

# Pre-Delegation Testing

## Whois Test Plan

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## Document control

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2013-01-14	PA3	Rickard Bellgrim	Updates on IDN and the protocol called Weirds
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2013-03-03	PA7	Rickard Bellgrim	Test both port 43 and HTTP against <whois.nic.TLD>, the address is resolved using the DNS delegation data. Some of the values MUST correspond to the mapping in the EPP standard.
2013-04-08	B	Staffan Hagnell	Delivery D2 for production
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## 1. Introduction

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This Level Test Plan focuses on the Whois service of the new gTLDs.

### 1.1 Scope

The Pre-Delegation Testing Provider will test the Whois service over port 43 (Whois) and 80/443 (HTTP/HTTPS), and verify the response format. All tests are to be performed over IPv4 and IPv6 from at least five points on the Internet. At least one probe node should be located in every ICANN region.

### 1.2 References

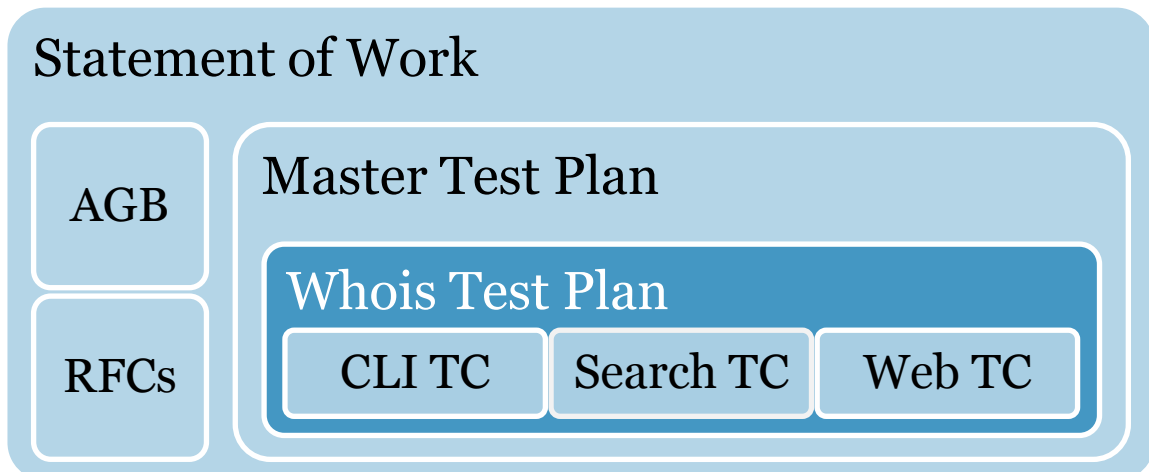
#### 1.2.1 External

- 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, Documentation Test Plan
- Pre-Delegation Testing, Whois CLI Test Cases
- Pre-Delegation Testing, Whois Search Test Cases
- Pre-Delegation Testing, Whois Web Test Cases

#### 1.2.3 Document Hierarchy



### 1.3 Level in the overall sequence

This Test Plan and the associated Test Cases can be run in parallel with the other Level Test Plans.

#### 1.4 Test classes and overall test conditions

The Whois service of the gTLD is available over IPv4/IPv6 via TCP port 43 and via a web interface. Both reachability and response format will be tested with positive test cases. Valid test data is provided by the applicant. In case of an IDN-TLD, the ASCII-compatible form (A-Label) must be used.

## 2. Details for this level of test plan

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### 2.1 Test items and their identifiers

#### 2.1.1 Statement of Work

The main requirement for testing the Whois service is found in the Statement of Work:

- [R11]** Test the applicant's Whois interface for compliance with the requirements described in the Section 5.2 of the AGB, including response format and review of the data mining detection and mitigation control functions.

Only the first part of the requirement is handled within this test plan. The review of the data mining detection and mitigation control functions are handled as part of the Documentation Test Plan.

