The IDN Variant TLD Program:
Proposed Project Plans
4 May 2012

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Project Background

On 20 April 2011, ICANN announced the IDN Variant Issues Project to facilitate the development of workable approaches to the deployment of IDN TLDs containing variant characters. This project was initiated by a decision of the ICANN Board of Directors in 2010. The Board directed ICANN to develop an issues report identifying what needs to be done with the evaluation, possible delegation, allocation and operation of IDN variant TLDs.

Phase I of the project involved the formation of six case study teams for the Arabic, Chinese, Cyrillic, Devanagari, Greek and Latin scripts. These teams were comprised of community experts that worked with support from ICANN on identifying issues related to IDN variant TLDs for each particular script, resulting in the publication in October 2011 of six individual reports detailing their findings.

Phase II of the project focused on integrating those six case study reports into the Integrated Issues Report. To complete this phase, ICANN formed a coordination team comprised of experts from each of the case study teams. The coordination team advised ICANN on completing the Integrated Issues Report, which summarizes and categorizes the various issues related to the identification and management of IDN variant TLDs.

On 23 December 2011, ICANN published for public comment the draft Integrated Issues Report. Following the public comment period, ICANN published a Summary and Analysis of comments received and considered this input in producing the final Integrated Issues Report.

ICANN is now at a decision point in considering next steps to build on this work.

The IDN Variant TLD Program

The IDN Variant TLD program includes a number of activities resulting from the issues identified in the final Integrated Issues Report. The work is now focused on using the approach outlined in the Integrated Issues Report to define milestones that must be completed to manage the implementation of IDN variant TLDs.

The goal of the program is to define the necessary processes that must be in place to enable the management of variant TLDs. This incorporates the creation and maintenance of IDN tables for the root zone, and updating operational processes as appropriate to allow for the implementation of the IDN variant TLDs.

Revised Program Plan, Projects and Timeline:

An initial project plan describing a set of additional projects was published for public comment on 20 February 2012, and ICANN held a public session during the meeting in Costa Rica in March 2012 to discuss the plan. Feedback received expressed concern about the length of time to implement that version of the plan, and the priorities given to some of the projects in the plan.

ICANN has reorganized the proposed project plan based on community feedback, as described in this section.

With the reorganization of the project plan, resources can be focused on the processes for creating and maintaining IDN Tables for the root, which are on the critical path to a variant management process for the root zone. The revised IDN Variant TLD Program plan gives priority to the following (re-named) projects:

- IDN Table Format. This will develop a standard tool specification for listing allowed code points and their corresponding variant code points, if any, for a domain name registry. (Project 1 in the included graphic and description.)

- IDN Table Creation and Maintenance Process for the Root. This will develop, in consultation with the community, the process to define allowed code points, corresponding variant code points, and related allowed states for IDN Variant TLDs. (Project 2.1 in the included graphic and description.) Follow-on work (project 2.2) will focus on using this process to populate the tables for the root.

- User Experience with active Variants. This will study the possible user experience implications of activating two or more IDN variant TLDs. (Project 6 in the included graphic and description.)

These projects will require substantial community input and work, supported by ICANN staff members and consultants. By completing these three projects, the community will have worked through the processes that must be clearly defined before implementing any types of IDN variant TLDs.

It is anticipated that these three projects can be completed during the FY13 fiscal year, and subsequent projects that might lead to the delegation of IDN variant TLDs during FY13.

On completion of the above three projects, it is anticipated that ICANN Board approval will be sought for the follow-on projects:

- Implementation of Root IDN Tables Process (Project 2.2 in the included graphic and description.) This will implement the IDN Table Creation and

Maintenance Process for the Root to be developed in project 2.1 (i.e., IDN tables for the root can be populated).

- Updates to ICANN's gTLD and ccTLD Programs (Project 7 in the included graphic and description.) This will implement changes needed as a result of the implementation of the Root IDN Table Process (projects 2.1 and 2.2).

- Updates to ICANN Operations (Project 8 in the included graphic and description.) This will implement the changes needed in ICANN operational processes as a result of the implementation of Root IDN Table Process (projects 2.1 and 2.2).

The projects that appeared in the previous draft of the project plan, and have been re-prioritized, are:

- Whole-String Variants Feasibility Study (project 3). This has been removed based on community feedback that the Integrated Issues report had clearly highlighted the difficulties involved in whole-string variants and did not make a compelling case for implementing variant TLDs of this type. See Integrated Issues Report section 3.5 Whole-String Issues.

