Internationalized Domain Name (IDN) Report - June 2024

IDN-UA Program

July 2024
# Table of Contents

1. Executive Summary .......................................................... 3
2. Background of IDNs ......................................................... 4
3. Status of IDNs ................................................................. 5
   3.1 IDNs Delegated at the Top-Level ...................................... 5
   3.2 IDN Registrations at the Second-Level Under gTLDs .......... 7
   3.3 IDN Tables Published in the IANA Repository ................... 9
4. IDN Policy Development by the ICANN Community ............... 11
   4.1 IDNs in the New gTLD Program: Next Round .................. 11
   4.2 GNSO EPDP on IDN .................................................. 11
   4.3 ccNSO ccPDP4 ....................................................... 12
5. Status of IDN-Related Projects at ICANN ......................... 12
   5.1 String Similarity Review for the New gTLD Program: Next Round 12
   5.2 Single Character TLDs .............................................. 13
   5.3 Second-Level Reference Label Generation Rules ............... 14
   5.4 Label Generation Rule (LGR) Tool ............................... 15
   5.5 IDN Implementation Guidelines .................................. 15
6. IDN Implementation and Operations at ICANN Org ............... 16
   6.1 IDN ccTLD String Evaluation ...................................... 16
   6.2 IDN Table Reviews .................................................. 16
   6.3 Review IDN Tables for Which Reference Label Generation Rules Are Not Available 17
7. Conclusion ........................................................................ 18
1. Executive Summary

The ICANN organization (ICANN org) has been working with the ICANN community to make the Internet’s Domain Name System (DNS) accessible in local languages for a linguistically diverse global population, while maintaining the stability and security of the DNS. Internationalized Domain Names (IDNs) help lower the linguistic accessibility barrier by enabling Internet users around the world to use domain names in local languages and scripts, promoting digital inclusion. This report provides an overview of the status of IDNs and the implementation of IDN work from January 2023 to June 2024.

As of June 2024, the total number of delegated top-level domains (TLDs) is 1,447. Table 1 shows the breakdown into American Standard Code for Information Interchange (ASCII) TLDs, IDN TLDs, country code TLDs (ccTLDs), and generic TLDs (gTLDs).

<table>
<thead>
<tr>
<th></th>
<th>ASCII TLDs</th>
<th>IDN TLDs</th>
<th>Total TLDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ccTLD</td>
<td>248</td>
<td>61</td>
<td>309</td>
</tr>
<tr>
<td>gTLDs</td>
<td>1,048</td>
<td>90</td>
<td>1,138</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,297</strong></td>
<td><strong>151</strong></td>
<td><strong>1,447</strong></td>
</tr>
</tbody>
</table>

At the second level, there were 1.467 million IDN registrations across all gTLDs as of March 2024. This is a decline of 3.36% from the previously reported number at the end of 2022 (1.52 million). IDN registrations were highest in the Chinese script (48.74%) followed by the Latin script (27.47%).

The Generic Names Supporting Organization (GNSO) and the Country Code Names Supporting Organization (ccNSO) are working on IDN-related policies.

- On 8 June 2024 the ICANN Board adopted the GNSO IDN Expedited Policy Development Process (IDN EPDP) Phase 1 based on the Scorecard: IDN EPDP Phase 1 Recommendations. The Phase 2 Report will be finalized after the public comment closes in May 2024.
- The work of ccNSO Policy Development Process (ccPDP4) - (De-) Selection of IDN ccTLD Strings Working Group concluded in February 2024 and the proposed ccPDP4-IDN ccTLD policy was adopted by the ccNSO Council in June 2024. The proposed policy was transmitted to the ICANN Board for consideration.

The IDN projects currently active within ICANN org include:

- The String Similarity Review Guidelines, which were published for public comment on 7 February 2024. The work on the tool and relevant data to support the review process are being developed.
- The proposed consideration on Han script single character gTLDs by Chinese, Japanese, Korean communities, which has been published for the community’s feedback through the public comment on 27 June 2024.

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2. This data is collected by ICANN org internally using the gTLD zone files data as of 30 June 2024.
• The Reference Label Generation Rules project, which added 7 more script-based reference LGRs that were finalized after public comment and published in January 2024.
• The LGR tool, which has been enhanced to enable the review of IDN tables against code point property value based on IDNA2008.
• The IDN Implementation Guidelines version 4.1, which were adopted by the ICANN Board, and ICANN org is working with contracted parties on their implementation.

