

Pre-Delegation Testing

Master Test Plan

Version C

File name: PDT_MTP.docx

Last saved: 2013-05-03

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Document control

Document information and security

Made by	Responsible for fact	Responsible for document
Rickard Bellgrim	Rickard Bellgrim	Rickard Bellgrim

Security class	File name
External	PDT_MTP.docx

Revisions

Date	Version	Name	Description
2012-12-14	PA1	Jan Säll	Initial document
2013-01-02	PA2	Rickard Bellgrim	Start planning the test cases
2013-01-24	PA3	Rickard Bellgrim	Update text after review
2013-02-06	PA4	Rickard Bellgrim	Update text after meeting with ICANN
2013-03-01	PA5	Rickard Bellgrim	Clarify that IDN tables are only required if the gTLD supports IDN. Each test node is using both IPv4 and IPv6. State that input data is validated against an XML schema and assertions made in the application.
2013-04-08	B	Staffan Hagnell	Delivery D2 for production
2013-05-03	C	Amar Andersson	Released

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1. Introduction

This section gives an introduction to the Pre-Delegation Testing.

1.1 Background

ICANN (Internet Corporation for Assigned Names and Numbers) are now allowing applications for new gTLDs (generic Top-Level Domains). All applicants have to go through the evaluation process. One step in the evaluation process is the Pre-Delegation Testing (PDT).

1.2 Purpose

The purpose of the Pre-Delegation Testing is to verify that the applicant has met its commitment to establish registry operations in accordance with the technical and operational criteria described in the gTLD Applicant Guidebook (AGB). Each applicant will be required to complete Pre-Delegation Testing as a prerequisite to delegation into the root zone.

1.3 Goals

Each of the requirements will be broken down into a set of test procedures. The process of doing this will be done in accordance with the standard IEEE 829-2008.

1.4 Scope

Only the requirements given (and referred to) in the agreement between the Pre-Delegation Testing Provider and ICANN will be used as a foundation for the test cases. The set of testing documents will focus on the actual test cases and procedures rather than the testing system.

1.5 References

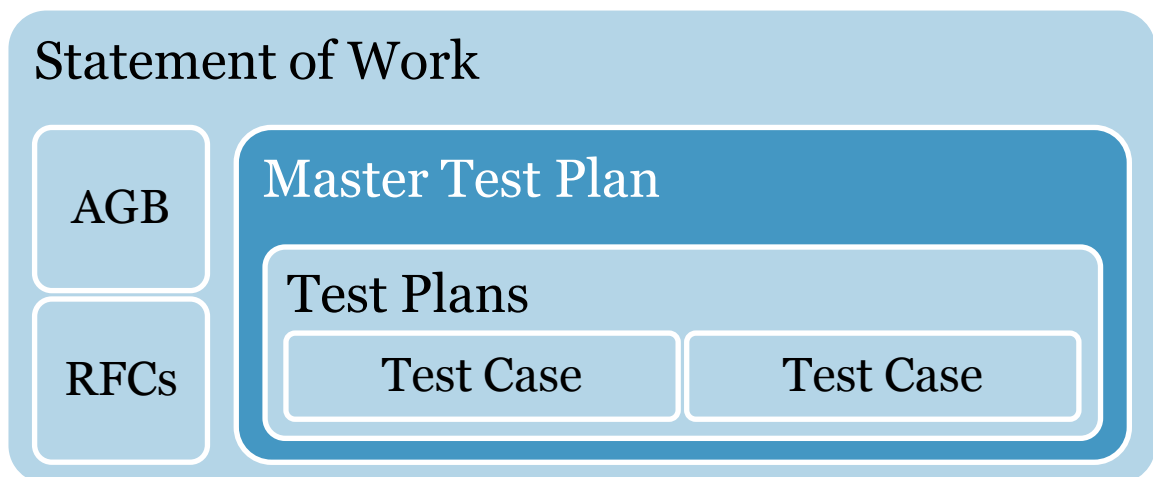
1.5.1 External

- IEEE 829-2008
- ICANN gTLD Applicant Guidebook, Version 2012-06-04

1.5.2 Internal

- Pre-Delegation Testing, Statement of Work
- Pre-Delegation Testing, DNS Test Plan
- Pre-Delegation Testing, Whois Test Plan
- Pre-Delegation Testing, EPP Test Plan
- Pre-Delegation Testing, IDN Test Plan
- Pre-Delegation Testing, Data Escrow Test Plan
- Pre-Delegation Testing, Documentation Test Plan

1.5.3 Document Hierarchy



1.6 System overview and key features

Each applicant for a new gTLD will undergo the Pre-Delegation Testing. The primary purpose is to test the publicly exposed interfaces. This includes:

- Whois
- EPP
- DNS/DNSSEC
- Data Escrow

There is also a set of technical documentation that needs to be reviewed. This set includes:

- DNSSEC Practice Statement (DPS)
- IDN Tables, if supported by the applicant

1.7 Test overview

The test organization, test schedule, integrity level scheme, test resources, responsibilities, tools, techniques, and methods are necessary to perform the testing.