- Mirroring Variants Feasibility Study (project 5). This has been removed based on community feedback, including technical feedback, that the Integrated Issues Report presented enough data to show that mirroring variants is not feasible with the currently available technology. See Integrated Issues Report sections 1.2 Variants and the Current Environment, and 5.2 User Experience with Variant Labels.

The project removed from the umbrella of the IDN Variant Program is:

- Visual Similarity Process Enhancement (project 4). While this work should occur, this project has been moved to take place outside the scope of the IDN Variant TLD projects. Improvement to the string similarity review processes will support multiple ICANN initiatives, and the applicability is not limited to IDN variant issues.

The re-prioritization of these projects is described in detail in the section entitled "Re-prioritized/Relocated projects" below.

The projects outlined in this revised program plan follow the approach presented in section 7 of the final Integrated Issues Report[1], and take into account feedback from the

[1] http://www.icann.org/en/topics/idn/idn-vip-integrated-issues-final-clean-20feb12-en.pdf

community to prioritize the next steps. This revised plan outlines projects to be completed, along with estimated resources needed to complete them.

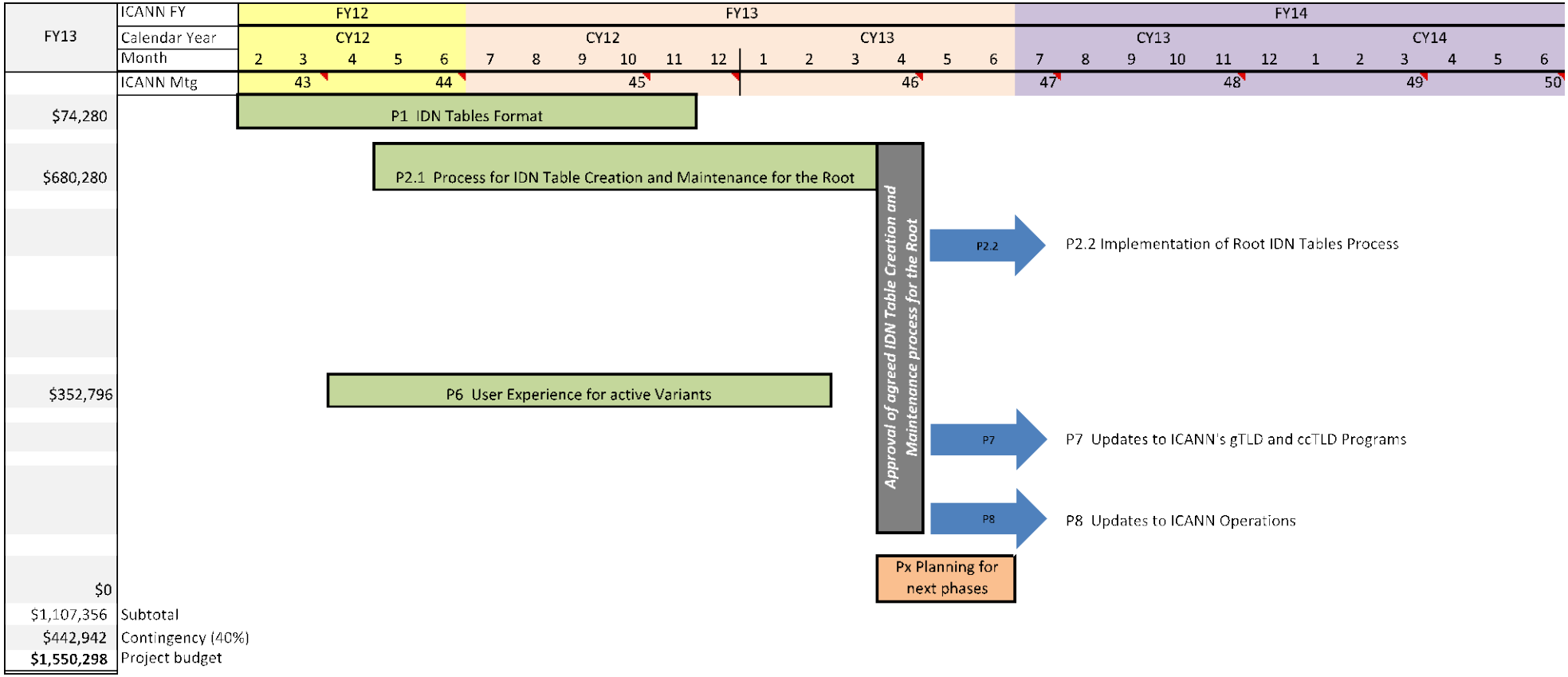
The plan allows for the use of resources already dedicated to the IDN Variant Issues Project to cover the costs associated with projects scheduled to start in the current fiscal year (FY2012 – to end in June 2012). The proposed ICANN budget framework for FY13[2] envisions funding for all of these projects, but, in addition, ICANN will also seek partners in the community that may be willing to contribute resources towards completing the work.

