Universal Acceptance

Universal Acceptance Readiness Report FY21

1 September 2021

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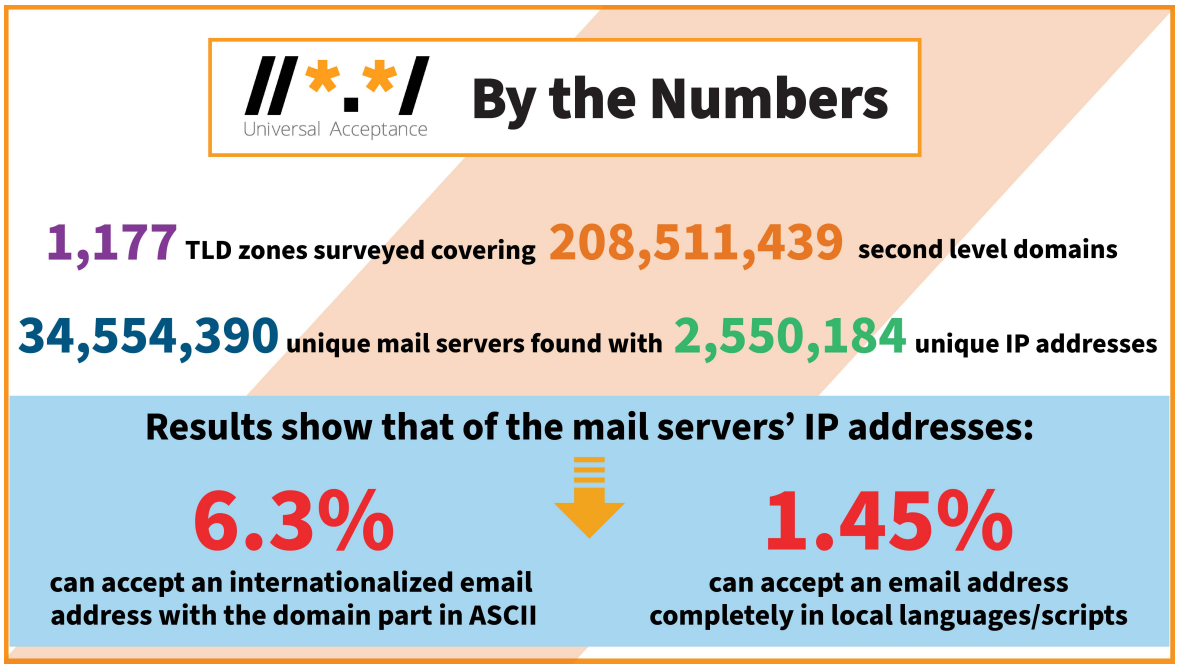


1. UNIVERSAL ACCEPTANCE: PROVIDING CHOICE AND INCLUSION THROUGH A DIVERSE AND MULTILINGUAL INTERNET

Domain names provide a unique opportunity to create an online identity. ICANN organization (org) has been supporting the work of the community to create additional options for such identities representing countries/territories through country code top-level domains (ccTLDs) in local languages, as well as for businesses and organizations through generic top-level domains (gTLDs).

Through these efforts, the Internet's Domain Name System (DNS) has expanded to include new and longer TLDs, which provide global consumers and end users with more online identity choices and promotes competition in the domain name industry. Individuals, businesses, and organizations are able to choose TLDs representing a particular geography, profession, interest, community, and more. For example, end users can now choose from more than 1,200 TLDs including .london, .accountant, .photography, .men, .pizza, .fun, and others.

To make the Internet more inclusive for communities around the world, domain names are now available in many different languages and scripts. For example, more than 150 TLDs are in different local languages, including .شبكة (.network in Arabic), .संगठन (.organization in Devanagari), .קום (.com in Hebrew), .我爱你 (.Iloveyou in simplified Chinese), .বাংলা (.bangladesh in Bangla), and .ευ (.eu in Greek), and more.

Even with this expansion of the DNS, users are still excluded from experiencing the full benefits of using the domain name or email address of their choice due to online websites, services, and applications not supporting them. This presents an opportunity for the public and business sectors to upgrade their systems to give users real choice in the domain name ecosystem.

Universal Acceptance (UA) is the cornerstone to a diverse Internet, aiming to ensure that all domain names and email addresses are supported equally by all Internet-enabled applications on all devices and systems.

Achieving UA ensures everyone can effectively navigate and communicate on the Internet using a chosen domain name and email address that best aligns with their interests, business, culture, language, and script. UA support is crucial to enabling consumer choice online and achieving digital inclusivity. Further, UNESCO explains that "Increasingly, information and knowledge are key determinants of wealth creation, social transformation and human development. Language is a primary vector for communicating information and knowledge, thus the opportunity to use one's language on the Internet will determine the extent to which one can participate in emerging knowledge societies."

The Universal Acceptance Steering Group (UASG) is a community-based group dedicated to promoting UA with the support of the ICANN org. It undertakes gap analysis of standards, technology, services, and applications to determine the current state of UA. It also raises awareness, conducts trainings, and supports remediation of technology applications and services to achieve UA-readiness.

This report summarizes the scope of UA, documents current gaps in technology related to UA-readiness, and provides an update on the activities undertaken by the UASG in FY21 (July 2020 – June 2021). This work builds on the UA Readiness Report for FY20.

2. OUR COMMITMENT

Dr. Ajay Data
Chair, Universal Acceptance Steering Group (UASG)

“As Chair of the UASG, I am privileged to work with individuals and organizations that are committed to enabling a more equitable and multilingual Internet. For the UASG, this effort is focused on ensuring that all domains, whether long or short, in Latin- or non-Latin based languages, work seamlessly in all connected devices and applications. Universal Acceptance is the gateway to the next billion Internet users. I encourage all “connected” device, software, systems, and solutions providers to become UA-ready now. The UASG is here to help.”

Akinori Maemura
Chair, ICANN Board IDN-UA Working Group

“Universal Acceptance and Internationalized Domain Names are included in ICANN's strategic goals because of their importance and impact to the users of the global Internet. The ICANN Board IDN-UA Working Group appreciates the Universal Acceptance Steering Group for its instrumental role in motivating the development of technical roadmaps at organizations globally, and will continue to support the efforts of the UASG and oversee the work at ICANN org in order to promote and improve UA-readiness to reach a more diverse Internet user base.”

Göran Marby
ICANN, President and CEO

“Now more than ever, the Internet is essential to connecting individuals and communities, personally and professionally, no matter where they are located or what language or script they use to communicate. ICANN, in collaboration with the Universal Acceptance Steering Group and its many volunteers, will continue to drive awareness of the software and system changes that are needed to support linguistic diversity in all Internet-enabled devices and applications.”

3. THE PROCESS FOR ACHIEVING UA

UA-readiness is achieved through multiple steps for each target technology shown in Figure 1. As a start, the relevant technology needs to be shortlisted and evaluated to determine what the existing gaps are. Selection of technology needs to be prioritized based on multiple factors, e.g., the complexity of fixing the problem and impact on end users.

If gaps are identified, the relevant UA-related bug or feature requests need to be submitted to these technology platforms in order to be fixed in their subsequent versions. In parallel, where technology is UA-compliant or can be made UA-compliant, code examples may need to be developed to illustrate how to use the technology correctly to support UA. Extra coding efforts may be required for technology that is not UA-compliant.

Once the solutions to support UA have been developed, training materials are created to train relevant stakeholders. Such training requires global outreach efforts.

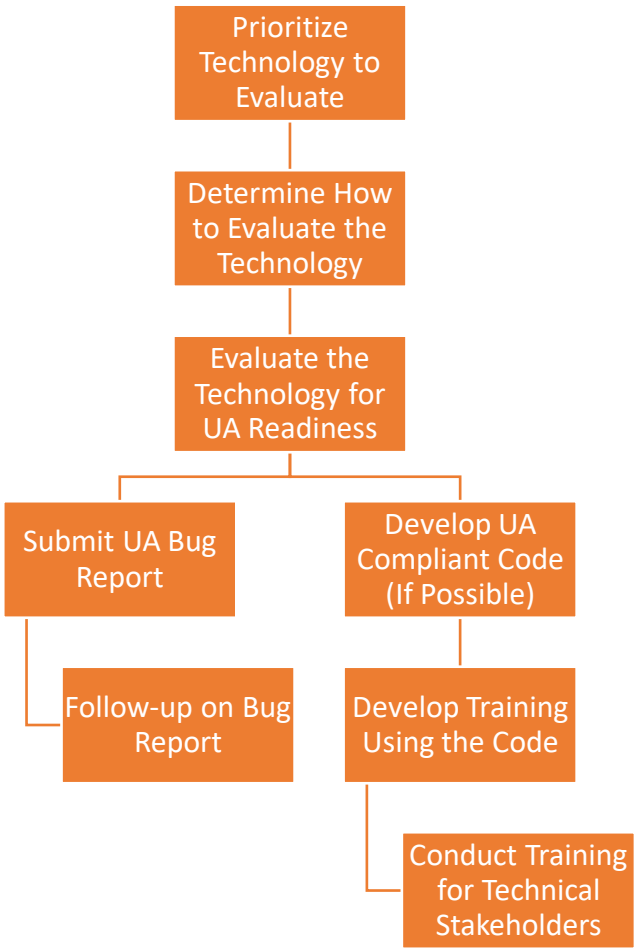


Figure 1: Steps for Remediation of Technology to Support Universal Acceptance

The Internet and ICANN community has realized the significance of UA and organized itself into the Universal Acceptance Steering Group (UASG). To address the multifaceted challenges of UA, the UASG organized six working groups to help address the various stages in the UA remediation process. The UA Measurement Working Group (WG) focuses on identifying relevant technology and undertaking gap analyses to identify the extent and nature of the UA issues in them. The Technology and Email Address Internationalization (EAI) WGs develop technical recommendations, determine remediation measures, and develop training materials. The Communications Working Group plans and drafts messaging that is used in outreach to relevant stakeholders. The Local Initiatives and UA Ambassadors raise awareness, and train and motivate local stakeholders to update their technology to be UA-compliant.

- **Measurement WG** – Plans, oversees, and directs work to identify UA readiness gaps in tools and technologies.
- **Technology WG** - Plans, coordinates, and oversees remediation work on standards, 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.
- **Communications WG** – Plans and develops a communication strategy and oversees its execution in collaboration with other working groups.
- **Local Initiatives WG** – Plans, develops, and oversees the execution of local initiatives across various geographies.
- **UA Ambassadors WG** – Undertakes training and outreach at national and regional levels.

The work of the UASG has largely focused on gap analysis as the first step and prerequisite in the process of achieving UA-readiness. Work has also been done to develop training materials and conduct training to support the subsequent remediation work. Some initial remediation work has started in FY21 and will pick up in FY22. More specific messaging for stakeholders has also been formulated, while the outreach to make communities aware of UA challenges, solutions, and its advantages has continued. The UASG's FY21 Action Plan provides details on how the UASG has organized and planned its work. The information provided below presents some aspects of the work undertaken so far (largely reporting on the UA-readiness of technology in mid-2021) based on the most recent data available through the work of the UASG. It also summarizes the UA outreach conducted over the past year.

4. UA-READINESS SCOPE AND TESTING FRAMEWORK

Multiple layers of technology may need to be fixed in order to achieve UA-readiness. Figure 2 shows how such technology may be categorized at a high level with examples for each layer.

Applications and Websites

- Wikipedia.org, ICANN.org, Amazon.com, custom websites globally
- PowerPoint, Google-Docs, Safari, Acrobat, custom apps

Social Media and Search Engines

- Chrome, Bing, Safari, Firefox, local (e.g., Chinese) browsers
- Facebook, Instagram, Twitter, Skype, WeChat, WhatsApp, Viber

Programming Languages and Frameworks

- JavaScript, Java, Swift, C#, PHP, Python
- Angular, Spring, .NET core, J2EE, WordPress, SAP, Oracle

Platforms, Operating Systems and System Tools

- iOS, Windows, Linux, Android, App Stores
- Active Directory, OpenLDAP, OpenSSL, Ping, Telnet

Standards and Best Practices

- IETF RFCs, W3C HTML, Unicode CLDR, WHATWG
- Industry-based standards (health, aviation, ...)

Figure 2: Layers of Technology Relevant for Universal Acceptance Testing

The UA-readiness of each layer may have dependency on the UA-readiness of the layer below it. Therefore, the whole technology stack would need to be reviewed and upgraded, where needed, to be able to accept, validate, process, store, and display all domain names and email addresses. The figure only provides a limited list that may be extended to include database management systems, authentication services, additional system tools, and more.

Similarly, email systems would also need to be updated to adopt the recent changes in the standard for Email Address Internationalization (EAI). Figure 3 shows the different email components (explained below), all of which need to be upgraded and configured to support EAI.

- MUA – Mail User Agent: A client program that a person uses to send, receive, and manage mail.
- MSA – Mail Submission Agent: A server program that receives mail from a MUA and prepares it for transmission and delivery.
- MTA – Mail Transfer Agent: A server program that sends and receives mail to and from other Internet hosts.
- MDA – Mail Delivery Agent: A server program that handles incoming mail and typically stores it in a mailbox or folder.