1.7.1 Organization

The tests are executed in the Test System (TS) by the Test Leaders and the Test Officers. Input parameters are collected by the external facing Applicant System (AS) and the results are reported back to the Review System (RS) for further analysis.

A detailed view of the organization can be found in the project plan and its associated documents.

1.7.2 Master test schedule

The Pre-Delegation Testing scheduling is handled by ICANN using the TLD Application System (TAS). The scheduling is delivered as a feed from the TAS database.

Re-execution of individual tests may be scheduled by the test system.

1.7.3 Integrity level schema

An integrity level schema is used for illustrating relative importance of a software component. The effect of a failing component can range from negligible to catastrophic. A component with a high integrity level needs to be tested more thoroughly than a component with a low level. There is, however, no guidance in the requirements that indicate the relative importance of different areas. Each area is thus considered equally important. However, one of the main objectives is to ensure the stability of DNS.

1.7.4 Resources summary

There are two types of resources working with the tests:

- Test Leader – Initiate and coordinate the tests for a single new gTLD.
- Test Officer – The ones performing the tests in each test area.

1.7.5 Responsibilities

The Applicant selects a time slot for when the pre-delegations tests should be performed on their systems and documentation. ICANN then delivers the test schedule to the PDT Provider. Tickets are created and assigned to a Test Leader in the Review System based on the test schedule. The Test Leader will review the task and assign Test Officers for the different test areas. The Test Officers are the ones performing the actual tests.

1.7.6 Tools, techniques, methods, and metrics

The automated and scripted tests are performed in the Test System. The Test System consists of a Test Master and Test Nodes. All of the tests are initiated from the Test Master and can be run on the different

Test Nodes. There is at least one Test Node in each ICANN region using both IPv4 and IPv6: Africa, Asia/Australia/Pacific, Europe, Latin America/Caribbean islands, and North America.

Each test area is automated as much as possible and uses different support tools and scripts. Below is a list of tools used for each test area:

- **DNS** - DNSCheck
- **Whois** - Whois client
- **EPP** - PHP registrar script
- **Data Escrow** - GnuPG

2. Details of the Master Test Plan

The utilization of the IEEE 829-2008 is described in this chapter. There is also a mapping between the test areas and the requirements.

2.1 Test processes

The goal of these documents is to describe the test cases and how the new gTLDs are tested. This is just a part of a larger project where the only goal is to do testing. Processes for Management, Acquisition, Supply, Development, Operation, and Maintenance are not part of this subproject to define.

2.2 Definition of test levels

There can be different types of tests, e.g. unit, system, and acceptance tests. This test environment will only focus on acceptance testing, thus only one test level. Multiple areas have however been identified within the system requirements:

- DNS
- Whois
- EPP
- IDN
- Data Escrow
- Documentation

These areas are defined as horizontal levels within the acceptance test level. The mappings of the requirements to these areas can be found in section 2.6.4.

The test areas On-site Audit and Load Tests are documented separately since they are not part of the default Pre-Delegation Testing. ICANN may request such tests separate to the ordinary test schedule.

2.3 Test documentation requirements

The following documents can be created according to the standard:

- Level Test Plan (LTP)
- Level Test Design (LTD)
- Level Test Case (LTC)
- Level Test Procedure (LTPr)

However, the LTD has been incorporated in the LTP and in the LTC. LTPr has been incorporated in the LTC.

2.3.1 Level Test Plan

The systems will undergo acceptance testing against the requirements. Each area is documented in a separate test plan. The purpose is to map the requirements into test cases and also to describe the approach for testing this level.

In the title of the plan, the word “Level” is replaced by the name for the particular level being documented by the plan. E.g. DNS Test Plan and EPP Test Plan

2.3.2 Level Test Case

The purpose of the LTC is to define the information needed as it pertains to inputs to and outputs from the software or software-based system being tested. The test cases may be documented in a single or multiple LTC depending on the extent of the area. Any procedures are included in the documentation.

In the title of the test case, the word “Level” is replaced by the name for the particular level being documented by the test case. The documents have sub-titles since there can be more than one document within one level. E.g. Whois CLI Test Cases or DNS Delegation Test Cases.

2.4 Test administration requirements

These activities are needed to administer the tests during execution.