This plan describes projects that must be completed in order to implement IDN variant TLDs. A basic assumption is that no variant TLDs can actually be implemented until the necessary community work on the code point repertoire and label generation processes for the root has been finalized.

The diagram below summarizes the project timelines, including an overall program management effort.

[2] http://www.icann.org/en/planning/ops-budget-framework-fy2013-en.pdf

Timeline of Proposed IDN TLD Variants Program Plan



Below is a description of projects identified for next steps, along with the proposed schedule and the estimated resources required to complete them.

Project 1. IDN Tables Format

Description: Develop a standard tool specification for listing allowed code points and their corresponding variant code points, if any, for a domain name registry. See Integrated Issues Report section 7.1 Label Generation Ruleset tool.

Rationale: Based on discussions during the development of the Integrated Issues Report, it became apparent that there is a need to use a tool to machine-generate sets of variant labels in accordance with formal label generation rules. Currently, different registries use different formats for describing their variant tables.

The community would benefit from the standardization of a table format that would allow software implementers to easily and predictably generate variant labels. Such a table format should be developed with input from potential implementers (registries) and other interested parties, possibly through a technical standards body such as the IETF. In conjunction with this work, ICANN could facilitate a reference implementation of software that demonstrates how the table format could be utilized. Such work could be used internally within ICANN for its processes when handling IDN variant TLDs in the root zone.

It should be noted that this project is independent of the decision to implement any type of variant TLD in the root. The IDN Table format is expected to be useful for any registry implementing variant labels at any level in the DNS tree, and therefore is not specific to variant labels in the DNS root zone. It would also be useful to standardize the tables maintained in the IDN Practices Repository on the IANA website.

Schedule: Started in February 2012, estimated 10-month duration.

Budget: $74K FY13 (consultants and travel cost)
Budget plan includes one ICANN staff member attending four international meetings including IETF, regional ccTLD and similar meetings to consult with the community on the proposed IDN Table Format specification.

Plan also includes retaining one consultant with expertise in IETF standardization. Consultant would travel to IETF meetings to shepherd creating a technical specification through consensus building in the community. Primary skills for consultant are IETF standardization process, consensus building within TLDs and familiarity with IDNs, and IDNA specifications.

Resources: ICANN Staff (0.2 FTE), Consultants (1)

Project 2. Label Generation Ruleset (LGR) Process for the Root Zone

Project 2 consists of two parts:

Project 2.1: Developing the IDN Table Creation and Maintenance Process for the Root:

Description: This project will develop, in consultation with the community, a proposed approach to defining allowed code points, corresponding variants, and related allowed states for labels in the root zone. A number of approaches to developing this process have been discussed at length in the Integrated Issues Report. Section 4 of the report describes the need to define items such as: the comprehensiveness of the Label Generation Ruleset; the potential need for expert oversight and decision on the IDN top-level tables submitted to ICANN; whether code points can be included in any table independent of their Unicode script property; whether it should be language, script, or other criteria to define the communities that would develop the IDN tables, and other issues.

It should be noted that the definitions described above cannot be written solely on the basis of a single language, script, or other community. The definitions must be written in a comprehensive way with participation from experts and different communities so that the root zone, as a shared resource, is supported by an approach that is workable for its multiple user communities.

In summary, this project will build a common set of rules that can be used in the root to consider the IDN top-level tables submitted from specific communities.

Rationale: The community needs to discuss and agree on a set of commonly applicable rules, for creating and maintaining IDN Tables for the root. From a security and operational point of view, it seems necessary to have common rules that can be applied to all entries in the root.

Schedule: Start in May 2012, estimated 10-month duration.

Budget: $680K FY13 (consultants and travel cost)
The budget plan includes recruiting and building a team of volunteers representing the diverse ICANN community and with expertise in IDNA, linguistics and policy. The volunteer team and staff will hold two meetings to carry out the work of the project. One of these meetings will be at a regular ICANN meeting, while the other will be specially organized for this purpose.

The budget plan also includes hiring consultants with subject matter expertise in IDNA, policy, and linguistics.

Resources: ICANN Staff (1.5 FTE), Consultants (4 – one shared with project 6), Travel Support for (10) Volunteers

Project 2.2: Implementation of the Root IDN Tables Processes

Description: Depending on the outcome of the project to develop the IDN Table Creation and Maintenance process for the Root (P2.1), the approach to the implementation could range from keeping the status quo (the ad-hoc incremental approach as in the IDN ccTLD Fast Track Program) to establishing a comprehensive Label Generation Ruleset to be used in the root.