On the operational side, ICANN org continues to implement the Final Implementation Plan for IDN ccTLD Fast Track Process for ccTLDs and conducted the IDN Table Reviews for gTLDs.
• There was one IDN ccTLD String Evaluation Request received in 2024.
• ICANN org conducted 272 IDN table reviews for 33 gTLDs through the IDN Services and Registry System Testing (RST) from January 2023 to June 2024. ICANN org is collaboratively working with registry operators (ROs) to address how the IDN tables review should be conducted when the reference LGR is not available.

2. Background of IDNs

IDNs are domain names in different scripts, such as Arabic, Chinese, Latin, and others, using at least one non-ASCII character in the domain name. IDNs support a multilingual Internet and allow organizations, governments, and businesses to reach more citizens and consumers in their preferred language or script.

The Internationalized Domain Name in Applications (IDNA) Standard was developed by the Internet Engineering Task Force (IETF) in 2003, and later updated in 2008 (called IDNA2008) and published in 2010. The technical community also issued additional guidance through IDN-related Request for Comments (RFCs) and ICANN's Security and Stability Advisory Committee (SSAC) reports.

Further, for the top-level, script communities have developed the Root Zone Label Generation Rules (RZ-LGR) proposals, integrated into the RZ-LGR. Each script panel follows the multistakeholder model including representatives from script users, the domain name industry, and the technical community. There are 26 scripts integrated into the RZ-LGR, covering more than 386 languages, and taking into account usability and security considerations.

IDN TLDs were first delegated through the IDN ccTLD Fast Track Process starting in 2010, and then through the New gTLD Program from 2013 onwards. The next round of gTLDs will continue to expand the DNS and support IDN top-level domains in the different scripts and languages, giving new opportunities to billions of people around the world.

For second-level domain name registrations, IDNs must conform with the IDNA 2008 Standard and further specifications based on input from respective script communities and the IDN Implementation Guidelines for secure implementation.
3. Status of IDNs

3.1 IDNs Delegated at the Top-Level

As of 18 June 2024, there were 1,447 TLDs\(^3\) delegated into the root zone.

- 309 are ccTLDs, of these, 61 are IDN ccTLDs.
- 1,138 are gTLDs, of these, 90 are IDN gTLDs.

Applicants were first able to apply for IDN ccTLDs in 2009. The first IDN TLDs were delegated in 2010 under the IDN ccTLD Fast Track process. To date, 62 strings have been successfully evaluated for 43 countries and territories (61 delegated, one pending delegation), as shown in Figure 1.

![IDN Country Code Top-Level Domains](image)

*Figure 1: IDN ccTLDs Successfully Evaluated Under the IDN ccTLD Fast Track Process*

Applicants were able to apply for IDN gTLDs in the new gTLD application round in 2012. The first IDN gTLDs were delegated in 2013.

The 90 IDN TLDs delegated to date represent 37 languages in 23 scripts.

- The languages include Arabic, Armenian, Assamese, Bangla, Belarusian, Bengali, Bulgarian, Chinese, Georgian, Greek, Gujarati, Hebrew, Hindi, Japanese, Kannada, Kashmiri, Kazakh, Korean, Lao, Macedonian, Malay, Malayalam, Mongolian, Oriya, Persian, Punjabi, Russian, Sanskrit, Santali, Serbian, Sindhi, Sinhalese, Tamil, Telugu, Thai, Ukrainian, and Urdu.

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\(^3\) [https://data.iana.org/TLD/tlds-alpha-by-domain.txt](https://data.iana.org/TLD/tlds-alpha-by-domain.txt), accessed on 20 June 2024
The scripts include Arabic, Armenian, Bengali, Cyrillic, Devanagari, Georgian, Greek, Gujarati, Gurmukhi, Han, Hangul, Hebrew, Hiragana, Kannada, Katakana, Lao, Latin, Malayalam, Oriya, Sinhala, Tamil, Telugu, and Thai.

The IDN TLDs are grouped by scripts and presented in Figure 2 and Table 2. In Figure 2 “CJK” represents Chinese, Japanese and Korean scripts. “Neo-Brahmi” includes nine scripts: Bengali, Devanagari, Gujarati, Gurmukhi, Kannada, Malayalam, Oriya, Tamil, and Telugu.

