

# Internationalized Domain Names (IDNs)

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APRALO Webinar on IDNs  
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# Overview

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- ⦿ Introduction of IDNs
  - IDNs at the Second Level
  - IDN ccTLD Fast Track Process
  - New IDN gTLDs
- ⦿ IDN Variant TLDs
  - Need and Issues
  - Solution
- ⦿ Current IDN Related Policy Development
- ⦿ Universal Acceptance Impact

# Introduction of IDNs at the Second Level

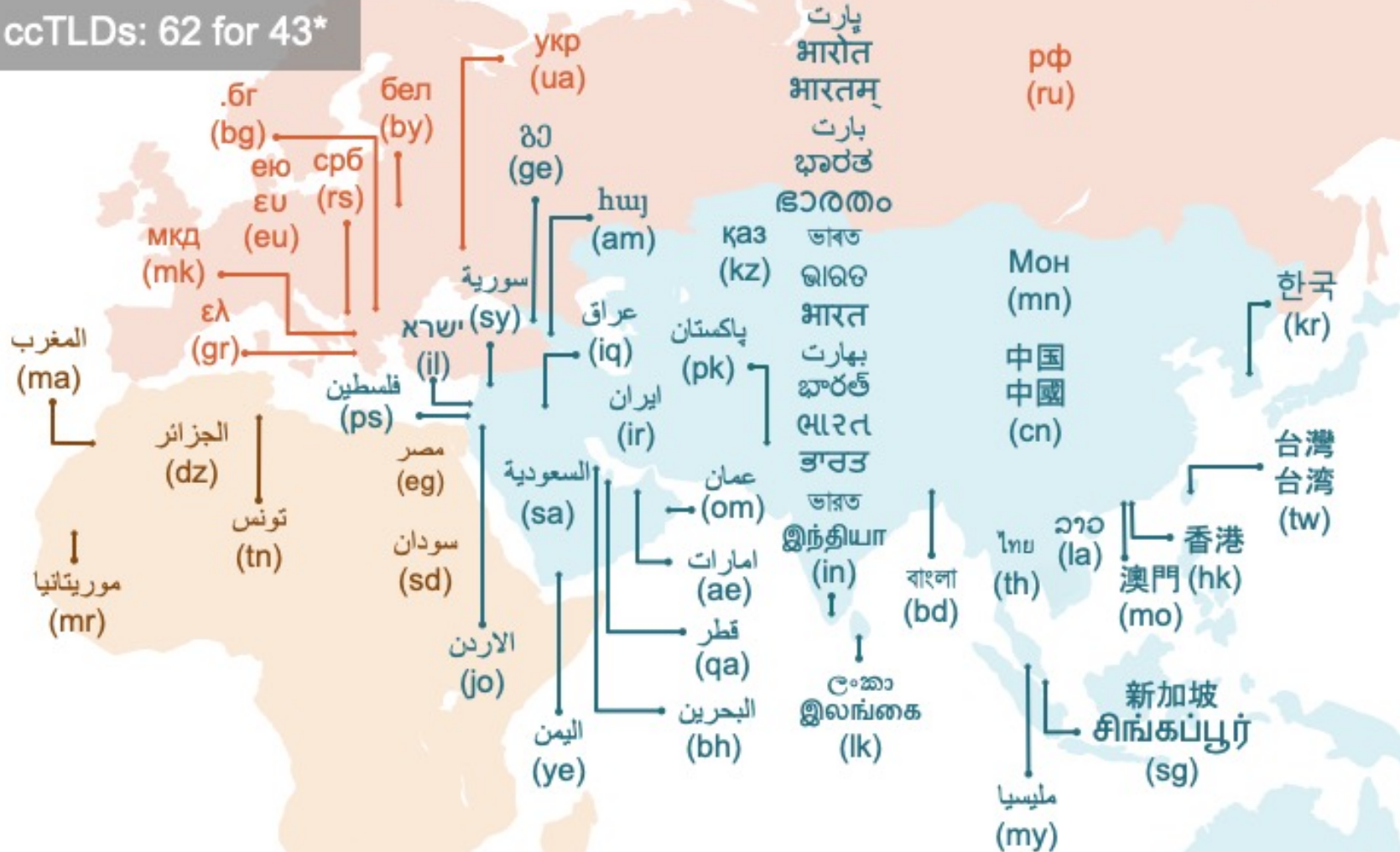
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- ⦿ Internet Engineering Task Force (IETF) developed the IDNA2003 standard, laying the groundwork for IDN implementation.
- ⦿ At ICANN, the registries collaboratively developed IDN Implementation Guidelines version 1.0 in 2003.
- ⦿ These IDN Guidelines were [endorsed by the ICANN Board](#) in 2003 to allow for IDN implementation: “authorizing registration of IDNs in registries with agreements with ICANN on the basis of those Guidelines”.
- ⦿ Following it, the registries started offering IDNs based on IDN Guidelines (e.g. [for Global Name Registry](#)).
- ⦿ The IDN Guidelines have been [amended](#) multiple times since 2003 and currently version 3.0 is applicable.
- ⦿ IDN Guidelines 4.0 published in 2018; GNSO [requested](#) for review.

