Internationalized Domain Names and Universal Acceptance Programs

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ICANN

Brief overview on ICANN

ICANN's Mission

The mission of the Internet Corporation for Assigned Names and Numbers (ICANN) is to **ensure the stable and secure operation of the Internet's unique identifier systems**

Specifically, ICANN:

1 Coordinates the allocation and assignment of names in the root zone of the Domain Name System

2 Coordinates the development and implementation of policies concerning the registration of second-level domain names in generic top-level domains (gTLDs)

3 Facilitates the coordination of the operation and evolution of the DNS root name server system

4 Coordinates the allocation and assignment at the top-most level of Internet Protocol numbers and Autonomous System numbers

5 Collaborates with other bodies as appropriate to provide registries needed for the functioning of the Internet as specified by Internet protocol standards development organizations

Some of What the ICANN Organization Does

Domain Name System

The Domain Name System provides addressing for the Internet so people can find websites, send email, and other tasks. The ICANN org also supports the stability of the DNS through its work, contracts, and accreditations.

Policy Development

The ICANN org supports inclusive, open and transparent multi-stakeholder bottom-up consensus-based policy development mechanisms.

L-Root

The ICANN org hosts and supports 1 of the 13 L-Root infrastructures. At over 160 locations worldwide, L-Root is critical to infrastructure that helps reduce latency and improves performance of the DNS.

Support and Grow the Community

The ICANN org engages, nurtures and supports interested stakeholders for active and meaningful participation in ICANN. ICANN connects with stakeholders through outreach and engagement, and meeting and event support.
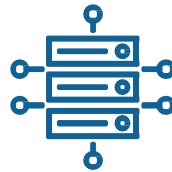
Generic Top-Level Domains

The ICANN org manages the Domain Name System's top-level domains. ICANN helps promotes competition and choice in the gTLD marketplace.
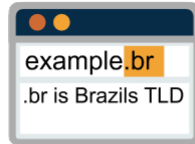
Country Code Top-Level Domains

The ICANN org delegates top-level domains identified with a country code. Management is done by national ccTLD operators.

Protocol Parameters

The ICANN org, in coordination with the Internet Engineering Task Force, manages protocol parameters by maintaining many of the codes and numbers used in Internet protocols.

Internet Protocol Addresses

By serving as the central repository for IP addresses, the ICANN org helps coordinate how IP addresses are supplied – preventing repetition and conflicts.

Root Zone Management

The ICANN org helps manage the root zone through the IANA functions, which involves assigning the operators of top-level domains, such as .bank and .com, and maintaining technical and administrative details.

IANA Functions

Supporting Organizations (SOs)

ASO
The ASO Address Council is composed of 15 volunteers – 3 from each of the Regional Internet Registries (RIRs) – who work on global Internet Protocol (IP) Address Policy.

ccNSO
The ccNSO Council and members work on global policies relating to country code top-level domain names (ccTLD) policies (e.g., .br, .uk).

GNSO
The GNSO Council is composed of 21 members – divided into 2 houses (contracted and non-contracted parties) – who work on generic top-level domain names (gTLD) policies (e.g., .com, new gTLDs).

Supporting Organizations (SOs)

Three SOs in the ICANN community are responsible for developing policy recommendations in the areas they represent.

Address Supporting Organization (ASO)

Country Code Names Supporting Organization (ccNSO)

Generic Names Supporting Organization (GNSO)

Advisory Committees (ACs)

Advisory Committees (ACs)

Four ACs give advice and make recommendations on ICANN topics.

At-Large Advisory Committee (ALAC)

Governmental Advisory Committee (GAC)

Root Server System Advisory Committee (RSSAC)

Security and Stability Advisory Committee (SSAC)

ALAC
The ALAC voices the interests of the individual Internet user and is composed of 15 members – 2 from each of the 5 Regional At-Large Organizations (RALOs) and 5 appointed by the ICANN Nominating Committee. It is supported by over 200 At-Large Structures (ALSes) and volunteers.

GAC
The GAC provides advice on public policy issues, particularly on interactions with policies and national laws or international agreements.

RSSAC
The RSSAC advises the ICANN community and Board on the operation, administration, security, and integrity of the Internet's Root Server System.

SSAC
The SSAC advises on matters related to the security and integrity of the Internet's naming and address allocation systems.

