

# Internationalized Domain Name (IDN) Progress Report

Progress Report

ICANN IDN-UA Steering Committee  
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## TABLE OF CONTENTS

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<b>1 EXECUTIVE SUMMARY</b>	<b>3</b>
<b>2 DEVELOPING AN IDN TECHNICAL KNOWLEDGE BASE</b>	<b>5</b>
Background	5
Current Status	6
Next Steps	6
<b>3 SUPPORTING IDN POLICY DEVELOPMENT AND IMPLEMENTATION</b>	<b>7</b>
Background	7
Current Status	7
Next Steps	8
<b>4 IDN IMPLEMENTATION AND OPERATIONS AT ICANN ORG</b>	<b>8</b>
Background	8
Current Status	8
Next Steps	9
<b>5 COMMUNICATION AND OUTREACH</b>	<b>9</b>
<b>6 CONCLUSION</b>	<b>10</b>

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# 1 Executive Summary

Internationalized Domain Names (IDNs) allow individuals, businesses, organizations, governments, and others to access the Internet using domain names in local languages and scripts. The secure implementation of IDNs in multiple languages and scripts is essential for enabling a truly multilingual and global Internet.

Implementing IDNs is included as a strategic objective in the [ICANN Strategic Plan for 2021-2025](#). In promoting the unique identifier system, IDNs are a key component in the org's strategic goal to "[f]oster competition, consumer choice, and innovation in the Internet space by increasing awareness and encouraging readiness for Universal Acceptance, IDN implementation, and IPv6."

The support of IDNs and Universal Acceptance (UA) are included in the ICANN President and CEO's [FY22 goals](#). The IDN and UA Program within ICANN org is dedicated to implementing IDNs and UA. The work also requires collaboration across multiple departments within ICANN org which resulted in the creation of the IDN and UA Steering Committee (IDN-UA-SC). While the annual [UA Readiness Report for FY21](#) is provided by the Universal Acceptance Steering Group (UASG), IDN-UA-SC members collaborate to provide an annual IDN Progress Report to track the advancement of IDN implementation across ICANN. This inaugural report captures the background, development, and status of IDN work and implementation at the end of December 2021.

Since the first IDN top-level domain (TLD) was delegated in 2010, ICANN org and the community have actively worked to progress the implementation of IDNs. In recent years, this work focused on defining policy for variant top-level domains (TLDs), preparing for the implementation of IDNs in the next round of new generic top-level domains (gTLDs), making existing IDN implementations more secure and improving IDN-related services.

This report contains four main sections, one for each area of work. It includes (1) Developing an IDN Technical Knowledge Base, (2) Supporting IDN Policy Development and Implementation, (3) IDN Implementation and Operations at ICANN org, and (4) Communication and Outreach.

# Internationalized Domain Names (IDNs) in Numbers

## MARKET LANDSCAPE

**153** delegated IDN top-level domains (TLDs)

**8.3** million IDN registrations under all TLDs

**1.6** million IDN registrations under all generic TLDs

## COMMUNITY EFFORTS

**18** scripts integrated into the RZ-LGR < **5** scripts waiting for integration  
**3** scripts being finalized

**46**

reference LGRs published

**14,026**

IDN tables published in the IANA repository by registry operators

**270+**

script community volunteers

**10,000+**

volunteer hours

Statistics as of December 2021

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## 2 Developing an IDN Technical Knowledge Base

### Background

The Internationalized Domain Name in Applications 2003 (IDNA2003) standard was finalized by the Internet Engineering Task Force (IETF) in 2003, and IDN guidelines were developed by some gTLD registries and country code top-level domain (ccTLD) managers to implement IDNs at the second level. The ICANN Board [endorsed](#) the guidelines for the implementation of IDNs in March 2003. Version 1 of the IDN Implementation Guidelines was published in June 2003 and ICANN org began authorizing registries that have agreements with ICANN to deploy IDNs according to the provisions in the guidelines. The IDN Implementation Guidelines are updated according to the needs of the community. All versions can be found [here](#).