![Delegated IDN TLDs by Script](image)

**Figure 2: Delegated IDN ccTLDs and IDN gTLDs by Script Group**

<table>
<thead>
<tr>
<th>Script</th>
<th>ccTLD</th>
<th>gTLD</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>21</td>
<td>11</td>
<td>32</td>
</tr>
<tr>
<td>Armenian</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Bengali</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Chinese</td>
<td>7</td>
<td>52</td>
<td>59</td>
</tr>
<tr>
<td>Cyrillic</td>
<td>9</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>Devanagari</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Georgian</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Greek</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Gujarati</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Gurmukhi</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Hebrew</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
3.2 IDN Registrations at the Second-Level Under gTLDs

According to estimates in the 2024 IDN World Report there are at least approximately 4.4 million second-level IDNs globally, 69 percent of which are under ccTLDs. IDNs represent around 1.2 percent of the global domain name market.

IDN registrations at the second-level under gTLDs, based on gTLD zone file data collected by ICANN org, grouped by script, are provided in Table 3 and Figure 3. Currently, there are 1.467 million IDN registrations under all gTLDs as of 31 March 2024.

While other script registrations have been decreasing in recent years, Latin script registration was slowly increasing over time until the end of 2023, and subsequently decreased in March 2024.

Table 3: Second-Level IDN Registrations Under All gTLDs (in thousands)4

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>1,162</td>
<td>1,251</td>
<td>1,119</td>
<td>1,207</td>
<td>995</td>
<td>877</td>
<td>793</td>
<td>760</td>
<td>723</td>
<td>715</td>
</tr>
<tr>
<td>Latin</td>
<td>300</td>
<td>306</td>
<td>316</td>
<td>359</td>
<td>353</td>
<td>364</td>
<td>381</td>
<td>396</td>
<td>405</td>
<td>403</td>
</tr>
<tr>
<td>Korean</td>
<td>112</td>
<td>131</td>
<td>126</td>
<td>143</td>
<td>146</td>
<td>136</td>
<td>134</td>
<td>134</td>
<td>137</td>
<td>138</td>
</tr>
<tr>
<td>Cyrillic</td>
<td>68</td>
<td>139</td>
<td>190</td>
<td>109</td>
<td>93</td>
<td>85</td>
<td>72</td>
<td>69</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>Japanese</td>
<td>347</td>
<td>482</td>
<td>435</td>
<td>341</td>
<td>222</td>
<td>140</td>
<td>97</td>
<td>74</td>
<td>65</td>
<td>64</td>
</tr>
</tbody>
</table>

4 The numbers are adjusted from the IDN Annual Report 2022 as the methodology has been updated, i.e., the IDNA2008 invalid label has been removed from the calculation.
Registrations as of March 2024 are 1.467 million, 3.36 percent less than the previously-reported 1.518 million registrations at the end of 2022. IDN registrations under gTLDs have been decreasing over the past few years but at a slower rate.

Based on the data for March 2024 in Table 3, Figure 4 shows the relative number of IDN registrations for different scripts under gTLDs. A total of 48.74 percent of IDN registrations are in the Chinese script, followed by 27.47 percent of registrations in the Latin script.
3.3 IDN Tables Published in the IANA Repository

When gTLD registry operators intend to offer registrations in different languages and scripts, they must define an IDN table for each particular language or script. The IDN table represents permitted code points (letters), variant, and contextual rules allowed for IDN registrations in a particular TLD.

The IDN tables for the gTLDs are reviewed by ICANN for security and stability considerations. It is required under the registry agreement with ICANN that the approved IDN tables be published in the IANA Repository of IDN Practices (IANA Repository). ccTLD managers are also encouraged to publish their IDN tables in the IANA Repository as per the IDN ccTLD Fast Track Process.

As of 5 June 2024, 876 TLDs list their IDN tables\(^5\) in the IANA Repository. A total of 12,006 IDN tables are published across all gTLDs and ccTLDs.

- 5,715 are script-based IDN tables
- 6,291 are language-based IDN tables

The top 10 script-based IDN tables are shown in Table 4, while the top 10 language-based IDN tables are shown in Table 5.