Internationalized Domain Names and Universal Acceptance Programs

What Are Internationalized Domain Names (IDNs)?

IDNs are domain names with non-Latin characters or Latin characters beyond letters (a to z) digits (0 to 9) and hyphens (-), as allowed by relevant protocols.

Until late 2009, top-level domains were restricted to only the Latin letters a to z without accents or symbols. After 2009, IDN TLDs were introduced in other scripts, including Arabic, Chinese, and Cyrillic scripts.
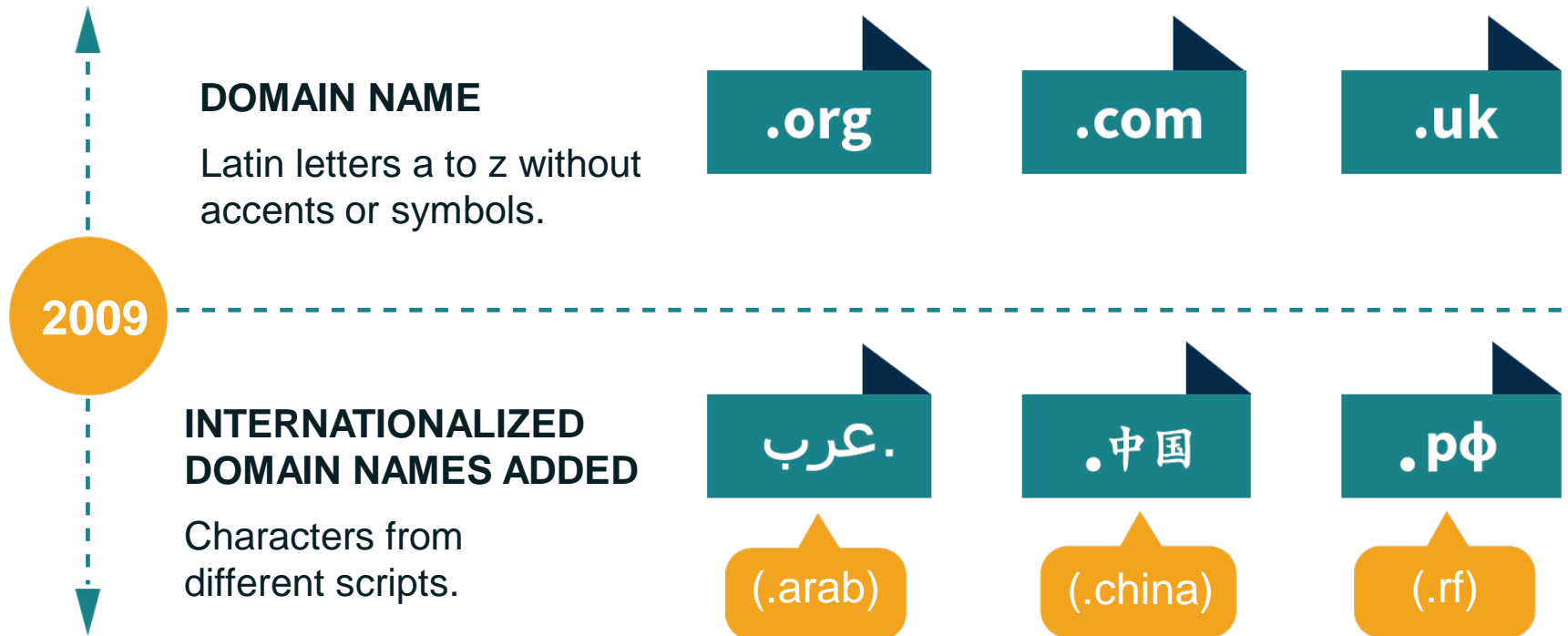
IDN TLDs can be either ccTLDs or gTLDs.

IDNs use a particular encoding and format to allow a wider range of scripts to represent domain names.

IDN Program Objective

Enable deployment of domain names

in the local languages and scripts

used by the communities globally

in a secure and stable manner.

How Have Top-Level Domains Changed?

2009

DOMAIN NAME

Latin letters a to z without accents or symbols.

.org   .com   .uk

INTERNATIONALIZED DOMAIN NAMES ADDED

Characters from different scripts.