- ⦿ Based on IDNC WG proposal, the [Final Implementation Plan for the IDN ccTLD Fast Track Process](#) was [approved](#) by the ICANN Board and launched in 2009.
  - The plan requires string to be meaningful representation of a country/territory and supported by the government and the community
  - The plan also requires string to be reviewed by independent experts for technical considerations and string similarity.
- ⦿ The plan had a provision for annual review, and has undergone multiple revisions, and [latest version](#) published in 2019.
  - Revisions have included enhancements in the methodology for string similarity review.

# Status of IDN ccTLDs

ccTLDs: 62 for 43\*



\* Successfully evaluated IDN ccTLDs for total countries and territories (as of May 2020)

# IDN Generic Top-Level Domains (gTLDs)

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- ⦿ GNSO in its [Final Report on Introduction of New Generic Top-Level Domains](#) for new gTLDs in 2007 included the following:
  - Principles:
    - B. Some new generic top-level domains should be internationalised domain names (IDNs) subject to the approval of IDNs being available in the root.
    - C. The reasons for introducing new top-level domains include that there is demand from potential applicants for new top-level domains in both ASCII and IDN formats.
  - Recommendations:
    - 18. If an applicant offers an IDN service, then ICANN's IDN Guidelines must be followed.
- ⦿ Further details in the [Applicant GuideBook](#) (AGB) for the New gTLDs.



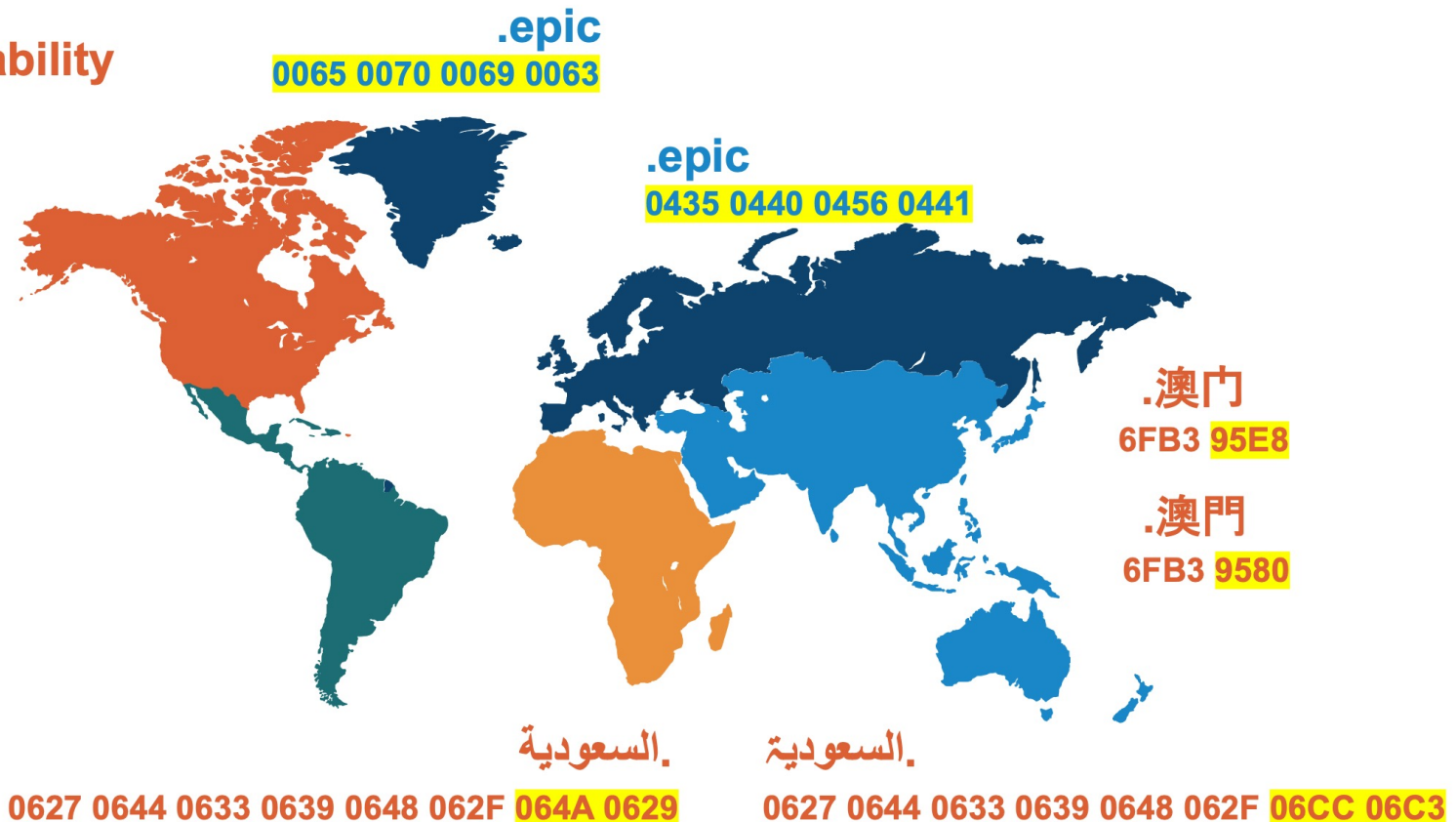


# IDN Variant Top-Level Domains (TLDs)

- Community noted technically distinct labels could be considered the “same” by a script community, called variant labels.
  - No clear definition of the “same” or variant labels across scripts.

## Security

## Usability





# IDN Variant Top-Level Domains (TLDs)

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- ⦿ The concept of variant labels is applicable to the gTLD and ccTLD labels, but it was not clear how to apply it.
- ⦿ Initial policies around IDN TLDs reflected this gap with placeholders for variant TLDs.