#### 2.1.2 Applicant Guidebook

Section 5.2 of the AGB states the following requirements:

**Whois support --** Applicant must provision 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. Response format according to Specification 4 of the registry agreement and access to Whois (both port 43 and via web) will be tested by ICANN remotely from various points on the Internet over both IPv4 and IPv6.

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.

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

The following requirements have been identified from the text above. Note that the requirements on Self-certification documents are handled by the Documentation Test Plan.

- [AGB1]** Whois data **MUST** be accessible over IPv4 via TCP port 43
- [AGB2]** Whois data **MUST** be accessible over IPv6 via TCP port 43
- [AGB3]** Whois data **MUST** be accessible over IPv4 via a web interface
- [AGB4]** Whois data **MUST** be accessible over IPv6 via a web interface

The AGB also states there are no requirements related to IDN.

Requirements related to IDN for Whois are being developed. After these requirements are developed, prospective registries will be expected to comply with published IDN-related Whois requirements as part of predelegation testing.

### 2.1.3 Specification 4

Specification 4 of the registry agreement will not be fully cited here, but a number of requirements have been identified. Optional requirements have been removed.

- [REG1]** Registry Operator **MUST** operate a WHOIS service available via port 43 in accordance with RFC 3912 at <whois.nic.TLD>
- [REG2]** Registry Operator **MUST** operate a web-based Directory Service at <whois.nic.TLD>
- [REG3]** **MUST** provide free public query-based access to at least the following elements:
  - [REG3.1]** Domain Name Data
  - [REG3.2]** Registrar Data
  - [REG3.3]** Nameserver Data
- [REG4]** The format of responses **MUST** follow a **semi-free text format**, as outlined in Specification 4, followed by a blank line and a legal disclaimer specifying the rights of Registry Operator, and of the user querying the database.
- [REG5]** Each data object **MUST** be represented as a set of key/value pairs, with lines beginning with keys, followed by a colon and a space as delimiters, followed by the value.
- [REG6]** For fields where more than one value exists, multiple key/value pairs with the same key **MUST** be allowed (for example to list multiple name servers).
- [REG7]** The format of the following data fields: domain status, individual and organizational names, address, street, city, state/province, postal code, country, telephone and fax numbers, email addresses, date and times **MUST** conform to the mappings specified in EPP RFCs 5730-5734.
- [REG8]** Offering searchability capabilities on the Directory Services is **OPTIONAL** but if offered by the Registry Operator it **MUST** comply with this specification:
  - [REG8.1]** Offer searchability on the web-based Directory Service
  - [REG8.2]** Offer partial match capabilities, at least, on the following fields: domain name, contacts and registrant's name, and contact and registrant's postal address, including all the sub-fields described in EPP (e.g., street, city, state or province, etc.).
  - [REG8.3]** Offer exact-match capabilities, at least, on the following fields: registrar id, name server name, and name server's IP address (only applies to IP addresses stored by the registry, i.e., glue records).
  - [REG8.4]** Offer Boolean search capabilities supporting, at least, the following logical operators to join a set of search criteria: AND, OR, NOT
  - [REG8.5]** Search results will include domain names matching the search criteria.
  - [REG8.6]** Implement appropriate measures to avoid abuse of this feature (e.g., permitting access only to legitimate authorized users)

[REG4] says that the response must follow a semi-free text format. The interpretation is that the number of objects, name of objects (the key), order of objects, comments, spacing, and similar may be different from service to service. Parts of [REG4] and [REG5] can thus not be fully enforced.

[REG7] shall be interpreted as mandatory according to discussions with ICANN, even if the original text used the word "should".

Furthermore, ICANN states that they *"reserves the right to specify alternative formats and protocols, and upon such specification, the Registry Operator will implement such alternative specification as*

*soon as reasonably practicable*". There is a newer alternative to Whois under development / standardization, Web Extensible Internet Registration Data Service (Weirds). Weirds is not taken into consideration for these tests.