To offer IDN registrations under a TLD, a registry operator needs to develop IDN tables for a particular language or script. Once adopted, these IDN tables are to be published in the Internet Assigned Numbers Authority (IANA) [repository](#). ICANN org has developed [reference Label Generation Rules \(LGRs\) for the second level](#) which are pre-vetted for security and stability considerations to help facilitate registry operations. The gTLD registry operators (ROs) and registry service providers (RSPs) can refer to or reuse these reference LGRs when designing their own IDN tables before submitting them to ICANN org for review.

IDN TLDs were first delegated through the IDN [ccTLD Fast Track Process starting](#) in 2010, and then through the [New gTLD Program](#) since 2013. The ICANN community has gained considerable experience by implementing IDNs at the second level since the early 2000s and the delegation of IDN TLDs since 2010. Following the publication of the IDNA2008, the technical community has [issued](#) additional guidance through IDN-related Request for Comments (RFCs) (e.g., [RFC 6912](#)) and Security and Stability Advisory Committee (SSAC) reports (e.g., [SAC060](#)). Further, script communities are developing [proposals](#) which are incrementally integrated into the Root Zone Label Generation Rules ([RZ-LGR](#)). ICANN org provides [LGR procedure](#) trainings for the script communities and facilitates the community panel meetings as requested.

Based on the definition of variant TLDs developed by RZ-LGR, ICANN org has also developed a set of [recommendations](#) and supporting documentation on the mechanisms for implementing IDN variant TLDs which were [approved](#) by the ICANN Board on 14 March 2019. The Board requested that the Generic Names Supporting Organization (GNSO) and Country Code Names Supporting Organization (ccNSO) consider these recommendations when developing their respective policies for IDN variant TLDs. In addition, a technical study group formed from the community developed [Recommendations for the Technical Utilization of the RZ-LGR](#). The recommendations were [adopted](#) by the ICANN Board in January 2020. The Board requested that the ccNSO and GNSO also take these recommendations into account in their policy development processes.

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## Current Status

### RZ-LGR Project

On 7 July 2021, the Maximal Starting Repertoire Version 5 (MSR-5) was updated to support Unicode version 11.0 and was subsequently [released](#). MSR provides the starting point for the work of script-based panels. [RZ-LGR version 4](#) (RZ-LGR-4) was published on 6 November 2020 with the additional scripts of Chinese and Bangla. A total of 18 scripts have now been integrated into RZ-LGR-4: Arabic, Bangla, Chinese, Devanagari, Ethiopic, Georgian, Gujarati, Gurmukhi, Hebrew, Kannada, Khmer, Lao, Malayalam, Oriya, Sinhala, Tamil, Telugu, and Thai. The proposals for the Armenian and Cyrillic scripts have been completed and are waiting to be integrated in the RZ-LGR once the Greek and Latin proposals are also made available. Additionally, the Korean script proposal was finalized and published on 1 May 2021 and is anticipated to be integrated in the next version of RZ-LGR.

The [Japanese script proposal](#) and the [Latin script proposal](#) Public Comment periods closed in November 2021. The Japanese script proposal has been finalized by the Japanese GP and published for Integration Panel (IP) review on 20 December 2021. The Latin script proposal is currently being finalized.

### IDN Implementation Guidelines

[Version 4](#) of the IDN Implementation Guidelines was finalized by a community-based [IDN Implementation Working Group](#). These guidelines were presented to the ICANN Board for consideration in 2019, but deferred based on the [request](#) of the GNSO. On 18 August 2021, the GNSO [requested](#) that the adoption of the IDN Implementation Guidelines be delayed until the IDN Expedited Policy Development Process (IDN EPDP) is concluded due to some overlap. The ICANN Board [responded](#) on 20 October 2021 requesting the GNSO to analyze and identify the guidelines which overlap with the topics included in the IDN EPDP and share the details for further consideration by the Board.