# IDN ccTLD Variant Labels Placeholder

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- ⦿ Instructions for variant TLDs in the IDN ccTLD Fast Track Process:
  - Variant TLDs desired by the requester for delegation must be indicated by the requester.
  - Desired variant TLDs will be allocated to the requester (if successfully evaluated) in order to be reserved to the entitled manager for potential future delegation in the DNS root zone.
  - A list of non-desired variants will be generated based on the received IDN Tables and placed on a blocked list by ICANN.
- ⦿ The community is expected to continue working on more clear definitions of variant labels and solutions or methods for delegation of variants.

# IDN gTLD Variant Labels Placeholder

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- ⦿ Instructions in AGB for variant TLDs in the New gTLD round of 2012:
  - The applicant may also declare any variant strings for the TLD in its application.
  - However, no variant gTLD strings will be delegated through the New gTLD Program until variant management solutions are developed and implemented.
  - Declaring variant strings is informative only and will not imply any right or claim to the declared variant strings.
- ⦿ When a variant delegation process is established, applicants may be required to submit additional information such as implementation details for the variant TLD management mechanism, and may need to participate in a subsequent evaluation process, which could contain additional fees and review steps.

# Initial Work on IDN Variant TLDs

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- ⦿ Due to limitations in understanding, on 25 September 2010, the ICANN Board resolved:
  - *No variants of gTLDs will be delegated through the New gTLD Program until appropriate variant management solutions are developed.*
- ⦿ ICANN initiated Variant Issues Project in 2011, with community looking at [Arabic](#), [Chinese](#), [Cyrillic](#), [Devanagari](#), [Greek](#), and [Latin](#) scripts.
- ⦿ The [Integrated Issues Report, IIR](#) (2012) collated the issues and identified the following gaps:
  1. **No definition of IDN variant TLDs.**
  2. **No IDN variant TLD management mechanism.**

# IDN Variant TLDs - Definition of Variants

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- ⦿ **Gap 1: No definition of IDN variant TLDs**
- ⦿ **Solution:** Define these using the Root Zone Language Generation Rules Procedure ([RZ-LGR Procedure](#)).
  - The procedure was developed in consultation with the community.
- ⦿ On 11 Apr. 2013, the ICANN Board [resolved](#) to implement the RZ-LGR Procedure.

# RZ-LGR Procedure

## Generation Panels

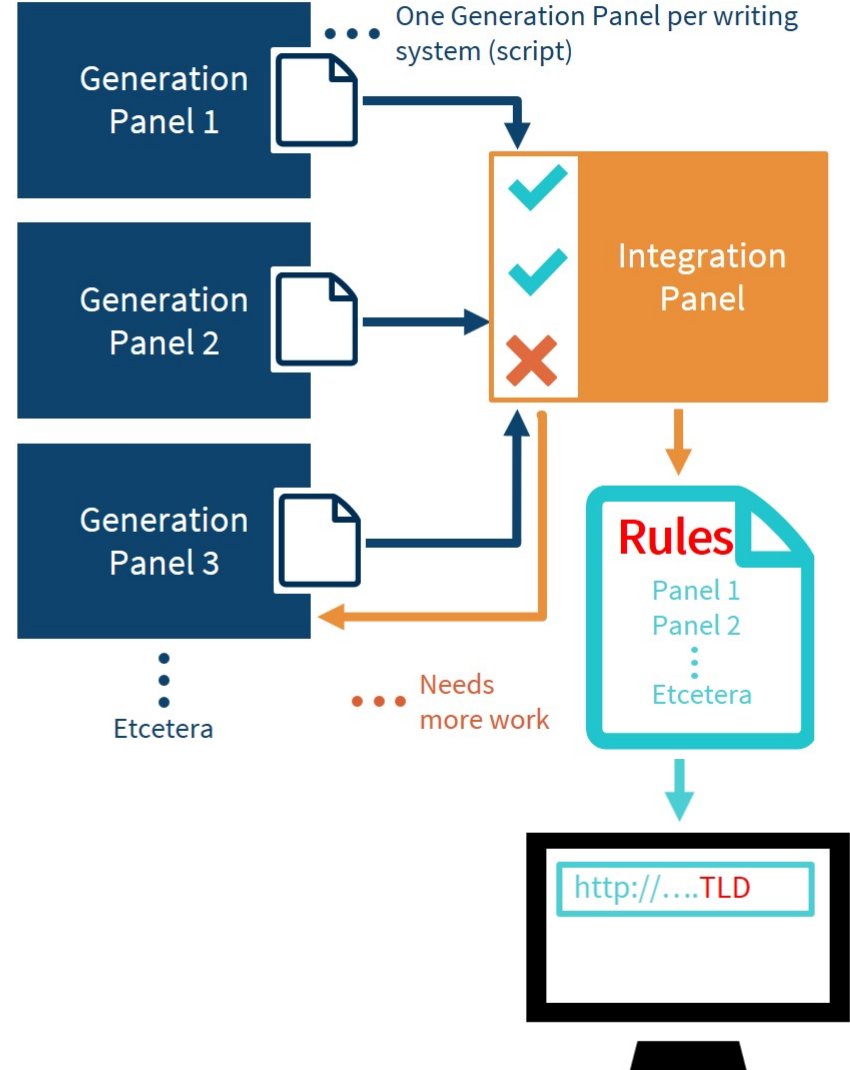
- Generate proposals for script specific LGRs, based on community expertise and linguistic, security and stability requirements