Again, the ecosystem provides a limited view that may be extended to include spam filtering, calendars, and other relevant tools related to emailing systems.

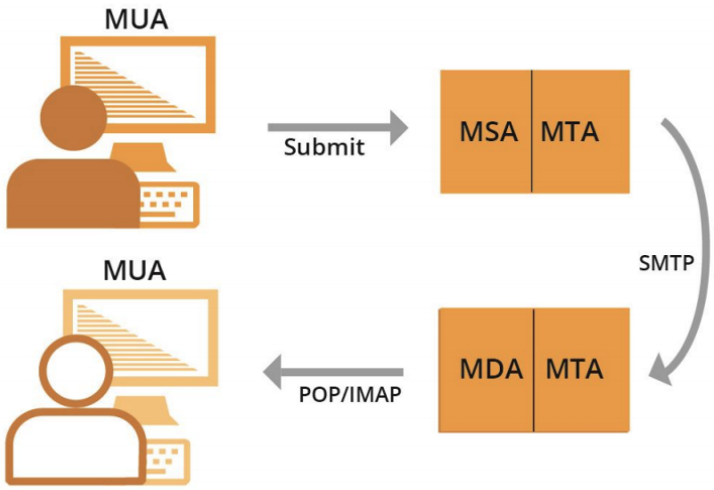


Figure 3: Layers of Technology Relevant for Universal Acceptance Testing

The Universal Acceptance (UA) of all domain names and email addresses requires that all software applications are able to accept, validate, process, store, and display them correctly. The Universal Acceptance Readiness Framework lays out details on how to check for UA-readiness using a gating approach to verify UA conformance of an application (shown in Figure 4). This gating approach is based on applying tests at the various steps, named gates, and on the various components. Accept Tests (AT), Validate Tests (VT), Process Tests on the Input and Output (P1T, P2T), Store Tests (ST), and Display Tests (DT) are identified. The following figure shows the proposed gating approach.

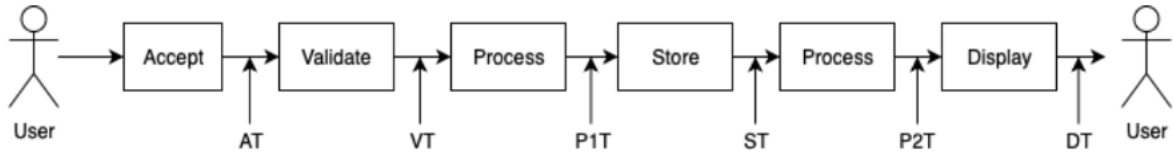


Figure 4: Universal Acceptance Testing Framework

Details of these tests and how they are applicable to the different categories of applications are provided in the framework document. Developers can use this framework to plan specific test cases and check the UA-readiness of their applications.

UA-readiness issues can happen if software applications are not able to handle any one of the following categories of a domain name or email address at any of the stages outlined in the UA-readiness Framework.

1. **Domain Names**
    1. **New short** top-level domain names: example.sky
    2. **New long** top-level domain names: example.berlin
    3. Internationalized Domain Names: παράδειγμα.ευ

2. **Email Addresses**
    1. ASCII@ASCII; new short or long TLD: ekrem@misal.istanbul
    2. ASCII@**IDN**: john@société.org
    3. **Unicode**@ASCII: 测试@example.com

4. **Unicode@IDN**: ईमेल@उदाहरण.भारत
5. **Unicode@IDN**; right-to-left scripts: مثال.موقع@اي-ميل

To allow for global UA testing, a set of domain names has been registered covering the various categories and scripts, including Arabic, Armenian, Bengali, Chinese (Simplified, Traditional), Cyrillic, Devanagari, Ethiopic, Georgian, Greek, Gujarati, Gurmukhi, Hangul, Hebrew, Hiragana, Kannada, Katakana, Lao, Latin, Malayalam, Myanmar, Oriya, Sinhala, Tamil, Telugu, Thaana, Thai, and Tibetan. In addition, an email test-bed has also been set up using these domain names. This provides a comprehensive dataset to test applications for UA as captured in UASG004. Some example email categories and addresses are listed below from the companion UASG004A document with this dataset in UTF8 format:

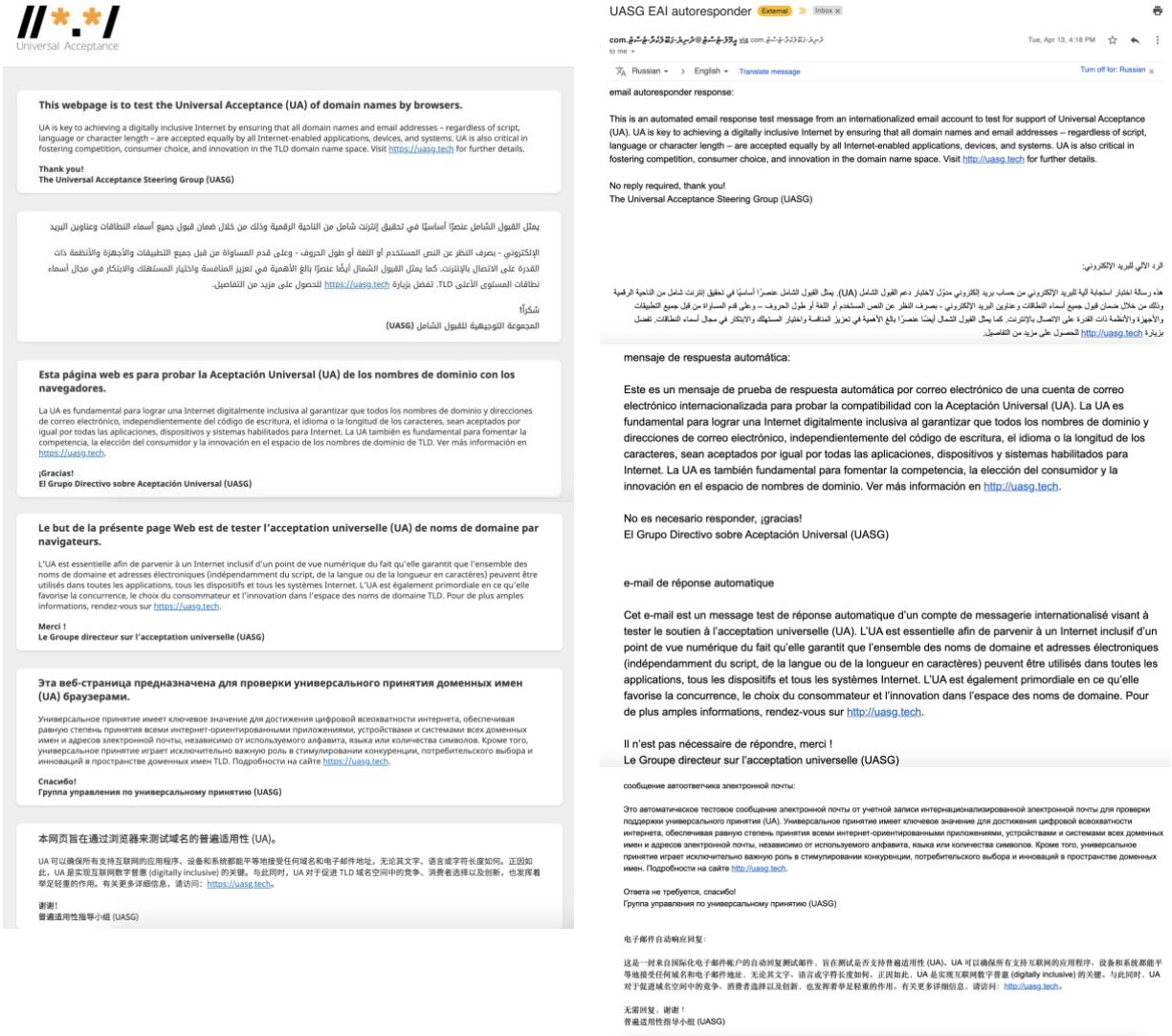
- Example Domain Names
  - #2, ASCII.ASCII, new-short, Short ASCII
    universal-acceptance-test.icu
  - #4, IDN.IDN, Armenian
    համընդհանուր-ընկալում-թեստ.հայ
  - #10, IDN.IDN, Gujarati
    સાર્વત્રિક-સ્વીકૃતિ-પરીક્ષણ.ભારત
  - #12, IDN.IDN, Hangul
    다국어도메인이용환경테스트.한국
  - #13, IDN.IDN, RTL, Hebrew
    מבחן-קבלה-אוניברסלי.קום
  - #16, IDN.IDN, Katakana
    ユニバーサルアクセプタンス.クラウド
  - #17, IDN.IDN, Lao
    ສາກ ົນ-ການຍອມຮ ັບ-ທ ົດສອບ.ລາວ
  - #18, ASCII.IDN, Latin
    Universales-Akzeptanz-Test.vermögensberatung

- Example Email Addresses
  - #32, ASCII@ASCII.ASCII, new-long, Long ASCII
    email-test@universal-acceptance-test.international
  - #34, Unicode@IDN.IDN, RTL, Arabic
    تجربة-بريد-الكتروني@تجربة-القبول-الشامل.موريتانيا
  - #37, Unicode@IDN.IDN, Cyrillic
    почта-тест@универсальное-принятие-тест.москва
  - #38, Unicode@IDN.IDN, Devanagari
    ईमेल-परीक्षण@सार्वभौमिक-स्वीकृति-परीक्षण.संगठन
  - #39, Unicode@IDN.IDN, Georgian
    ფოსტის-ტესტი@უნივერსალური-თავსობადობის-ტესტი.გე
  - #40, Unicode@IDN.IDN, Greek
    ηλεκτρονικό-μήνυμα-δοκιμή@καθολική-αποδοχή-δοκιμή.ευ
  - #52, Unicode@IDN.IDN, Sinhala
    ඉ-තැපෑල්-පිරික්සුම@විශ්ව-සම්මුති-පිරික්සුම.ලංකා
  - #55, Unicode@IDN.IDN, Thai

อีเมลทดสอบ@ยูเอทดสอบ.ไทย

- #56, Unicode@IDN.IDN, Simplified Chinese
  电子邮件测试@普遍适用测试.我爱你

The domain names resolve to a UA test webpage, and an email sent to any of the addresses gets an auto-response (shown in Figure 5). To see the messages, please click on the links or send an email to one the addresses above.



(a) Test Webpage (b) Test Email Response

Figure 5: Responses of Test Domains and Emails for Universal Acceptance Testing

5. UA-READINESS GAP ANALYSIS

Much of the recent work done by the UASG has focused on understanding the gaps in the technology related to UA-readiness. The UASG has investigated the following technology:

1. Technical Platforms and Applications
    a. Platforms used to enable and develop applications: Standards, Frameworks, Libraries, and Tools.
        i. UA Readiness of Programming Languages and Frameworks (updated in FY21; another update in progress)
        ii. UA Readiness of Networking Command Line Tools
        iii. Universal Acceptance (UA) of Content Management Systems (CMS) Phase 1 - WordPress (published in FY21)
    b. Actual deployment: Applications, including websites developed.
        i. UA Readiness of Popular Web Browsers (update in progress)
        ii. Email Acceptance by Websites
        iii. UA-Readiness of Open Source Code Pilot (published in FY21)
2. Email Software and Services
    a. Platforms used to enable and develop applications: Standards, Frameworks, Libraries, and Tools.
        i. EAI Support of Major Email Software and Services (updated in FY21)
    b. Actual deployment: email services and servers deployed.
        i. EAI Readiness of Email Servers (updated in FY21 to review quarterly)

5.1 UA-READINESS OF PROGRAMMING LANGUAGES AND FRAMEWORKS

Programming languages and their specific libraries are used to develop applications. These software applications can provide a host of Internet services. For example, an application can ask for an email address as a username to register a new user, send an email to confirm the request, and then set up the new user using the email address as the user's identity. The software application can be on a variety of operating systems like Linux, Windows, iOS or on mobile platforms like Android. Many applications make use of Internet identifiers which - while historically represented only in characters in American Standard Code for Information Interchange (ASCII) - can now be fully multilingual. These identifiers include:

- Domain names, e.g., example.com or 普遍适用测试.我爱你
- Email addresses, e.g., email@example.com or อีเมลทดสอบ@ยูเอทดสอบ.ไทย

It is important that all stakeholders involved in the development of a software application are aware of the available libraries for their chosen development environment that can be used for processing Internet identifiers and how to use them to support UA. Additionally, it's important to have a clear basis to assess those libraries for technical and business suitability with regard to UA-readiness and compliance.