#### 2.1.3.1 Domain name data

Specification 4 of the registry agreement gives the following example for domain name data:

**Query format:** whois EXAMPLE.TLD

**Response format:**

Domain Name: EXAMPLE.TLD  
Domain ID: D1234567-TLD  
WHOIS Server: whois.example.tld  
Referral URL: http://www.example.tld  
Updated Date: 2009-05-29T20:13:00Z  
Creation Date: 2000-10-08T00:45:00Z  
Registry Expiry Date: 2010-10-08T00:44:59Z  
Sponsoring Registrar: EXAMPLE REGISTRAR LLC  
Sponsoring Registrar IANA ID: 5555555  
Domain Status: clientDeleteProhibited  
Domain Status: clientRenewProhibited  
Domain Status: clientTransferProhibited  
Domain Status: serverUpdateProhibited  
Registrant ID: 5372808-ERL  
Registrant Name: EXAMPLE REGISTRANT  
Registrant Organization: EXAMPLE ORGANIZATION  
Registrant Street: 123 EXAMPLE STREET  
Registrant City: ANYTOWN  
Registrant State/Province: AP  
Registrant Postal Code: A1A1A1  
Registrant Country: EX  
Registrant Phone: +1.5555551212  
Registrant Phone Ext: 1234  
Registrant Fax: +1.5555551213  
Registrant Fax Ext: 4321  
Registrant Email: EMAIL@EXAMPLE.TLD  
Admin ID: 5372809-ERL  
Admin Name: EXAMPLE REGISTRANT ADMINISTRATIVE  
Admin Organization: EXAMPLE REGISTRANT ORGANIZATION  
Admin Street: 123 EXAMPLE STREET  
Admin City: ANYTOWN  
Admin State/Province: AP  
Admin Postal Code: A1A1A1  
Admin Country: EX  
Admin Phone: +1.5555551212  
Admin Phone Ext: 1234  
Admin Fax: +1.5555551213

Admin Fax Ext:  
Admin Email: EMAIL@EXAMPLE.TLD  
Tech ID: 5372811-ERL  
Tech Name: EXAMPLE REGISTRAR TECHNICAL  
Tech Organization: EXAMPLE REGISTRAR LLC  
Tech Street: 123 EXAMPLE STREET  
Tech City: ANYTOWN  
Tech State/Province: AP  
Tech Postal Code: A1A1A1  
Tech Country: EX  
Tech Phone: +1.1235551234  
Tech Phone Ext: 1234  
Tech Fax: +1.5555551213  
Tech Fax Ext: 93  
Tech Email: EMAIL@EXAMPLE.TLD  
Name Server: NS01.EXAMPLEREGISTRAR.TLD  
Name Server: NS02.EXAMPLEREGISTRAR.TLD  
DNSSEC: signedDelegation  
DNSSEC: unsigned  
>>> Last update of WHOIS database: 2009-05-29T20:15:00Z <<<

#### 2.1.3.2 Registrar data

Specification 4 of the registry agreement gives the following example for registrar data:

**Query format:** whois "registrar Example Registrar, Inc."

**Response format:**

Registrar Name: Example Registrar, Inc.  
Street: 1234 Admiralty Way  
City: Marina del Rey  
State/Province: CA  
Postal Code: 90292  
Country: US  
Phone Number: +1.3105551212  
Fax Number: +1.3105551213  
Email: registrar@example.tld  
WHOIS Server: whois.example-registrar.tld  
Referral URL: http://www.example-registrar.tld  
Admin Contact: Joe Registrar  
Phone Number: +1.3105551213  
Fax Number: +1.3105551213  
Email: joeregistrar@example-registrar.tld  
Admin Contact: Jane Registrar  
Phone Number: +1.3105551214  
Fax Number: +1.3105551213  
Email: janeregistrar@example-registrar.tld  
Technical Contact: John Geek  
Phone Number: +1.3105551215  
Fax Number: +1.3105551216



New Generic Top-Level  
**Domains**

Email: johngeek@example-registrar.tld

>>> Last update of WHOIS database: 2009-05-29T20:15:00Z <<<

### 2.1.3.3 Nameserver data

Specification 4 of the registry agreement gives the following example for nameserver data:

**Query format:** whois "NS1.EXAMPLE.TLD" or whois "nameserver (IP Address)"

**Response format:**

Server Name: NS1.EXAMPLE.TLD

IP Address: 192.0.2.123

IP Address: 2001:0DB8::1

Registrar: Example Registrar, Inc.