## Integration Panel

- Integrates them into common Root Zone LGR while minimizing the risk to Root Zone as shared resource

## Label Generation Rules (LGR)

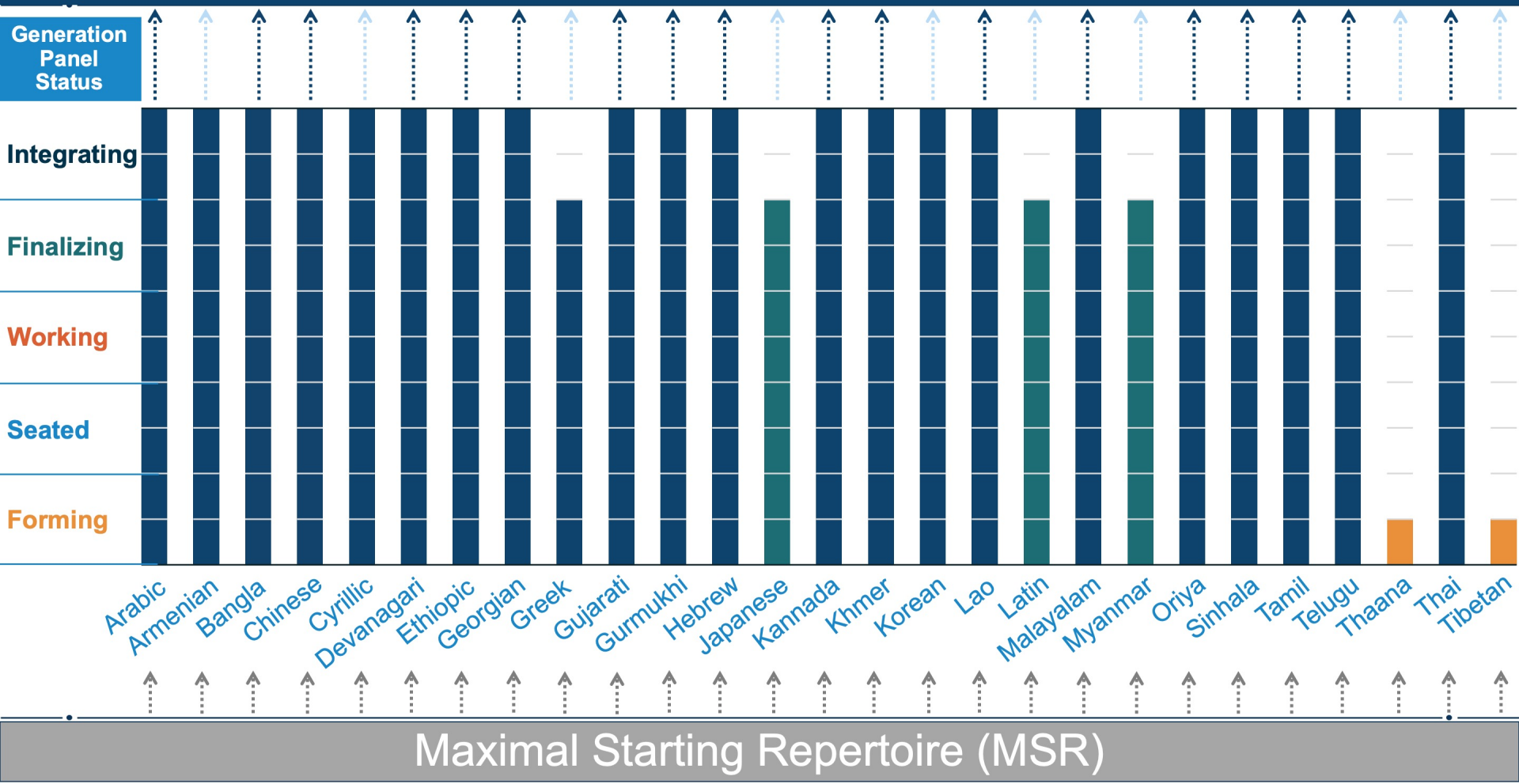
- Which labels are permissible?
- Which variant labels exist?
- Are there any more constraints?