### Reference LGRs for the Second Level

In FY21, 17 additional [reference LGRs](#) were published on 13 January 2021, and another 4 published on 22 April 2021. These include Arabic, Bangla, Devanagari, Ethiopic, Georgian, Gujarati, Gurmukhi, Hebrew, Kannada, Khmer, Lao, Malayalam, Oriya, Sinhala, Tamil, and Telugu script-based LGRs, and the Arabic, Chinese, Hebrew, Hindi, and Thai language-based LGRs. A total of 46 Reference LGRs have been published.

### Next Steps

At the top level, Greek, Latin, and Myanmar script proposals are being finalized by the respective script communities. At the second level, the ICANN Board will consider the adoption of version 4.0 of the IDN Implementation Guidelines timeline based on the analysis provided by the GNSO. In addition, ICANN org will develop additional reference LGRs based on the work finalized by the script communities for RZ-LGR. ICANN org is also exploring what additional scripts can be supported through IDNs.

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## 3 Supporting IDN Policy Development and Implementation

### Background

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 as per the ICANN Board's request, and collaborating with each other for a consistent solution.

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

The GNSO Council adopted the [GNSO New gTLD Subsequent Procedures \(SubPro\) PDP Final Report](#) in February 2021. In this report, Topic 25 focuses on IDNs and contains relevant recommendations and implementation guidance. 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](#).

### Current Status

#### ccNSO Policy Development

The IDN ccPDP4 Working Group is completing its initial review of the policy proposals for IDN ccTLD String Selection Criteria, Requirements, and Processes. In addition, the working group conducts further work through three sub-working groups on Variant Management, Deselection IDN ccTLD String, and Confusing Similarity, respectively. The Variant Management Working Group and the Deselection Working Group are already formed and addressing relevant topics. The Confusing Similarity Sub-working Group will start work in January 2022.

#### GNSO Policy Development

Following the [call](#) for a chair of the IDN EPDP Working Group on 2 June 2021, the working group was officially formed and started meeting in August 2021. ICANN org has gathered and provided the data to support the working group's analysis based on what has been specified in its [charter](#). The work currently addresses questions in Section A of the charter, which focuses on the consistent definition and technical utilization of RZ-LGR.

#### Preparing for IDN-related SubPro Implementation

Based on the [SubPro Final Report](#), ICANN prepared the proposal for the Operational Design Phase (ODP) for SubPro, which was [adopted](#) by the ICANN Board on 12 September 2021. After three months of preparation, on 17 December 2021, the org [advised](#) the Board that it has officially started the ODP.

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## Next Steps

ICANN org will continue to support the community's policy development work through ccNSO ccPDP4 and the GNSO IDN EPDP. ICANN org will consider models for how the IDN recommendations in the SubPro Final Report may be implemented as part of the anticipated SubPro ODP. This would include, for example, steps required to implement IDN applications, e.g., by designing the tool or mechanism to integrate the use of RZ-LGR into the application process.

# 4 IDN Implementation and Operations at ICANN org

## Background

ICANN org implements various IDN policies and procedures finalized by the ICANN multistakeholder community. For gTLDs, ICANN org reviews IDN tables submitted through the Registry Services Evaluation Policy ([RSEP](#)) Process and Registry System Testing ([RST](#)). In 2019, the gTLD Registry Stakeholder Group (RySG) [requested](#) that ICANN org provide more consistency and transparency in the IDN table review process. In April 2020, a cross-functional IDN table project team was formed within ICANN org to address the RySG request.

For ccTLDs, ICANN org performs the IDN ccTLD string evaluation, the first step before their delegation by IANA, as per the [IDN ccTLD Fast Track Process](#). To date, 62 applications from 43 countries and territories have been [successfully evaluated](#). Of these, 61 applications from 42 countries and territories have been delegated covering 35 languages in 20 different scripts.

## Current Status

### IDN Table Update Project

The IDN table update project was initiated by ICANN org to address concerns raised by RySG on the IDN table review process and to incorporate additional security and stability considerations for IDN implementation identified by the technical community. The first phase started by ensuring that all the contractually approved IDN tables are made available in the IANA [repository](#) as required in Specification 6, Section 1.4 of the [Base gTLD Registry Agreement](#). As of December 2021, of the 3316 missing IDN tables, 3,225 IDN tables were published through outreach to ROs/ and RSPs.

