5.2 Pre-Delegation Testing and Transition to IANA

5.2.1 Introduction

Pre-Delegation Testing (PDT) was a technical test required of applicants who had executed an RA with ICANN before delegation of the TLD into the root zone. PDT allowed the applicant to demonstrate that they could operate the TLD in a stable and secure manner.

Transition to IANA referred to the process steps by which ICANN recommended to IANA the delegation of the applied-for TLD. This section of the Program Implementation Review report discusses the following aspects of the PDT and Transition to IANA processes:

- PDT Requirements Development and Service Delivery
- Transition to IANA Process

5.2.2 Relevant Guidance

The following guidance is relevant to the topic of Pre-Delegation Testing and Transition to IANA and will be discussed in further detail in Sections 5.2.3 and 5.2.4 of this report:

- GNSO Principle D: "A set of technical criteria must be used for assessing a new gTLD registry applicant to minimise the risk of harming the operational stability, security and global interoperability of the Internet."[310]
- GNSO Principle E: "A set of capability criteria for a new gTLD registry applicant must be used to provide an assurance that an applicant has the capability to meets its obligations under the terms of ICANN's registry agreement."
- GNSO Recommendation 4: "Strings must not cause any technical instability."
- GNSO Recommendation 7: "Applicants must be able to demonstrate their technical capability to run a registry operation for the purpose that the applicant sets out."
- GNSO Recommendation 9: "There must be a clear and pre-published application process using objective and measurable criteria."
- GNSO Recommendation 18: "If an applicant offers an IDN service, then ICANN's IDN guidelines must be followed."
- GNSO Implementation Guideline I: "An applicant granted a TLD string must use it within a fixed timeframe which will be specified in the application process."
- Applicant Guidebook, Section 5.2: Pre-Delegation Testing[311]

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[310] ICANN. (8 August 2007) ICANN Generic Names Supporting Organization Final Report Introduction of New Generic Top-Level Domains, Part A. Retrieved from http://gnso.icann.org/en/issues/new-gtlds/pdp-dec05-fr-parta-08aug07.htm
[311] ICANN. (4 June 2012) gTLD Applicant Guidebook Version 2012-06-04. Retrieved from http://newgtlds.icann.org/en/applicants/agb/guidebook-full-04jun12-en.pdf

- Applicant Guidebook, Sections 5.3: Delegation Process
- Registry Agreement Specifications 2, 4, 6, and 10; Exhibit A[312]

5.2.3 Background

Section 5.2 of the AGB stated that "the purpose of the pre-delegation technical test is to verify that the applicant has met its commitment to establish registry operations in accordance with the technical and operational criteria described in Module 2." Further, that "the test [was] also intended to indicate that the applicant [could] operate the gTLD in a stable and secure manner." To this end, the AGB provided high-level testing requirements for DNS Infrastructure (e.g., UDP, TCP Support) and Registry Systems (e.g., System Performance, Whois Support). In addition, the AGB specified some tests, such as load testing, be performed by the registry itself, rather than ICANN, and that the registry would submit self-certification documentation showing that the test was performed and how it was performed.

To administer the testing process, ICANN issued a Request for Proposal (RFP) and selected the vendor Stiftelsen för Internetinfrastruktur (IIS) in 2012.[313] IIS is the registry operator for the .SE ccTLD (Sweden) and was selected based on criteria in the RFP.[314]

On 28 February 2013, ICANN requested volunteers for a PDT Pilot project, which would serve as a learning period for both ICANN and the PDT Provider ahead of PDT production.[315] In implementing the Pilot Project, ICANN and the PDT provider sought to verify the operational process, systems, specifications and criteria of the test. Twelve applicants, each supported by a different technical back-end provider, participated in the Pilot Project. The findings from the pilot were shared with the community during the ICANN46 Meeting in Beijing, China. Following the pilot, a beta testing period was offered, geared toward helping applicants prepare for PDT. Specifically, beta testing sought to expose more participants to the full suite of tests that were to be conducted during the official PDT phase of the Program and to reveal any requirements that may have required adjustment in testing approach or criteria. Eligible applicants were not able to move forward with Contracting and subsequently PDT until the finalization of the Registry Agreement on 02 July 2013 (see Section 5.1: Contracting of this report). While anticipating the final RA, beta testing allowed applicants to prepare and learn about PDT before PDT production operations.