# RZ- LGR - Generation Panels Status

July 2021

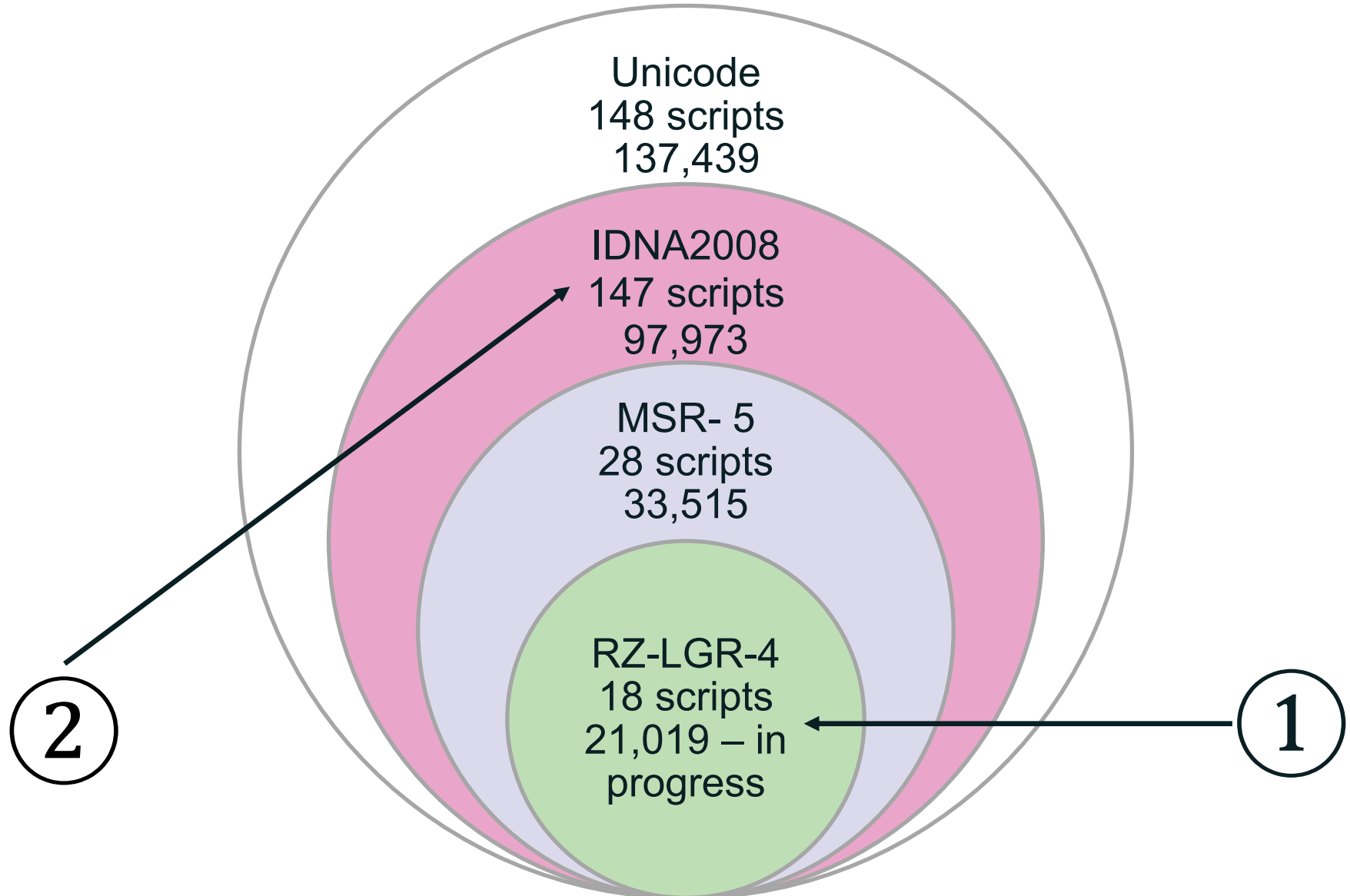
## Root Zone Label Generation Rules (RZ-LGR)







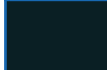
	060	061	062	063	064	065	066	067	068	069	06A	06B	06C	06D	06E	06F	075	076	077	08A	08B	08C	08D	08E	08F	
0		م	ي	ذ	-	و	و	پ	ڈ	غ	گ	ة	ي	و	و	و	ي	و	ش	ب	ک				و	
1		م	ء	ر	ف	و	ا	ا	خ	ڑ	ف	گ	ہ	ي	و	ا	ب	پ	ڑ	ب	ا					و
2		م	آ	ز	ق	و	ا	ا	خ	ز	ب	گ	ا	م	و	ا	پ	ک	خ	ج	ز					و
3		م	ا	س	ك	و	ا	ا	ج	ر	ف	گ	ا	م	و	ا	پ	ک	ا	ظ						و
4		م	و	ش	ل	و	ا	ا	ج	ر	ف	گ	و	-	و	ا	پ	ک	ا	ق						و
5		م	ا	ص	م	و	ا	ا	خ	ر	پ	و	و	و	و	ا	پ	م	ی	ق						و
6		م	و	ض	ن	و	ا	و	چ	ر	ق	و	و	و	و	ا	پ	م	ی	ث						و
7		م	ا	ط	ه	و	ا	و	چ	ر	ف	و	و	و	و	ا	پ	ن	ي	ث						و
8		م	ب	ظ	و	و	ا	ا	ڈ	ڑ	ق	و	و	و	و	ا	پ	ن	و	ج						و
9		م	ة	ع	ی	و	ا	ا	ڈ	ڑ	ک	و	و	و	و	ا	پ	ن	و	ڈ						و
A		م	ت	غ	ي	و	ا	ا	ب	ب	ک	و	و	و	و	ا	پ	ل	م	د						و
B		م	ث	ک	و	و	ا	ا	ب	پ	ک	و	و	و	و	ا	پ	ر	م	ر						و
C			ج	ک	و	و	ا	ا	ب	ڈ	پ	ن	ی	و	و	ا	پ	ر	ج	ت						و
D			ح	ی	و	و	ا	ا	ب	ڈ	پ	ن	ی	و	و	ا	پ	ر	ش	س						و
E		م	خ	ی	و	و	ا	ا	ب	ڈ	پ	ن	ی	و	و	ا	پ	ر	ج	س						و
F		م	د	ی	و	و	ا	ا	ب	ڈ	پ	ن	ی	و	و	ا	پ	ر	ک	غ						و

