



# Self-certification

**Submitted to ICANN by: <Applicant>**

**String: <TLD>**

**Application ID: <ID>**

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## About this document

This document provides a template and instructions for the self-certification documentation for the Pre Delegation Testing, PDT. The document is provided in different formats, including pdf.

The self-certification documentation is expected to follow the structure, headings and numbering given in this document, and must be submitted in pdf-format.

The self-certification documentation shall comply with

- the requirements stated in Module 5 of the AGB.
- the requirements stated in the registry agreement including the specifications 2,4,6 and 10.
- assertions made by the applicant in the gTLD application.

The applicant shall provide the information as outlined below. The template is based on the requirements in the AGB.

## 1. DNS infrastructure

AGB, chapter 5.2.2:

All tests shall be done both over IPv4 and IPv6, with reports providing results according to both protocols.

AGB, chapter 5.2.2:

Self-certification documentation shall include data on load capacity, latency and network reachability.

### 1.1. Load capacity

#### 1.1.1. Expected load

**Instruction:** Describe the expected load on the name servers during normal operation. If it is a shared name server, then the load of other zones must be taken into consideration. Do this for both IPv4 and IPv6.

[A short motivation for figures is expected and a description of the shared name server, if applicable. Provide references to the gTLD application, if applicable.]

**Applicant self-certification:**

### 1.1.2. Statistical population

AGB, chapter 5.2.2:

The load capacity test shall be performed against a randomly selected subset of servers within the applicant's DNS infrastructure.

**Instruction:** Describe the selected subset, how it has been selected and what percentage of the total set of servers it represents. This applies to both IPv4 and IPv6.

[A short description and motivation is expected.]

**Applicant self-certification:**

### 1.1.3. Method

AGB, chapter 5.2.2:

Responses must either contain zone data or be NXDOMAIN or NODATA responses to be considered valid.

AGB Module 5, Registry Agreement, Specification 10, section 3.11:

Placement of DNS probes. Probes for measuring DNS parameters shall be placed as near as possible to the DNS resolvers on the networks with the most users across the different geographic regions; care shall be taken not to deploy probes behind high propagation-delay links, such as satellite links.

**Instruction:** Describe the method of measurement and what type of queries and responses are used.

**Applicant self-certification:**

### 1.1.4 DDoS

**Instruction:** Describe mitigation of Distributed Denial of Service (DDoS) attacks.

[A description of strategies and controls is expected. Provide references to the gTLD application, if applicable.]

**Applicant self-certification:**

### 1.1.5. Result

AGB, chapter 5.2.2:

Load capacity shall be reported using a table and a corresponding graph, showing percentage of queries responded against an increasing number of queries per second generated from local (to the servers) traffic generators. The table shall include at least 20 data points and loads of UDP-based [and TCP-based] queries that will cause up to 10% query loss against a randomly selected subset of servers within the applicant's DNS infrastructure.

AGB, chapter 5.2.2:

Load capacity [...] [for DNSSEC support] shall be documented as for UDP and TCP above.

AGB, chapter 5.2.2:

The documentation provided by the applicant must include the results from a system performance test indicating available network and server capacity and an estimate of expected capacity during normal operation to ensure stable service as well as to adequately address Distributed Denial of Service (DDoS) attacks.

***Instruction:***

- *Describe available network and server capacity.*

[Provide a brief description and a table.]

- *Describe an estimate of expected capacity during normal operation.*

[Provide a brief motivation for the figures.]

- *Create a table and graph according to the requirements.*
  - *The table shall include at least 20 data points.*
  - *The table shall include loads that cause up to 10% query loss against a randomly selected subset of servers.*
  - *The table shall include both UDP and TCP.*
  - *The table shall include DNSSEC.*
- *Examples can be found below.*
- *Repeat for both IPv4 and IPv6.*