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[312] ICANN. Registry Agreement. Retrieved from
http://newgtlds.icann.org/en/applicants/agb/agreement-approved-09jan14-en.pdf
[313] ICANN. Request for Proposal: Pre-Delegation Testing Provider for the New gTLD Program. Retrieved from
https://www.icann.org/en/system/files/files/pre-delegation-testing-30oct12-en.pdf
[314] ICANN. (21 December 2012) Announcement: Pre-Delegation Testing Services for the New gTLD Program –Selection of Provider. Retrieved from https://www.icann.org/news/announcement-2012-12-21-en
[315] ICANN. Announcement: Participants Needed for New gTLD Pre-Delegation Testing Pilot. Retrieved from
http://newgtlds.icann.org/en/announcements-and-media/announcement-28feb13-en

The timeline to PDT production operations is illustrated in Figure 5.2.i:

Figure 5.2.i: PDT Timeline
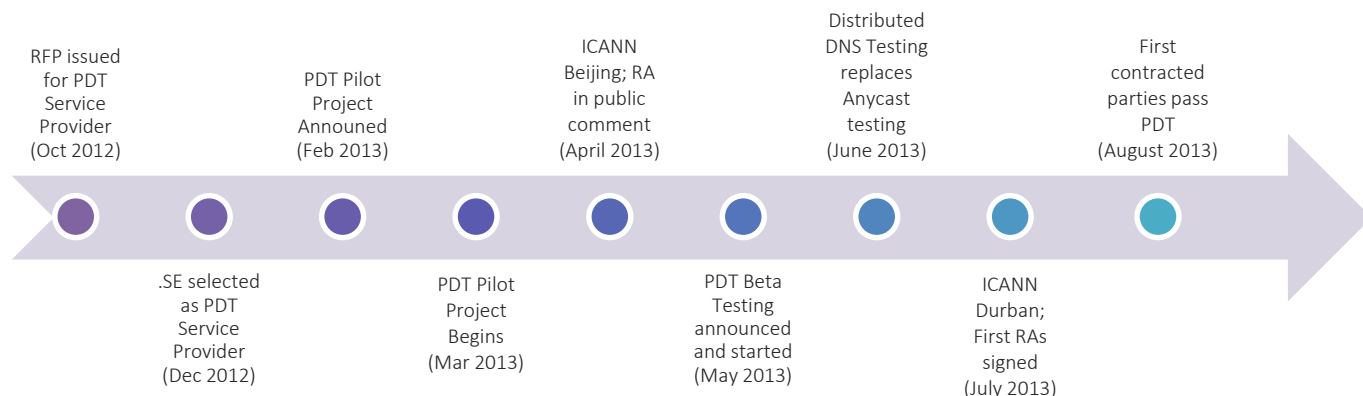
Throughout the process, ICANN and the PDT provider continued to make updates and improvements to PDT Testing Specifications, input requirements, and FAQs.[316]

Following PDT, applicants moved to the "Transition to IANA" phase, which was a quality assurance and hand-off process that occurred before ICANN recommended the TLD to IANA for delegation into the root zone. The Transition to IANA process confirmed that the application had successfully completed all of the required Program steps and ensured that any exceptions were documented in a final report. Part of the Transition to IANA process included onboarding, where the applicant provided contact and technical information to establish an account as a registry operator with ICANN, as well as the issuing of a "token," with which the applicant was able to access IANA's Root Zone Management (RZM) system and initiate the delegation process.[317]

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[316] ICANN. (19 March 2015) PDT Resource Update, Pre-Delegation Test Preparation Resources. Retrieved from http://newgtlds.icann.org/en/applicants/pdt#resources
[317] IANA. Root Zone Management. Retrieved from https://www.iana.org/domains/root

Figure 5.2.ii is a general overview of the process from Contracting to Delegation, including the PDT and Transition to IANA processes:

