Executive Summary

Thai Network Information Center (THNIC) Foundation, a not-for-profit organization focused on developing Internet usage and infrastructure in Thailand, organized the country's first-ever GitHub hackathon focused on Universal Acceptance (UA). In this week-long virtual event, 37 developers competed to modify a series of popular, public GitHub repositories to be UA-ready. The event resulted in the successful merging of one of the pull requests into the GitHub origin repository, as well as more widespread awareness among the Thai developer community of the importance of UA and the steps needed to update systems to be UA-ready.

Overview

The Internet has undergone a paradigm shift over the past two decades, expanding beyond the legacy limitations of English and American Standard Code for Information Interchange (ASCII) characters to offer more multilingual choices for domain names and email addresses. Hundreds of new top-level domains (TLDs) that speak to interests (e.g., .organic, .photography) or are in a language not based on the English script (e.g., .世界, .بازار) give people greater freedom in their choice of Internet identity. But while the Domain Name System (DNS) has changed, the rules used by many applications haven't kept up, creating problems for organizations and frustrations for users who are unable to use the domain name and email address that best reflects their language, culture and interests.

As the creators and stewards of the modern Internet, developers play a critical role in making the Internet more inclusive by supporting Universal Acceptance (UA), a technical compliance best practice that ensures all domain names and email addresses can be used by all Internet-enabled applications, devices and systems. Today's developers have both an opportunity and an obligation to help people worldwide experience the social and economic power of the Internet by updating legacy systems and ensuring every new system is UA-ready. As the next billion Internet users come online, most of whom will likely not speak or understand English or recognize the ASCII characters used by English speakers, an understanding of UA principles is therefore critical for developers who want to be at the forefront of their industry and keep pace with the new, global Internet.

That's why Thai Network Information Center (THNIC) Foundation, along with the developers from other Thai companies such as Google Developers Experts, WISESIGHT, and Siam Chamnankit, organized a UA hackathon to raise awareness of the importance of UA and support developers in their journeys toward UA proficiency. Held from 9-15 September 2021, the GitHub Pull Request Hackathon .ไทย Universal Acceptance aimed to promote open-source code improvements on GitHub repositories in support of Internationalized Domain Names (IDNs) and new gTLDs using Thai characters (like คน.ไทย), as well as Thai email addresses based on those domains. Participants, including Thai developers, students and other interested parties, competed to see who could successfully modify the repositories to be UA-ready.

Hackathon Details

Participation in the hackathon was open to anyone with a GitHub account. Leading up to the event, THNIC held an online workshop to educate participants on UA-readiness and provide them with relevant technical resources, including a guide prepared by the Universal Acceptance Steering Group (UASG) that offers strategies for discovering and improving UA-associated code in open-source software (UASG033).

Over the course of the week-long virtual event, participants took 40 popular, public GitHub repositories that had been submitted in advance and modified them to support (accept, validate, process, store and display) Thai IDNs and associated email addresses using JavaScript framework software like AngularJs and VueJS and coding tools such as VSCode.

Scores were based on the number of modifications (and pull requests) that repository owners merged into the origin repository. Most participants used regular expressions as part of their strategy, which led to the conclusion that the best method for writing regular expressions to support Thai language is ก-๛. The extended regex using Thai characters was used as an interim mechanism to validate Thai domain names as part of Thai email addresses, but this method may have limitations. A comprehensive solution is possible using domain name validation mechanisms available through programming libraries which support IDNA2008. More information is available in the UASG's UA training for Java developers.

Results and Implications

The hackathon was successful in two ways: First, one of the submitted pull requests was merged into the GitHub origin repository – meaning, the updates to the code were accepted by the repository owner so that the software is now UA-ready. UA-readiness increases the number of potential users in each repository, leading to more inclusivity and opportunities for collaboration. Secondly, the hackathon was successful in raising awareness of the need for UA and the advantages of UA expertise for developers entering the job market and those in the field looking for a competitive edge.

According to a 2017 UASG study, the Universal Acceptance of domain names is a $9.8+ billion opportunity for global businesses. Developers who have a strong understanding of UA can therefore set themselves apart with a valuable skill and advise employers on how to capitalize on the social and economic benefits of becoming UA-ready. They can also ensure their work is future-proofed and supportive of current Internet users, as well as the next billion who come online.

As the hackathon demonstrated, becoming proficient in UA does not require learning a new category of coding, but rather builds upon existing skills to expand systems to recognize and support URLs and email addresses in all character lengths, languages and scripts. The UASG offers many resources, guides and training for current and aspiring developers who want to learn more about UA. THNIC also plans to offer another hackathon in September 2022 for those who missed the first one or would like another opportunity to hone their UA skills. For more information on the hackathon, visit https://academy.thnic.or.th/hackathon/.

About Universal Acceptance (UA)

The Domain Name System (DNS) has expanded dramatically over the past decade in terms of the number of generic top-level domains (gTLDs), scripts and languages used, and character length. There are now more than 1,200 active gTLDs, as well as country code top-level domains (ccTLDs), that are available in different scripts and that may be longer than three characters (e.g., .ไทย, .PHOTOGRAPHY). No longer should applications assume that the list of valid TLDs is fixed, or that a TLD will be just two or three ASCII characters. Likewise, email mailbox names can be in local languages and scripts based on the Email Address Internationalization (EAI) standards. However, many online systems don't recognize or appropriately process new domain names and internationalized email addresses, and not all online portals are primed for the opening of a user account with an internationalized email address. While filling out online forms, new TLDs and email addresses containing Unicode are not always accepted (i.e., the user receives an error message).

Universal Acceptance (UA) solves these issues by ensuring all domain names and email addresses – in any language, script or character length – are accepted equally by all Internet-enabled applications, devices and systems. When systems are UA-ready, everybody, regardless of where they are located or the language they speak, can 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 is a cornerstone of a truly multilingual Internet, one where everyone, everywhere can experience its full power and benefits.

About UASG

The Universal Acceptance Steering Group (UASG) is an Internet community initiative that was founded in February 2015 and tasked with undertaking activities that will effectively promote the Universal Acceptance of all valid domain names and email addresses. The group is made up of more than 500 individuals from different companies, governments and community groups. The UASG receives significant financial and administrative support from ICANN. For more information, visit https://uasg.tech/.

About

Thai Network Information Center (THNIC) Foundation is a not-for-profit organization which focuses on developing Internet usage and infrastructure in Thailand. The THNIC Foundation was established in 2007 with a mission of promoting the usage of .th and .ไทย (dot Thai) domain names, as well as encouraging studies, research and development to increase knowledge of Internet technology. Another noteworthy mission is to push forward the development of Thai Internet infrastructure, including but not limited to the areas of technological knowledge, Internet speed and value.