‎.عرب‎   .中国   .рф

(.arab)   (.china)   (.rf)

ASCII Domain Name Label

www.cafe-123.com

Third-level domain

Second-level domain

Top-level domain (TLD)

② **Forming ASCII Labels**
Use **LDH**
- **L**etters [a-z]
- **D**igits [0-9]
- **H**yphen [H]

Label length = 63
Other constraints (e.g. on hyphen)

① **Forming ASCII Labels**
Use only Letters
- Letters [a-z]

Label length = 63

Domain Name Mnemonics in ASCII

Using LDH

- **Letters [a-z]**
- **Digits [0-9]**
- **Hyphen (H)**

②

Top-level Domain Name Mnemonics in ASCII

Using Letters only

- **Letters [a-z]**
- ~~**Digits [0-9]**~~
- ~~**Hyphen (H)**~~

①

	0	1	2	3	4	5	6	7
0	NUL	DLE	space	0	@	P	`	p
1	SOH	DC1 XON	!	1	A	Q	a	q
2	STX	DC2	"	2	B	R	b	r
3	ETX	DC3 XOFF	#	3	C	S	c	s
4	EOT	DC4	$	4	D	T	d	t
5	ENQ	NAK	%	5	E	U	e	u
6	ACK	SYN	&	6	F	V	f	v
7	BEL	ETB	'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y
A	LF	SUB	*	:	J	Z	j	z
B	VT	ESC	+	;	K	[	k	{
C	FF	FS	,	<	L	\	l		
D	CR	GS	-	=	M	]	m	}
E	SO	RS	.	>	N	^	n	~
F	SI	US	/	?	O	_	o	del

Internationalized Domain Name (IDN) Labels

Ľ'ŤŹř φ . ±ř

IDN
second-level
domain

IDN
top-level
domain
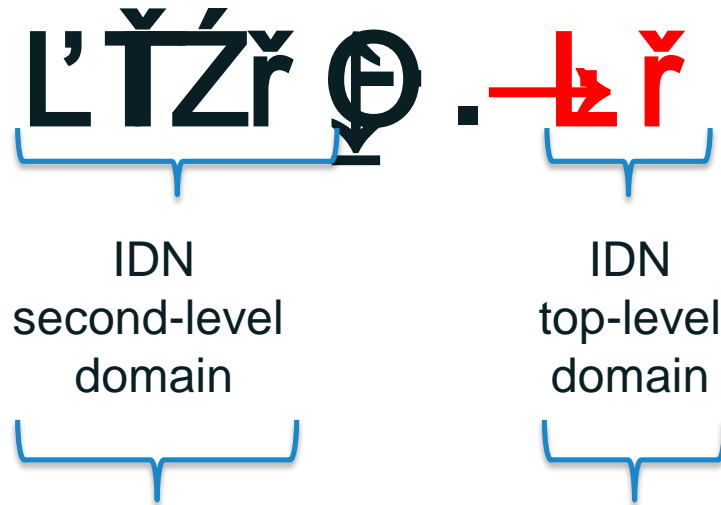
Syntax of IDN Labels
Valid U-Label: Unicode code points as constrained by the "LDH" scheme within IDNA 2008

②

Syntax of IDN Labels
Valid U-label, further constrained by the "letter" principle for TLDs

①

IDN Mnemonics

	060	061	062	063	064	065	066	067	068	069	06A	06B	06C	06D	06E	06F
0	0600	0610	0620	0630	0640	0650	0660	0670	0680	0690	06A0	06B0	06C0	06D0	06E0	06F0
1	0601	0611	0621	0631	0641	0651	0661	0671	0681	0691	06A1	06B1	06C1	06D1	06E1	06F1
2	0602	0612	0622	0632	0642	0652	0662	0672	0682	0692	06A2	06B2	06C2	06D2	06E2	06F2
3	0603	0613	0623	0633	0643	0653	0663	0673	0683	0693	06A3	06B3	06C3	06D3	06E3	06F3
4	0604	0614	0624	0634	0644	0654	0664	0674	0684	0694	06A4	06B4	06C4	06D4	06E4	06F4
5	0605	0615	0625	0635	0645	0655	0665	0675	0685	0695	06A5	06B5	06C5	06D5	06E5	06F5
6	0606	0616	0626	0636	0646	0656	0666	0676	0686	0696	06A6	06B6	06C6	06D6	06E6	06F6
7	0607	0617	0627	0637	0647	0657	0667	0677	0687	0697	06A7	06B7	06C7	06D7	06E7	06F7
8	0608	0618	0628	0638	0648	0658	0668	0678	0688	0698	06A8	06B8	06C8	06D8	06E8	06F8