Rationale: This will complete the work by implementing the process developed in project 2.1.

Since Project 2.2 depends on the outcome of Project 2.1, the level of effort required is still uncertain, and it is difficult to estimate the budget required. Nevertheless, on the assumption that it is desirable to ensure broad community agreement on the code point repertoire and Label Generation Ruleset for the root, it is anticipated that substantial coordination effort will be required. We anticipate this project will be executed in FY14.

Project 6. Examining the User Experience Implications of Active Variant TLDs

Description: The project will study the user experience implications when two or more IDN variant TLDs are activated (i.e., have resource records in the DNS).

In accordance with ICANN's mission and core values, any variant TLDs must be activated in the DNS in a manner that maintains the security and stability of the DNS and promotes a good user experience.

In order to achieve these broad policy goals, a set of questions related to user experience needs to be answered. These include:

- What are the components of an acceptable user experience for variant TLDs?
- What are the necessary rules or guidelines a TLD should operate under in order to provide an acceptable user experience for variants?
- What are the policy / contractual considerations that will make these rules effective?
- How does the impact of variant TLDs on applications affect user experience?
- What other entities have a critical role to play in addressing these issues and what educational or consultative steps could be implemented to generate support and collaboration by these parties?

To answer these questions, this study will consider the different user roles identified in the Integrated Issues Report (e.g. end-user, registrant, registrar, registry, system administrator, network operator), and the impacts to these users, should variant TLDs be activated. The study will also attempt to define requirements for an acceptable user experience for the various user roles, and analyze the risks if these requirements are not met.

The study findings are expected to support two important outcomes:

1. Recommended rules or guidelines a TLD should operate under to provide an acceptable user experience with regard to variant TLDs, including appropriate policy or contractual provisions to make these rules effective.
2. Creation of a useful reference for educating application developers and others affected by these changes.

Rationale:

Should ICANN activate variant TLDs in the root, many parts of the Internet ecosystem will be affected, with corresponding impacts on the user experience. Examples of user roles that have been identified previously include registrants, registrars, registry operators, system administrators, network operators, application developers, and end users. As the coordination body for the DNS, ICANN has a responsibility to investigate possible impacts of new developments, and to proactively identify and publicize potential issues. Implementation of variant TLDs without adequate consideration of outcomes such as user confusion, inconsistent and error-prone experience, or security risks could lead to significant gaps in the desired results.

The study will consider the user roles identified in the Integrated Issues Report, and the impacts to these users should variant TLDs be activated. Based on the study findings, a definition for a good user experience can be specified and subsequently used as a means for discussing, considering, and assessing performance. Based on the factors identified in the study, additional steps may be recommended to support a good user experience with regard to variant TLDs. To the best of our knowledge, bits and pieces of this information are available, but no systematic study has been done in this area, so the proposed work fills this gap.

Registry and registrar policies play an important role in shaping the user experience. Given the need for a cautious approach in the early stages, operators of variant TLDs may be subject to a more stringent set of requirements to minimize the possibility of user confusion or inconsistent user experience. In this regard, the study will identify a set of factors for acceptable user experiences, some of which could mapped into requirements to be written into contracts where possible, others could be turned into best practices or guidelines for registries.

It should be noted that ICANN has no direct control or influence over many issues that the study may identify. For example: system administrators' need for automated tools to configure web and email servers; applications not able to handle variants. In these areas, it is still helpful to raise and communicate these issues to the relevant affected communities. This could also help the communities interested in the implementation of variant TLDs to focus their efforts in improving the user experience.

Last but not least, the root is a special shared resource by all user communities. Policies and best practices set at the root level should be fair, consistent and conservative. Such policies could influence TLD and SLD policies. This study will contribute to this overall policy goal.

Schedule: Start in April 2012, estimated 8-month duration.

Budget: $353K FY13 (consultants and travel cost)

The budget plan includes hiring consultants with subject matter expertise in user experience and DNS. Consultants will travel to two international ICANN meetings and one additional meeting to work with ICANN staff.

Resources: ICANN Staff (0.6 FTE), Consultants (4 – one shared with project 2.1)

Project 7. Updates to ICANN's gTLD and ccTLD Programs

Description: Scope of work depends on the outcome of previous projects. This project implements the changes needed as a result of the IDN Table Creation and Maintenance Process for the Root project (2.1). We anticipate this project will be executed in FY14.

