Session 1: Introduction to Universal Acceptance

LACRALO, UASG, ICANN

LACRALO Universal Acceptance training
May 2021

Many thanks !

https://atlarge.icann.org/ralos/lacralo

https://uasg.tech

Housekeeping

1) Interpretation is available in Spanish, English and Portuguese;
   - Visit www.adigo.com/icann and call the number according to your country
   - Dial the channel your prefer
     - English: 9001
     - Spanish: 9003
     - Portuguese: 9007

2) Please mute your microphones;
3) Type your questions on the chat anytime and in any language or raise your hand to speak;
4) Have fun !

Welcome !

Welcome!

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Universal Acceptance (UA) training

Overview

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

- Certificates will be provided upon attendance and examination for modules 2 and 3.

Hello!

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Today's Agenda (May 4th, 2021)

Session 1: Introduction to Universal Acceptance

- What is the Domain Name System and ICANN ?
- Internationalized Domain Names
- Why Universal Acceptance ?
- Key Fundamental Aspects:
  - Unicode
  - IDNs
  - EAI
  - UA

What Is the DNS ?
What Is ICANN?

Unique Names and Numbers

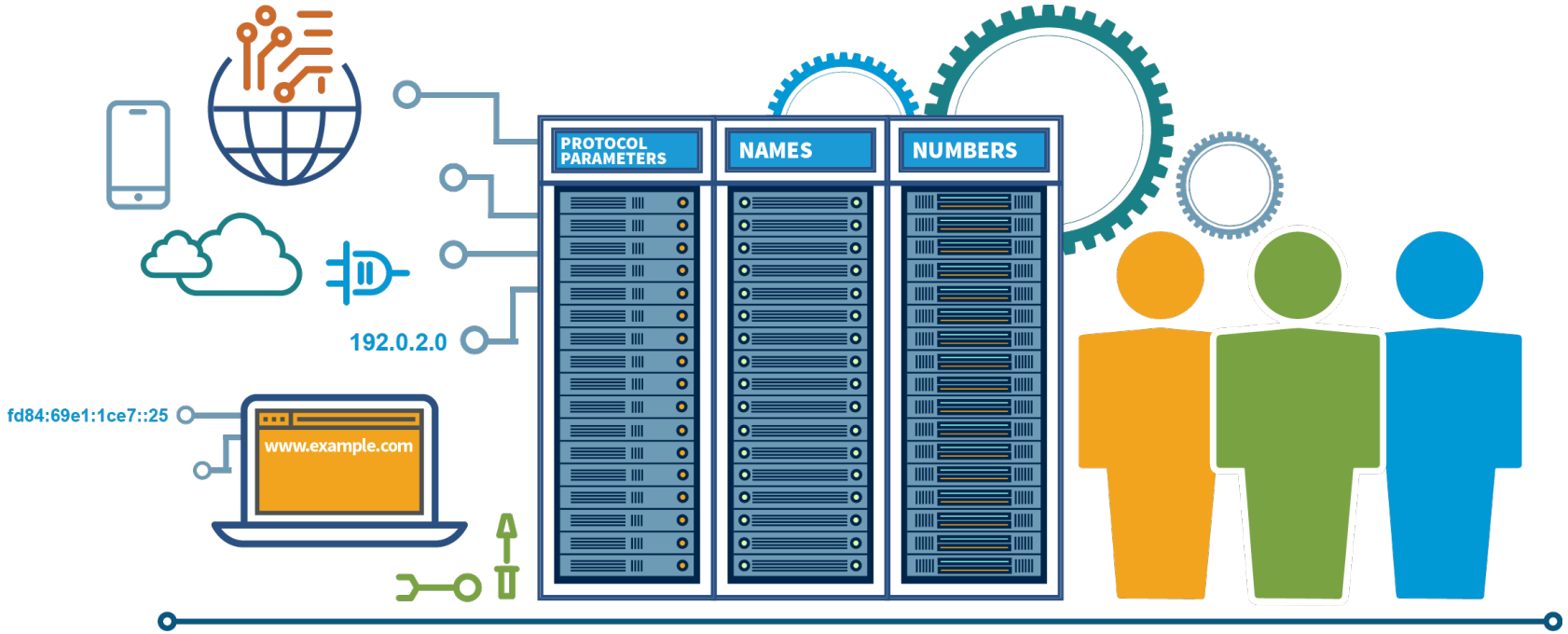
Anything connected to the Internet – including computers, mobile phones, and other devices – has a unique number called an IP address. IP stands for Internet Protocol.