As all TLDs support ASCII, which covers the English language, it is not listed in the IANA Repository. Other Latin-based languages, e.g., Spanish, German, French and others, include additional characters beyond those in ASCII. For example, ñ in Spanish, ß in German, é in French. Therefore, the IDN tables for these languages are required for IDN registrations.

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\(^5\) The number previously reported in IDN Annual Report Dec 2022 was incorrect and has been corrected in this report.
**Table 4: Top 10 Script-Based Published IDN Table as of June 2024**

<table>
<thead>
<tr>
<th>Script</th>
<th>TLDs Offering the IDN Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin script</td>
<td>415</td>
</tr>
<tr>
<td>Cyrillic script</td>
<td>371</td>
</tr>
<tr>
<td>Greek script</td>
<td>357</td>
</tr>
<tr>
<td>Arabic script</td>
<td>322</td>
</tr>
<tr>
<td>Thai script</td>
<td>319</td>
</tr>
<tr>
<td>Hebrew script</td>
<td>317</td>
</tr>
<tr>
<td>Tamil script</td>
<td>317</td>
</tr>
<tr>
<td>Devanagari script</td>
<td>316</td>
</tr>
<tr>
<td>Myanmar script</td>
<td>80</td>
</tr>
<tr>
<td>Armenian script</td>
<td>77</td>
</tr>
</tbody>
</table>

**Table 5: Top 10 Language-Based Published IDN Table as of June 2024**

<table>
<thead>
<tr>
<th>Language</th>
<th>TLDs Offering the IDN Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese language(^6)</td>
<td>764</td>
</tr>
<tr>
<td>Spanish language</td>
<td>544</td>
</tr>
<tr>
<td>Japanese language</td>
<td>512</td>
</tr>
<tr>
<td>Korean language</td>
<td>499</td>
</tr>
<tr>
<td>German language</td>
<td>490</td>
</tr>
<tr>
<td>French language</td>
<td>453</td>
</tr>
<tr>
<td>Russian language</td>
<td>234</td>
</tr>
<tr>
<td>Polish language</td>
<td>223</td>
</tr>
<tr>
<td>Portuguese language</td>
<td>206</td>
</tr>
<tr>
<td>Swedish language</td>
<td>194</td>
</tr>
</tbody>
</table>

\(^6\) The count for Chinese language in Table 5 includes all IDN tables for Chinese language, Chinese (Simplified) language, Chinese (Traditional) language, and Chinese (Han) language as listed on the IANA Repository.
4. IDN Policy Development by the ICANN Community

The ccNSO and the GNSO are developing IDN-related policies, taking the Variant TLD Recommendations and Recommendations for the Technical Utilization of the RZ-LGR into account and collaborating with each other for a consistent solution, as per the resolution by the ICANN Board.

4.1 IDNs in the New gTLD Program: Next Round

Webpage: [https://newgtldprogram.icann.org/en](https://newgtldprogram.icann.org/en)

The GNSO New Generic Top Level Domain (gTLD) Subsequent Procedures Policy Development Process Final Report (SubPro) includes the following topics and recommendations relevant to IDNs.

- String Similarity Evaluations (Topic 24)
- Internationalized Domain Names (Topic 25)
  - RZ-LGR is used to validate a gTLD string and to determine its variant labels (Recommendation 25.2).
  - Single character gTLDs are allowed, pending input from Chinese, Japanese, and Korean script communities (Recommendation 25.4).
  - Variant gTLDs are allowed with the following conditions:
    - Variant gTLDs are managed by the same RO and backend provider (Recommendation 25.5).
    - Variant labels at the second level are registered to the same registrant (Recommendation 25.6 – 25.8).

The progress of the implementation for the next round can be found on the New gTLD Program: Next Round webpage.

4.2 GNSO EPDP on IDN

Webpage: [https://gnso.icann.org/en/group-activities/active/idn-epdp](https://gnso.icann.org/en/group-activities/active/idn-epdp)

On 20 May 2021, the GNSO Council initiated an Expedited Policy Development Process (EPDP) on IDNs to address additional issues related to IDNs not discussed in the SubPro report, including how to securely and stably define and manage variant gTLDs and how to update IDN guidelines in the future. The scope of this work is defined in the EPDP charter.