Project 8. Updates to ICANN Operations

Description: Scope of work depends on the outcome of the previous projects. This project implements the changes needed in ICANN processes and operation as a result of the IDN Table Creation and Maintenance Process for the Root project (2.1). We anticipate this project will be executed in FY14.

IDN Variant TLD Program Planning for Next Phases

This effort has been set up to plan for IDN Variant TLD projects for the next phase and includes the following activities:

- Project planning for Project 2.2
- Project planning for Project 7
- Project planning for Project 8

As these activities are covered with existing staff resources, there is no budget amount specified.

Budget Contingency

Due to the nature and scope of the program, it is deemed likely that ICANN will implement additional project activities or secure additional expertise. To bring the plan for delegating variant TLDs to closure, these activities should be undertaken as soon as possible, during the upcoming fiscal year. Because these additional tasks will not be determined until much of the program work is completed, it would be speculative to predict and budget for specific tasks at this time. Accordingly, an extra 40% of the program budget is being established for contingency purposes, to be spent at the project team's direction as necessary work is identified.

While at this point is difficult to identify the tasks or expenditures that could be needed, these could include activities such as: running registry operations simulations, soliciting user opinions and experiences, starting subsequent project phases to accelerate delegations; extending a project if more complex issues arise.

ICANN's goal is to provide a plan and budget as precisely as possible. Providing a relatively large contingency, rather than budgeting for a number of projects that might not be necessary, is more conservative and appropriate in this situation.

The IDN Variant TLD program deals with complex issues whose outcomes are not easy to foresee. Therefore, this contingency fund is proposed to address uncertainties as we move forward with the program.

Budget: $443K FY13

Re-prioritized/Relocated Projects:

As described above, this project plan has been revised based on community feedback on the previous draft. These changes are described in this section.

This revised plan has re-prioritized two projects: (i) Whole-String Variants Feasibility Study and (ii) Mirroring Variants Feasibility Study. Separately from the IDN variant TLD program, a new project has been established to enhance the Visual Similarity Process. Improvement to the Visual Similarity Process will help ICANN multiple initiatives; however its outcome is not dependent on the IDN Variant TLD Program.

Mirroring Variants Feasibility Study:

One potential treatment of variants is mirroring, whereby two or more labels use some DNS technology (currently a choice between CNAME and DNAME DNS aliasing records) to ensure they provide the same result in the Domain Name System. (Section 4.1 of the Integrated Issues Report discussed the current limitations of this approach). Due to the distributed nature of the DNS, using these approaches is a complex challenge, as it is difficult to ensure consistency (both vertically and horizontally) throughout the DNS tree. A study was proposed to establish whether it is technically feasible to implement mirroring. Community feedback, including technical feedback, suggested that the final Integrated Issues Report presented enough data to show that mirroring variants is not feasible with the currently available DNS technology.

As noted previously, even if the DNS issues could be solved, application protocols that use the DNS (e.g., the Web, e-mail) would not know of this special relationship between the names, making them fail to deliver the expected result. It also appears challenging to ensure appropriate software support for products which rely on the DNS but do not have proper understanding of the many-to-one domain name relationship that mirroring creates. In addition, it seems mirroring requires a number of actors (some of which are not in direct relation with the registrant/registrar/registry) to act appropriately and with knowledge of the variant relation of the names to obtain the expected result.

For these reasons it is being proposed to not do the feasibility study on mirroring variants and not to implement the mirroring state for IDN variant TLDs at this point.

Whole-String Variants Feasibility Study:

While much of the focus of the final Integrated Issues Report was on character-level variants, one of the case studies discussed the inclusion of whole-string variant TLDs in the root. However, the final Integrated Issues Report identified significant challenges with whole-string variants.

A study was proposed to assess the feasibility of delegating whole-string variant TLDs. Community feedback suggested that the Integrated Issues report already highlighted the difficulties involved in implementing whole-string variants and did not make a compelling case for implementing whole-string variants.

ICANN recognizes that whole string variants may be of concern to some communities, and may re-visit this project if techniques for reliably and unambiguously handling such whole string variants are identified.

For these reasons it is being proposed to not do the feasibility study on whole-string variants and not to implement them for IDN variant TLDs at this point.

Visual Similarity Process Enhancement:

During the discussions in the development of the final Integrated Issues Report, a number of the case study teams suggested ways to improve the visual similarity processes. In SAC 052, SSAC also pointed out that further review and modifications of the String Similarity Review processes are required to reduce ambiguity and increase consistency in the processes.

Given the size and importance of the visual similarity processes, it is believed that this work should be considered independent of the IDN variant TLD issues, and executed as its own project. The main goal of this project will be to develop an enhanced visual similarity process for the root that is as predictable and repeatable as possible.