IDN Mnemonics

	060	061
0	0600	0610
1	0601	0611
2	0602	0612
3	0603	0613
4	0604	0614
5	0605	0615
6	0606	0616
7	0607	0617
8	0608	0618

	120	121	122	123	124	125	126	127	128	129	12A	12B
0	ሀ 1200	ሐ 1210	ሠ 1220	ሰ 1230	ቀ 1240	ቐ 1250	በ 1260	ተ 1270	ኀ 1280	ነ 1290	አ 12A0	ኰ 12B0
1	ሁ 1201	ሑ 1211	ሡ 1221	ሱ 1231	ቁ 1241	ቑ 1251	ቡ 1261	ቱ 1271	ኁ 1281	ኑ 1291	ኡ 12A1	
2	ሂ 1202	ሒ 1212	ሢ 1222	ሲ 1232	ቂ 1242	ቒ 1252	ቢ 1262	ቲ 1272	ኂ 1282	ኒ 1292	ኢ 12A2	ኲ 12B2
3	ሃ 1203	ሓ 1213	ሣ 1223	ሳ 1233	ቃ 1243	ቓ 1253	ባ 1263	ታ 1273	ኃ 1283	ና 1293	ኣ 12A3	ኳ 12B3
4	ሄ 1204	ሔ 1214	ሤ 1224	ሴ 1234	ቄ 1244	ቔ 1254	ቤ 1264	ቴ 1274	ኄ 1284	ኔ 1294	ኤ 12A4	ኴ 12B4
5	ህ 1205	ሕ 1215	ሥ 1225	ስ 1235	ቅ 1245	ቕ 1255	ብ 1265	ት 1275	ኅ 1285	ን 1295	እ 12A5	ኵ 12B5
6	ሆ 1206	ሖ 1216	ሦ 1226	ሶ 1236	ቆ 1246	ቖ 1256	ቦ 1266	ቶ 1276	ኆ 1286	ኖ 1296	ኦ 12A6	
7	ሇ 1207	ሗ 1217	ሧ 1227	ሷ 1237	ቇ 1247		ቧ 1267	ቷ 1277	ኇ 1287	ኗ 1297	ኧ 12A7	

IDN Mnemonics

Code Point Repertoires

Unicode 11.0
146 scripts
??? of 137,439
allowed

ASCII
1 script
63 of 127
allowed

*IDNA2008 expects registries at all levels will reduce opportunities for confusion by **restricting characters** or **using variant techniques**.*

Code Point Repertoires

**Unicode 11.0
146 scripts
137,439**

;)

**IDNA2008
145 scripts
97,973**

**ASCII
1 script
63 of 127
allowed**

*IDNA2008 expects registries at all levels will reduce opportunities for confusion by **restricting characters** or **using variant techniques**.*

Code Point Repertoires

Unicode 11.0
146 scripts
137,439

;)