The EPDP Team decided to publish Phase 1 and Phase 2 final reports, focused on top-level domain recommendations and second-level domain recommendations, respectively. This two-phased approach allowed the EPDP Working Group to more quickly deliver the first set of recommendations to the GNSO Council, and then the ICANN Board, while work on recommendations for second-level domains continued.

The IDN EPDP Team finalized its recommendations and submitted its Phase 1 Final Report to the GNSO Council in November 2023. The Council approved the Final Report, and it was transmitted to the ICANN Board on 18 April 2024.
The ICANN Board further sought the community’s input on the Phase 1 Final Report via the Public Comment proceeding on 23 January 2024. After that, the Scorecard: IDN EPDP Phase 1 Recommendations was developed to support the Board decision. Section A of the Scorecard identifies the Outputs that the Board adopted. Section B identified the Outputs, related to fees, that the Board designated as pending. On 8 June 2024, the ICANN Board adopted the Scorecard: IDN EPDP Phase 1 Recommendations.

The Phase 2 Initial Report covering issues pertaining to second-level variant management was published for public comment on 11 April 2024. The IDN EPDP Team is considering the comments that were received and now finalizing the Phase 2 Report.

### 4.3 ccNSO ccPDP4


In August 2020, the ccNSO formed the Policy Development Process (ccPDP4) - (De-) Selection of IDN ccTLD Strings Working Group to recommend new policy based on the experience from the IDN ccTLD Fast Track Process.

On 23 February 2024, the IDN ccPDP4 Working Group finalized the Final Report after the Public Comment. The report focuses on four stages with respect to IDN ccTLDs:

- the selection of the IDN ccTLD string and related variants;
- the validation of the selected IDN ccTLD string and its variants;
- the delegation, transfer, and revocation of the IDN ccTLD string and its variants, and the retirement of the IDN ccTLD string and its variants; and
- the potential review of specific decisions pertaining to the delegation, transfer, revocation and retirement of an IDN ccTLD string and its related variants.

The ccNSO membership supported the ccNSO Council’s recommendation to adopt the proposed ccPDP4-IDN ccTLD policy. In June 2024, the proposed policy was transmitted to the ICANN Board for consideration.

### 5. Status of IDN-Related Projects at ICANN

#### 5.1 String Similarity Review for the New gTLD Program: Next Round

**Webpage:** [https://community.icann.org/display/SPIR/Resources](https://community.icann.org/display/SPIR/Resources) (New gTLD Program: Next Round Resource Page)

As recommended in the GNSO’s Final Report on the New gTLD Subsequent Procedures Policy Development Process, the String Similarity Review is a part of the Initial Evaluation of the New gTLD Program: Next Round application evaluation. The objective of this review is to prevent user confusion and loss of confidence in the DNS due to the delegation of similar strings.
In preparation for the New gTLD Program: Next Round, ICANN org developed an initial draft of the String Similarity Review Guidelines, which the String Similarity Review Panel will evaluate. The guidelines outline issues affecting the visual similarity of strings that may be applied for in the next round. They also include details based on recommendations regarding variant strings provided in the GNSO Phase 1 IDN EPDP Final Report. The String Similarity Review Guidelines were published for public comment on 7 February 2024.

Currently, the string similarity pre-screening tool and relevant data to support the review process are being developed based on the methodology proposed. Following the completion of subsequent work on string similarity review, ICANN org will update the guidelines and publish them, along with relevant data, for another round of Public Comment before its finalization. The final version will be a part of the New gTLD Program: Next Round implementation.

5.2 Single Character TLDs


Single character IDN TLDs were considered by the Joint ccNSO-GNSO IDN Working Group (JIG) in the JIG Final Report on Single Character IDN TLDs, published in March 2011. The JIG suggested moving forward with the implementation of single character IDN TLDs while addressing relevant technical, linguistic, and policy matters. As resolved by the ICANN Board to conduct further work on this topic, the SSAC looked into the matter further and published the SSAC Advisory on Delegation of Single-Character Internationalized Domain Name Top-Level Domains (SAC052) in January 2012. The SSAC wrote that “Single-character TLDs are more likely to cause user confusion than TLDs with more than one character,” and “No other significant security concerns are apparent with the delegation of single-character TLDs.” The SSAC also noted that there was additional ongoing work on string similarity and variant issues, which should be able to inform this discussion. Therefore, the SSAC recommended “a very conservative approach to the delegation of single-character IDN top-level domains” adding that delegation of all single-character IDN TLDs in all scripts should be disallowed by default.

