

Pre-Delegation Testing

Documentation DNS Test Cases

Version D

File name: PDT_Documentation_TC_DNS.docx
Last saved: 2013-05-03

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Document control

Document information and security

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| Security class | File name |
|----------------|-------------------------------|
| External | PDT_Documentation_TC_DNS.docx |

Revisions

| Date | Version | Name | Description |
|------------|---------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2013-02-01 | PA1 | Björn Sjöholm | Initial document |
| 2013-02-07 | PA2 | Björn Sjöholm | Test case 23 moved to DOC SL |
| 2013-02-07 | PA3 | Rickard Bellgrim | Add Document Hierarchy and final chapter |
| 2013-02-11 | PA4 | Lennart Bonnevier | Review text |
| 2013-03-01 | PA5 | Rickard Bellgrim | “KSK/ZSK keys” to “cryptographic keys” |
| 2013-03-05 | PA6 | Björn Sjöholm | References added. Testcases 17 and 22 deleted. A new testcase 21 added. |
| 2013-03-26 | PA7 | Björn Sjöholm | Testcases 07, 13 and 17 merged into 02. Testcases 08, 14 and 18 merged into 03. Testcases 09, 15 and 19 merged into 04. Testcases 10, 16 and 20 merged into 05. Testcase 11 renumbered to 07. Testcase 12 renumbered to 08. Testcase 21 renumbered to 09. Clarification of testcase 09 |
| 2013-04-18 | PA8 | Lennart Beckman | Testcase 06 withdrawn. Testcase 07-09 renumbered accordingly. |
| 2013-04-19 | B | Mats Dufberg | Released. |
| 2013-05-02 | PC1 | Lennart Beckman | Misprints corrected regarding numbering of Testcases 07-09 |
| 2013-05-02 | C | Lennart Beckman | Release |
| 2013-05-03 | D | Mats Dufberg | Released |

LIST OF CONTENTS

| | |
|-----------------------------------------------------------------------------|-----------|
| 1. INTRODUCTION | 5 |
| 1.1 SCOPE | 5 |
| 1.2 REFERENCES | 5 |
| 1.2.1 External | 5 |
| 1.2.2 Internal | 5 |
| 1.2.3 Document Hierarchy | 5 |
| 1.3 CONTEXT..... | 5 |
| 1.4 NOTATION FOR DESCRIPTION | 5 |
| 2. DOCUMENT DNS o1..... | 6 |
| 2.1 TEST CASE IDENTIFIER | 6 |
| 2.2 OBJECTIVE | 6 |
| 2.3 INPUTS | 6 |
| 2.4 OUTCOME(S) | 6 |
| 2.5 ENVIRONMENTAL NEEDS | 6 |
| 2.6 SPECIAL PROCEDURAL REQUIREMENTS..... | 6 |
| 2.7 INTERCASE DEPENDENCIES | 6 |
| 2.8 ORDERED DESCRIPTION OF STEPS TO BE TAKEN TO EXECUTE THE TEST CASE | 6 |
| 3. DOCUMENT DNS o2 | 8 |
| 3.1 TEST CASE IDENTIFIER | 8 |
| 3.2 OBJECTIVE | 8 |
| 3.3 INPUTS | 8 |
| 3.4 OUTCOME(S) | 8 |
| 3.5 ENVIRONMENTAL NEEDS | 8 |
| 3.6 SPECIAL PROCEDURAL REQUIREMENTS..... | 8 |
| 3.7 INTERCASE DEPENDENCIES | 8 |
| 3.8 ORDERED DESCRIPTION OF STEPS TO BE TAKEN TO EXECUTE THE TEST CASE | 8 |
| 4. DOCUMENT DNS o3 | 9 |
| 4.1 TEST CASE IDENTIFIER | 9 |
| 4.2 OBJECTIVE | 9 |
| 4.3 INPUTS | 9 |
| 4.4 OUTCOME(S) | 9 |
| 4.5 ENVIRONMENTAL NEEDS | 9 |
| 4.6 SPECIAL PROCEDURAL REQUIREMENTS..... | 9 |
| 4.7 INTERCASE DEPENDENCIES | 9 |
| 4.8 ORDERED DESCRIPTION OF STEPS TO BE TAKEN TO EXECUTE THE TEST CASE | 9 |
| 5. DOCUMENT DNS o4 | 10 |
| 5.1 TEST CASE IDENTIFIER | 10 |
| 5.2 OBJECTIVE | 10 |
| 5.3 INPUTS | 10 |
| 5.4 OUTCOME(S) | 10 |
| 5.5 ENVIRONMENTAL NEEDS | 10 |
| 5.6 SPECIAL PROCEDURAL REQUIREMENTS..... | 10 |
| 5.7 INTERCASE DEPENDENCIES | 10 |
| 5.8 ORDERED DESCRIPTION OF STEPS TO BE TAKEN TO EXECUTE THE TEST CASE | 10 |
| 6. DOCUMENT DNS o5 | 12 |
| 6.1 TEST CASE IDENTIFIER | 12 |
| 6.2 OBJECTIVE | 12 |
| 6.3 INPUTS | 12 |
| 6.4 OUTCOME(S) | 12 |
| 6.5 ENVIRONMENTAL NEEDS | 12 |
| 6.6 SPECIAL PROCEDURAL REQUIREMENTS..... | 12 |
| 6.7 INTERCASE DEPENDENCIES | 12 |
| 6.8 ORDERED DESCRIPTION OF STEPS TO BE TAKEN TO EXECUTE THE TEST CASE | 12 |