The UASG conducted a study on Reviewing Programming Languages and Frameworks for Compliance with Universal Acceptance Good Practice in 2019. This study documented the test cases for evaluating UA support of programming languages and frameworks based on the requirements from different protocols, including those for IDNA2008 and EAI. This work was used to test widely used programming languages and platforms in 2020, and the findings were published in UASG018A: Universal Acceptance Compliance of Some

Programming Language Libraries and Frameworks. The report tested three kinds of libraries for:

1. Unicode strings
2. Domain names, including IDNs
3. Email, to test for EAI

These findings are summarized in Table 1 below, with further details in the report and the test results. Red signifies not being UA-ready; pink signifies being UA-ready but some details need to be managed; and green signifies being UA-ready. The results show that programming languages Java, JavaScript, and Python3 have support for processing IDNs and EAI. Some additional platforms support IDNs but EAI is not supported by the remaining libraries.

Table 1: Level of UA Support by Programming Language Libraries

Language	Library Name	Type of Test
C	libcurl	Email Syntax
C	libidn2	ASCII to/from Unicode
C#	mailkit	Email Syntax
C#	microsoft	ASCII to/from Unicode
Go	idna	ASCII to/from Unicode
Go	mail	Email Syntax
Go	smtp	Email Syntax
Java	commons-validator	Email Syntax, Domain Name Syntax
Java	guava	Domain Name Syntax
Java	icu	ASCII to/from Unicode
Java	jakartamail	Email Syntax
Java	jre	ASCII to/from Unicode
JavaScript	idna-uts46	ASCII to/from Unicode
JavaScript	nodemailer	Email Syntax
JavaScript	validator	Email Syntax, Domain Name Syntax
Python3	django_auth	Email Syntax, Unicode ID

Python3	**email_validator**	**Email Syntax**
Python3	**encodings_idna**	**ASCII to/from Unicode**
Python3	**idna**	**ASCII to/from Unicode**
Python3	**smtplib**	**Email Syntax**
Rust	**idna**	**ASCII to/from Unicode**
Rust	**lettre**	**Email Syntax**

5.2 UA-READINESS OF NETWORKING COMMAND LINE TOOLS

Modern operating systems have a variety of command line tools used in system management and program development. Many of these tools operate on domain names, while a few do on email addresses. The study UASG024: UA Readiness of Command Line Networking Tools was conducted in 2019 and looked at these tools to see how well they support UA.

The tools generally accept domain names as arguments from the command line and then use them in the tools' operation, which includes looking them up in the DNS. They all return some sort of report to the console, sometimes including the domain name and sometimes not. The report says that a tool can accept and validate a name if it receives a name from the command line and correctly recognizes it as an ASCII or IDN domain name. It can process the name if it does something useful with it, typically a DNS lookup. Some tools put domain names in their output, so if they do so correctly, they can display names.

The UA-related support for the tools reviewed is summarized in Table 2 below. See the report for further details. **Yes** means that the command at least accepts, validates, and processes. **Yes(D)** means it also displays domain names and shows IDNs as U-labels. **Yes*** means that the command accepts IDNs but processes them with IDNA2003 rather than IDNA2008. An empty box means that the system is not distributed with that tool. **No** means IDNs as U-labels are not supported. An empty box means that the system is not distributed with that tool.

Table 2: Level of UA Support by Some Networking Tools

Tool	MacOS 10.14 (BSD/Mach)	FreeBSD 12 (BSD)	Ubuntu 18 (linux)	Centos 7 (linux)	Windows 10
host	**No**	**No**	**No**	**Yes*(D)**	
ping	**Yes***	**No**	**Yes*(D)**	**Yes*(D)**	**Yes**
ping6	**Yes***	**No**	**Yes*(D)**	**Yes(D)**	
traceroute	**Yes***	**No**	**Yes*(D)**	**Yes(D)**	
traceroute6	**Yes***	**No**	**Yes*(D)**	**Yes(D)**	
dig	**No**		**No**	**Yes*(D)**	

nslookup	No		No	Yes*(D)	No
telnet	Yes*	No	No		
openssl	Yes*	No	Yes*	No	
gnutls-cli		Yes	Yes		
tracert					Yes

5.3 UA-READINESS OF CONTENT MANAGEMENT SYSTEMS

Content Management Systems (CMS) allow for quick development, deployment and maintenance of websites, and are popular tools to develop websites globally. There are many Content Management Systems available, both open source and proprietary. Examples include WordPress, Joomla, Drupal, and many more. The UASG recently conducted a pilot study with the intention to carry out UA-readiness testing in CMS, specifically WordPress and its associated plugins, for IDNs, path Internationalized Resource Identifiers (IRIs), and EAI. The results are documented with additional details in UASG032: UA of Content Management Systems (CMS) Phase 1 - WordPress published in 2021.

Table 3 summarizes UA support in the WordPress core system and the plugins tested. A-level means that all tests passed; B-level means end-to-end works but some tests fail; and C-level means that end-to-end testing did not pass, although some individual tests may have passed. The results indicate reasonable (though not complete) support for IDNs and IRIs, but no support for EAI.

Table 3: Level of UA Support by WordPress and Some Plugins

	Plugin Name	IDN UA Readiness	Path IRI UA Readiness	EAI UA Readiness
CMS	WordPress Instance	B-Level	A-Level	C-Level
Extensions for Subscription Management	MailChimp	C-Level	B-Level	C-Level
	Mailster	C-Level	C-Level	C-Level
	OptinMonster	B-Level	B-Level	C-Level
	Newsletter	B-Level	A-Level	C-Level
	Sumo List Builder	C-Level	C-Level	C-Level
Extensions for Membership Management	MemberPress	B-Level	A-Level	C-Level
	WooCommerce	B-Level	A-Level	C-Level
	Restrict Content Pro	B-Level	A-Level	C-Level
	Paid Memberships Pro	B-Level	A-Level	C-Level

	S2Member	C-Level	C-Level	C-Level
Extensions for Event Management	Events Manager	B-Level	A-Level	C-Level
	WP Event Manager	C-Level	C-Level	C-Level
	Event Organizer	B-Level	A-Level	C-Level
	All - in - One Event Calendar	B-Level	B-Level	C-Level
	Event Espresso 4 Decaf	B-Level	C-Level	C-Level

5.4 UA-READINESS OF POPULAR WEB BROWSERS

In 2017, a study was conducted to review the support of UA in browsers and its results were published in UASG016: UA of Popular Browsers. A variety of browsers were tested on both desktop and mobile platforms using the set of domain names and email addresses. The results are summarized below. This study is currently being performed again to see how UA-readiness support has changed since 2017.

After performing individual tests of 17 URLs in eight browsers on six different operating systems (four desktop, two mobile), only Internet Explorer on desktop performed completely as expected, meaning the expected webpage loaded and was displayed properly. Most browsers running on a desktop platform (Windows 10, macOS 10.12, Ubuntu 17.04) performed very well, Vivaldi being the exception of those tested. Of the others, Chrome, Opera, Safari, and Edge failed to correctly render URLs mixing right-to-left scripts with ASCII in the tab title bar. Neither Firefox nor Safari handle the open dot " 。 " as a label delimiter, which is recommended by the UASG. This leads to search results being displayed instead of the browser loading the expected webpage.

The results were more varied on the two mobile platforms tested (iOS 10.3 and Android 7.0). Firefox and Opera had poor results because the location bar displayed URLs in Punycode instead of in Unicode in almost all cases. There were no obvious settings in either browser to change this behavior. It is also noted that in several test cases, sites are secured with HTTPS, but the certificate name is displayed only in Punycode. While the certificate is associated with the Punycode domain name, users should reasonably expect to see the name in its expected script.

In summary, the community did notice all browsers – except for Internet Explorer on desktop – showed certain issues resolving searches and displaying results properly. The findings indicate that while browser developers are making progress toward becoming UA-ready, there is still more work to be done. This study is being performed again to see how the results have improved since 2017 and has been expanded to include local web browsers in different countries and regions.

5.5 EMAIL ACCEPTANCE BY WEBSITES

In 2017 and 2019, the UASG conducted studies to check how many of the top 1,000 websites globally could accept email addresses based on a variety of top-level domains (TLDs), including new, long, and IDN TLDs. The study also evaluated EAI with non-ASCII mailbox names represented in Unicode. The results showed that there is much work to be

done before the websites are UA-ready. In 2020, the study was repeated with a slightly different design for choosing the 1,000 websites but with the same testing strategy.

The 2020 testing, UASG027: Country-Based Evaluation of Websites for Accepting Email Addresses, did analysis of 50 popular websites in 20 different countries and provided the overall acceptance rates of different types of email addresses. It should be noted that this testing was limited to whether a website accepts a particular email address – it does not cover whether the website can store the email address or respond to it. The countries included in the current phase of the study are Argentina, Bahrain, Benin, Brazil, China, Egypt, Germany, Ghana, India, Israel, Japan, Kenya, Korea, Kuwait, Mexico, Nigeria, Russia, Sweden, Thailand, and Turkey.

Figure 6 compares the 2020 results to the earlier 2017 and 2019 testing results, noting that different email addresses were tested (but they were of the same category), and the websites tested in 2020 were different than previous ones as they were the 50 most popular ones in the 20 countries rather than the 1,000 most popular globally. However, these results may still be used to compare overall trends.

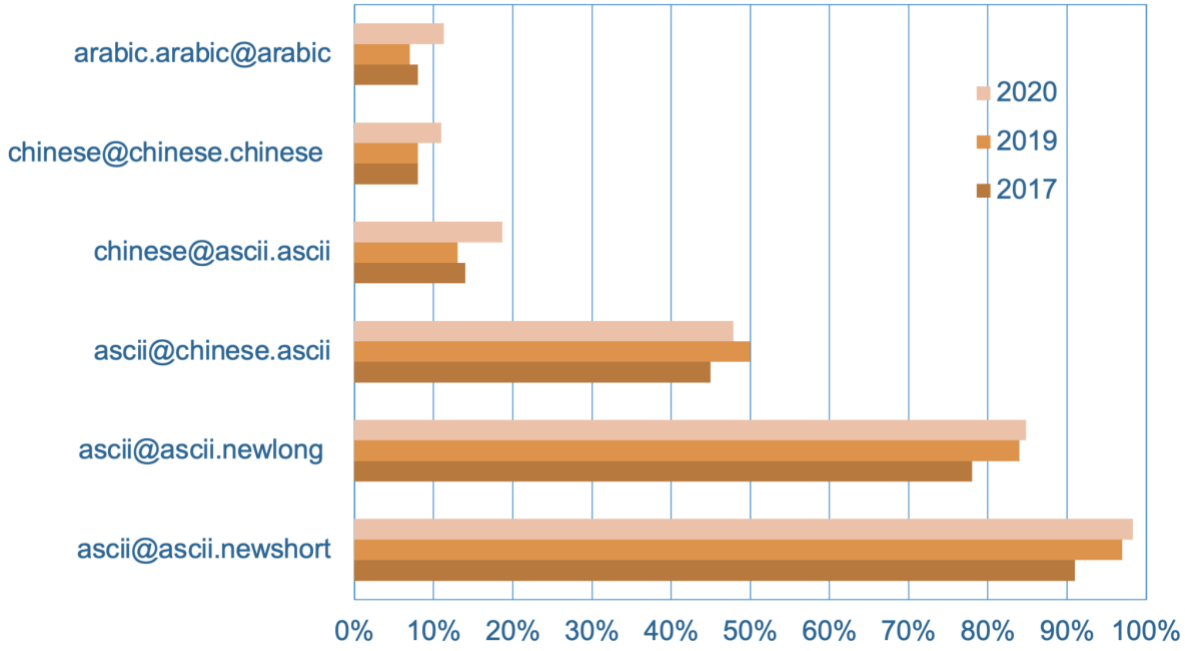


Figure 6: Email Acceptance by Popular 1000 Websites Globally

Specific country-based detailed results are available in the report. The report also looked at data in different categories across the countries, e.g., media, government, e-commerce, academia, etc. See the report for further details.

5.6 UA-READINESS OF OPEN SOURCE SYSTEMS

A survey of 10,000 popular open source projects in GitHub shows that most of the applications in Java use outdated methods and libraries for domain names and email addresses. However, the applications in Python use libraries that provide UA support as indicated in Figure 7. Many Java-based applications use regular applications (regex) which are generally not UA-compliant and should be checked carefully before using for validating domain names or email addresses. It should be noted that the projects were not compiled and tested individually so it cannot be deduced if they are UA-compliant, though using a UA-

compliant library is a step in that direction. A study with this data has been published as UASG033: UA Readiness of Open Source Code.

