Creating Commonality to Increase the Inclusiveness and Diversity of the Internet

Situation Overview

ICANN manages the highest level of the domain name system (DNS), called the Root Zone. The Root Zone matches each unique top-level domain name (TLD) with its unique Internet address (IP address). Without a seamless matching process, the Internet could work differently depending on a user's location.

Today, the Internet has expanded to include domain names in non-Latin based languages, and extensions that can be longer than the traditional two or three letters. Due to the rapidly changing domain name landscape, many Internet-enabled applications, devices and systems do not recognize or appropriately process these new domain names or emails associated with the domain names. This could cause inconsistencies in how TLDs are handled by systems around the world.

Universal Acceptance (UA) is the technical compliance process that allows organizations to ensure consistency across all domain names and email address wherever users are, and whatever language they choose to use on the Internet. This compliance will help ensure a consistent and positive experience for Internet users globally.

Through UA, ICANN – and any organization that is UA-ready – can help increase the inclusiveness and diversity of the Internet. The Universal Acceptance Steering Group (UASG) is a community-based team working to share the concept and purpose of UA with Chief Information Officers (CIOs), software developers, government advisors and organizations around the world. As an early adopter and a founding member of the UASG, ICANN is working to set an example of how other organizations might achieve UA-readiness.

Universal Acceptance Approach

ICANN's CIO and Enterprise Architect oversee its UA initiative, which spans all of the organization's global systems and services. As a C-level project, updates to achieve UA-readiness are made opportunistically, and efforts are integrated into the organization's ongoing systems maintenance. This allows the team to make consistent progress on the initiative, even while focusing on other high-priority projects.

ICANN created a three-phase approach to update its systems. This plan can also be applied to other organizations:

PHASE 1:

* *Map All Systems and Services.* Identify if the systems are off-the-shelf or custom, and what coding languages they're built on.
* *Choose Systems and Services to Pilot.* Within the pool of custom systems, select one system from each coding language.
* *Fix the Code.* For each pilot system, locate all

Universal Acceptance Case Study:

Internet Corporation for Assigned Names and Numbers (ICANN)

Industry: Technology
Location: Los Angeles, CA, USA
UA-Ready Systems:

* *At-Large system.* The website dedicated to Internet community users who participate in the policy development work of ICANN.
* *Board Advice and Global Stakeholder engagement systems.* The online systems for Board and Stake-holder Executive communications, built on a Salesforce platform.
* *WHOIS system.* The directory containing contact and technical information of registered top-level domain name holders.

Benefits Identified:

* Ensures global commonality
* Provides greater access
* Promotes best practices

"By making UA-readiness a priority, organizations can deliver a better user experience and more effectively reach customers or new populations through new domains and local language domains, including Arabic, Hindi and many others. As an active member of the UASG, we've prioritized this effort so that we're ahead of the curve on adopting best practices and supporting the next billion Internet users."

— Ashwin Rangan
SVP, Engineering & Chief Information Officer

instances in the code that process email addresses or URLs. Update the code to accept Unicode as part of a top-level domain.

* *Test the Updates.* Develop a testing environment for each pilot system and test each instance identified in Step 3. The testing environment must be able to trap all outgoing email and DNS queries. Systems managers can determine whether the instances pass or fail the test by reviewing system logs. Continue to test and update until the pilot systems accept all email addresses and URLs. Get test materials.

PHASE 2:

* *Update all custom services to handle long Latin-based characters* (e.g. www.abc.cloud).

PHASE 3:

* *Set UA-readiness as a requirement.* As each service undergoes a more than minor update or upgrade, include full UA-readiness as a requirement.

ICANN began its PHASE 1 work by taking an inventory of all of its applications. As of mid-2016, ICANN staff found that ICANN had 87 different systems and services. Forty-one of the systems were "off-the-shelf," meaning only the service providers can alter the code. The remaining 46 were custom, and controlled by ICANN.

Currently, ICANN is in the "Test the Updates" step in PHASE 1. ICANN developed testing environments for systems built on Ruby on Rails and Java. These test environments are critical because they reduce the amount of time it takes to test and fix each system or service.

* In September 2016, ICANN completed updates to its At-Large website. This system is built on Ruby on Rails.
* In October 2016, ICANN completed updates to the WHOIS system. This system is built on Java.

ICANN started with the At-large and WHOIS systems because they offered a good representative example of an application on a supported platform.

ICANN found that creating code libraries greatly reduced programming efforts. For example, when looking at Python, ICANN determined that it already had the ability to process kanji (Chinese) characters in its code library, so there was no need to program it in since that would rework the code. This finding could be useful to other organizations as they embark on their projects.

ICANN's system updates are ongoing. By making its environment UA-ready, ICANN is well poised to increase the accessibility and convenience of its services to help support the next billion Internet users.

About:

ICANN

ICANN's mission is to help ensure a stable, secure and unified global Internet. To reach another person on the Internet, you need to type an address into your computer or other device – a name or a number. That address must be unique so computers know where to find each other. ICANN helps coordinate and support these unique identifiers across the world. ICANN was formed in 1998 as a not-for-profit public-benefit corporation and a community with participants from all over the world.