# Code Point Repertoire after Various Filters



# Which Scripts have Variant Code Points?

- ⊙ Arabic
- ⊙ Armenian
- ⊙ Bengali
- ⊙ Cyrillic
- ⊙ Devanagari
- ⊙ Ethiopic
- ⊙ Georgian
- ⊙ Greek
- ⊙ Gujarati
- ⊙ Gurmukhi
- ⊙ Han
- ⊙ Hebrew
- ⊙ Japanese
- ⊙ Kannada
- ⊙ Khmer
- ⊙ Korean
- ⊙ Lao
- ⊙ Latin
- ⊙ Malayalam
- ⊙ Myanmar
- ⊙ Oriya
- ⊙ Sinhala
- ⊙ Tamil
- ⊙ Telugu
- ⊙ Thaana
- ⊙ Tibetan
- ⊙ Thai

	Variant code points
	No variant code points
	To be determined

# IDN Variant TLDs - Definition of Variants

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- ⦿ **Gap 1: No definition of IDN variant TLDs**
- ⦿ **Solution:** Define using Root Zone Language Generation Rules (RZ-LGR) Procedure – based on community input.
- ⦿ Script communities formed panels. Proposals for 22 out of 27 scripts or writing systems identified completed and [published](#).
  - [RZ-LGR-4](#), published on 6 Nov. 2020. integrated 18 scripts
    - Arabic, Bangla, Chinese, Devanagari, Ethiopic, Georgian, Gujarati, Gurmukhi, Hebrew, Kannada, Khmer, Lao, Malayalam, Oriya, Sinhala, Tamil, Telugu, and Thai.
  - [Proposals](#) for Armenian, Cyrillic, Greek and Korean also finalized.
  - Japanese, Latin and Myanmar script panels in progress.

# IDN Variant TLDs - Variant Management Mechanism

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- ⦿ **Gap 2: No IDN variant TLD management mechanism**
- ⦿ **Solution:** ICANN org [published](#) IDN Variant TLD Recommendations for further consideration.
- ⦿ ICANN Board [approved](#) the recommendations on 14 March 2019, and requested:
  - *the ccNSO and GNSO take into account the recommendations while developing their respective policies to define and manage the IDN variant TLDs for the current TLDs as well as for future TLD applications.*
  - *the ccNSO and GNSO keep each other informed to ensure a consistent solution, based on the Variant TLD Recommendations, is developed for IDN variant ccTLDs and IDN variant gTLDs.*

# Recommendations for IDN Variant TLDs

	Administrative	Policy	Implementation
Root Zone	<p><b>Rec.2</b> Variant TLDs allocated to same entity: {t1, t1v1, ...}.</p> <p><b>Rec.7</b> Variant TLDs operated by same registry service providers.</p>	<p><b>Rec.1</b> Root Zone Label Generation Rules (RZ-LGR) the only source for valid TLDs and their variant labels.</p>	<b>None</b>
Second Level	<p><b>Rec.3</b> Same label under variant TLDs registered to the same entity: s1.t1 and s1.t1v1.</p> <p><b>Rec.4</b> Second-level variant labels under variant TLDs registered to the same entity: s1.t1, s1v1.t1, s1.t1v1 and s1v1.t1v1.</p>	<p><b>Rec.5</b> Variant labels allocatable or activated under variant TLDs not necessarily same.</p> <p><b>Rec.6</b> Second-level IDN tables under variant TLDs harmonized.</p>	<b>None</b>

Additional at Root Zone and Second Level:

**Rec.8** Existing policies and procedures updated to accommodate these recommendations.

**Rec.9** All other existing top-level and second-level policies apply, unless identified otherwise.

A [detailed analysis](#) of impact on gTLDs and IDN ccTLDs processes is also presented.

# IDN Variant TLDs - Variant Management Mechanism

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- ⦿ **Gap 2: No IDN variant TLD management mechanism**
- ⦿ In addition, the ICANN Board asked the ICANN community (including [SOs/ACs](#) and [IAB](#)) to study and recommend how to technically apply the RZ-LGR in a harmonized way to all TLDs.
- ⦿ [The RZ-LGR Technical Study Group](#) (TSG) developed the [Recommendations for the Technical Utilization of the RZ-LGR](#).
- ⦿ ICANN Board [approved](#) these recommendations on 26 January 2020 and requested:
  - *the ccNSO and GNSO Councils take into account the Recommendations while developing their respective policies to define and manage the IDN variant TLDs.*



# IDN Work by GNSO – SubPro WG

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- ⦿ SubPro WG Final Report [published](#) on 2 February 2021.
- ⦿ Covers IDNs in addition to other topics:
  - Topic 25 on IDNs.
    - Supports IDN gTLD applications.
    - Suggests mechanism for IDN Variant gTLD applications.
    - Provides additional implementation guidance.
  - Topic 11 on Universal Acceptance.
  - Additional recommendations and guidelines.
    - R-19.3: Prioritization of IDN applications.
    - IG-26.10: Algorithmic checking of gTLD string.
    - IG-39.5: IDN table review.

# IDN Work by GNSO – IDN Scoping Team

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- ⦿ GNSO set up an **IDN Scoping team** to look at IDN Guidelines v4.0 and IDN Variant TLD Recommendations.
- ⦿ The IDN Scoping team proposes two work tracks in its [Final Report](#) on 17 February 2020:
  - Track 1: A working group that would be focused on IDN Guidelines v4.0 operational issues.
  - Track 2: An EPDP that would include:
    - How to define, manage, and coordinate IDN Variant TLDs?
    - How the IDN Guidelines should be revised in the future?