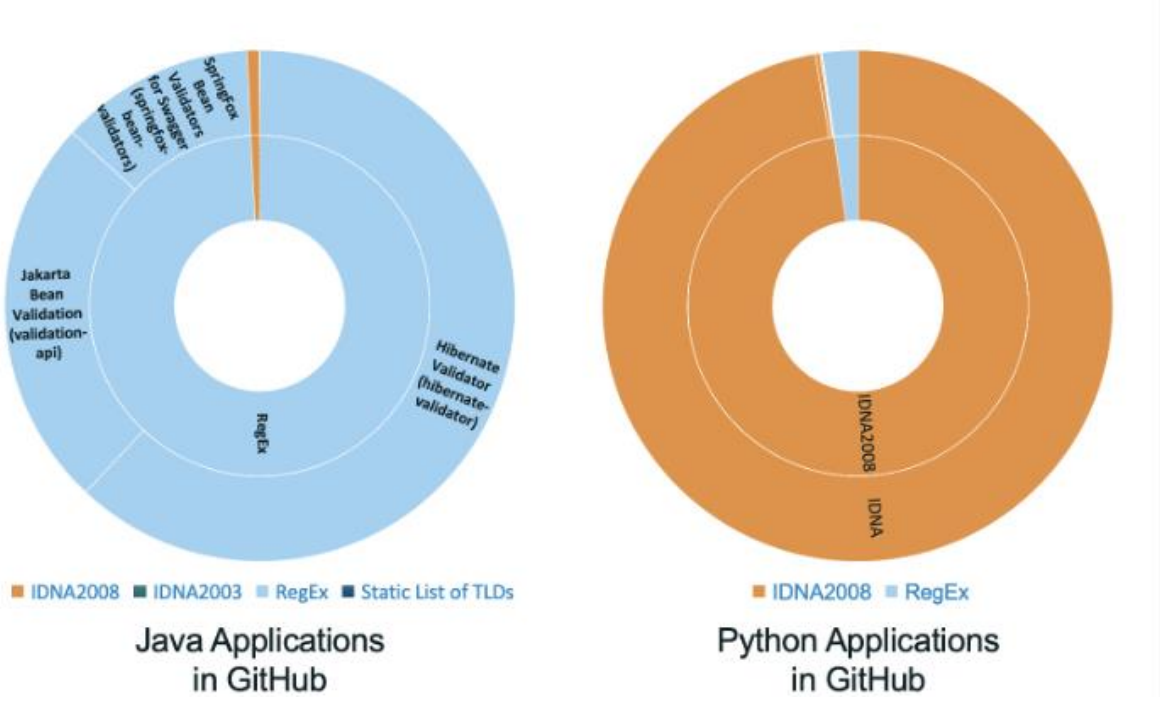


Figure 7: Usage of UA-Relevant Libraries in Open Source Software

Table 4 lists the UA-relevant libraries in popular use by the open source projects surveyed in the study, along with their occurrence and their UA-compliance status based on results in the UASG018 report or their own documentation available online. Focusing remediation efforts on non-UA-compliant libraries which are more frequently used can create greater impact on UA-readiness.

Table 4: Occurrence of UA-Relevant Libraries in Open Source Projects Surveyed

Language	Library	Occurrence in Projects	Status (Source)
Java	hibernate-validator	62963	IDNA2003 implied, RegEx via annotations; Hibernate implementation of validation-api. (Documentation)
Java	validation-api	25190	IDNA2003 implied, RegEx via annotations. (Documentation)
Java	Springfox-bean-validators	12501	IDNA2003 implied, RegEx via annotations; SpringFox implementation of validation-api. (Documentation)
Java	commons-validator	4906	Relies on a static list of TLDs from 2017. (UASG018A)
Java	icu4j	886	IDNA2008. (UASG018A)

Java	libidn	29	IDNA2003, deprecated and ported to the Java language as “java.net.IDN”. (Documentation)
Python	idna module	70789	IDNA2008. (UASG018A)
Python	email_validator	1178	IDNA2008. (UASG018A)
Python	validators	1660	Email validation based on Django validator, Not compliant; URL validation based on regex-weburl.js, which is a RegEx. (Code analysis)
Python	PyICU	243	IDNA2008. (Documentation)
Python	idna_ssl	10	IDNA2008. (Documentation)

5.7 EAI SUPPORT OF MAJOR EMAIL SOFTWARE AND SERVICES

Because email constitutes a significant part of online communications, it is important that email software and email service providers meet UA requirements. EAI is the protocol that allows email addresses to use Unicode-based mailbox names (in UTF-8) format before the “@” sign and IDNs or ASCII domain names after the “@” sign. A series of studies have been conducted to evaluate the existing EAI capabilities of the email ecosystem, which have been published cumulatively in the most recent report in this series in 2021: UASG030A: EAI Software Test Results.

The summary of EAI support in email tools from the report is presented in Table 5. Blank cells in the table indicate a component that does not exist. A tool or service is considered to have Level 1 (L1) support if it can send to or receive from an internationalized email address but cannot create an internationalized email address. Level 2 (L2) is assigned if the tool or service can also create an internationalized email address in addition to sending and receiving emails from such addresses.

Table 5: EAI Support by Various Email Tools and Services

Name	MUA	MSA	MTA	MDA	MSP	Webmail
Coremail	Few	All L2	Most L2	Few	All L2	Most L2
MS Outlook.com	Most L1	Most L1	Most L1	None	None	Most L1
Yandex Mail	Few	None	None	Few	Part L1	Few
Roundcube	Most L2					
Apple Mail	Few					
Apple iOS Mail 14.x	Most L2					
Mozilla Thunderbird	Few					
MS Outlook	Most L1					

MS Exchange Server (hosted)		All L1	All L1	Few		
Exim		Most L2	All L2			
Postfix		All L2	All L2			
Courier		All L2	All L2	All L2		
Gmail	All L1	All L1	All L1	Few		
XgenPlus		Most L2	Most L2	Most	All L2	Most L2
Sendmail 8.17 Alpha		Most L2	Most L2			
Halon		Most L2	Most L2			
Thunderbird 89 beta	Most L1					
Dovecot				None*		

*Dovecot is a unique case as it does not support the EAI standard but can still provide L1 support due to its ability to handle different legacy character sets allowing it to support Unicode UTF-8 format.

The study shows that there is now good L1 support for EAI in many tools, while some tools are also providing L2 compliance.

This study also did a pilot investigation into EAI support by a few arbitrarily selected spam filters, especially those that advertise EAI support. The aim was to develop test cases and do initial testing to finalize them. The results of the pilot testing are promising as two of the three systems tested provide good EAI support, as shown in Table 6.

Table 6: EAI Support by Various Spam Filters

Name	Spam
Spamassassin 3.4.5	All L2
Mailchannels	Part L1
Spamjadoo (Xgenplus)	All L2

5.8 EAI-READINESS OF EMAIL SERVERS

The use of internationalized email addresses has been slowly growing. To determine how widely such email addresses are accepted, a survey of email servers across domains registered in hundreds of TLDs was conducted in early 2019, with results published in a report on EAI-Readiness in TLDs. It tested mail servers under a TLD that was responding with EAI support flag SMTPUTF8 on a request to connect; further EAI support beyond it was not tested. Details of the methodology are presented in the report. Overall, 9.7% of the domains sampled may be EAI-ready. In the largest TLDs (over a million names), 10.5% of the domains sampled indicated EAI support. Microsoft's Outlook.com recently became EAI-ready; before that the numbers would have been 7.41% and 7.93%. Interestingly, IDN TLDs

were significantly less ready than non-IDN (4.7% rather than 9.8%), but most IDN TLDs are small and none of the ones sampled have many active mail servers.

The study has been repeated recently with much broader coverage and with a two-step review process: first, how many mail servers respond with SMTPUTF8 flag on EHLO request; and second, how many of these can accept a MAIL FROM request with an internationalized email address (with domain name part in either A-label or U-label format). A total of 1,177 TLD zones were surveyed covering 208,511,439 second level domains. A total of 34,554,390 MX server records were found with 2,550,184 unique IP addresses. Figure 8 shows the aggregate results which show a total of 6.8% mail servers respond with SMTPUTF8 flag (IP passed EHLO + IP passed A-Label + IP passed U-label tests), of which 6.3% accept an internationalized email address with UTF-8 mailbox name (IP passed A-Label + IP passed U-label tests) but domain name in A-label format, and of these, only 1.45% accept the complete email address in Unicode format (IP passed U-label tests).

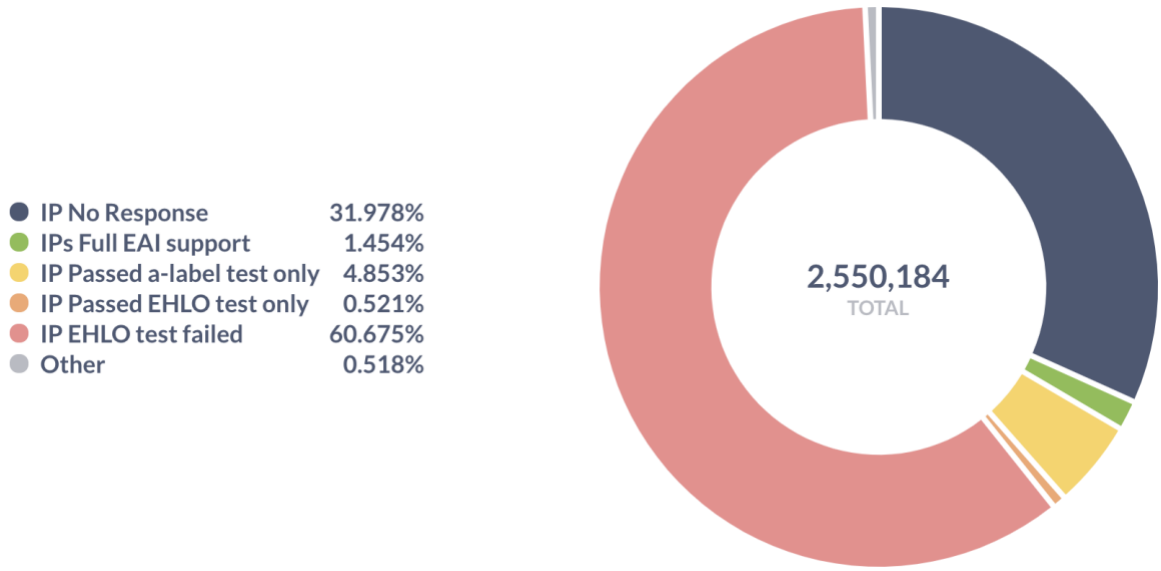


Figure 8: Aggregate Results of Mail Servers Supporting Internationalized Email Addresses

The study also looked at how these mail servers are distributed geographically. Figure 9 below summarizes the data.

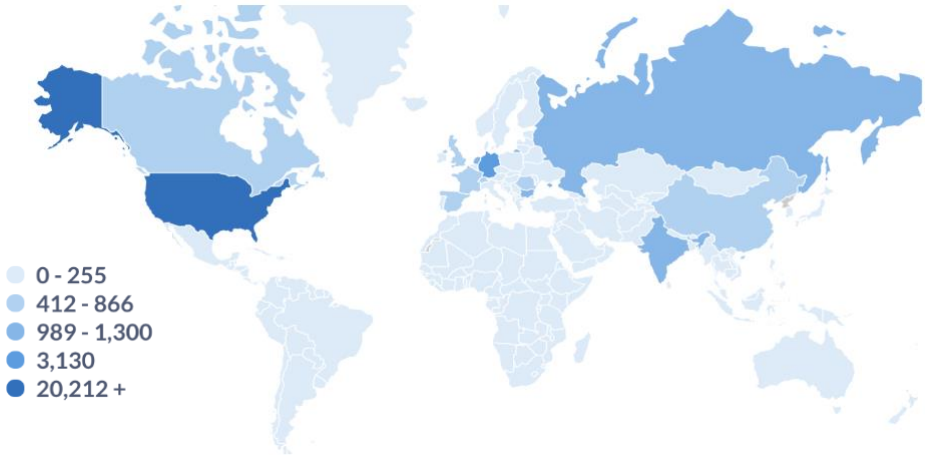


Figure 9: EAI-Ready Mail Servers Across Geography

The figure 6.3% is lower than the 9.7% calculated earlier. The difference may be attributed to the much more comprehensive study done in 2021 compared to the sampling of IP addresses done earlier, as well as the different methodology used to aggregate the IP and MX server counts.

Table 7 presents the actual numbers for the top 15 geographies (using ISO 3166 codes) with mail servers supporting EAI.

Table 7: EAI-Ready Mail Servers Across Geography

Country Code	IP total	IP EHLO success	IP A-label success	IP U-label success	IP A-label support percentage
US	963139	51396	47214	20212	4.9
DE	294141	35729	33559	3130	11.4
BG	10903	1917	1888	1300	17.3
NL	105667	8022	7444	1272	7.0
IN	26967	2581	2387	1229	8.9
SG	38783	3050	2982	1127	7.7
RU	49523	3602	3248	989	6.6
CN	48310	2679	2590	866	5.4
FR	147812	16474	15653	816	10.6
GB	106491	6463	5924	765	5.6
CH	13124	1813	1649	683	12.6
CA	76644	4566	4177	571	5.4
ES	51938	2639	2538	423	4.9
RO	20659	1155	815	412	3.9
FI	14602	2609	2502	255	17.1

6. GUIDANCE, TRAINING, AND REMEDIATION FOR UA

The UASG working groups have been developing guidelines and training materials to address UA. Although the focus has still been on gap analysis for FY21, some remediation work is now underway to fix the technical issues in the software tools and applications. The remediation efforts will become more significant moving forward as the gap analysis indicates what needs to be fixed. This section provides an overview of these activities by the UASG.