IDNA2008
145 scripts
97,973

0..9

クスネ...
αβγδ…

MSR- 4
28 scripts
33,511

ASCII
1 script
63 of 127
allowed
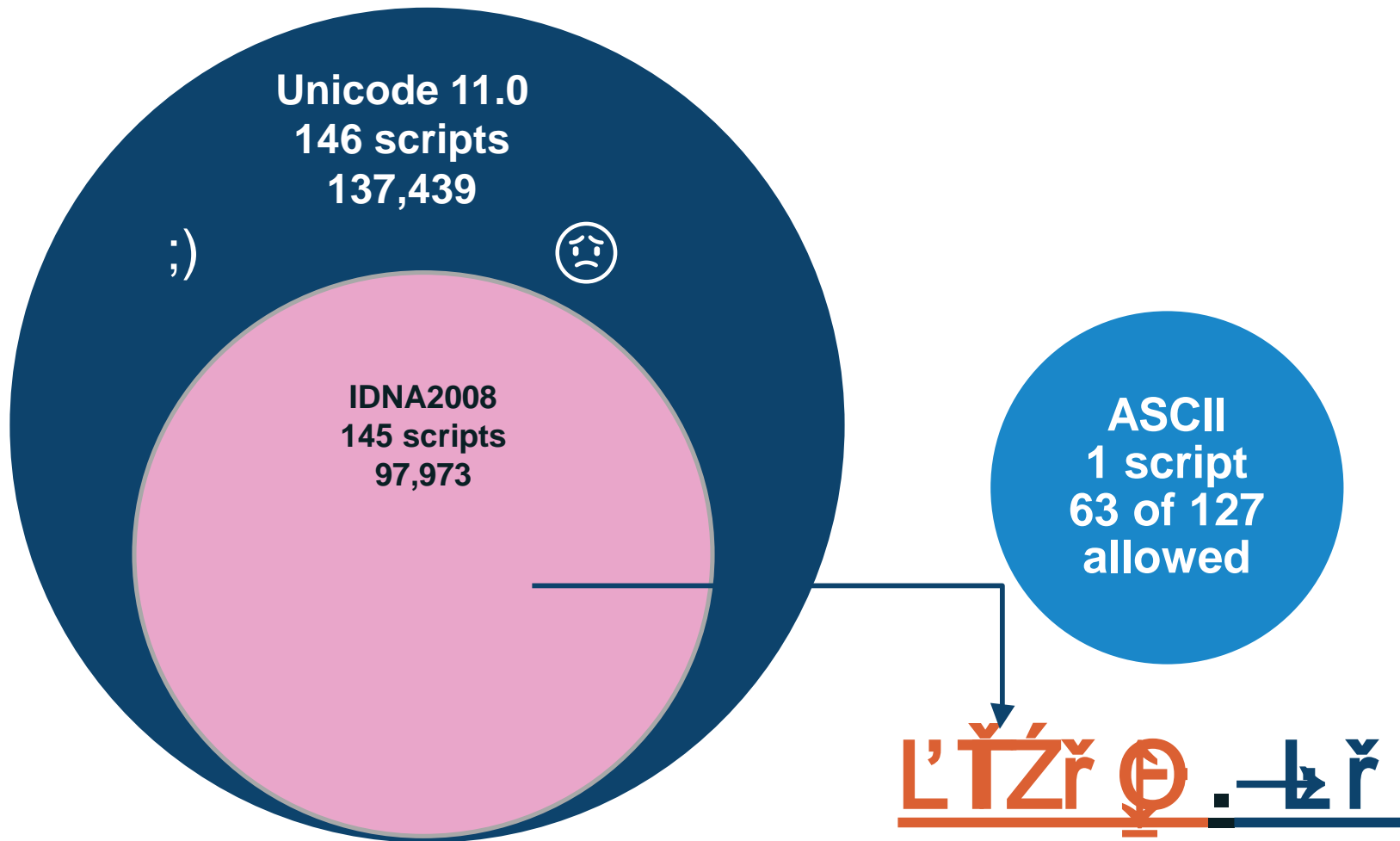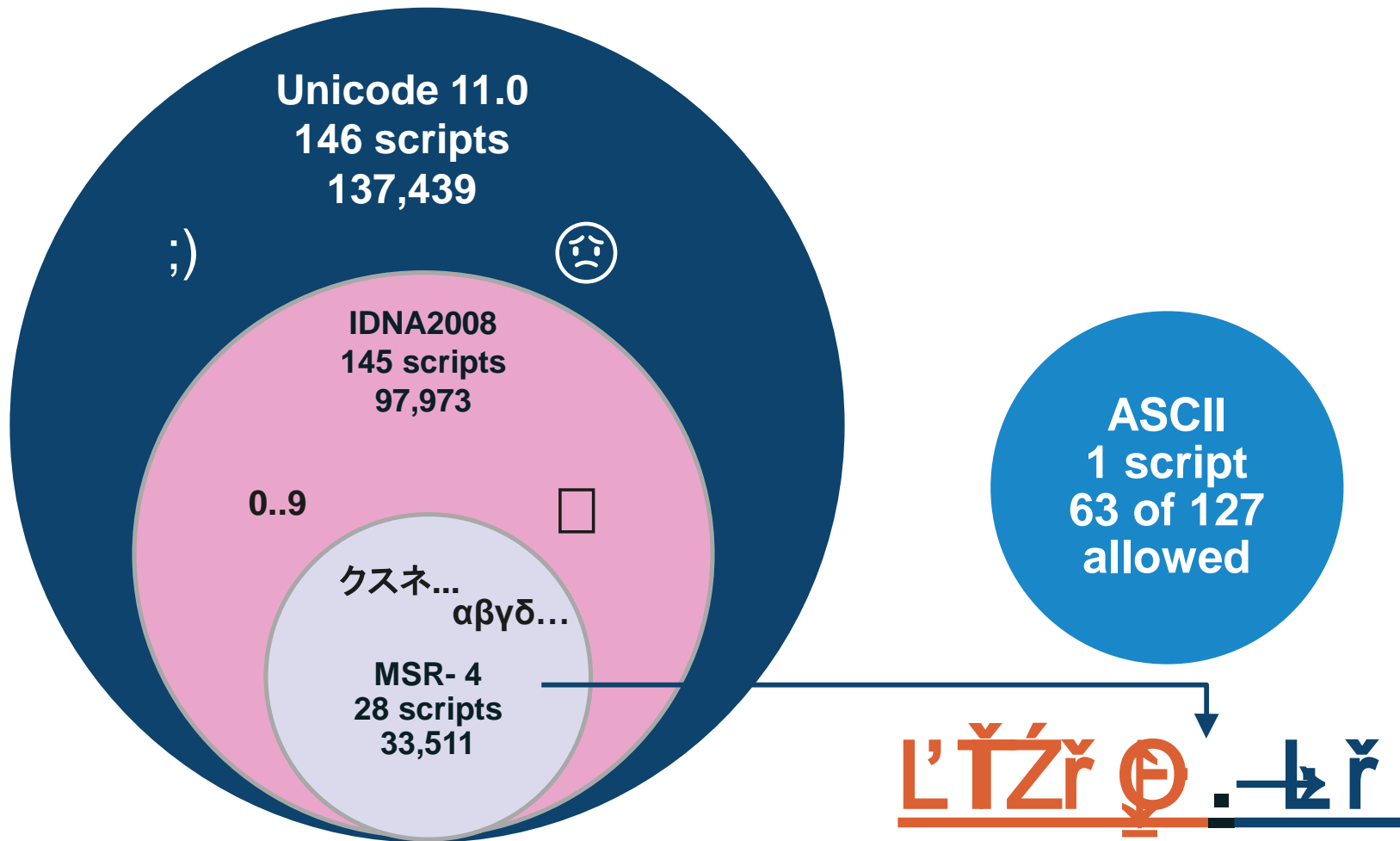
*IDNA2008 expects registries at all levels will reduce opportunities for confusion by **restricting characters** or **using variant techniques**.*