# Focus of SubPro WG and IDN EPDP WG

	SubPro WG		IDN EPDP WG	
	Existing gTLDs	Future gTLD Applications	Existing gTLDs	Future gTLD Applications
IDN Implementation		x	x	x*
IDN Variant TLD Recommendations		x	x	x*
Analysis of IDN Variant TLD Recommendations			x	x
Recommendation for the Technical Use of RZ-LGR			x	x
Updates to IDN Guidelines			x	x

x\* indicates work beyond already done by SubPro WG.

# Scope of the IDN EPDP

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- ⦿ Following a GNSO [call](#), a charter drafting team was set up, which has developed the [IDN EPDP charter](#).
- ⦿ The charter has the following scope:
  1. The definition of all gTLDs and the management of variant labels to facilitate the delegation of variant gTLDs in the root zone while achieving the security and usability goal of variant labels in a stable manner; and
  2. How the IDN Implementation Guidelines, which Contracted Parties are required to comply with, should be updated in the future.
- ⦿ The scope of this EPDP may be expanded specifically as a result of the Operational Track on the IDN Implementation Guideline 4.0.

# Detailed Scope of the IDN EPDP

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- ⦿ TLD Label Validation and Variant Label(s) Calculation:
  - A. Consistent definition and technical utilization of RZ-LGR (a1-10).
  
- ⦿ IDN Variant TLD Management:
  - B. “Same entity” at the top-level (b1-5).
  - C. “Same entity” at the second-level (c1-6).
  - D. Adjustments in registry agreement, registry service, registry transition process, and other processes/procedures related to the domain name lifecycle (d1-8).
  - E. Adjustments to objection process, string similarity review, string contention resolution, reserved strings, and other policies and procedures (e1-7).
  - F. Adjustments in registration dispute resolution procedures and trademark protection mechanisms (f1-2).
  
- ⦿ IDN Implementation Guideline:
  - G. Process to update the IDN Implementation Guidelines (g1).

# Status of IDN EPDP

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- ⦿ The [IDN EPDP charter](#) which was adopted by the GNSO Council for further work on 20 May 2021.
- ⦿ GNSO issued calls for [team](#) and [chair](#) of IDN EPDP in June 2021 and is now forming the IDN EPDP WG.

## ⦿ Domain Names:

- Newer top-level domain names: example.**sky**
- Longer top-level domain names: example.**africa**
- Internationalized Domain Names (IDN): **คน.ไทย**

## ⦿ Internationalized email addresses (EAI):

- ASCII@ASCII (new and long TLD) ekrem@misal.**istanbul**
- ASCII@IDN marc@**société**.org
- Unicode@ASCII **测试**@example.com
- Unicode@IDN **ईमेल@उदाहरण.भारत**
- Unicode@IDN; right to left scripts **ای-میل @مثال.موقع**