6.1 UA-READINESS FRAMEWORK

The UA of all domain names and email addresses requires that all software is able to accept, validate, process, store, and display them correctly. The Universal Acceptance Readiness Framework provides guidance on how to implement UA-readiness and test it using a gating approach to verify UA conformance of an application (shown in Figure 4). More details on this are discussed earlier in this report.

6.2 NAMING INTERNATIONALIZED EMAIL MAILBOXES

Mailbox names – the part of the email address before the "@" symbol – are important as to how useful, user-friendly, and secure an email system will be. Therefore, it's important that email administrators adopt good policies for naming mailboxes. Historically, email addresses have been limited to ASCII letters and digits but now email technology has evolved to allow both mailbox names and domain names to be written in multiple languages and scripts. This flexibility makes policy choices more complex. The UASG has investigated and published guidelines for implementing mailbox names in its report on Considerations for Naming Internationalized Email Mailboxes. This report aims to guide email administrators in adapting mailbox name policy to cover email addresses outside of Latin-script letters and digits.

Ultimately, the business purpose of email systems, along with the language needs of users and their correspondents, will decide policy choices and determine what scripts (writing systems for languages) will be allowed in mailbox names and their length. Since some spellings, character combinations, signs, or symbols are confusing or deceptive, the policy used by administrators should forbid them (details depend on the language used for the mailbox name). Technical issues about how names that look the same to users but might actually consist of different characters require special attention. Right-to-left (RTL) scripts have unique possibilities for confusing name spellings, so if your system allows these scripts there are additional policy topics that should be addressed.

Users may exchange emails with people who experience difficulty reading the particular script used in an email address. To reduce these difficulties, implementing a policy that allows users to choose display names (the personal name displayed) and use aliases (alternate addresses for the same user) is recommended. This document also includes resources and references that provide more detail on several of these policy topics. It also includes a glossary of terms, some of which may be new to administrators when adopting multiple scripts and languages for mailbox names.

6.3 ROLE OF CCTLDS IN ACHIEVING UA-READINESS

The Asia Pacific Top Level Domain Association (APTLD) partnered with the Internet Corporation for Assigned Names and Numbers (ICANN) and conducted a UA training program for members of the Asia Pacific (APAC) community. As part of the series of webinars, the final one convened a panel of country code top-level domain (ccTLD) managers to discuss the role of ccTLDs in achieving UA-readiness.

The panel discussion presented a general consensus about the significant role ccTLD managers need to play in supporting and promoting UA. First and foremost, ccTLD managers should make their own systems UA-ready, especially in local languages. In addition, ccTLD managers should play an active role in promoting UA in their communities by working with a broad range of stakeholders, planning outreach, and conducting technical training activities for stakeholders. There are many national, regional, and global efforts already underway to promote UA adoption resulting in readily available resources and best practices for both ccTLDs and other stakeholders. Working to achieve UA is an evolving process so ccTLD managers should stay up to date on the latest UA resources and initiatives as they work to make UA-readiness a reality in their local communities.

The panel's recommendations have been compiled into a White Paper on The Role of ccTLDs in Achieving Universal Acceptance. The white paper can help other ccTLDs managers achieve UA-readiness as well.

Figure 10: White Paper on UA Published by APTLD

6.4 CASE STUDIES ON UA ADOPTION

The UASG works to publish case studies that document how an organization becomes UA and EAI-ready in order to provide motivation and guidance for others. Recently, two organizations – Coremail and the Thai Network Information Center Foundation (THNIC) – embarked on their own EAI-ready journeys. Coremail provided the first Chinese domain name registration platform at http://互.联网.中国. To promote localization in domain names, THNIC provides a free .ไทย domain for each .th domain registration and offers free email service via a dedicated webmail client ณ.คน.ไทย. By updating their systems to support domain names and email addresses in localized languages, they reduced technical debt and have ensured their systems keep pace with the evolving domain name landscape. Most importantly, these organizations can better serve the needs of their local communities by enabling users to communicate with others in their region/worldwide while using a unique online identity of choice.

While Coremail and THNIC's EAI journeys were unique, there were common key learnings which were captured in a 2021 case study: Supporting a Culturally and Linguistically Diverse Internet Through Email Address Internationalization (EAI).

ICANN org has also been assessing and updating its systems since 2017 to ensure all its systems become UA-ready. A case study was published in 2020 on ICANN's journey to UA-readiness, which is divided into three stages:

- Stage 1: Support both new short and long ASCII TLDs – completed.
- Stage 2: Support Internationalized Domain Names (IDNs) – in progress.
- Stage 3: Support non-ASCII email addresses – in progress.

ICANN org has completed the first stage and is set to complete Stage 2 in 2021. Work has already started to achieve Stage 3 goals by working with other relevant organizations to make their own email systems support EAI.

6.5 UA TRAINING MATERIALS

The UASG has developed technical training materials for relevant UA stakeholders. Three distinct training modules are now available at the UASG's training wiki page. The first training provides an overall technical overview of UA and how to support it for technology managers. The second training aims to provide technical details on how to configure email servers for supporting and deploying email addresses in local languages and scripts (i.e., EAI) for email and system administrators. The third training covers the technical details on how to program websites and applications with UA support aimed at software developers. The training is currently using examples from Java programming language, and is being enhanced to cover Python programming language. These training materials are summarized in Table 8. See the "Outreach" section below for details on conducting UA trainings.

Table 8: Summary of UA Training Materials

Training	Audience	Description	Duration
UA Technical Overview	- CIOs - IT managers - System administrators - Software developers - Email administrators	An overview about UA and EAI readiness issues	1.5 hours
Configuring Email Address Internationalization (EAI)	- Email administrators - System administrators - IT managers	Technical configuration and setup of EAI supported email service	3 hours
UA for Java developers	- Software developers - IT managers	Develop current best practices for UA compliant Java applications	3 hours

6.5.1 UA COURSE ON ICANN LEARN

An Introduction to Universal Acceptance (UA) course was developed for the ICANN Learn platform in FY21 and launched in August 2021. The course is intended for a wide audience including the general Internet community, technology enablers and developers, email

service providers, governments, and policymakers. By completing this course, participants will develop a basic understanding of UA and its technical challenges, the current state of UA-readiness globally, and the economic and social benefits of being UA-ready. The course will also serve as a great resource for people who want to get involved in regional and global efforts to address UA, and for those who want to make their own systems UA-ready.

6.6 UA REMEDIATION EFFORTS

UA gap analysis of existing technology and applications deployed has identified areas that need to be remediated. As reasons for issues become more evident, the UASG's focus has started shifting towards fixing them. These remediation efforts need to be targeted at both the tool providers and the application developers.

As part of the outreach to tool providers to fix or update their technology, the UASG has published Frequently Asked Questions (FAQs): UA Readiness of Programming Languages and Email Tools. This document provides answers to FAQs regarding UA support in programming languages and frameworks, as well as support for EAI in email tools and services. The document is intended for those who maintain programming languages, their libraries and frameworks, and those who provide and maintain email tools. This document aims to help fix bugs and enable support to allow software to become UA-ready and promote usability and access to a global audience. Based on the testing, active outreach to the tools providers has also started.

Bugs are generally reported through bug reporting systems online. Many mail software tested do not have ticketing systems to report bugs, so in such cases their developers were contacted. Minor bugs were found while testing the sendmail MTA and MSA and Mailchannels mail filter. Those bugs were reported to the developers by email and in each case they responded and fixed the bugs promptly.

Postfix and Exim MTAs, which failed a few of the tests, were also contacted. In those cases, the authors disagreed with the interpretation of the standards and did not change their software (the issues are minor and do not affect EAI compatibility for the vast majority of users.) A small error in the "Received" header added by Courier was also communicated which the developer has fixed. While developing the Python test scripts, one bug and one limitation were found that were fixed locally. The bugs were then reported and patches were provided.

- In the smtplib module that handles SMTP and submission, authentication usernames and passwords were limited to ASCII rather than UTF-8 even if EAI features were enabled: https://bugs.python.org/issue44269.
- When testing XgenPlus, it was found that it sends an extra blank line in some responses that made the python imap library crash, so we patched the library to disregard the blank line: https://bugs.python.org/issue44408.

ICANN Global Support provides support to the UA Program by receiving and triaging cases based on issues submitted through the UASG's UA reporting center, and reaching out to service providers. Whenever reports indicate that a digital service does not support UA, ICANN Global Support attempts to contact their customer support or other teams that support those services. The two key activities are to inform and educate. Some of the organizations are not aware of UA and therefore the team provides relevant information and resources to explain the scope of UA issues and recommended solutions. Here is a summary of all UA-related cases received from 1 July 2020 through 30 June 2021.

- 251 Total UA Cases
    - 45% (112 cases) were from ICANN's contracted parties (registries and registrars).
        - 105 cases were sent by Radix FZC. Radix consistently sends in emails regarding UA findings and ICANN reaches out to the domain owner to make them aware of the UA issue.
        - 7 cases were sent by other contracted parties because their gTLD emails were unacceptable with the reported domain.
    - 55% (139 cases) of cases were from the community and registrants.

The 251 UA cases that were created within the system resulted in 115 (46%) outreach cases. The Global Support team reached out to the various domain name holders in these cases to make them aware of the concerns that were reported.

7. OUTREACH FOR PROMOTING UA

Outreach to promote UA is done through multiple channels with the major ones including:

- UA Ambassador Program
- UA Local Initiatives
- UASG website and social media channels
- UA-related reports and publications
- UA awareness and capacity building events

Due to the COVID-19 pandemic, there have been few in-person events organized. However, the UASG community has remained active online to promote UA-readiness. The outreach conducted during FY21 is summarized in this section.

7.1 UA AMBASSADOR PROGRAM

The UASG has identified several ways to promote UA and EAI issues and solutions, one of which is through the UA Ambassador Program. The UASG Ambassador Program was created in 2018 to recruit industry leaders and UA experts who are committed to raising awareness around UA and EAI within their respective spheres. Designated UA Ambassadors are empowered to raise awareness of UA and EAI issues to target stakeholders. There are currently 11 UA Ambassadors located in Benin, China, Egypt, India, Nigeria, South Africa, and Turkey. Their details are posted on the uasg.tech website. The COVID-19 pandemic had an impact on how effectively the ambassadors could conduct their outreach, but many were still able to do awareness sessions online during the year. This section shares examples of the outreach and training done by some of the UA Ambassadors.

Abdalmonem Galila from Egypt continued to be an active UA Ambassador. He was a resource person in the Russian Summer School Hackathon for UA organized online in August 2020 with 80 participants. He contributed to Universal Acceptance Project Statement by the Joint AFRALO-AfrICANN Meeting submitted at ICANN69 in October 2020. He has conducted online UA training in Tanzania in December 2020 and Kenya in April 2021. He also participated in an online training on how to make websites UA-ready conducted by ISOC-Hyderbad chapter in India in June 2021.

Abdulkarim Oloyede from Nigeria conducted a UA awareness session during the West Africa Internet Governance Forum (IGF) in July 2020, covering the motivation and basics of UA with 95 online participants. He also organized a technical session titled *Connecting the Unconnected: The Role of Universal Acceptance* in February 2021 with the Nigeria Society of Engineers Ilorin Chapter. The session was attended by more than 200 participants and focused on the role of engineers in achieving UA. Abdulkarim also spoke at an event organized by ICANN's engagement office for Africa with the Nigeria Communication Commission (NCC) in April 2021. The session was well attended by the staff of the NCC. He also organized a two hour engagement with students of University of Ilorin in June 2021. The aim of the session was to introduce students to UA and explain to them the role of students and programmers in achieving UA. The session was attended by 275 students of technology at the University of Ilorin. The session generated a lot of discussion and suggestions to set up a task force for UA in Nigeria.

Harish Chowdhary provided technical inputs in developing the website https://भारतभाषा.भारत/, a project funded by the Government of India and implemented by Internet and Mobile Association of India. He conducted a technical workshop on EAI in November 2020 organized by the UA Local Initiative of India, was a panelist in the UA webinar on Scaling-up of UA & Its Standardization organized during India Internet week December 2020, and also conducted a technical workshop on EAI during India Internet week. Harish also provided input to the India Internet Governance Forum secretariat to enable IDNs corresponding to the languages of the website (https://indiaigf.in/), which are being considered by the secretariat. Harish has also been providing Indian government officials with the documents published by UASG for the information, implementation, and dissemination to relevant stakeholders.

Malick Alassane from Benin contributed to the UASG video talking about "What does UA mean to you?" He discussed UA with students and professors as part of an Internet governance session at the University of Abomey Calavi in March 2021, and organized a webinar on UA and EAI in French-speaking Africa on 28 May 2021 with more than 50 developers and system administrators as participants. Within the local community, he assisted organizations to update their email systems by supporting the SMTPUTF8 flag. He also published multiple articles on UA for local audiences.

