.5.1 IDN table code point selection and presentation format

The reference documents prescribed for the IDN Level Test require policy declarations that are not amenable to algorithmic evaluation. A prime example of this is the IDNA requirement that a registry makes a reasoned determination of the subset of protocol-valid code points that it will support, and articulates the policies that determine how this repertoire may appear in a second-level label. Protocol validity does not, in itself, provide adequate justification for the inclusion of a code point in an IDN table.

The IDN Guidelines express further constraints on the repertoire that may appear in a single label with particular reference to Unicode Standard Annex #24, itself introducing further constraints in narrative format. The response to requirements such as these will frequently, if not invariably, also have a narrative component that can only be reviewed empirically.

The IDN Level Test will make a binary determination of the presence or absence of a required algorithmic or narrative policy declaration. The resulting report will, however, only comment on the substantive detail of that statement if there is reason for concern about it having negative consequence for the stability of the IDN space. This includes both infrastructural considerations and the interests of the user community. Such concern will be noted in the evaluation report but weighted as a yes/no criterion only if there is compelling reason for doing so.

### 2.5.2 IDN variant code point processing

The variant generation algorithms referenced in R20 are extrinsic to the code point repertoire they produce and therefore not attributes of the IDN tables under evaluation. Although RFC 4920 provides for the indication of variant relationships in a table, it does not even mention variant generation algorithms. The alternative RFC 3743 does specify a format for presenting such algorithms but it is specifically designed for CJK ideographs. There is no reason to expect this formalism to have been widely applied in other contexts.

In any case, the narrative component of a table needs to be parsed manually to extract information needed during the verification of that table. Given the uncertainty about the frequency with which this will provide a basis for subsequent algorithmic validation, it may be more efficient to apply the manual exception handling procedures prescribed in R20 as a single uniform process in this test level.

This will involve a manual determination that the system being tested processes the variant relationships indicated in the table according to the rules declared for them, with no direct concern for the manner in which that processing is implemented on the registry side, beyond verifying its functionality.

## 2.6 Item pass/fail criteria

An IDN table will be rejected if it contains a code point that is disallowed by the IDNA protocol when its algorithms are applied to the Unicode Standard, version 6.2. The table will also be rejected if it includes any code point requiring a contextual rule given in the protocol, if this rule is not found in the registry-specific policy statement.

The reference documents for the presentation format of an IDN table afford latitude in the way it can be structured. If a table conforms to either of the permitted alternatives, it will pass. If it does not conform to either, it will fail. If it is a synthesis of permissible options without strictly adhering to any single one of them, note will be made of that fact and a warning flag will appear in the level test report.

Discrepancies between policies for managing variant relationships and the tabulated code points will be noted explicitly for each case where they are detected. If errors are detected in only a small proportion of variant listings, a warning flag will appear in the test report. If that proportion is significant the test will fail.

## 2.7 Suspension criteria and resumption requirements

If a table does not include the data necessary to conduct the entire suite of tests listed in section 2.2, above, the test will be suspended. If requisite statements of rules and policies have not been provided, the test will also be suspended. The applicant will be advised about the reasons for this suspension and the test will be resumed when the requested supplementary information has been provided or other remedial action has been taken.

## 2.8 Test deliverables

The IDN test level will produce:

- Level Test Logs (LTL)
- Anomaly Report (AR) in case of error
- Level Test Report (LTR)



### 3. Test management

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The goal of these documents is to describe the test cases and how the new gTLDs are tested. This is just a part of a larger project and defining test management is not part of this subproject. However, some information can be found in the Master Test Plan.

## 4. General

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### 4.1 Glossary

The glossary is available in the Master Test Plan.

### 4.2 Document change procedures

Document change procedures are documented in the Master Test Plan.