2.4.1 Anomaly Resolution

The tests are executed with the input given by the applicant. The input data is validated against the corresponding XML schema and assertions made in the application. However, it can be the case that a test will not run successfully because:

- Wrong input was given by the applicant
- Wrong information was gathered from the application
- The test is not written correctly
- There are issues with the communication between the registry service and test environment

The Test Officer must investigate why the test was not run successfully. In most cases this can be resolved after a clarifying question to the applicant.

2.4.2 Reporting Processes

Each test area is reported separately back to the Review System where the overall assessment is performed.

2.5 Test reporting requirements

The following documents can be created according to the standard:

- Level Test Log (LTL)
- Anomaly Report (AR)
- Level Interim Test Status Report (LITSR)
- Level Test Report (LTR)
- Master Test Report (MTR)

The LITSR has been excluded from this test environment, since there will always be an LTR generated by the system.

2.5.1 Level Test Log

Each automated test will generate a log based on the output from the test script. The format does not follow the IEEE standard, but is intended to be machine readable.

The review of the self-certification and other documents will however comply with the standard.

2.5.2 Anomaly Report

An Anomaly Report is created if the result from the test is not conclusive due to internal or external anomalies. It gives suggestions on how the issue can be resolved, but it needs approval either from the steering committee or ICANN.

2.5.3 Level Test Report

The results from the test areas are reported back to the Review System. It contains a summary of the different tests.

2.5.4 Master Test Report

The Master Test Report is created once all of the test areas have been finalized. It will give the recommendation to ICANN whether the applicant has passed or failed the tests.

2.6 System requirements

The initial requirements are found in the Statement of Work. Some of the requirements are also referring to requirements in the ICANN gTLD Applicant Guide Book and the IANA Technical Requirements.

2.6.1 Statement of Work

The Statement of Work (SOW) clearly marks the requirements with a number. R1 to R8 are requirements on the actual test process. The table below will focus on R9 to R28.

2.6.2 gTLD Applicant Guide Book

Module 5 in the gTLD Applicant Guide Book (AGB) describes the final steps for the applicant before the new gTLD can be delegated. There is a mixture of test areas, as defined in section 2.2, e.g. DNS, document, and performance testing. No clear requirement reference can be used. It is thus up to each test plan to define a requirement that refers to that particular text segment.

2.6.3 IANA Technical Requirements

IANA clearly defines the requirements on authoritative name servers and the DNSSEC trust anchors.

2.6.4 Mapping

This table describes the mapping between the requirements in the Statement of Work and the different test areas.

Req.	DNS	Whois	EPP	IDN	Data Esc.	Doc.
R9						
R10						
R11						
R12						
R13						
R14						
R15						
R16						
R17						
R18						
R19						
R20						
R21						
R22						
R23						
R24						
R25						
R26						
R27						
R28						

3. General

This section contains the glossary and document change procedures for all of the test plans and test cases.

3.1 Glossary

Word / Acronym	Explanation
AGB	Applicant Guidebook
Applicant	The organization applying for a domain and approved by ICANN
AR	Anomaly Report
DNS	Domain Name System
DNSSEC	DNS Security Extensions
EPP	Extensible Provisioning Protocol
IDN	Internationalized Domain Name
LTC	Level Test Case
LTL	Level Test Log
LTP	Level Test Plan
LTR	Level Test Report
MTP	Master Test Plan
MTR	Master Test Report
PDT	Pre-Delegation Testing
SOW	Statement of Work
TAS	TLD Application System
Test Master (TM)	System used by the PDT Provider to coordinate the Test Nodes.
Test Nodes (TN)	System used by the PDT Provider to perform tests in different regions.
Test Officer	Testing services personnel responsible for executing one or several PDT tests.
Test System (TS)	System used by the PDT Provider to perform tests on the Applicant's systems. The test System consists of Test Nodes and the Test Master.

Other glossaries can be found in the Pre-Delegation Testing Project Plan.

3.2 Document change procedures

The overall change procedures are defined by the project and the change management. However, there are some steps to take into consideration when changing the test documents.

3.2.1 Identifying

A change to the documents may be initiated because of several reasons:

- New internal or external requirements
- Problems with the test cases
- Texts that needs to be clarified
- Etc.

3.2.2 Implementing

The documents are handled by the internal document management software.

It is important that the outcome of the test cases stays the same; unless the change was based on new or updated requirements by ICANN.

3.2.3 Recording Changes

An overall description must be stated in the document control chapter, including a new revision number. A more detailed description of the changes is sent together with the document for approval.

3.2.4 Approving

The updated documents can be sent to ICANN for approval after the changes have been reviewed internally.