The Final Report on the new gTLD Subsequent Procedures Policy Development Process included a recommendation on single character gTLDs which is consistent with JIG and SSAC reports. The GNSO’s IDN EPDP Phase 1, adopted by the ICANN Board, also addressed single character gTLDs. IDN EPDP Phase 1 Final Recommendation 3.17 elaborated that “the only script that meets the criteria is the Han script, which is used in the Chinese, Japanese, and Korean languages. Nevertheless, applications for single-character gTLDs that are ideographs must not be accepted until relevant guidelines from the Chinese, Japanese, and Korean Script Generation Panels are developed, finalized after Public Comment, and implemented in the New gTLD Program.”

ICANN org reached out to the Chinese, Japanese, and Korean Script Generation Panels (CJK GPs) to seek their guidance on single character IDN gTLD applications in the Han
script. The CJK GPs agreed that the work already conducted to identify the code points and their variant code points in Root Zone Label Generation Rules (RZ-LGR) sufficiently addresses the technical and linguistic concerns around string similarity for single character IDN TLDs identified in the JIG and SSAC reports. This proposed consideration by the CJK GP was published for public comment, seeking the broader community’s feedback from 27 June 2024 through 16 August 2024.

Based on the comments received, ICANN org will coordinate with the Generation Panels to finalize the considerations for the application of single character IDN gTLDs. The final considerations will be a part of the New gTLD Program: Next Round implementation.

### 5.3 Second-Level Reference Label Generation Rules


Based on input from script communities through the RZ-LGR project, ICANN org developed reference LGRs for the second-level domain names. Reference LGRs are vetted for security and stability through community input. TLD registry operators can use reference LGRs when they develop their IDN tables, which are rules for IDN registrations under their TLDs.

Following the public comment proceeding, ICANN org published 56 reference LGRs on 31 January 2024:

- **25 script-based LGRs:** Arabic, Armenian, Bangla (Bengali), Chinese, Cyrillic, Devanagari, Ethiopic, Georgian, Greek, Gujarati, Gurmukhi, Hebrew, Japanese (Hiragana, Katakana, Kanji [Han]), Kannada, Khmer, Korean (Hangul, Hanja [Han]), Lao, Latin, Malayalam, Myanmar, Oriya, Sinhala, Tamil, Telugu, and Thai.

- **31 language-based LGRs:** Arabic, Belarusian, Bosnian (Cyrillic), Bosnian (Latin), Bulgarian, Chinese, Danish, English, Finnish, French, German, Hebrew, Hindi, Hungarian, Icelandic, Italian, Japanese, Korean, Latvian, Lithuanian, Macedonian, Montenegrin, Norwegian, Polish, Portuguese, Russian, Serbian, Spanish, Swedish, Thai, and Ukrainian.

In addition, the latest release also includes:

- A set of “full-variant” LGRs has been defined for cases where LGRs may be used in concert with other LGRs under a TLD. The suggested cross-script variants are identified to mitigate whole-script homograph labels. This “full-variant” LGR set may be updated based on policy recommendations from IDN EPDP Phase 2, once these are finalized by the EPDP team.

- A Common LGR created by merging the data from the script based LGRs. This file is intended for name collision checking.

When a specific language-based reference LGR is not available, the IDN table can still be reviewed by using a relevant script-based reference LGR. For example, a Dutch language IDN table can be reviewed by using the Latin script LGR. The current script-based reference LGRs cover more than 386 languages which are actively used across the world.

ICANN org continues to support the script community in developing additional reference LGRs. The ongoing reference LGR work includes Balinese script, Thaana script, and multiple languages in the Unified Canadian Aboriginal Syllabics script.
5.4 Label Generation Rule (LGR) Tool


The LGR Tool has been developed and maintained by ICANN org to provide three main functions.

1. **Validate Label(s) mode**: Users can easily validate a label or list of labels, and generate their variant labels by selecting the applicable LGR. The user manual for this mode is available [here](https://www.icann.org/resources/pages/lgr-toolset-2015-06-21-en).

2. **Advanced mode**: Users can use the mode to create an LGR, modify, merge, compare, and manage multiple LGRs. The user manual for this mode is available [here](https://www.icann.org/resources/pages/lgr-toolset-2015-06-21-en).