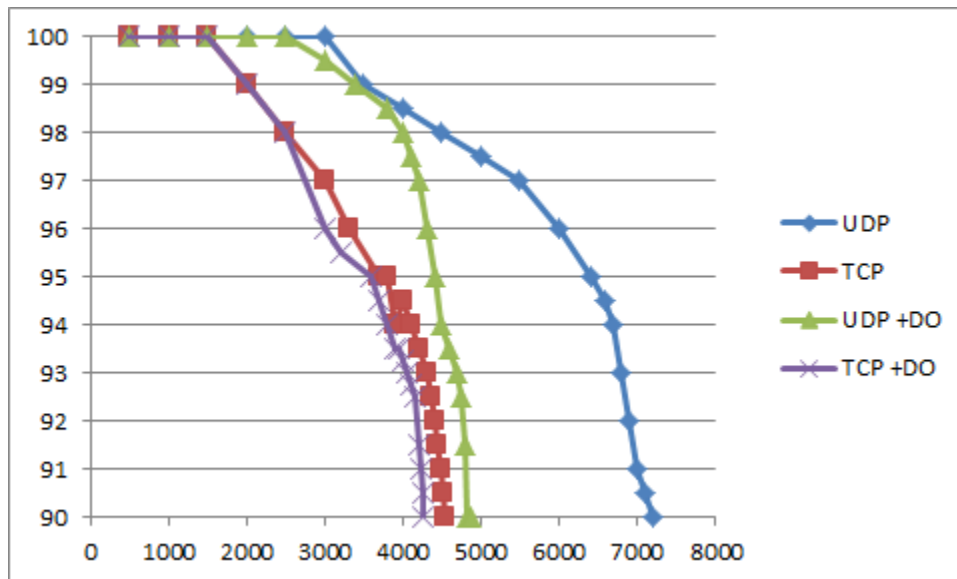
***Applicant self-certification:***

**Example table showing percentage of queries responded against an increasing number of queries per second:**

	UDP		TCP		UDP +DO		TCP +DO	
#	QPS	%	QPS	%	QPS	%	QPS	%
1	500	100	500	100	500	100	500	100
2	1000	100	1000	100	1000	100	1000	100
3	1500	100	1500	100	1500	100	1500	100
4	2000	100	2000	99	2000	100	2000	99
5	2500	100	2500	98	2500	100	2500	98
6	3000	100	3000	97	3000	99.5	3000	96
7	3500	99	3300	96	3400	99	3200	95.5
8	4000	98.5	3700	95	3800	98.5	3600	95
9	4500	98	3800	95	4000	98	3700	94.5
10	5000	97.5	3900	94	4100	97.5	3800	94
11	5500	97	4000	94.5	4200	97	3900	93.5
12	6000	96	4100	94	4300	96	3950	93.5
13	6400	95	4200	93.5	4400	95	4000	93.25
14	6600	94.5	4300	93	4500	94	4050	93
15	6700	94	4350	92.5	4600	93.5	4100	92.75
16	6800	93	4400	92	4700	93	4150	92.5
17	6900	92	4450	91.5	4750	92.5	4200	91.5

18	7000	91	4500	91	4800	91.5	4225	91
19	7100	90.5	4525	90.5	4825	90	4250	90.5
20	7200	90	4550	90	4875	90	4260	90

**Example graph:**



## 1.2. Query latency

AGB, chapter 5.2.2:

Query latency shall be reported in milliseconds as 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.

### 1.2.1. Method

AGB Module 5, Registry Agreement, specification 10:

3.8. Measuring DNS parameters.

Every minute, every DNS probe will make an UDP or TCP “DNS test” to each of the public-DNS registered “IP addresses” of the name servers of the domain name being monitored. If a “DNS test” result is undefined/unanswered, the tested IP will be considered unavailable from that probe until it is time to make a new test.

AGB Module 5, Registry Agreement, specification 10:

3.9. Collating the results from DNS probes. The minimum number of active testing probes to consider a measurement valid is 20 at any given measurement period, otherwise the measurements will be discarded and will be considered inconclusive; during this situation no fault will be flagged against the SLRs.

AGB Module 5, Registry Agreement, specification 10:

3.11. Placement of DNS probes. Probes for measuring DNS parameters shall be placed as near as possible to the DNS resolvers on the networks with the most users across the different geographic regions; care shall be taken not to deploy probes behind high propagation-delay links, such as satellite links.

**Instruction:** *Describe how the query latency has been measured.*  
[A brief description showing how the requirements are met.]

**Applicant self-certification:**

**1.2.2. Result**

**Instruction:** *Report the min/avg/max values of query latency in milliseconds. The test shall include both UDP and TCP. The tests shall also include DNSSEC. Perform the tests on all name servers (IPv4/IPv6).*

**Applicant self-certification:**

**Example table showing query latency (min/avg/max) in milliseconds:**

NS	IP	UDP	TCP	UDP +DO	TCP +DO
a.ns.TLD	192.0.2.1	120/125/134	150/151/152	122/140/200	152/160/171
a.ns.TLD	2001:DB8::1	100/103/109	125/126/127	110/115/116	135/141/145
b.ns.TLD	192.0.2.2	90/91/92	90/93/94	91/91/92	91/97/100
b.ns.TLD	2001:DB8::2	98/99/103	110/115/118	105/125/190	107/130/200
c.ns.TLD	192.0.2.3	50/55/60	53/54/55	60/69/81	70/71/72

## 1.3. Reachability

### 1.3.1. Reachability TCP-based DNS queries

AGB, chapter 5.2.2:

Reachability will be documented by providing records of TCP-based DNS queries from nodes external to the network hosting the servers. These locations may be the same as those used for measuring latency above.