| | |
|-----------------------------------------------------------------------------|-----------|
| 7. DOCUMENT DNS o6 | 13 |
| 7.1 TEST CASE IDENTIFIER | 13 |
| 7.2 OBJECTIVE | 13 |
| 7.3 INPUTS | 13 |
| 7.4 OUTCOME(S) | 13 |
| 7.5 ENVIRONMENTAL NEEDS | 13 |
| 7.6 SPECIAL PROCEDURAL REQUIREMENTS..... | 13 |
| 7.7 INTERCASE DEPENDENCIES | 13 |
| 7.8 ORDERED DESCRIPTION OF STEPS TO BE TAKEN TO EXECUTE THE TEST CASE | 13 |
| 8. DOCUMENT DNS o7..... | 14 |
| 8.1 TEST CASE IDENTIFIER | 14 |
| 8.2 OBJECTIVE | 14 |
| 8.3 INPUTS | 14 |
| 8.4 OUTCOME(S) | 14 |
| 8.5 ENVIRONMENTAL NEEDS | 14 |
| 8.6 SPECIAL PROCEDURAL REQUIREMENTS..... | 14 |
| 8.7 INTERCASE DEPENDENCIES | 14 |
| 8.8 ORDERED DESCRIPTION OF STEPS TO BE TAKEN TO EXECUTE THE TEST CASE | 14 |
| 9. DOCUMENT DNS o8 | 16 |
| 9.1 TEST CASE IDENTIFIER | 16 |
| 9.2 OBJECTIVE | 16 |
| 9.3 INPUTS | 16 |
| 9.4 OUTCOME(S) | 16 |
| 9.5 ENVIRONMENTAL NEEDS | 16 |
| 9.6 SPECIAL PROCEDURAL REQUIREMENTS..... | 16 |
| 9.7 INTERCASE DEPENDENCIES | 16 |
| 9.8 ORDERED DESCRIPTION OF STEPS TO BE TAKEN TO EXECUTE THE TEST CASE | 16 |
| 10. GLOBAL | 17 |
| 10.1 GLOSSARY | 17 |
| 10.2 DOCUMENT CHANGE PROCEDURES | 17 |

1. Introduction

1.1 Scope

The Pre-Delegation Testing Provider will test self-certification documents regarding DNS and verify that the requirements are fulfilled.