3. **IDN Table Review mode**: Users can upload IDN tables and compare them with the reference data. The reference data can be pre-loaded RZ-LGRs, pre-loaded reference LGRs, or the user's uploaded IDN table. Users can also compare the IDN table with the explicit requirements in the IDNA2008 standard ([RFC5890](https://www.rfc-editor.org/rfc/rfc5890), [RFC5891](https://www.rfc-editor.org/rfc/rfc5891), [RFC5892](https://www.rfc-editor.org/rfc/rfc5892), and [RFC5893](https://www.rfc-editor.org/rfc/rfc5893)), which is a new feature as of 2023. This function aims to aid registry operators and registry service providers. The user manual for this mode is available [here](https://www.icann.org/resources/pages/lgr-toolset-2015-06-21-en).

In 2023, a batch processing to the Label Form function was also added. Users can upload a list of labels in multiple forms (A-label, U-label, and code point sequence) in a single file and the tool will generate all forms of that label, including A-label, U-label, and code point sequence of the labels.

The LGR Tool is updated over time based on user feedback. Any user who has an ICANN account can automatically use the tool and have full control of the tasks and reports generated. The tool is an open source software. Parties interested in integrating this functionality into their own systems can find the source code on GitHub: [lgr-core](https://github.com/lgr-core/lgr-core), [lgr-django](https://github.com/lgr-django/lgr-django), [munidata](https://github.com/munidata/munidata), and [picu](https://github.com/picu/picu).

5.5 IDN Implementation Guidelines

Webpage: https://www.icann.org/resources/pages/implementation-guidelines-2012-02-25-en

As part of its commitment to ensure the stable and secure operation of the Internet's unique identifiers, ICANN has taken important steps to combat DNS abuse. These actions are in line with Section 1.1 (Mission) and 1.2. (Commitments and Core Values) of the ICANN Bylaws and are a key element of ICANN's [Strategic Plan](https://www.icann.org/resources/pages/strategic-plan-2021-2025-en) for Fiscal Years 2021 - 2025, which states that a "coordinated approach is necessary to effectively identify and mitigate DNS security threats and combat DNS abuse."

The [DNS Abuse Amendments](https://www.icann.org/resources/pages/dns-abuse-amendments-en) are the first step in a new, proactive approach from ICANN and its contracted parties to fight DNS Abuse. The contracted parties voluntarily raised the standard in combating and mitigating DNS Abuse.

While ICANN advocates for a multilingual Internet via IDNs, there is a risk that bad actors may use the opportunity to use confusing second-level domain names to trick users (for example mixed-script or variant strings in another language). These domains can appear to...
users to be in any script, including Latin, which could negatively impact trust in domain names. Registry operators should be aware of accompanying risks and how to avoid them.

The IDN Implementation Guidelines limit opportunities for bad actors; these guidelines relate to IDN registration policies and practices designed to minimize the risk of cybersquatting and consumer confusion. The guidelines apply to second-level IDN registration policies and practices under TLDs. They are contractually binding through most gTLD Registry Agreements (RAs) and the 2013 Registrar Accreditation Agreement (RAA). They are also recommended through the IDN ccTLD Fast Track Process. The Guidelines version 4.1 was adopted by the ICANN Board and was published on 11 November 2022.

Since the publication, ICANN org has prepared for the processes and tools required for Guideline version 4.1 implementation. An analysis of the current status of potential issues has been conducted. Based on ICANN org’s review, at present there are only 754 registrations under all gTLDs (out of more than 219 million total gTLD domains) that are potentially non-compliant with IDN Guidelines 4.1. This equates to a .0003 percent rate overall.

ICANN org is working with the relevant ROs to learn more about the reasons for potential non-compliance and steps that can be taken to address issues prior to IDN Guidelines 4.1 implementation in Q3 2024.

6. IDN Implementation and Operations at ICANN Org

6.1 IDN ccTLD String Evaluation

Project webpage: https://www.icann.org/resources/pages/fast-track-2012-02-25-en

Based on the IDN ccTLD Fast Track Process, 62 IDN ccTLD strings have been successfully evaluated from 43 countries and territories, as shown in Figure 1. Of these, 61 applications from 42 countries and territories have been delegated covering 35 languages in 20 different scripts.