**Instruction:** Provide the information as specified by the requirements. Repeat for both IPv4 and IPv6.

#### **Applicant self-certification:**

## 1.4 DNSSEC



AGB, chapter 5.2.2:

DNSSEC support -- Applicant must 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. In particular, the applicant must demonstrate its ability to support the full life cycle of KSK and ZSK keys.

**Instruction:**

*Provide information regarding*

- o support for EDNS(0) in the server infrastructure.*
- o the ability to return correct DNSSEC-related resource records (e.g. DNSKEY, RRSIG, NEC/NSEC3) for the signed zone.*
- o the ability to accept and publish DS resource records from second-level domain administrators.*
- o the applicants ability to support the full life cycle of cryptographic keys.*

**Applicant self-certification:**

## 1.5. SLA, DNS Infrastructure

**Specification:**

The DNS infrastructure must meet all service level requirements described in specification 10 of the registry agreement.

The infrastructure must also meet all service level assertions made in the gTLD application in relation to system performance as described in specification 10 of the registry agreement.

The infrastructure must furthermore meet all other performance assertions made in the gTLD application.

**Instruction:**

- o Provide a table describing the adherence to the SLA Service Level Requirements as given in specification 10 of the registry agreement.

[Provide references to assertions given in the gTLD relating to system performance, if applicable.]

**Applicant self-certification:**

**Example table showing adherence to the SLA:**

Parameter	Self-certification (monthly basis)
DNS service availability	_____ min downtime
DNS name server availability	≤ _____ min of downtime
TCP DNS resolution RTT	≤ _____ ms, for at least 95% of the queries
UDP DNS resolution RTT	≤ _____ ms, for at least 95% of the queries
DNS update time	≤ _____ min, for at least 95% of the probes

## 2. Whois

AGB, chapter 5.2.3:

Applicant must provide Whois services for the anticipated load. ICANN will verify that Whois data is accessible over IPv4 and IPv6 via both TCP port 43 and via a web interface and review self-certification documentation regarding Whois transaction capacity.

## 2.1. Load capacity

AGB, chapter 5.2.3:

Self-certification documents shall describe the maximum number of queries per second successfully handled by both the port 43 servers as well as the web interface, together with an applicant-provided load expectation.

### 2.1.1. Expected load

**Instruction:** Describe the expected load on the Whois service (port 43 and HTTP) during normal operation. If it is a Shared Registry System, then the load of other TLD:s must be taken into consideration. Do this for both IPv4 and IPv6.

[A short motivation for the figures is expected and a short description of the shared registry system, if applicable.]

#### **Applicant self-certification:**

### 2.1.2. Port 43

#### 2.1.2.1. Method

**Instruction:** Describe how the performance has been measured.

[A brief description is expected.]

#### **Applicant self-certification:**

## 2.1.2.2. Result

**Instruction:** Describe the maximum number of queries per second successfully handled by the port 43 servers over IPv4 and IPv6.

### **Applicant self-certification:**

Example table showing maximum queries per second:

	QPS
IPv4	5000
IPv6	5100

## 2.1.3. HTTP

### 2.1.3.1. Method

**Instruction:** Describe how the performance has been measured.

[A brief description is expected.]

### **Applicant self-certification:**

### 2.1.3.2. Result

**Instruction:** Describe the maximum number of queries per second successfully handled by the web interface over IPv4 and IPv6.

#### **Applicant self-certification:**

Example table showing maximum queries per second:

(QPS)	http	HTTPS
IPv4	500	400
IPv6	505	396

## 2.2. Data mining

AGB, chapter 5.2.3:

Additionally, a description of deployed control functions to detect and mitigate data mining of the Whois database shall be documented.

**Instruction:** Describe the control functions for detection and mitigation of datamining of the Whois database. This is applicable for both port 43 and HTTP.

[The description should cover both the strategy used and implemented controls.]

**Applicant self-certification:**

## 2.3. Searchable whois

**Instruction:** Describe any provision made for searchable Whois lookup services for names registered in the TLD.

[Provide references to assertions given in the gTLD application, if applicable.]

**Applicant self-certification:**

## 2.4. SLA, Whois

AGB, chapter 5.2.3:

System performance -- The registry system must scale to meet the performance requirements described in specification 10 of the registry agreement.

**Specification:**

The registry data directory services must meet all service level requirements described in specification 10 of the registry agreement.

The services must also meet all service level assertions made in the gTLD application in relation to system performance as described in specification 10 of the registry agreement.

The services must furthermore meet all other performance assertions made in the gTLD application.

**Instruction:**

- o *Provide a table describing the adherence to the Service Level Requirements as given in specification 10 of the registry agreement.*

[Provide references to assertions given in the gTLD relating to Whois service performance, if applicable.]