This address is like a postal address. It allows messages, videos, and other packets of data to be sent from anywhere on the Internet to the device that has been uniquely identified by its IP address.

IP addresses can be difficult to remember, so instead of numbers, the Internet's Domain Name System uses letters, numbers, and hyphens to form a name that is easier to remember.

Overview

Coordinating with our partners, we help make the Internet work.



Some of What the ICANN Organization Does

Domain Name System

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

Policy Development

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

L-Root

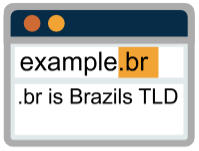
The ICANN org hosts and supports 1 of the 13 L-Root infrastructures. At over 160 locations worldwide, L-Root is critical to infrastructure that helps reduce latency and improves performance of the DNS.

Support and Grow the Community

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

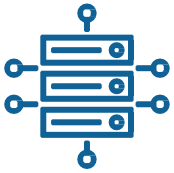
Generic Top-Level Domains

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



Country Code Top-Level Domains

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



Protocol Parameters

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

Internet Protocol Addresses

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

Root Zone Management

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

IANA Functions

Expansion of the DNS

The introduction of new generic top-level domains (gTLDs), including long TLDs, and Internationalized Domain Names (IDNs) into the Internet ecosystem through the New gTLD Program, has enabled the largest expansion of the DNS.

Pre-2009

Generic TLDs (gTLDs)

(**22** total)

.com	.edu
.org	.net
.aero	.asia
.mobi	.travel
.info	

Country Code TLDs (ccTLDs)

(two-character ASCII ccTLDs)

.uk	.jp
.de	.fr

2009-onward

IDN ccTLDs

(in non-Latin scripts)

.pф	.台灣
.한국	.ଭାରତ

2013-onward

New gTLD Program

New and Long gTLDs

(Over 1,200 total)

.bank	.bar	.club
.car	.global	.london
.rio	.vote	.sky

IDN gTLDs

(in various scripts)