Sushanta Sinha from India got involved with India's UA Local Initiative and participated in their community calls, including a technical session in July 2020. He also engaged with the Computer Society of India, a large community of computer experts from the industry and academia, on UA. He conducted an online session with 50 participants on IDNs and EAI with a focus on the future of the Internet on 13 September 2020. During the India Internet Week 2020, he co-organized and presented in a workshop on 29 December 2020, and a roundtable on 30 December 2020 focused on UA. Sushanta is actively promoting content in local languages of India and engaging the local government to enable their own portals to support UA. He is currently working with academia to enhance spam filtering algorithms for IDN and EAI support and detecting whether their own websites are UA-compliant, while following UASG working group meetings. He is working with India Internet Foundation (IIFON) on a pilot project for an end-to-end solution, starting by creating a new website with IDNs and enabling it for IDN and EAI support.

7.2 UA LOCAL INITIATIVES

The UA Local Initiatives work in close consultation with UASG leadership and working groups, and with the support and collaboration of ICANN org. The purpose of these initiatives is to plan and undertake outreach to and collaborate with the local stakeholders identified by the UASG in their region to promote UA-readiness. The initiatives also engage with local stakeholders to encourage them to become UA-ready.

The UA Local Initiatives program started in 2019 in two regions, later expanding to four in FY20. These include initiatives in China, Commonwealth of Independent States and Eastern Europe (CIS-EE), India, and Thailand.

7.2.1 CHINA UA LOCAL INITIATIVE

The Chinese Domain Names Initiative (CDNI) of the Internet Society of China (ISC) was established on 9 January 2020. With the leadership of CDNI and the support of ICANN, the UASG, and three UA Ambassadors, a series of outreach and engagement sessions with stakeholders were carried out to actively promote UA-readiness.

Significant progress was achieved in the last year. In terms of email service providers, the top two personal email brands, QQ Mail and 163 Mail, had already put EAI into their working plans and will move forward to become EAI-ready. As for search engines and browsers, Baidu and 360 search, as well as browser brands Sogou, QQ, and UC, continue to enlarge the number and recognition of Chinese domain names. Various government departments have also gradually begun to pay more attention to the importance of UA.

The CDNI made outreach visits to Tencent and Netease on 16-17 September 2020. The China Local Initiative team members flew to Guangzhou, China where the email technical groups of Tencent and Netease are based. Tencent and Netease are the leading personal email brands and market shares in China. CDNI also conducted outreach and engagement sessions with stakeholders including browsers and search engines.

Outreach to NetEase

Outreach to Tencent

Figure 11: China UA Local Initiative Outreach to Technology Providers

On 16 October 2020, the CDNI organized an online training course for UA. During the training, Mr. Walter Wu presented on the background of domain names and history of Chinese domain names, the importance of developing the universal application of IDNs, and explained the application and use of Chinese domain names from identification and marketing perspectives. In November 2020, Mr. Wu Xiucheng, Vice Chairman of the CDNI,

made a UA presentation at South China University of Technology which was attended by 180 students. He spoke about ICANN and the significance of implementing UA, the current development of global UA, and the challenges and opportunities that China face in promoting UA.

The CDNI held a three-day workshop in December 2020 to discuss the working plan of UA realization for 2021. Representatives from website administrators, Internet Service Providers, Registries and Registrars, Government Sectors attended the workshops to discuss how to promote better development of UA.

The Fourth Chinese Domain Name Innovation and Application Forum was held on 20 April 2021. The forum is guided by the ISC, and co-organized by CNNIC, CONAC, CNIC, and Knet. During the forum, CDNI released *The Test Report on Browsers Supporting Chinese Domain Names*. The report follows the UASG's evaluation standards and metrics to conduct sampling evaluations on browsers. As a next step, the CDNI will conduct random tests on more application scenarios of Chinese domain names, such as search engines, mailboxes, input methods, and social network tools.

Figure 12: The Fourth Chinese Domain Name Innovation and Application Forum

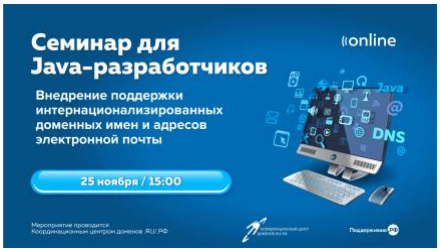
7.2.2 CIS-EE UA LOCAL INITIATIVE

The Commonwealth of Independent States (CIS) and Eastern Europe (EE) UA Local Initiative was set up in 2019 and gathers local experts from seven countries: Armenia, Belarus, Georgia, Latvia, Russia, Serbia, and Ukraine. The members of the CIS-EE UA Local Initiative are mostly representatives of IDN ccTLD and new gTLD registries, registrars, and local IT companies from the region. In 2020, the Russian chapter of the UA Local Initiative, Russian Working Group on Universal Acceptance, has also started to work on EAI/IDN implementation in Russia and support for Cyrillic script on the Internet. The CIS-EE UA Local Initiative activities during FY21 were focused on three main areas: technical collaboration and support, general outreach and UA awareness raising, and public sector engagement.

To reach and train regional technical stakeholders, the following UA events and activities were organized by CIS-EE UA Local Initiative members:

- July 2020: the *UA Overview Webinar* for local hosting providers and registrars was held by the Internet Society NGO – the registry of the Armenian IDN ccTLD .հայ (Yerevan, Armenia).

- 10 August 2020: the *Universal Acceptance Readiness Hackathon* was held in a hybrid format for 80 students and scholars learning cybersecurity and software development. It was organized by the Coordination Center for TLD .RU/.РФ in collaboration with the Summer School CTF (http://letoctf.org/) and consisted of a UA introductory webinar and 15-hour competition on the development of UA-ready applications and websites. UA Ambassador Abdalmonem Galila was a technical expert supporting the hackathon (Moscow, Russia).
- 25 November 2020: a three-hour online training, *UA for Java Developers*, was held by the Coordination Center for TLD .RU/.РФ for local developers, IT project managers, and CTO in an online format. The training was based on UASG training materials and best practices in the development of UA-ready applications. Recordings were published and provided as public learning materials at https://youtu.be/sncf92vW5J0 (in Russian, 102 views).
- 10 March 2021: a two-hour online workshop, *UA for Python Developers*, was developed and held by the Coordination Center for TLD .RU/.РФ. About 30 regional participants were educated on UA concepts, EAI/IDN support good practices, and how to make UA-ready applications. Recording was published and provided as public learning materials at https://youtu.be/nTOLXTf7qo4 (in Russian, 108 views).
- 27-29 May 2021: the open talk on *UA Readiness Compliance* with Russian hosting providers and registrars was initiated at the 20th *HostObzor* annual conference, co-organized by the Coordination Center for TLD .RU/.РФ. It aimed to discuss the benefits of UA and existing UA-ready solutions for improving IDN/EAI services for end users (Saint-Petersburg, Russia).



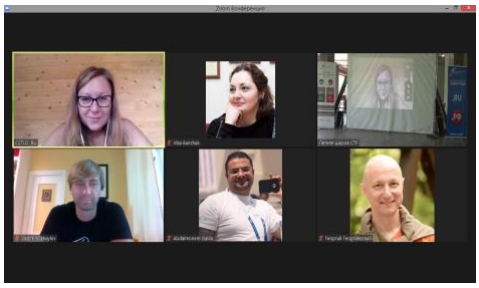


Figure 13: The CIS-EE UA Local Initiative Trainings and UA Hackathon in FY21

To improve the UA knowledge base of local technical audiences and keep them updated, additional materials were made available on the UA-related online resource https://поддерживаю.рф/:

- October 2020: A learning course on UA (in Russian) was launched covering the main aspects of UA concepts, its five criteria, and IDN/EAI support good practices.

- Continued work on the adaptation of UASG documentation and reports for Russian-speaking stakeholders during FY21.
- May 2021: Published an updated list of popular software products and tools, including their UA/EAI/IDN-readiness status, based on testing results and UASG recent reports.

In terms of UA remediation and mitigation efforts, the CIS-EE UA Local Initiative members worked on achieving UA-readiness in software and standards:

- July 2020: Launched the *UA Readiness Self-Certification Program* focused on Cyrillic IDN/EAI support for owners and developers of software products and websites in the region on https://поддерживаю.рф.
- Implementation of *RFC 8398 «Internationalized Email Addresses in X.509 Certificates»* recommendations in *OpenSSL 3.0* (initiated by Dmitry Belyavsky).
- December 2020: *EAI Testbed* was launched by the Coordination Center for TLD .RU/.РФ in collaboration with one of the largest Russian hosting providers REG.RU. A set of EAI addresses in Cyrillic script can be requested by local developers of software products for testing purposes.
- January 2021: Announced guidelines on revision of the most popular regional Content Management Systems *1C:Bitrix and WordPress* to implement support of Cyrillic domain names and email addresses on a website developed, and shared with UASG working groups.
- June 2021: Published *Recommendations for System Administrators* on how to set up mail services supporting EAI in the Cyrillic script on https://поддерживаю.рф.
- Continued work on draft Internet standard *Use of Internationalized Email Addresses in EPP protocol* within the IETF community (co-authors Dmitry Belyavsky and James Gould) since 2020.
- June-July 2021: Published *CommuniGate PRO mail service (*v6.3.6) and *CMS 1C:Bitrix* (v21.300.0) in support of Cyrillic IDN and EAI testing..

Additionally, the CIS-EE UA Local Initiative members provided several studies to evaluate UA, including IDNs and EAI-readiness and their usage, as outlined below:

- 10 September 2020: Published the *Report on Evaluation of Cyrillic IDN and EAI Usage*, based on results of an online survey conducted by the Coordination Center for TLD .RU/.РФ and ROCIT. It asked IT and media experts, businesses, and end users in Russia on how they use Cyrillic domain names and emails on a regular basis (724 responses received in Russian).
- 5 February 2021: Published the *Report on Evaluation of IDN Survey 2020 Results* following the annual IDN Survey 2020 on support for IDN and EAI conducted among members of regional ccTLD organizations such as CENTR, APTLD, LACTLD and AFTLD in 2020 (in English). The IDN Survey 2020 was organized by CENTR, EURid and the Coordination Center for TLD .RU/.РФ and is a part of the IDN World Report, a joint global study by UNESCO, EURid and Coordination Center for TLD .RU/.РФ on IDN growth (https://idnworldreport.eu).
- 12 February 2021: Published the *Cyrillic EAI Support on Social Online Resources Study* aimed at evaluating EAI acceptance of a determined list of websites

considered for providing free Internet access to end users in Russia. The study was conducted by the Coordination Center for TLD .RU/.РФ (in Russian).

- August-September 2020: a series of educational articles on IDN and EAI for non-technical audiences was published on a digital skills training platform "Digital Dictation" created to improve the digital literacy of end users in Russia.

Figure 14: Examples of the CIS-EE UA Local Initiative Publications

To raise UA awareness and engage with a wide range of stakeholders, including the public sector, business, civil society, academia, and end users, the CIS-EE UA Local Initiative members initiated and participated in a variety of local, regional, and global events during FY21:

- 5 August 2020: participated as a speaker at the *ICANN Readout Meeting* for the Russian-speaking community to provide an overview of the three UA sessions held by the UASG at ICANN68 Virtual Policy Forum.
- 7 September 2020: organized the *Internationalized Domain Names: Global and Regional Initiatives in Universal Acceptance* session held at TLDCON 2020 – an international conference for ccTLD registries and registrars of CIS, Central and Eastern Europe to discuss the prospects of reaching equal service for internationalized Internet identifiers such as domain names, email addresses, and accounts on the Internet. There were more than 250 participants.
- 30 September 2020: presented on the need for UA-readiness to CCNSO members at *Pre-ICANN69 ccTLD News Session*s.
- 19 October 2020: participated at ICANN69 as a panelist for the *Outreach for Addressing Universal Acceptance* session.
- 9-13 November 2020: participated as a panelist at the ENOG 17 | RIPE NCC Regional Meeting – an annual meeting for the regional RIPE community, telecom operators, vendors, and Internet service providers.
- 9-17 November 2020: participated in the virtual Internet Governance Forum 2020 as an organizer, moderator, and panelist in two UA-related sessions.
- 18-19 November 2020: participated in the Eastern European DNS Forum as a panelist for *UA Regional Digest* session.
- 3 December 2020: organized a special award for UA and IDN projects at the annual Russian Internet Award event (more than 20 applications were submitted).