**Applicant self-certification:**

**Example table showing adherence to the SLA:**

Parameter	Self-certification (monthly basis)
RDDS availability	_____ min downtime
RDDS query RTT	≤ _____ ms, for at least 95% of the queries
RDDS update time	≤ _____ min, for at least 95% of the probes

### 3. EPP

### 3.1. Load capacity

AGB, chapter 5.2.3:

Documentation shall provide a maximum Transaction per Second rate for the EPP interface with 10 data points corresponding to registry database sizes from 0 (empty) to the expected size after one year of operation, as determined by applicant.

**Instruction:**

- o *Describe the expected registry database size after one year of operation.*

[A brief motivation is expected.]

- o *Describe the transaction capacity as a function of the registry database. The description shall contain at least 10 data points ranging from an empty database to the size after one year.*

[A motivation should be given.]

**Applicant self-certification:**

Example table showing the load capacity:

#	Number of domains	TPS
1	0	2000
2	200000	1900



3	250000	1850
4	300000	1825
5	350000	1800
6	400000	1775
7	500000	1750
8	650000	1700
9	800000	1625
10	1000000	1550

### 3.2. Initial load

AGB, chapter 5.2.3:

Documentation shall also describe measures taken to handle load during initial registry operations, such as a land-rush period.

**Instruction:** Describe how the load is handled for the initial registry operations, such as a land-rush period.

[A brief description is expected. A justification of the chosen solution should be provided.]

#### **Applicant self-certification:**

### 3.3. EPP Extensions

***Instruction:***

- o *Describe all provided EPP extensions.*

[Brief descriptions are expected.]

- o *Describe how these extensions comply with RFC 3735.*

[Provide references to assertions given in the gTLD relating to EPP extensions, if applicable.]

***Applicant self-certification:***

### 3.4. EPP IPv6

***Instruction:***

*If EPP services are available over IPv6, give a short description of IPv6 usage.*

[Provide references to assertions given in the gTLD application, if applicable.]

***Applicant self-certification:***

### 3.5. SLA, EPP

AGB, chapter 5.2.3:

System performance -- The registry system must scale to meet the performance requirements described in specification 10 of the registry agreement.

**Specification:**

The EPP services must meet all service level requirements described in specification 10 of the registry agreement.

The services must also meet all service level assertions made in the gTLD application in relation to system performance as described in specification 10 of the registry agreement.

The services must furthermore meet all other performance assertions made in the gTLD application.

**Instruction:**

- o *Provide a table describing the adherence to the Service Level Requirements as given in specification 10 of the registry agreement.*

[Provide references to assertions given in the gTLD relating to EPP service performance, if applicable.]

**Applicant self-certification:**

Example table showing adherence to the SLA:

Parameter	Self-certification (monthly)
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	<b>basis)</b>
EPP service availability	_____ min downtime
EPP session-command RTT	≤ _____ ms, for at least 90% of the commands
EPP query-command RTT	≤ _____ ms, for at least 90% of the commands
EPP transform-command RTT	≤ _____ ms, for at least 90% of the commands

## 4. Escrow Agreement

The Data Escrow Agreement forms part of the Registry Agreement stated in Module 5 of the AGB.

AGB, chapter 5.1, Registry Agreement:

The Registry Agreement can be reviewed in the attachment to this module.  
... All successful applicants are expected to enter into the agreement substantially as written.

AGB, chapter 5.2.1, Testing Procedures:

The applicant [shall submit] all of the following information:  
... The executed agreement between the selected escrow agent and the applicant.

AGB, Module 5, Registry Agreement,

Specification 2 Data Escrow Requirements:

Registry Operator will engage an independent entity to act as data escrow agent ("Escrow Agent") for the provision of data escrow services related to the Registry Agreement. The following Technical Specifications set forth in Part A, and Legal Requirements set forth in Part B, will be included in any data escrow agreement between Registry Operator and the Escrow Agent, under which ICANN must be named a third-party beneficiary. In addition to the following requirements, the data escrow agreement may contain other provisions that are not contradictory or intended to subvert the required terms provided below.

### **Specification:**

The applicant must provide an executed escrow agreement substantially as written in Specification 2 to the Registry Agreement as stated in AGB Module 5.

***Instruction:***

1. *Verify that ICANN is named a third-party beneficiary in the escrow agreement.*

*[YES or NO is expected.]*

2. *Verify that all provisions in Part A of Specification 2 Data Escrow Requirements are included in the escrow agreement.*

*[YES or NO is expected.]*

3. *Verify that all provisions in Part B of Specification 2 Data Escrow Requirements are included in the escrow agreement.*

*[YES or NO is expected.]*

4. *Verify that the data escrow agreement does not contain other provisions that are contradictory or intended to subvert the required terms stated in 1, 2 and 3 above.*

*[YES or NO is expected.]*

5. *Verify that references to provisions in the escrow agreement can be provided for all of the abovementioned on request.*

*[YES or NO is expected.]*

***Applicant self-certification:***