.संगठन	.在线
.닷넷	.ストア
.ابوظبي	. дети

A little story

Meet João, Lee and Mohammed

João, Campina Grande, Brazil

Lee, Beijin, China

Mohammed, Doha, Qatar

Meet João, Lee and Mohammed

João@comércio.online

ascii@ascii.newlong

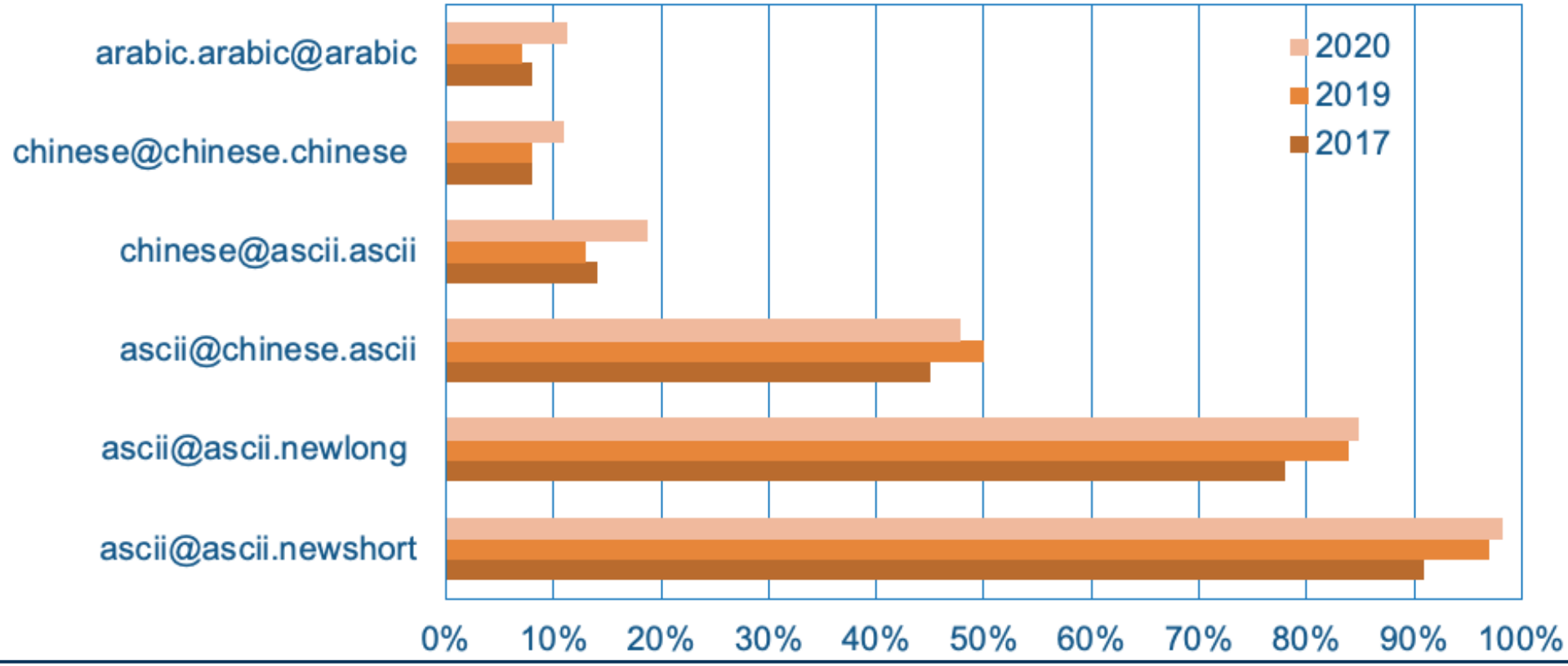
测试@普遍接受-测试.世界

chinese@chinese.chinese

دون@رسيل.سعودية

arabic.arabic@arabic

Acceptance of email addresses in websites



What is Universal Acceptance?

What is Universal Acceptance?

The Domain Name System (DNS) has changed dramatically over the last decade. There are now more than 1,200 active generic top-level domains (gTLDs) and some of these include domain names in different scripts and that are longer than three characters (e.g. .ไทย, .LONDON, .SPORT).

Universal Acceptance (UA) is cornerstone to a digitally inclusive Internet by ensuring all domain names and email addresses – in any language, script, or new or long TLD (e.g., .рф, .ENGINEERING) – are accepted equally by all Internet-enabled applications, devices, and systems.

What's Involved: Domain Names and Email Addresses

Universal Acceptance (UA) is about how to appropriately support internationalized identifiers (IDNs and EAI), as well as new and long top-level domains (TLDs).

Domain Names:

- New short top-level ASCII domain names: example.sky
- New long top-level ASCII domain names: example.engineering
- Internationalized Domain Names (IDNs): คน.ไทย

Email Addresses:

- ASCII@ASCII (new and long TLD) ekrem@misal.istanbul
- ASCII@IDN marc@société.org
- Unicode@ASCII 测试@example.com
- Unicode@IDN όνομα@παράδειγμα.ευ
- Unicode@IDN; right-to-left scripts ايميل@مثال.موقع

The Role of Universal Acceptance

UA-ready

http://soap.organic

Welcome to organic

SOAP

We make the best soap in the world. It's 100% organic.

http://tokyo.ストア

TOKYO

当社の製品を購入します

http://bank.com

Bank

Email 测试@普遍.世界

Email validated.
Account created.

Not ready

http://soap.organic

http://tokyo.ストア

http://bank.com

Bank

Email 测试@普遍.世界

Not a valid email address.

Why Does Universal Acceptance Matter?

Achieving UA ensures every person has the ability to navigate and communicate on the Internet using their chosen domain name and email address that best aligns with their interests, business, culture, language, and script.