Accept



Validate



Process



Store

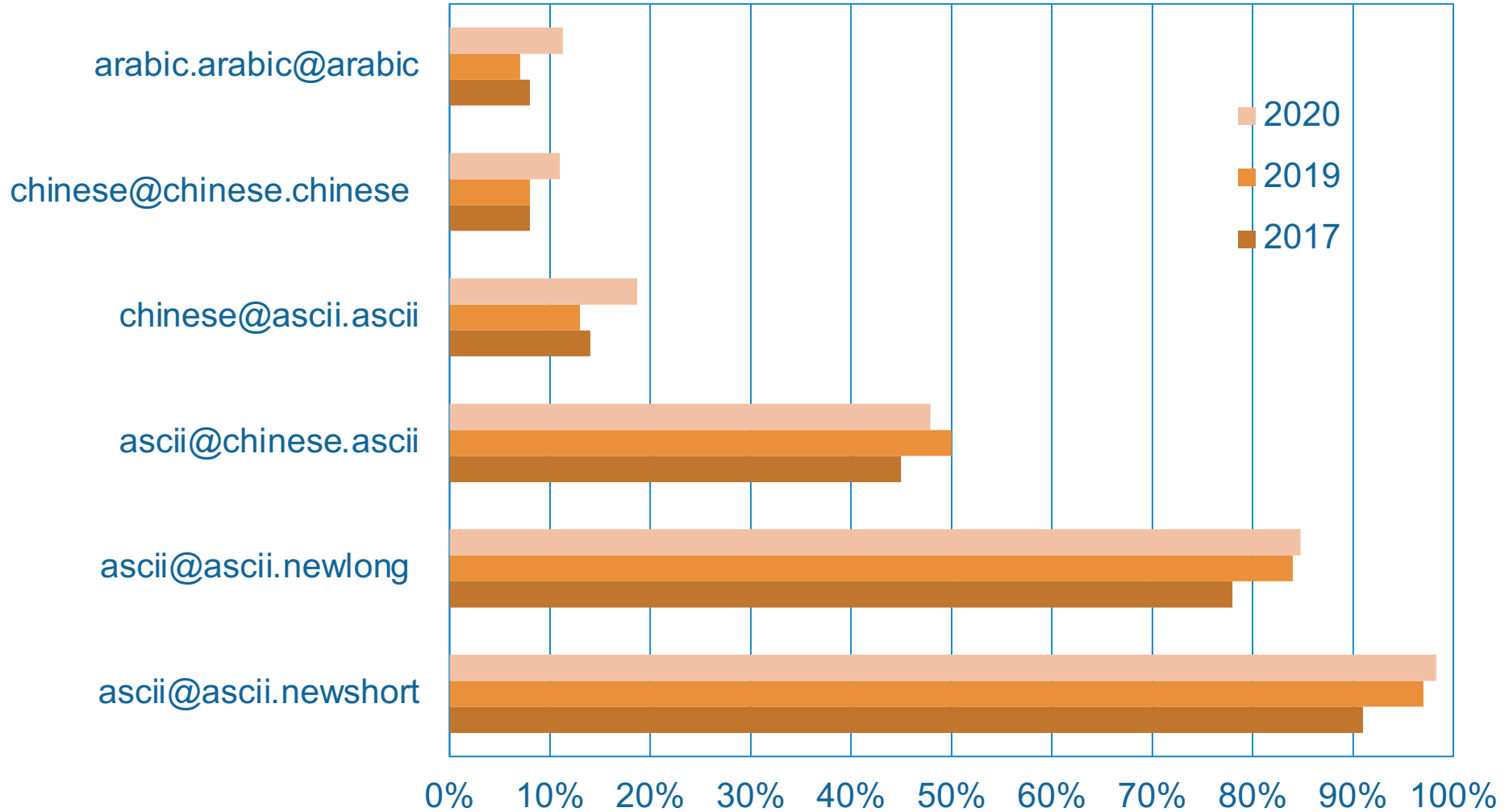


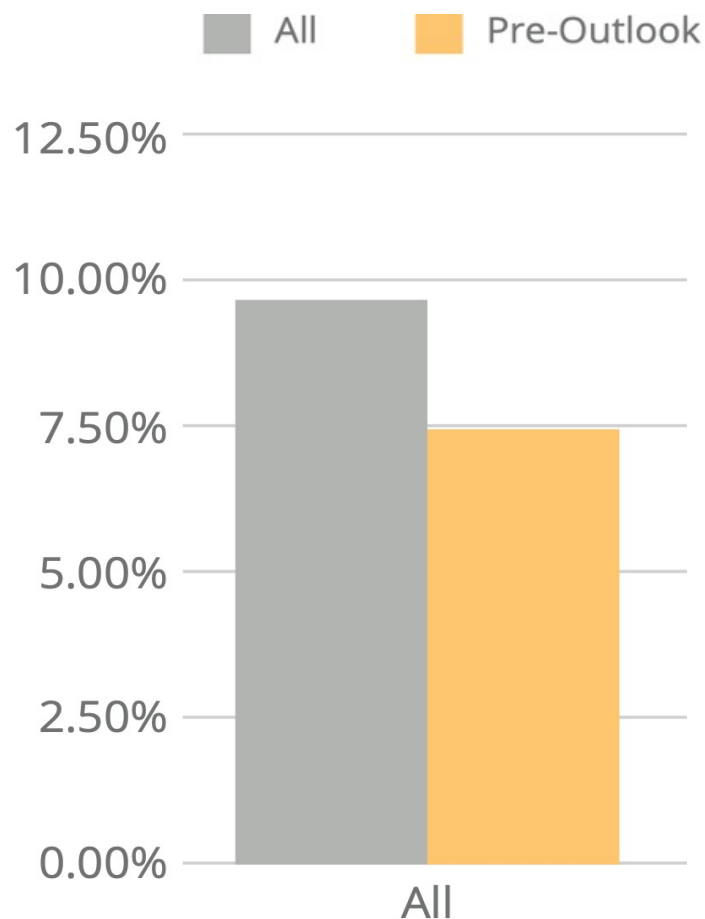
Display



# Email Address Acceptance by Global Websites

For details, see [UASG027](#)





- ⦿ Only **9.7%** of the mail-servers sampled were EAI-ready in 2019.
- ⦿ For details on methodology, see [UASG021D: EAI Readiness in TLDs](#).

# Is Your Email Address Globally Inclusive?

<https://uasg.tech/eai-check/>



Universal Acceptance



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Information

Media

Case Studies

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## Email Address Internationalization

### EAI Check

This widget takes an email address and checks to see if the mail server advertises support for receiving EAI (Email Address Internationalization) email addresses.

Check to see if your email address is EAI compliant. Enter a valid email address below:

Enter Valid Email Address

CHECK ADDRESS

# Universal Acceptance Activities

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- ⊙ Contribute to UA Steering Group (UASG) – visit [UASG.tech](https://uasg.tech):
  - Community drive effort to address UA.
  - Tech, EAI, Comms, Measurement Working Groups.
  - UA Local Initiatives, UA Ambassadors.
  
- ⊙ Conduct Technical Research:
  - [UASG004](#) Test Domains and Emails for UA Readiness Evaluation.
  - [UASG018A](#) UA Readiness of Programming Languages.
  - [UASG030](#) Evaluation of EAI Support in Email Software and Services.
  - [UASG032](#) UA of Content Management Systems Phase 1 – WordPress.
  
- ⊙ Outreach and Trainings:
  - [APTLD Regional UA Training](#).
  - [LACRALO Regional UA Training](#).
  - Case studies, e.g., [Supporting a Culturally and Linguistically Diverse Internet Through EAI – How Coremail and THNIC Made it a Reality](#).

# Engage with ICANN



## Thank You and Questions

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