Figure 5.2.ii: Overview of Post-Contracting Processes
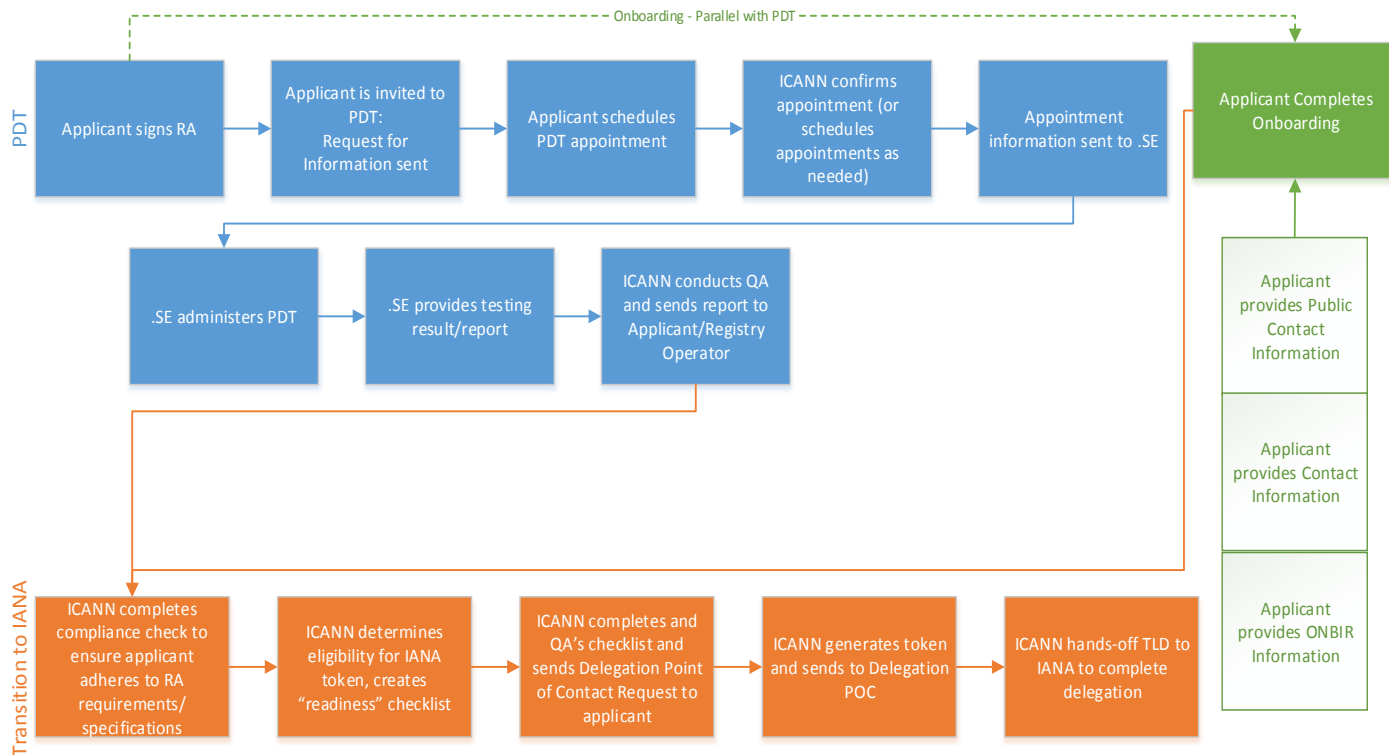
5.2.4 Assessment

5.2.4.1 PDT REQUIREMENTS DEVELOPMENT AND SERVICE DELIVERY

Section 5.2 of the AGB provided the high-level testing requirements for PDT, which "cover both the DNS server operational infrastructure and registry system operations. In many cases the applicant will perform the test elements as instructed and provide documentation of the results to ICANN to demonstrate satisfactory performance."