1.2 References

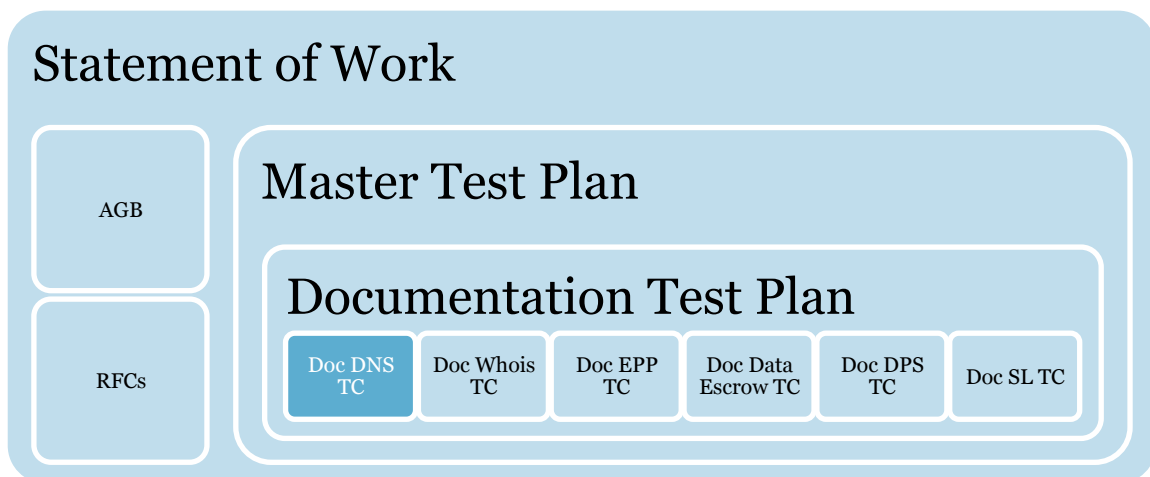
1.2.1 External

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

1.2.2 Internal

- Pre-Delegation Testing, Statement of Work
- Pre-Delegation Testing, Master Test Plan
- Pre-Delegation Testing, Document Test Plan

1.2.3 Document Hierarchy



1.3 Context

N/A

1.4 Notation for description

Each test case for the Documents DNS is described in their own chapter. The test procedures are described directly in the test case.

2. Document DNS 01

2.1 Test case identifier

DocDNS01

2.2 Objective

The test verifies that the self-certification documents

- include results from system performance tests indicating available network and server capacity.
- include an estimate of expected capacity during normal operation.
- include mitigation of DDoS attacks.

2.3 Inputs

The following information will be needed as input for this test case:

| Id | Description | Type |
|-----------------|-------------------------------------------------|-----------|
| gTLDSelfCert | The Applicants self-certification documentation | Documents |
| gTLDApplication | The Applicants original application | Document |

2.4 Outcome(s)

The self-certification documents MUST include the required information.

2.5 Environmental needs

N/A

2.6 Special procedural requirements

Suspend test if applicant documentation is missing or incomplete for most parts.

2.7 Intercase dependencies

This test has no intercase dependencies.

2.8 Ordered description of steps to be taken to execute the test case

1. Identify the parts in the self-certification documents that contain system performance test including available network and server capacity. Expected part is: document gTLDSelfCert section 1.1.5.
2. Verify that results from a system performance test indicating
 - a. available network and
 - b. server capacity is included.
3. Identify the parts in the self-certification documents that contain estimation of expected capacity during normal operation. Expected part is: document gTLDSelfCert section 1.1.2, 1.1.5.
4. Verify that an estimate of expected capacity during normal operation is included.

5. Identify the parts in the self-certification documents that cover DDoS attacks. Expected part is: document gTLDSelfCert section 1.1.4.
6. Verify that Distributed Denial of Service attacks are adequately addressed.

3. Document DNS 02

3.1 Test case identifier

DocDNS02

3.2 Objective

The test verifies that the self-certification documents include data on load capacity, latency and network reachability, for UDP and TCP support, and the corresponding for DNSSEC.

3.3 Inputs

The following information will be needed as input for this test case:

| Id | Description | Type |
|------------------|-------------------------------------------------|-----------|
| gTLDSelfCert | The Applicants self-certification documentation | Documents |
| gTLDAApplication | The Applicants original application | Document |

3.4 Outcome(s)

The self-certification documents MUST include the required information.

3.5 Environmental needs

N/A

3.6 Special procedural requirements

Suspend test if applicant documentation is missing or incomplete for most parts.

3.7 Intercase dependencies

This test has no intercase dependencies.