① Root Zone Label Generation Rules 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?

One Generation Panel per writing system (script)

Generation Panel 1

Generation Panel 2

Generation Panel 3

Etcetera

Integration Panel

Needs more work

Rules

Panel 1
Panel 2

Etcetera

http://....TLD

IDN Country Code Top-level Domains

ccTLDs: 61 for 42*

* Successfully evaluated IDN ccTLDs for total countries and territories
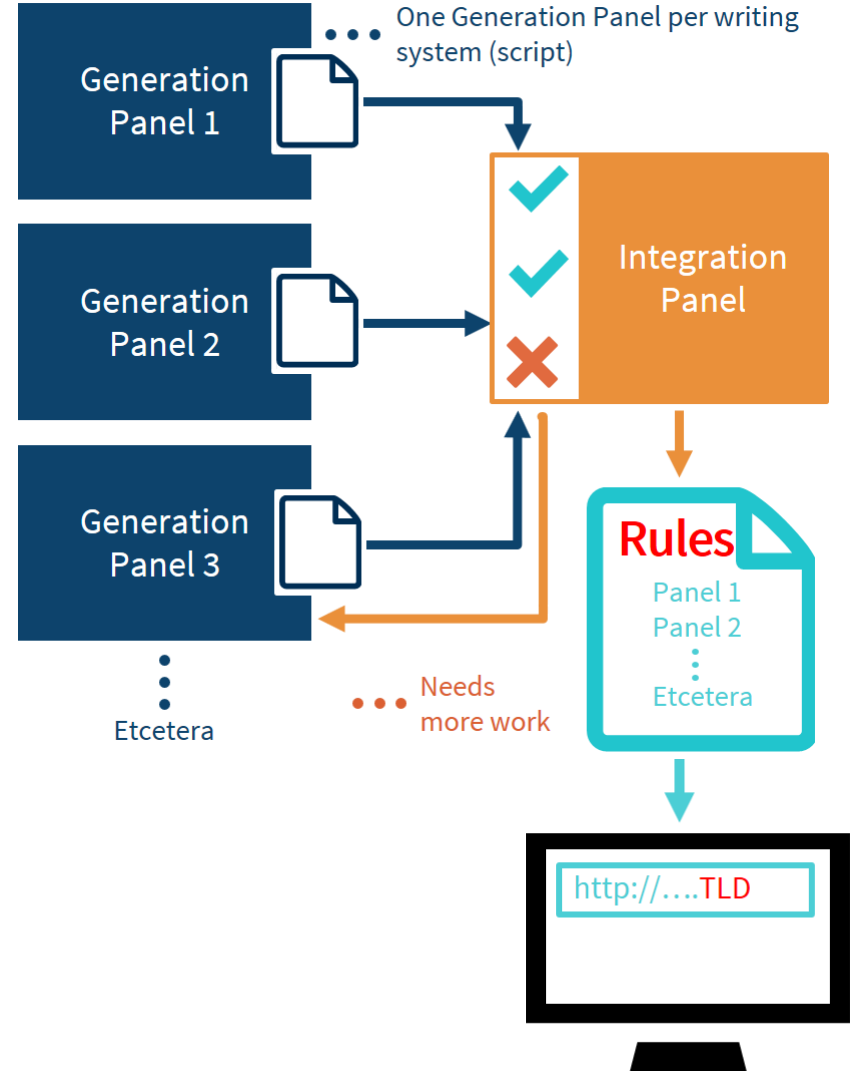
Example of .БЕЛ IDN ccTLD