For implementation, ICANN issued an RFP for a PDT service provider that could administer as well as design the testing of these requirements. Specifically, the RFP required the vendor to design and develop the testing specifications, the software to perform the testing, the processes to deliver the service and the system to manage the service delivery.[318] It was also important that a potential PDT provider could scale to meet the demands of the Program. Although the AGB did not specify an

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[318] ICANN. Request for Proposal: Pre-Delegation Testing Provider for the new gTLD program, page 1. Retrieved from https://www.icann.org/en/system/files/files/pre-delegation-testing-30oct12-en.pdf

exact number of tests to be conducted on a weekly basis, ICANN established a baseline of 20 tests per week, which corresponded to the metering requirement of 1,000 delegations per year (i.e., 1,000 delegations/year divided by approximately 50 weeks/year = 20 tests/week).[319],[320] The PDT provider also had to be able to ramp up to 100/week if needed, should some weeks see fewer than 20 tests and "catch-up" be desired.[321]

Following the RFP process in October-November 2012, IIS was selected as the PDT service provider in December 2012, as noted in the Background section of this report. By late February 2013, the Pilot Project had been announced and the PDT Documentation Instructions had been posted on the PDT microsite.[322] Together with IIS and technical consultants Kirei,[323] ICANN vetted the testing requirements and specifications before publishing in late March 2013. By posting the test requirements, ICANN helped ensure transparency and consistency. Further, ICANN implemented both a pilot and a beta testing period, which allowed ICANN and the PDT provider to help ensure that applicants were well-prepared for PDT.

The pilot and beta projects also contributed to an "evolution" of the PDT process to a more "interoperable" and service-oriented approach. Although the AGB provides for PDT to be structured in the format of asking questions and requesting clarification of any issues, it became apparent during the beta testing period that a more "interoperable" type of experience would be more beneficial. Rather than focus on the applicant providing responses to a test and the PDT provider "grading" the test as "Pass/Fail," both the community and the PDT provider provided feedback that a more useful type of experience would be one where the applicant could work with the PDT provider regarding any issues encountered throughout the testing process.

To facilitate this change, the PDT provider made necessary enhancements to the PDT system (e.g., allowing for the threading of messages and communications between the PDT provider and the applicant) as well as allowed for extensions of tests. In the beginning of beta testing, many applicants needed longer than the two weeks prescribed by ICANN. By the time PDT was in the production phase, after these enhancements had been made and applicants were able to learn from their interactions with the PDT provider during beta testing, most applicants were able to meet the two-week timeframe to complete PDT. Finally, over the course of beta testing, and as a result of ongoing community feedback, the anycast instance testing approach was replaced by Distributed DNS Testing, which only assessed the prospective registries' public-facing DNS service.[324]

[319] ICANN. Announcement: Roadmap for Processing New gTLD Applications. Retrieved from
http://newgtlds.icann.org/en/announcements-and-media/announcement-17aug12-en
[320] ICANN. Announcement: ICANN Seeks Input on GTLD Batching. Retrieved from
http://newgtlds.icann.org/en/announcements-and-media/announcement-29jul12-en
[321] Request for Proposal: Pre-Delegation Testing Provider for the new gTLD program, page 12. Retrieved from
https://www.icann.org/en/system/files/files/pre-delegation-testing-30oct12-en.pdf
[322] ICANN. (19 March 2015) Pre-Delegation Testing News and Views. Retrieved from
http://newgtlds.icann.org/en/applicants/pdt#resources
[323] Kirei. Retrieved from https://www.kirei.se/en/webusaito/about/
[324] For more information regarding this change, please see the announcement here:
http://newgtlds.icann.org/en/announcements-and-media/announcement-2-06jun13-en

All of these changes together led to a PDT production service model that worked more smoothly for both applicants and ICANN/the PDT service provider than the model used during the beta period. Applicants were both well-prepared by the beta testing as well as able to contribute feedback, leading to a testing experience that allowed applicants to demonstrate their ability to meet the DNS Infrastructure and Registry Operations requirements in the AGB. Lastly, continuous improvement extended beyond beta testing, as test requirements and specifications were periodically updated to improve clarity and ensure secure and stable delegation of all TLDs.[325]

From the experience of developing the PDT requirements and service delivery, ICANN has identified several lessons learned:

■ Review the requirements for self-certifying tests and the effectiveness of each. For example, is Service Level Agreement (SLA) monitoring/testing most effective as a self-certifying test, or should these be converted to operational type tests?