3.8 Ordered description of steps to be taken to execute the test case

1. Identify the parts in the self-certification documents that cover load capacity, latency and network reachability for UDP and TCP support, and the corresponding with DNSSEC..
Expected part is: document gTLDSelfCert section 1.1, 1.1.5, 1.2, 1.3.
2. Verify that
 - a. load capacity,
 - b. latency and
 - c. network reachability are included.

4. Document DNS 03

4.1 Test case identifier

DocDNS03

4.2 Objective

The test verifies that the self-certification documents include a report of load capacity both using a tables and corresponding graphs, for UDP and TCP support, and the corresponding for DNSSEC.. The graphs shall show the percentage of queries responded against an increasing number of queries per second, generated from local traffic generators.

4.3 Inputs

The following information will be needed as input for this test case:

| Id | Description | Type |
|------------------|-------------------------------------------------|-----------|
| gTLDSelfCert | The Applicants self-certification documentation | Documents |
| gTLDAApplication | The Applicants original application | Document |

4.4 Outcome(s)

The self-certification documents MUST include the required information.

4.5 Environmental needs

N/A

4.6 Special procedural requirements

Suspend test if applicant documentation is missing or incomplete for most parts.

4.7 Intercase dependencies

This test has no intercase dependencies.

4.8 Ordered description of steps to be taken to execute the test case

1. Identify the parts in the self-certification documents that contain report on load capacity for UDP and TCP support, and the corresponding with DNSSEC.. Expected part is: document gTLDSelfCert section 1.1.3, 1.1.5.
2. Verify that the load capacity is reported both using
 - a. a table, and
 - b. a corresponding graph,
 - c. showing percentage of queries responded against an increasing number of queries per second generated from local (to the servers) traffic generators.

5. Document DNS 04

5.1 Test case identifier

DocDNS04

5.2 Objective

The test verifies that the report on load capacity for UDP and TCP support, and the corresponding with DNSSEC, in the self-certification documents includes at least 20 data points, and loads of queries that will cause up to 10% query loss against a randomly selected subset of servers within the applicant's DNS infrastructure.

The test also verifies that the query response include either contains zone data or are NXDOMAIN or NODATA responses.

5.3 Inputs

The following information will be needed as input for this test case:

| Id | Description | Type |
|------------------|-------------------------------------------------|-----------|
| gTLDSelfCert | The Applicants self-certification documentation | Documents |
| gTLDAApplication | The Applicants original application | Document |

5.4 Outcome(s)

The self-certification documents MUST include the required information.

5.5 Environmental needs

N/A

5.6 Special procedural requirements

Suspend test if applicant documentation is missing or incomplete for most parts.

5.7 Intercase dependencies

This test has no intercase dependencies.

5.8 Ordered description of steps to be taken to execute the test case

1. Identify the parts in the self-certification documents that contain report on load capacity for UDP and TCP support, and the corresponding with DNSSEC.. Expected part is: document gTLDSelfCert section 1.1.3, 1.1.5.
2. Verify that the reported table includes
 - a. at least 20 data points and
 - b. loads that will cause up to 10% query loss against a randomly selected subset of servers within the applicant's DNS infrastructure.
3. Verify that the responses are shown to

- a. either contain zone data or
- b. be NXDOMAIN or NODATA responses.

6. Document DNS 05

6.1 Test case identifier

DocDNS05

6.2 Objective

The test verifies that the self-certification documents for UDP and TCP support, and the corresponding with DNSSEC include a report on query latency in milliseconds, measured by DNS probes located just outside the border routers.

6.3 Inputs

The following information will be needed as input for this test case:

| Id | Description | Type |
|------------------|-------------------------------------------------|-----------|
| gTLDSelfCert | The Applicants self-certification documentation | Documents |
| gTLDDApplication | The Applicants original application | Document |

6.4 Outcome(s)

The self-certification documents MUST include the required information.

6.5 Environmental needs

N/A

6.6 Special procedural requirements

Suspend test if applicant documentation is missing or incomplete for most parts.

6.7 Intercase dependencies

This test has no intercase dependencies.

6.8 Ordered description of steps to be taken to execute the test case

1. Identify the parts in the self-certification documents that contain report on latency for UDP and TCP support, and the corresponding with DNSSEC. Expected part is: document gTLDSelfCert section 1.2.1, 1.2.2.
2. Verify that query latency is
 - a. reported in milliseconds,
 - b. measured by DNS probes located just outside the border routers of the physical network hosting the name servers, from a network topology point of view.