- 7 April 2021: Shared CIS-EE UA Local Initiative experiences at the Middle East DNS Forum.
- 13 April 2021: organized the *Promoting Universal Acceptance as a Prerequisite for Progress in Ensuring Multilingualism and Local Content Generation in Eurasia and Asia Pacific* sessions at WSIS Forum 2021.
- 21 April 2021: participated in the ICANN Readout Meeting for the Russian-speaking community with an overview of the *Remediating Universal Acceptance* session at ICANN70 Virtual Policy Forum.
- 5 May 2021: participated in a round table on Armenian IDN .հայ; promotion with business, government, and civil society representatives to determine the roadmap for further domain space development in the country and the special role of government.
- 6 May 2021: participated in the *CENTR Joint Administrative and Marketing Webinar* as a panelist to share experiences on IDN promotion and provide an overview UA concepts for European ccTLD registries.
- 27 May 2021: the Coordination Center for TLD .RU/.РФ shared experiences at the third APTLD-ICANN UA Regional Training Program webinar, *The ccTLD Knights of the Round Table and the Quest for Universal Acceptance*.
- 7 June 2021: participated in a webinar on the Russian language on the Internet held by UN Moscow Information Center and Moscow State Linguistic University with lectures on multilingualism and internationalization.
- 21 June 2021: participated as a panelist in the SEEDIG 7 Series Kick-off event under the overarching theme of “Internet in your native language: Universal Acceptance.” The event brought together community members, governmental representatives, and DNS experts to brainstorm how to further advance UA in the SEE+ region

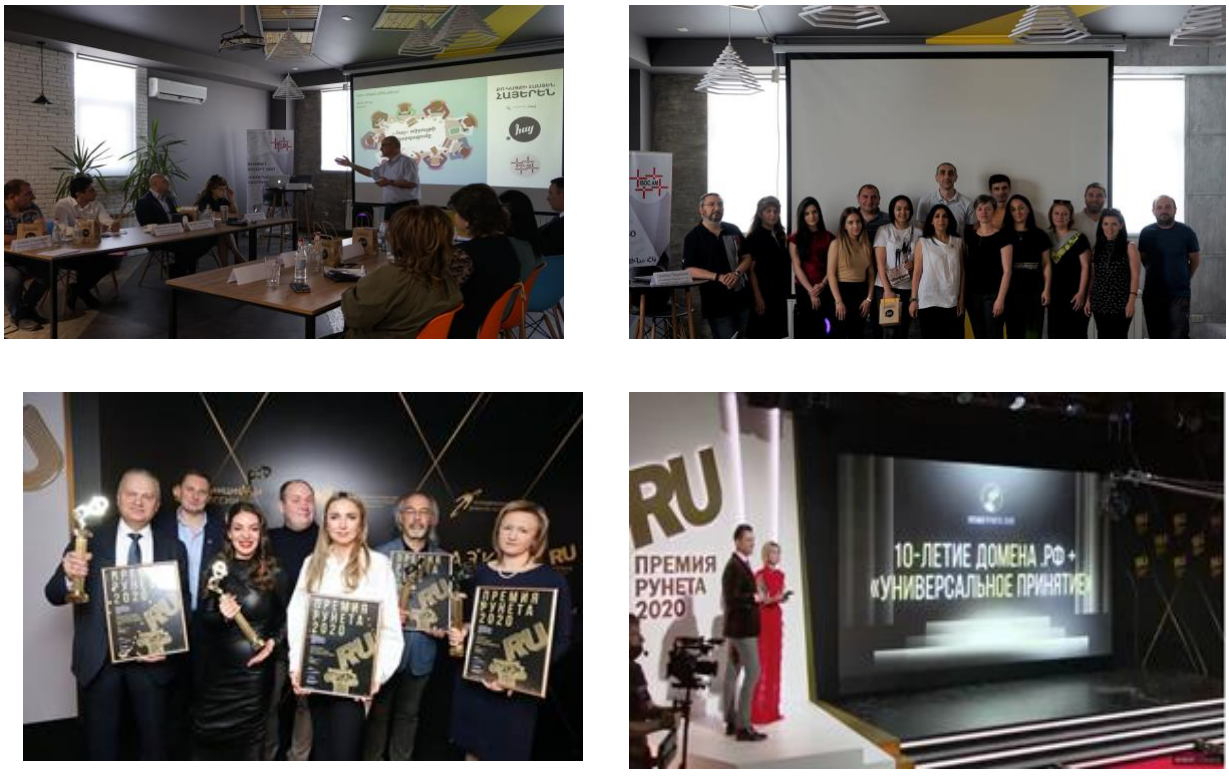


Figure 15: CIS-EE UA Local Initiative Activities on UA Awareness

7.2.3 INDIA UA LOCAL INITIATIVE

The FICCI-Indian Language Internet Alliance is a multistakeholder alliance established with the aim of sustainable development of the Indic Internet and Language Technology Sector of India. Carrying forward the same momentum, and with the support of ICANN, FICCI-ILIA started hosting the Local India Chapter of Universal Acceptance in 2019-20. The prime objective of this initiative was to promote UA in India so that more people can come online and leverage the Internet in their local languages.

Continuing its efforts which started in FY20, India's UA Local Initiative organized its third working group meeting in July 2020 to plan a cohesive approach towards the development of UA. The members included UASG leaders (Ajay Data, Satish Babu, and T. Santhosh), UA Ambassadors (Harish Chowdhary, Sushanta Sinha, and Aman Masjide), and the UA Local Initiative staff. FICCI-ILIA published the UA page as part of its official website. The page links to all the events and publications conducted by the initiative in India.

- 18 June 2021: Workshop on Universal Acceptance for a Globally Connected Internet. See details.
- 29 March 2021: How can Language Service Providers use Universal Acceptance Compliance Consulting as a Market Differentiator. See details.
- 19 March 2021: Tech Thought Leadership Session on Vernacular Internet - Challenges and Way Forward. See details.
- 27 February 2021: Tech Talk Session on Universal Acceptance: The Foundation of Indic-Internet. See details.
- 30 January 2021: Tech Talk Session on Universal Acceptance and Implementation Benefits. See details.
- 1 December 2020: Bhashantara 2020. See details.
- 6 November 2020: Universal Acceptance Technical Workshop on Email Address Internationalization Overview. See details.
- 29 September 2020: Webinar on Role of Universal Acceptance in Indic Internet and Language Technology Sector of India. See details.
- Role of Universal Acceptance in the Growth of Indic Internet and Language Technology Sector of India. See details.

In the Universal Acceptance Technical Workshop on 6 November 2020, the technical overview and configuration of EAI were discussed with more than 150 participants.

Figure 16: Speaker Gallery India UA Local Initiative Events

For UA success in India, the UA Local Initiative must engage with academia and future technical aspirants in the country, so it organized two "Tech-Talks" – one in January on the topic of *Universal Acceptance: Implementation and Benefits* and the second one in February on the topic of *Universal Acceptance: The Foundation of Indic-Internet*. Both sessions were appreciated by the community and were well attended by community members and academia. The India UA Local Initiative also organized a working group meeting in January 2021, covering the initiative's activities and how it can partner with stakeholders and continue promoting UA in India.

The UA Local Initiative also supported various other outreach events with partners. FICCI-ILIA, through the India UA Local Initiative, aims to continue promoting UA through community development and awareness campaigns for the years 2021-22.

7.2.4 THAILAND UA LOCAL INITIATIVE

The Thailand UA Local Initiative is spearheaded by the Thai Network Information Center Foundation (THNIC). The initiative finalized the APAC EAI Implementer Group mailing list, and its information page can be found here: https://mm.icann.org/mailman/listinfo/apac-eai-ig. The Thailand UA Local Initiative has also initiated the Thai EAI Implementation discussion group on a social media platform (Line OpenChat) to communicate EAI technical issues for Thai speakers. In addition, EAI training video clips in the Thai language have been developed in collaboration with the THNIC Foundation, the Thai Programmer Association, Thaiware Co., Ltd., and the UA Local Initiative.

The UA Local Initiative also organized the following events and activities:

- 4-5 July 2020: organized an online hackathon to set up EAI email servers during the COVID-19 lockdown. The activity aimed to enhance the EAI knowledge of participants from the previous THNG#9 camp. The hackathon participants received problems from real world businesses to set up UA-ready web and email servers.
- 21 December 2020: organized a hackathon to set up EAI email servers as a part of THNG Camp #10. More than 40 university students joined the activity.
- 17 March 2021: Hosted an online three-hour workshop, *Setting up an Email Server with EAI Support*, for system administrators. The workshop guided participants to set up email servers using Postfix on CentOS 8 and to configure some parameters to support EAI. There were 34 participants.
- Organized an open talk to create awareness of IDNs. IDN users were invited to be panelists to share their experiences and suggestions on using IDNs. There were 65 participants.
- 5-6 June 2021: organized a hackathon to set up EAI email servers as a part of Baengpun Camp (ค่ายแบ่งปัน). There were 44 high school students in the camp.

- 12 June 2021: a *UA for Developers* online workshop was organized. A total of 33 participants actively participated in the session. The workshop covered UA concepts, modifying *PHPmailer* for sending EAI emails, and modifying a PHP login module to accept and validate EAI email addresses.

THNIC has also worked to maintain and enhance local Thai online resources, including the following:

- EAI technical content: UA and EAI implementation technical content was updated and maintained in both Thai and English at https://wiki.thnic.or.th/.
- Website รู้จัก.ไทย or knows.in.th (https://xn--12cn4frcvb5f.xn--o3cw4h) has been maintained and enhanced with local content under IDN, EAI, and UA sections. Most of the content on this page is intended to create awareness for general Thai audiences.
- UA Local Initiative web page was published, containing information about the initiative, related news, and highlights of activities.

Additional activities have focused on communication and outreach to stakeholders:

- Regularly communicated to the public via social media channels.
- Published two paper booklets and two websites on IDNs to promote communities, e.g., เที่ยวทุ่งหว้า.ไทย, สินธุ์แพรทอง.ไทย.
- Led outreach to industry-related organizations to help create UA awareness with their partners, e.g., Thai Web Master Association, the Association of Thai Software Industry (ATSI), Thai E-commerce Association, the Digital Government Agency (DGA), the Cultural Promotion Department, and the Tourism Authority of Thailand.
- Conducted outreach to organizations to get them to consider user authentications with Thai email addresses, e.g., National Institute of Educational Testing Service, Thai Massive Online Course platform, and Dek-D.com web application.
- Contacted 25 well-known Thai website owners to introduce EAI and UA, and asked corporations to modify their websites to become UA-ready.
- Worked with the UASG on a UA and EAI case study: Coremail and THNIC (UASG013F): *Supporting a Culturally and Linguistically Diverse Internet Through Email Address Internationalization (EAI).*
- Worked with the Electronic Transaction Development Agency (ETDA) to reach out to more government and non-government parties to get them to consider using IDNs as a secure and reliable part of e-commerce and other electronic transactions.
- 19 October 2020: Participated in ICANN69 as a panelist in the *Outreach for Addressing Universal Acceptance* session.
- 12 November 2020: Shared THNIC experiences in the *EAI and IDN Email Service Solutions* session at TWIGF 2020.
- 9 December 2020: Shared experiences on .ไทย IDN ccTLD management in the *Online Strategic Workshop and Guidelines to Promote the use of IDN and IDN ccTLDs Among ASEAN Community*.
- 11 March 2021: Provided an update on Thailand UA-readiness at ICANN70.
- 7 April 2021: Shared THNIC experiences at the Middle East DNS Forum 2021.

- 27 May 2021: Shared THNIC experiences at the third APTLD-ICANN UA Regional Training Program webinar on Universal Acceptance: *ccTLD Knights of the Round Table and the Quest for Universal Acceptance*.

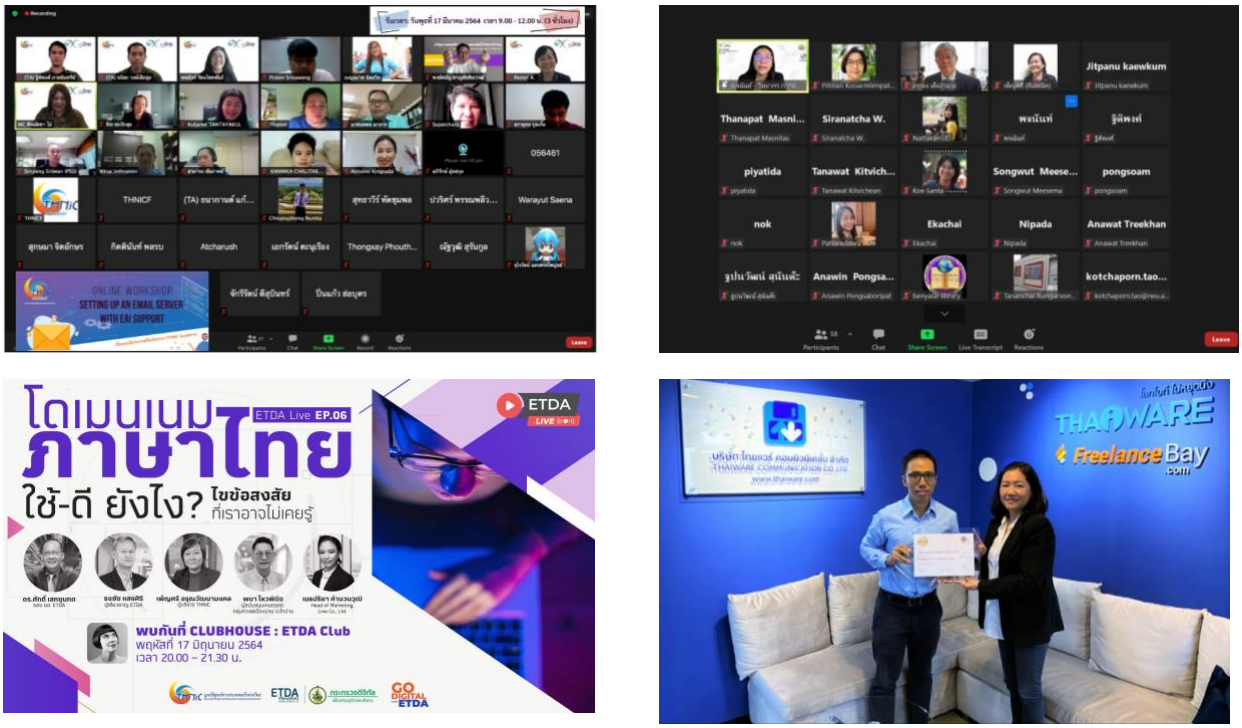


Figure 17: Thailand UA Local Initiative Outreach and Training Activities

7.3 UASG WEBSITE AND SOCIAL MEDIA CHANNELS

In order to globally showcase UA efforts and highlight events and achievements, the UASG continued to produce and publish important documents online at its website: uasg.tech, which are also translated into different languages based on the needs of the community (e.g. Arabic, Chinese, French, Russian, Spanish, etc.). The UASG published a total of 14 blogs and announcements in the fiscal year aimed at disseminating important UASG reports and analysis, events, and news to a general audience. The UASG also improved on the design of its website to be more user-friendly and to make it easier to access UA information and publications online.