UA can also help:

- Support a diverse and multilingual Internet.
- Enable greater competition, innovation, and consumer choice.
- Create business opportunities.
- Offer career advantages for developers and system administrators.
- Assist governments and policymakers in reaching their citizens.

Supporting a Multilingual Internet

The majority of the world does not speak English as a first language or write their language only using letters A-Z, a-z. In fact, only around 36 percent of the world population uses the Latin alphabet. There are billions of people who prefer to read and write in Arabic, Chinese, Cyrillic, Devanagari, or other scripts.

Many of these multilingual users are currently excluded from experiencing the full benefits of the Internet simply because they're unable to use a domain name or email address in their language and script of choice.

By being UA-ready, there are important economic and social benefits of supporting multilingual Internet users:

- Increasing their ability to access and connect to ecommerce, local communities, and governments.
- Embracing and proliferating cultural traditions through language as indicated by the OECD 2016 report on the economic and social benefits of Internet diversity and openness.

Greater Choice: New and Long TLDs

Hundreds of new gTLDS, including long TLDs (e.g., .BARCELONA, .BLOG, .INSURANCE) have been introduced through the New gTLD Program.

The goal of allowing new and long TLDs is to enhance competition, innovation, and consumer choice, and being UA-ready can help to fully achieve this.

Competition and Innovation

- New and long TLDs have spurred new businesses, not only through registries, but also in marketing, research, and technology.
- New and long TLDs have allowed brands, businesses, governments, organizations, and more the ability to refresh and modernize their online images.

Choice

- New and long TLDs offer greater consumer choice when it comes to selecting a domain name by allowing users to choose one that best reflects their business, hobby, community, geography, and more.

Business Opportunities

Many businesses are leaving money on the table by not updating their systems to be UA-ready, which has the potential to unlock billions in revenue from untapped customers.

A UASG study, conducted in 2017, found that the Universal Acceptance of Internet domain names is a $9.8+ billion opportunity, which is a conservative estimate.

Businesses that are UA-ready will be best positioned to reach growing global audiences and maximize revenue potential from the current Internet population, as well as the next billion.

Current Internet Population

4.5 billion active users with at least one billion more expected to come online by 2023.

Universal Acceptance Steering Group (UASG)

The Universal Acceptance Steering Group (UASG) is a community-led initiative that was formed in 2015. The group is made up of representatives from more than 120 companies, governments, and community groups.

The UASG is tasked with undertaking activities that will effectively promote the Universal Acceptance of all valid domain names and email addresses. Through its multiple working groups and Local Initiatives, the UASG:

- Develops UA resources, technical documents, and analysis.
- Creates UA messaging and outreach strategies targeted at identified stakeholders.
- Hosts and attends UA events (webinars, coding events, ICANN Public Meetings, developer conferences, etc.)
- Organizes UA local initiatives and appoints UA Ambassadors around the world.
- Communicates UA news and information through UASG social media channels and UASG.TECH website.
- And more!

Key Fundamental Aspects: Unicode, IDNs, EAI, UA

Plan

- Key fundamental aspects (just the necessary concepts)
  - Unicode, UTF-8, Normalization
  - Domain names, labels, top-level domains (TLDs), zones
  - Internationalized Domain Names (IDNs): Punycode, U-label, A-label.
  - Universal Acceptance (UA)
  - Email agents: MUA, MTA, etc.

Note

- In this section, there will be short summaries on multiple topics.
- Please keep in mind, each topic could be covered in a full-day tutorial, so these summaries are kept simple and cannot be considered complete.
- These summaries are meant to make sure that key concepts can be understood before the main content on EAI and Java programming.

Unicode

- Encoding glyphs into codepoints.

- In specifications, codepoints are shown in hex using the U+XXXX notation.

- Codepoints are typically carried using the UTF-8 (Unicode Transformation Format, 8 bit) format.
  - Variable number of bytes for a single codepoint.
  - ASCII is used as is.
  - Gold standard for carrying Unicode codepoints in web, protocols, etc.