7. Document DNS 06

7.1 Test case identifier

DocDNS06

7.2 Objective

The test verifies that the self-certification documents for TCP support include documentation on reachability by providing records of TCP-based DNS queries from nodes external to the network hosting the servers.

7.3 Inputs

The following information will be needed as input for this test case:

| Id | Description | Type |
|------------------|-------------------------------------------------|-----------|
| gTLDSelfCert | The Applicants self-certification documentation | Documents |
| gTLDAApplication | The Applicants original application | Document |

7.4 Outcome(s)

The self-certification documents MUST include the required information.

7.5 Environmental needs

N/A

7.6 Special procedural requirements

Suspend test if applicant documentation is missing or incomplete for most parts.

7.7 Intercase dependencies

This test has no intercase dependencies.

7.8 Ordered description of steps to be taken to execute the test case

1. Identify the parts in the self-certification documents that contain report on reachability for TCP support. Expected part is: document gTLDSelfCert section 1.3.2.
2. Verify that reachability is documented by providing records of TCP-based DNS queries from nodes external to the network hosting the servers. These nodes may be the same as those used for measuring latency for TCP support, TC DocDNS10.

8. Document DNS 07

8.1 Test case identifier

DocDNS07

8.2 Objective

The test verifies that the self-certification documents for DNSSEC support demonstrate support for EDNS(0) in its server infrastructure, the ability to return correct DNSSEC-related resource records such as DNSKEY, RRSIG, and NSEC/NSEC3 for the signed zone, and the ability to accept and publish DS resource records from second-level domain administrators.

The test also verifies that the documents demonstrate support for the full life cycle of cryptographic keys.

8.3 Inputs

The following information will be needed as input for this test case:

| Id | Description | Type |
|----------------|-------------------------------------------------|-----------|
| gTLDSelfCert | The Applicants self-certification documentation | Documents |
| gTLDApplcation | The Applicants original application | Document |

8.4 Outcome(s)

The self-certification documents **MUST** include the required information.

8.5 Environmental needs

N/A

8.6 Special procedural requirements

Suspend test if applicant documentation is missing or incomplete for most parts.

8.7 Intercase dependencies

This test has no intercase dependencies.

8.8 Ordered description of steps to be taken to execute the test case

1. Identify the parts in the self-certification documents that cover DNSSEC support.
Expected part is: document gTLDSelfCert section 1.4.
2. Verify that it demonstrates
 - a. support for EDNS(0) in its server infrastructure,
 - b. the ability to return correct DNSSEC-related resource records such as DNSKEY, RRSIG, and NSEC/NSEC3 for the signed zone, and
 - c. the ability to accept and publish DS resource records from second-level domain administrators.

3. Verify also that it demonstrates the ability to support the full life cycle of cryptographic keys.

9. Document DNS 08

9.1 Test case identifier

DocDNS08

9.2 Objective

The test verifies that the authoritative nameservers (anycast nodes, unicast nodes and DNS operators) declared in the AS are those that were stated in the Applicants gTLD application.

9.3 Inputs

The following information will be needed as input for this test case:

| Id | Description | Type |
|-----------------|-------------------------------------------------|-----------|
| gTLDSelfCert | The Applicants self-certification documentation | Documents |
| gTLDApplication | The Applicants original application | Document |

9.4 Outcome(s)

The self-certification documents **MUST** include the required information.

9.5 Environmental needs

N/A

9.6 Special procedural requirements

Suspend test if applicant documentation is missing or incomplete for most parts.

9.7 Intercase dependencies

This test has no intercase dependencies.

9.8 Ordered description of steps to be taken to execute the test case

1. Identify the authoritative nameservers declared in the AS.
2. Verify that there is no conflict between the authoritative nameservers (anycast nodes, unicast nodes and DNS operators)
 - a. defined for the technical test,
 - b. those declared in the self-certification documents and,
 - c. references to what was stated in the Applicants gTLD application.

10. Global

10.1 Glossary

The glossary is available in the Master Test Plan.

10.2 Document change procedures

Document change procedures are documented in the Master Test Plan.