Общая
информация

14 965 доменов

1 октября 2019

Вторая по величине национальная
кириллическая доменная зона **в мире**

БЕЛ
НАЦИОНАЛЬНАЯ
ДОМЕННАЯ
ЗОНА

Example of .БЕЛ IDN ccTLD

Статистика

300
В месяц

10
В день

39 знаков —
рекорд 2018 года

Солигорский-государственный-колледж.бел

46 знаков —
рекорд 2019 года

Шпатлевка-покраска-стен-проф-оборудованием.бел

БЕЛ
НАЦИОНАЛЬНАЯ
ДОМЕННАЯ
ЗОНА

Universal Acceptance of Domain Names

Universal Acceptance (UA) Initiative

Vision
All domain names and email addresses work in all software applications.

Mission
To mobilize the software application developers to get their products UA-ready by providing encouragement, documentation, case studies, tools, and measures to deliver the right user experience to the end user.

Impact
Promote consumer choice, improve competition, and provide broader access to end users.

Categories Affected by UA Issues

- ◉ **Newer top-level domain names:**   example.sky

- ◉ **Longer top-level domain names:**   example.photography

- ◉ **Internationalized Domain Names:**   البحرين.مثال

  - ○ Rendering problems

    - • Displaying A-label: xn--mgbh0fb.xn--mgbcpq6gpa15g

    - • Ordering right-to-left scripts: should be مثال.البحرين

- ◉ **Internationalized email addresses:**   अजय@डाटा.भारत (Hindi email)

  - ○ Available standards are not implemented by all email software
    and service providers making email delivery unreliable.

    - • Test if your email is compliant: https://uasg.tech/eai-check/

Five Actions for UA-readiness

Applications should be able to do the following for all domain names and email addresses:

Accept

Validate

Store

Process

Display

UASG and Its Action Plan for FY20

Universal Acceptance Steering Group

- ⊙ To address the Universal Acceptance of domain names and email addresses, the Universal Acceptance Steering Group (UASG) was organized as a community initiative.

- ⊙ UASG has produced documentation to define and address challenges, and share progress, available at https://UASG.tech.
  - ○ Quick Guide to Universal Acceptance
  - ○ Quick Guide to Email Address Internationalization
  - ○ UA Case Study: Government of Rajasthan, India
  - ○ Quick Guide to Tendering and Contractual Documents

- ⊙ UASG is actively engaged in disseminating the information to relevant stakeholders.

- **Technology Enablers** – Organizations producing relevant standards and best current practices, and providers of software programming languages, tools, and frameworks.

- **Technology Developers** – Organizations and individuals developing and directing applications.

- **Email Software and Service Providers** – Organizations and individuals providing internationalized email software and services.

- **Influencing Individuals and Organizations** – Individuals at the local and international levels who can help promote UA-readiness, and organizations which can be used to spread the UA message more broadly.