Unicode

- There are multiple ways to use a glyph:
  - “è” = U+00E8
  - “e`” = “è” = U+0065 U+0300
  - Normalization is a process to ensure that no matter the user type, the end representation will be the same.
    - For the two entries above, Normalization Form C (NFC) will generate U+00E8 for both.

Internationalized Domain Names (IDNs)

- Internationalized Domain Names (IDNs) enable the use of non-ASCII characters for any label of a domain name.
  - Not all labels of a domain name may be internationalized.
- Example: exâmple.ca
- User uses the IDN version, but the IDN is converted into ASCII for DNS resolution.
  - exâmple => exmple-xta => xn--exmple-xta
  - The xn-- prefix is added to identify an IDN.

Internationalized Domain Names (IDNs)

- Example process of using an IDN:
  - User enters in a browser: http://exâmple.ca
  - Browser does normalization on the user entry.
  - Browser converts exâmple.ca in an ASCII compatible representation called Punycode [RFC3492], and adds ‘xn--’ in front of it.
    - exâmple.ca becomes: xn--exmple-xta.ca
  - Browser calls the DNS to get the IP address of xn-- exmple-xta.ca
  - Browser connects to the HTTP server at the received IP address.

Internationalized Domain Names (IDNs)

- The protocol for handling IDNs is named IDN for Applications (IDNA).
  - Two versions: IDNA2003 and IDNA2008. The latter (IDNA2008) is the one currently used.

- U-label is the Unicode native representation of an IDN label: example

- A-label is the Punycode representation of an IDN label: xn--exmple-xta

Two IDN Standards

- IDNA2003 (RFC3490)
  - Was defined against Unicode 3.2 (March 2002).
  - Newer characters defined after Unicode 3.2 are accepted as is.

- IDNA2008
  - Based on Unicode codepoint properties.
    - New characters are automatically handled by their properties.
  - Therefore, fewer number of characters are accepted in IDNA2008 than IDNA2003.

Public Suffix List (PSL)

- The Public Suffix List (PSL) is an attempt to help web developers know whether or not domains are controlled by the same organization. This can be thought of as asking: does this domain name allow others to register under it?
- https://publicsuffix.org/
- Some libraries, frameworks, and applications use the PSL as a static list of TLDs.
- If used in applications:
  - The developer has to keep the copy up-to-date in its application.
  - A TLD may not be listed in the PSL.
- To know if a name is actually a TLD, use other means.

Email Address Internationalization (EAI)

- Email syntax: leftside@domainname
- Domain name can be internationalized as an IDN
- Left side (also known as local-part or mailbox name) with Unicode (UTF8) is EAI.

- Examples:
  - kévin@example.org
  - すし@快手.游戏

Email Address Internationalization (EAI)

- Side effect:
  - Mail headers need to be updated to support EAI.
  - Mail headers are used by mail software to get more information on how to deliver email.

- Since not every email server supports EAI, a negotiation protocol is used to only send EAI when the target server supports it. If not, then it falls back and returns an unable to deliver message back to the sender.

- The SMTPUTF8 option is used within the mail transfer protocol (SMTP: Simple Mail Transport Protocol) to signal the support of EAI by an email server.

Universal Acceptance (UA)

- UA is about how to appropriately support internationalized identifiers, as well as new and long TLDs.
  - Internationalized identifiers
    - IDN
    - EAI

Universal Acceptance (UA)

- UA is also about:
  - New and longer string TLDs (new generic top-level domains – new gTLDs)
  - In the early days, TLDs were either two or three characters long (.ca, .com). Recently, TLDs started to have longer strings (.info, .google)
  - A TLD label may have up to 63 octets.
  - Some applications are still verifying that the TLD entered by a user has a maximum of 3 characters.
  - Other ones are using regex which takes a maximum of 6-7 characters for the TLD

Universal Acceptance (UA)

- UA is also about:
  - Added/removed TLDs:
    - TLDs come and go on a « daily » basis.
    - Some applications are verifying the correctness of a TLD based on a static list which is not the latest one, therefore making wrong assumptions about the existence of a TLD

Engage with ICANN – Thank You and Questions

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