Figure 18: Sample of Blogs Published by the UASG

The UASG has active social media channels and generated organic content about UA for followers on Facebook, LinkedIn, and Twitter throughout the year. This includes promoting community events, available UA resources, and UA-related news. In 2020, the UASG developed and released a social video campaign highlighting what UA means to its members, and published multiple training videos and recordings on the UASG's video page. The topic of Universal acceptance was also taken up in the media with articles linked from the UASG website.

7.4 UA-RELATED REPORTS AND PUBLICATIONS

The UASG has published several UA and EAI-related reports and articles in different languages in order to reach a global and diverse audience to raise awareness about UA. The table below shows the UA research reports published from July 2020 - June 2021. Click here for a complete list of publications.

Table 9: UASG Reports and Publications in FY21

Document Title	Summary	Link	Language
UASG004 Test Domain Names and Email Addresses for UA Readiness Evaluation	Functional Domain Names and Email Addresses in different languages for developers to test and evaluate systems for Universal Acceptance readiness.	https://uasg.tech/wp-content/uploads/documents/UASG004-en-digital.pdf	English
UASG004A Test Domain Names and Email Addresses for UA Readiness Evaluation	Data file for UASG004 - functional Domain Names and Email Addresses in different languages for developers to test and evaluate systems for Universal Acceptance readiness.	https://uasg.tech/wp-content/uploads/2020/07/UASG004-en-digital.txt	English
UASG018A UA Compliance of Some Programming Language Libraries and Frameworks	This document describes the results of verifying the UA readiness of C, C#, Go, Java, JavaScript, Python3, Rust and frameworks, including the testing of internationalized email.	https://uasg.tech/wp-content/uploads/documents/UASG018A-en-digital.pdf Test report	English

UASG028 Considerations for Naming Internationalized Email Mailboxes	The document is intended for email systems administrators to help them provision mailboxes, configure, and manage systems compatible with internationalized email addresses. It outlines the considerations for naming internationalized mailboxes.	https://uasg.tech/wp-content/uploads/documents/UASG028-en-digital.pdf	Arabic Chinese English French Russian Spanish
UASG030 Evaluation of EAI Support in Email Software and Services Report	Study of the support of Email Addresses Internationalization (EAI) in the different email systems and tools. The report tests the different components of the email technology stack, the Mail User Agent (MUA), Mail Submission Agent (MSA), Mail Transfer Agent (MTA), Mail Delivery Agent (MDA), and Mail Service Provider (MSP).	https://uasg.tech/wp-content/uploads/documents/UASG030-en-digital.pdf	Arabic Chinese English French Spanish
UASG030A EAI Software Test Results	This report is a follow up to UASG030 and tests the EAI readiness of seven additional software packages, including spam filters.	https://uasg.tech/wp-content/uploads/documents/EAI-Software-Test%20Results-UASG030A.pdf	English
UASG031 Frequently Asked Questions (FAQs): UA Readiness of Programming Languages and Email Tools	The document provides answers to Frequently Asked Questions (FAQs) regarding Universal Acceptance (UA) support in programming languages and frameworks, and support for Email Address Internationalization (EAI) in email tools and services. The document is intended for those who maintain programming languages, their libraries, and frameworks, as well as those who provide and maintain email tools.	https://uasg.tech/wp-content/uploads/documents/UASG031-en-digital.pdf	English
UASG032 Universal Acceptance (UA) of Content Management Systems (CMS) Phase 1 - WordPress	Testing of UA readiness in Content Management Systems, namely WordPress and its associated plugins. Report determines how well the software complies with the UA readiness of Internationalized Domain Names (IDNs), path Internationalized Resource Identifiers (IRIs), and Email Address Internationalization (EAI).	https://uasg.tech/wp-content/uploads/documents/UASG032-en-digital.pdf	English

UASG033 UA-Readiness of Open Source Code Pilot	The work evaluates the strategies to discover and improve UA-associated code in open source software.	https://uasg.tech/wp-content/uploads/documents/UASG033-en-digital.pdf	English

7.5 UA AWARENESS AND CAPACITY BUILDING EVENTS

In 2019 and 2020, the UASG developed technical training related to UA which is available at the UASG training wiki page. These training materials, along with more general information about UA, have been used to conduct outreach by UASG members and the ICANN org team. Due to the COVID-19 pandemic, most of the outreach activities were conducted online.

The Regional Universal Acceptance Training Program was launched in 2021, in addition to concluding the Train-the-Trainer Program in July 2020. Two regional awareness and training programs were organized. The first program focused on the Asia Pacific (APAC) region and was organized in collaboration with the APTLD. This program had a series of three technical training sessions followed by a panel discussion that was focused on engagement with ccTLDs from the region. The agenda and recordings are provided in Table 10. The proceedings of the last panel discussion were converted into a White Paper on the Role of ccTLDs in Achieving Universal Acceptance and was published by the APTLD as a guideline for other ccTLDs that want to support UA.

Table 10: APAC Regional Training Program in Collaboration with APTLD

Date	Session	Audience	Description	Recording
20 January 2021	Configuring for Email Address Internationalization (EAI) - Session Slides	Technical (systems)	A detailed training on how to configure email systems to support EAI.	Recording
13 April 2021	Programming for supporting Universal Acceptance - Session Slides	Technical (programmers)	A detailed training on how to design and develop applications and systems to support UA.	Recording
27 May 2021	Universal Acceptance: Its Impact and Next Steps White Paper on the Role of ccTLDs in Achieving Universal Acceptance	ccTLD managers, local regulators, tech, and business	A dialogue on how UA issues impact the APAC community, how best to address these issues, and highlight business opportunities by being UA-ready.	Recording

The second regional awareness and training program focused on the Latin America and Caribbean region and was conducted in collaboration with the Latin American and Caribbean Islands Regional At-Large Organization (LACRALO). See further details. This

program also contained a series of technical training sessions conducted in Spanish and English. A summary of the program is given in Table 11.

Figure 19: Announcement for the LAC Regional Training Program

Table 11: LAC Regional Training Program in Collaboration with LACRALO

Date	Session	Audience	Description	Recording
4 May 2021	Introduction to UA - Slides EN | ES	General	An introduction to the fundamentals of UA and EAI.	Recording
11 May 2021	EAI Configuration - Slides EN | ES	Technical (email and system administrators)	A detailed training on how to configure email systems to support EAI.	Recording
18 May 2021	UA for Java Developers - Slides EN | ES	Technical (software developers)	A detailed training on how to design and develop applications and systems to support UA.	Recording
25 May 2021	How to Engage in UA Activities - Slides ES	General	A session to discuss how participants can stay involved in UA efforts across the LAC region.	Recording

Table 12 lists additional UA-related outreach conducted during 2020-2021 by the UASG and ICANN org.

Table 12: Additional Outreach and Training Activities on UA in 2020-2021

Date(s)	Session	Event/Organizer
3 June 2021	UA Community Update	ICANN71 Prep Week
28 May 2021	ISOC Benin UA Webinar	Benin
21 May 2021	Overview of UA	Southern African Development Community (SADC) IXP
29 April 2021	IDN and UA Overview	Budapest University, Hungary
27 April 2021	Overview of UA	OSAINE Africa
20 April 2021	Current Work on IDN and UA	4th Chinese Domain Name Forum, Beijing China (Hybrid)
15 April 2021	Workshop on Universal Acceptance Implementation	ICANN APAC-TWNIC Engagement
7 April 2021	Improve internet usage by breaking language barriers	Sri Lanka Internet Day, Colombo, Sri Lanka (Hybrid)
7 April 2021	IDN and UA Track Sessions	Middle East DNS Forum
15 March 2021	Webinar on Universal Acceptance	Egyptian ICT Association (Eitesal)
28 January 2021	EAI Training	Czech and Slovak Network Operators Group
21 January 2021	Overview of IDNs and UA	African Association of Universities
9 December 2020	Need for IDNs and UA	ASEAN IDNs Workshop
25 November 2020	WS 3: Universal Acceptance (UA) and Email Address Internationalisation(EAI) for Supporting a Multilingual Internet in Africa	Africa IGF
24 November 2020	Overview of UA	Benin DNS Forum
16 November 2020	EAI Training	ICT Directors of African Association of Universities
16 November 2020	Workshop on Universal Acceptance of Domain Names and Email Addresses	Internet Governance Forum (IGF) 2020
11 November 2020	Panel Discussion on UA	Taiwan IGF 2020
10 November 2020	Overview of UA	Webinar for GAC African

		Members
6 November 2020	EAI Workshop	India UA Local Initiative
29 September 2020	Overview of UA	African Telecom Regulators Association
15 September 2020	Overview of UA	Arab ICT Organization
9 September 2020	Towards a More Inclusive Internet: Universal Acceptance of Domain Names and Email Addresses	Czech and Slovak Network Operators Group (CSNOG) 2020
6 September 2020	Overview of UA	African Association of Universities
20, 23 July 2020	Java Programming for UA	ICANN Train the Trainer Program

8. LOOKING AHEAD

The UASG recently finalized and published its FY22 Action Plan. While keeping the same stakeholders from before, the UASG has added two additional ones it considers playing an important role in UA adoption:

- **Top-level domain registries and registrars:** ccTLD managers and gTLD operators (especially IDN TLDs), as well as registrars.
- **Academia:** Faculty and students of technical programs at universities.

UA outreach in FY21 was challenging due to the COVID-19 pandemic, but the UASG has been able to make good progress on a local level through its UA Local Initiatives. The UA Local Initiatives provide the right connection to the community in order to raise awareness and train stakeholders. Therefore, the UASG aims to expand the program and looks forward to supporting additional initiatives while continuing to support those already established in China, CIS-EE, India, and Thailand. Similarly, the UASG will continue to conduct outreach through its UA Ambassador program virtually until conditions allow for in-person meetings.

The UASG Measurement WG has launched gap analysis of social network applications and browsers in addition to work already completed and published. Looking ahead, the WG will discuss other technologies to prioritize for measurement-related work which could include a second and more comprehensive phase on CMS and other technologies. Initial work on web hosting platforms has already started with a current discussion on cPanel.

The UASG EAI WG is currently finishing work on an EAI self-certification guide. It will focus on developing success stories on EAI implementation in order to create greater enthusiasm and showcase working solutions. The WG also aims to create user-centric documentation on how to find a service provider and use/test that provider's services, and provide system administrators with working EAI setups, configurations, and tests for self-hosting. The EAI WG also wants to reach out to global technology leaders like Facebook, eBay, and others to encourage them to support EAI.

The UASG Technology WG will be focusing on technology remediation, while it finalizes the work on gap analysis of programming languages and standards which is currently underway.

The WG aims to develop, test, and publish functional minimal running prototypes to demonstrate UA-readiness on the prioritized technology stacks. The purpose is to demonstrate UA-readiness to developers so that they can be persuaded to adopt the practice. The WG will also develop training materials for different platforms, including programming languages, CMS, and others.

The UASG Communications WG plans to coordinate with other WGs to make sure their output is effectively disseminated to the right audiences by publishing blogs, case studies, videos, while also actively engaging with the community through its social media channels. The WG also aims to engage at a global level with a cohesive strategy for outreach at national, regional, and global Internet Global Forums (IGFs). The WG also continues to maintain and improve the UASG.tech website experience.

Achieving UA is a collective responsibility and it will only be fully achieved if we make all of our own systems UA-ready. With an abundance of literature, materials, training, and code examples now available through the UASG, we hope that the community will also engage and help implement UA adoption.

9. CONTACT THE UASG

- For further information about the UASG visit https://uasg.tech/
- Contact the UASG at https://uasg.tech/contact/ or email info@uasg.tech
- Meet the people of the UASG: https://uasg.tech/about/people/
- Join UASG working groups: https://uasg.tech/join/
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- Report UA problems with other applications: https://uasg.tech/global-support-centre/
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