Work Item: UA Readiness Evaluation of Programming Languages and Development Frameworks – Phase 3

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Purpose

For pursuing its chartered mission, the Technology Working Group has set its focus on addressing UA readiness issues with programming languages and software development frameworks. Given the vastness, diversity and complexity of platforms, we aim to address the UA readiness issues in an incremental manner. The main objective of Phase 3 is to test and evaluate the remaining identified/selected programming language technologies and development frameworks for UA readiness, especially on mobile platform.

Description of Work

The work builds on testing of programming languages and frameworks done in phase 1 in UASG018 and phase 2 in UASG018A to check how effectively they support Universal Acceptance of domain names and email addresses. This includes checking if they appropriately support input, validation, storage, processing and display of all domain names and email addresses. The current study aims to test and evaluate the UA readiness of additional programming language and software development frameworks in the same context.

This includes the functionality for handling all aspects of UA as discussed in UASG026, covering the variety of test domain names, internationalized domain names (IDNs) and internationalized email addresses (EAI) in UASG004. The testing should also cover basic Unicode processing, including normalization to NFC form for IDNs, compatibility to the latest IDNA2008 standard, and support of both A-labels in ASCII and U-labels in UTF-8 format. The testing should also cover URL resolution and email addresses, including the Email Address Internationalization (EAI) support with mailbox in UTF-8 format.

1. As a first step, the new version of UASG004 should be reviewed to select the domain names and email addresses to be used for testing. At least 10 email addresses should be included in the proposal, based on covering the variety of issues to be covered and a sample of different scripts.
2. In addition, the test cases developed earlier should be reviewed and updated.

The updated test cases and testing plan will be reviewed by the community before testing.

The testing, using the updated test plan, should be done for the various programming languages and mobile development platforms identified below.

3. All basic functions relevant to UA should be tested, including support for Unicode and IDNs
   a. normalization of Unicode strings (to NFC form)
   b. implementation of conversions between U-labels and A-labels

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c. compatibility to IDNA2008 instead of IDNA2003
d. checking validity of top-level domains and complete domains (using IDNA2008 and through resolving the domain names)
e. others relevant

4. The following list of libraries/frameworks should be tested.

	Platform	Framework Name	Category	Programming Language
1	Android	Fuel	http	Kotlin
2	Android	okhttp	http	Java/Kotlin
3	Android	Volley	http	Java
4	Android	HttpURLConnection	http	Java
5	Android	Apache	http	Java
6	Android	Retrofit	http	Java
7	Android	android-mail	email	Java/Kotlin
8	Android	UI (Intent)	email	Java/Kotlin
9	iOS	URLSession and related	http	Swift/Objective-C
10	iOS	AlamoFire	http	Swift/Objective-C
11	iOS	MessageUI	email	Swift/Objective-C
12	Linux		http, email and others relevant	PHP
13	Windows		http, email and others relevant	PHP

The proposals should include these, and any additional libraries and frameworks used in the platforms listed.

5. Following the testing, complete functioning code for correctly supporting UA, including EAI should also be proposed for the following. This is intended to be posted for use of developers and used in training for these platforms.
    i.   Android – Java/Kotlin
    ii. iOS - Swift/Objective-C
    iii. PHP

Deliverables

The work will have the following deliverables:

1. Draft revised/updated test case suite for testing UA readiness of programming languages (spreadsheet with test cases) for review
2. Final revised/updated test case suite for testing UA readiness of programming languages (spreadsheet with test cases) after review

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3. Draft report on UA readiness of programming languages, including the following
    a. Selection of languages and platforms tested
    b. UA readiness of these languages, covering Unicode processing, IDNs and EAI support, as listed above
    c. Summary information
    d. Code for correctly supporting UA on Android, iOS and PHP, as listed
4. Presentation (using UASG PowerPoint template provided) covering the contents of the report, with explanation of the sample code

Timeline

What should be the preferred starting date and ending date of the work item. This period should be within a financial year. This will be used as part of the contract.
1. Tentative start date: As suggested here.
2. Tentative end date: 3 months from start date of the contract.

History (if any)

This work builds on UASG018 and UAS018A and details published at https://uasg.tech/software.

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