ICANN org continues to process requests for IDN ccTLDs through the Fast Track Process and engage with individuals interested in learning more.

6.2 IDN Table Reviews

IDN tables define which labels can be registered for a particular language or script under a TLD. ICANN gTLD ROs that intend to offer registrations in different languages and scripts must define an IDN table for each language and script. ICANN org reviews each IDN submitted table through its IDN services and Registry System Testing (RST) processes.

Reference Label Generation Rules are used as a baseline for reviewing IDN tables to provide transparency and consistency.

From January 2023 to June 2024, ICANN org reviewed a total of 272 IDN tables for 33 gTLDs. The details by type of service request are shown in Table 6. Within these 272 IDN
tables, the majority were for different languages using the Latin script. The top 10 language or script IDN table reviews are shown in Table 7.

Table 6: Number of IDN Table Reviews, January 2023 to June 2024

<table>
<thead>
<tr>
<th>Type of Request</th>
<th>Number of gTLDs</th>
<th>Number of IDN Table Reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDN Service: Add, Modify, or Remove</td>
<td>16</td>
<td>159</td>
</tr>
<tr>
<td>IDN Service: Update and Publish</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Registry System Testing</td>
<td>8</td>
<td>98</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>33</strong></td>
<td><strong>272</strong></td>
</tr>
</tbody>
</table>

Table 7: Top 10 Language or Script IDN Tables Reviewed in 2023

<table>
<thead>
<tr>
<th>Language or Script</th>
<th>Number of IDN Tables Reviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>German language</td>
<td>16</td>
</tr>
<tr>
<td>French language</td>
<td>13</td>
</tr>
<tr>
<td>Spanish language</td>
<td>12</td>
</tr>
<tr>
<td>Latin script</td>
<td>11</td>
</tr>
<tr>
<td>Portuguese language</td>
<td>10</td>
</tr>
<tr>
<td>Chinese language</td>
<td>9</td>
</tr>
<tr>
<td>Cyrillic script</td>
<td>8</td>
</tr>
<tr>
<td>Japanese language</td>
<td>8</td>
</tr>
<tr>
<td>Swedish language</td>
<td>8</td>
</tr>
<tr>
<td>Danish language</td>
<td>6</td>
</tr>
</tbody>
</table>

6.3 Review IDN Tables for Which Reference Label Generation Rules Are Not Available

The Unicode standard encodes 161 scripts in its latest version 15.1. ICANN org currently supports 26 of these scripts (listed in Section 5.3), however there are still many scripts that are not covered by the current set of reference LGRs. ICANN org published the report on Evaluating Unicode Scripts for Use in IDNs for public comment in 2022 requesting community input on how to support different Unicode scripts.
In their feedback given during the public comment, the gTLD Registries Stakeholder Group (RySG) noted that the ROs should be allowed to support any scripts identified by the Unicode standard, “if a reasonable justification is made by a RO, this way, communities that use those scripts are not excluded from representation on the Internet from a domain name registration standpoint.” After the public comment, a RySG small group was formed to discuss the topic with ICANN org, and to identify the approach to implement the feedback provided by RySG.

In early 2024, based on the consultation with the RySG, the conclusion was that the RO should withdraw any request for an IDN table for which there is no reference LGR and then work with ICANN org and the relevant script community to develop one. Once the relevant reference LGR is published, the RO can (re)submit its IDN table for the script. The public comment proceeding on this topic is planned to open in Q3 2024.

7. Conclusion

ICANN and its community and ICANN org have been working diligently toward enabling a more multilingual Internet that users can navigate in their preferred language or script. The IDN policy development work being done by the GNSO and ccNSO, and its implementation by ICANN org, is an important element in this effort.

However, to fully harness the power of IDNs, the ICANN community must also champion Universal Acceptance (UA) to ensure that all domain names and email addresses, regardless of script, language, or character length, can be used seamlessly in all Internet-enabled applications, devices, and systems.

To organize or participate in a Label Generation Panel, please contact idnprogram@icann.org. To join the effort to drive the adoption of Universal Acceptance, contact ICANN at uaprogram@icann.org or one of ICANN community organizations including the At-Large Community (ALAC), ccNSO, Governmental Advisory Committee (GAC), GNSO, and Universal Acceptance Steering Group.