■ Reviewing PDT as a whole to determine what optimizations can be made with regard to effectiveness of the tests. Many in the community have expressed that it is inefficient to test every TLD. Consideration should be given as to which tests could be performed once per technical infrastructure implementation, and which tests should be performed for each TLD.

■ Building on lesson learned 2.8.c, in the development of evaluation criteria and procedures for IDNs, ICANN recommends that the review of IDN tables during PDT be limited to confirmation of compliance with the TLD's stated IDN policy.

5.2.4.3 TRANSITION PROCESS

Following PDT, applicants entered the "Transition to IANA" process, which was the final "hand-off" of the TLD to the IANA department, wherein ICANN officially recommended delegation of a TLD. This transition process was defined in Section 5.3 of the AGB. "Upon notice of successful completion of the ICANN pre-delegation testing, applicants may initiate the process for delegation of the new gTLD into the root zone database. This will include provision of additional information and completion of additional technical steps required for delegation."

ICANN's "hand-off" process before delegation into the root zone was to confirm that the applicant had successfully completed all required Program steps and PDT. In parallel with PDT, the applicant must also have completed Onboarding as indicated in the Graphic 5.2.2.b above. For Onboarding, an applicant was provided a Welcome Kit that explains in detail the requirements for its delegation into the root zone.[326]

In order to help facilitate the movement of applicants through the PDT and Onboarding processes and onto delegation, ICANN set up "post-contracting milestones," which served as intermediary deadlines from the signing of the RA to delegation, as the RA provides 12 months to complete this process.

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[325] The latest updates were made on 22 July 2015. For more information on these updates as well as others, please see the PDT microsite: http://newgtlds.icann.org/en/applicants/pdt
[326] ICANN. (12 June 2014) Webinar: Becoming a New gTLD Registry. Retrieved from https://icann.adobeconnect.com/p2moysmxspv/

Once both PDT and Onboarding were completed, ICANN completed final verification that all information had been received and was accurate, and then provided the applicant a "token" to access IANA's Root Zone Management (RZM) system. From this point, IANA managed the applicant into delegation.

5.2.5 Conclusion

The PDT and Transition to IANA processes were implemented in alignment with the AGB, and in such a way as to support transparency, predictability, and consistency. To this end, the implementation of PDT included a pilot and beta testing intended to provide applicants with a predictable and well designed experience. Updates were made to the process and system based on feedback from the pilot and beta testing project, and continuous improvement occurred throughout this phase of the New gTLD Program to enhance the quality of PDT and the Transition to IANA processes.

There are some valuable lessons learned from the implementation the Transition to Delegation phase that would be useful input to the development of procedures for future rounds. One lesson learned questions the effectiveness and efficiency of testing each TLD, when many TLDs share the same back-end registry services provider. Consideration should be given to whether some tests could be performed once per technical infrastructure implementation, while others are performed for each individual TLD. Another lesson learned is that self-certifying tests may not provide optimal effectiveness, so the community may wish to convert certain tests, such as SLA testing, into operational tests. Finally, the review of IDN tables in this round was performed during PDT, but based on the experience during this round, ICANN recommends that the review parameters be updated to leverage the IDN tools currently under development. Consideration should be given to whether the review of IDN tables during PDT could be limited to confirmation of compliance with the TLD's stated IDN policy.

In summary:

> **5.2.a** Consider which tests should be performed once per technical infrastructure implementation and which should be performed for each TLD

> **5.2.b** Consider which, if any, tests can be converted from self-certifying tests to operational tests

> **5.2.c** In considering an alternate approach to the Technical and Operational Capability evaluation, if an RSP accreditation program is considered, explore how Pre-Delegation Testing would be impacted

> **5.2.d** Building on lesson learned 2.8.c, in the development of evaluation criteria and procedures for IDNs, consider whether review of IDN tables during Pre-Delegation Testing could be limited to confirmation of compliance with the TLD's stated IDN policy