An [IDN Table Review Tool](#) and additional [reference LGRs](#) have been developed and made publicly available for ROs and RSPs to check their own IDN tables before submitting to ICANN org. This brings consistency and transparency to IDN table reviews by making the same review report used by ICANN org available to ROs and RSPs.

In addition, a dedicated IDN Service: Add, Modify, or Remove ([IDN Service](#)) service request is now available in ICANN's Naming Services portal (NSp) for contracted parties to create a more efficient process for ROs. A new process for IDN table reviews during the Registry System Testing (RST) was also developed and is now implemented, contributing to the



larger effort to bring RST in-house while providing consistency of IDN table reviews across the RSEP and RST services.

This has been achieved in Phase 1 of the IDN table update project, which was completed in June 2021.

## IDN ccTLD String Evaluation

The most recent successful IDN ccTLD string evaluation request was announced in May 2020 for the [Israel](#) IDN ccTLD string. There are no pending IDN ccTLD requests at this time.

## Next Steps

The IDN table update project will review the existing IDN tables published in the IANA repository for security and stability matters. ICANN org will also continue to improve the recently updated processes to review IDN tables.

ICANN org continues to provide information about the process for additional IDN ccTLD requesters and continues to process requests for IDN ccTLDs received through the Fast Track Process.

# 5 Communication and Outreach

ICANN org conducts regular outreach to the community on the various aspects of IDN implementation. The following table lists the IDN-related communications and outreach conducted from January 2021 to December 2021.

Date	Event Name	Activities Brief	Team
20 January - 27 May 2021	<a href="#">Asia Pacific Top Level Domain (APTLD)</a>	APTLD-ICANN joint training on IDNs/UA.	IDN-UA Programs, OCTO - TE
7 April 2021	Sri Lanka Internet Day 2021.	Spoke about IDN and UA as part of a panel discussion on improving Internet usage by breaking language barriers.	IDN-UA Programs, OCTO - TE
7 April 2021	<a href="#">ME DNS Forum</a>	IDN and UA sessions.	IDN-UA Programs
4-5 May 2021	<a href="#">IDN Table Review Tool Webinars</a>	Provide overview and demo of the self-service IDN Table Review Tool.	IDN-UA Programs
11-25 May 2021	<a href="#">LACRALO</a>	LACRALO-ICANN joint training on IDNs/UA	IDN-UA Programs, OCTO - TE
16 June 2021	<a href="#">ICANN org blog</a>	Hello World: Enabling Internationalized Domain Names (IDNs)	IDN-UA Programs

Date	Event Name	Activities Brief	Team
10 Nov 2021	ICANN72 Africa Readout	ICANN72 Africa Readout: Latin script RZ-LGR proposal presentation	IDN-UA Programs

In addition, ICANN org organized update sessions for the ICANN community during ICANN Public Meetings in 2021.

- ICANN70 Prep Week: IDN Programs Update ([11 March 2021](#))
- ICANN72 Prep Week: RZ-LGR Update ([14 October 2021](#))
- ICANN72: LAC Space (presented Latin script RZ-LGR proposal) ([26 October 2021](#))

## 6 Conclusion

In 2021, IDN work encompassed developing an IDN technical knowledge base, supporting IDN policy development, implementing IDN policies, and conducting IDN-related outreach.

Developing an IDN knowledge base includes RZ-LGRs, reference LGRs for the second level, and the IDN Implementation Guidelines. As requested by the ICANN Board, the ccNSO and GNSO are considering IDN-related recommendations and reports in their policy development work. In addition, IDN table review processes have been updated to enhance transparency and consistency.

Moving forward, ICANN org will continue to support the work being done by the community to advance an IDN technical knowledge base, as well as the ccNSO and GNSO in their policy development, and implement IDN policies.

Collaboration across functions within ICANN org is one of the key success factors for these projects. The IDN and UA Steering Committee continues to support and coordinate these various activities for IDN implementation.



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