- **Government Policymakers** – Government officials, as an explicit group, are included to try to generate demand for UA-ready products and services through accessibility standards and procurement processes.

FY20 Action Plan - UASG Working Groups

- ⦿ **Technology WG** - Plans, coordinates, and oversees work on standards, best current practices, programming languages, tools, and development platforms.

- ⦿ **Email Address Internationalization (EAI) WG** - Plans, executes and oversees engagement with email software and service providers to make them EAI-ready.

- ⦿ **Measurements WG** – Plans, oversees, and directs the measurement efforts for UA-readiness.

- ⦿ **Communications WG** – Plans and develops communication strategy and oversees its execution in collaboration with other WGs.

- ⦿ **Local Initiatives WG** – Plans, develops, and oversees execution of local initiatives in various geographies.

- ⦿ **UA Ambassadors WG** – Plans and executes training and outreach in local regions.

UA WGs and Stakeholder Interaction

Stakeholders: Organization:	Tech. Enablers	Tech. Developers	EAI Providers	Infl. Indv. and Orgs.	Policymakers
Technology WG	x	x			
EAI WG			x		
Measurements WG					
Communications WG	x	x	x	x	x
Local Initiatives WG		x	x	x	x
UA Ambassadors WG	x	x	x	x	x

Learn more and join

Internationalized Domain Names (IDNs)

- Visit us at icann.org/idn or email IDNProgram@icann.org for further information regarding IDNs.

Universal Acceptance (UA)

- Visit https://uasg.tech to access all UA documents and presentations.

- Contribute to UA:
    - Join UASG Working Groups
    - Join UA-discuss list

- For further information, please email info@uasg.tech.

Get involved and stay in touch

Get Involved and Informed

Attend an ICANN Public Meeting. Three times a year, ICANN holds free and open public meetings in different regions around the world. Visit **meetings.icann.org** to learn more.

Visit **go.icann.org/journey** to learn how you can attend an ICANN Public Meeting as part of the NextGen@ICANN or ICANN Fellowship programs.

Take a free online course at **learn.icann.org**.

Attend events in your region.

Find and participate in an ICANN community group by visiting **icann.org/community**.

Sign up for ICANN news alerts and regional newsletters.

Fellowship- NextGen – Newcomer Programs

Fellowship

Global Capacity Building Program to support ICANN's Multistakeholder community; online application process 3x year around an ICANN Meeting (1 Mtg for Alumni only)

NextGen

Regionally based Program to create awareness and promote future discussions within universities and other regional forums; online application process 3x a year around an ICANN Meeting

Newcomer

Those just entering the ICANN community can self-educate using the Newcomer webpage or participate in person or remotely at the ICANN Meeting Newcomer Sunday

Watch Fellowship and NextGen video:
https://www.youtube.com/watch?v=nrV_ZkDEfIQ

Watch Newcomer video:
https://www.youtube.com/watch?v=da1RQt9-e-g

ICANN Learn

ICANN|LEARN

- ⊙ ICANN Learn presents education and training, across a wide variety of topics that pertain to ICANN, to better educate stakeholders in the ICANN ecosystem.

- ⊙ It is an online platform that is free to access and free to create course content to share with fellow ICANN community members.

- ⊙ ICANN Learn is currently available in the six UN languages.

🌐 Learn more ▶

learn.icann.org

Upcoming ICANN Meetings

2021		
ICANN72 (23rd AGM)	23-28 Oct 2021	Seattle
ICANN71 | Policy Forum	14-17 Jun 2021	The Hague
ICANN70 | Community Forum	20-25 Mar 2021	Cancún
2020		
ICANN69 (22nd AGM)	17-22 Oct 2020	Hamburg
ICANN68 | Policy Forum	22-25 Jun 2020	Kuala Lumpur
ICANN67 | Community Forum	7-12 Mar 2020	Cancún
2019		
ICANN66 (21st AGM)	2-7 Nov 2019	Montréal
ICANN65 | Policy Forum	24-27 Jun 2019	Marrakech

To find out how to participate, go to:
https://meetings.icann.org/en/about

For a schedule of past and upcoming meetings,
go to: **http://meetings.icann.org/calendar**

Upcoming ICANN Meetings

Engage with ICANN

Thank You and Questions

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slideshare/icannpresentations

soundcloud/icann