WHOIS Server: whois.example-registrar.tld

Referral URL: <http://www.example-registrar.tld>

>>> Last update of WHOIS database: 2009-05-29T20:15:00Z <<<

### 2.1.4 EPP

The requirements states that domain status, individual and organizational names, address, street, city, state/province, postal code, country, telephone and fax numbers, email addresses, date and times MUST conform to the mappings specified in EPP RFCs 5730-5734. Below is a listing of the corresponding requirements from those RFCs;

- [EPP1]** The domain object MUST have at least one of the following status values: clientDeleteProhibited, serverDeleteProhibited, clientHold, serverHold, clientRenewProhibited, serverRenewProhibited, clientTransferProhibited, serverTransferProhibited, clientUpdateProhibited, serverUpdateProhibited, inactive, ok, pendingCreate, pendingDelete, pendingRenew, pendingTransfer, pendingUpdate
- [EPP2]** Names associated with a contact are represented using character strings.
- [EPP3]** Contact street, city, and state or province information is represented using character strings.
- [EPP4]** Contact postal codes are represented using character strings.
- [EPP5]** Contact country identifiers are represented using two-character identifiers specified in [ISO3166-1].
- [EPP6]** Telephone numbers described in this mapping are character strings that MUST begin with a plus sign ("+", ASCII value 0x002B), followed by a country code defined in [ITU.E164.2005], followed by a dot (".", ASCII value 0x002E), followed by a sequence of digits representing the telephone number. An optional "x" attribute is provided to note telephone extension information.
- [EPP7]** Email address syntax is defined in [RFC5322].
- [EPP8]** Date and time attribute values MUST be represented in Universal Coordinated Time (UTC) using the Gregorian calendar. The extended date-time form using upper case "T" and "Z" characters defined in [W3C.REC-xmlschema-2-20041028] MUST be used to represent date-time values.

### 2.1.5 RFC

Finally, RFC 3912 has a set of requirements on top of those mentioned before:

- [RFC1]** Each line in the response MUST be ended with ASCII CR and then ASCII LF.
- [RFC2]** The WHOIS server closes its connection as soon as the output is finished. The closed TCP connection is the indication to the client that the response has been received.

## 2.2 Test Traceability Matrix

This table describes the different test cases and their mapping to the requirements. They will be documented in three different test case documents: Whois CLI, Whois Web, and Whois Search.

Test ID	Description	Requirement Point
Whois CLI 01	Make an IPv4 TCP connection on port 43. Query for a known domain name. Verify format of the response.	R11, AGB1, REG1, REG3.1, REG4-7, RFC1, RFC2
Whois CLI 02	Make an IPv4 TCP connection on port 43. Query for a known registrar. Verify format of the response.	R11, AGB1, REG1, REG3.2, REG4-7, RFC1, RFC2
Whois CLI 03	Make an IPv4 TCP connection on port 43. Query for a known name server. Verify format of the response.	R11, AGB1, REG1, REG3.3, REG4-7, RFC1, RFC2
Whois CLI 04	Make an IPv6 TCP connection on port 43. Query for a known domain name. Verify format of the response.	R11, AGB2, REG1, REG3.1, REG4-7, RFC1, RFC2
Whois CLI 05	Make an IPv6 TCP connection on port 43. Query for a known registrar. Verify format of the response.	R11, AGB2, REG1, REG3.2, REG4-7, RFC1, RFC2
Whois CLI 06	Make an IPv6 TCP connection on port 43. Query for a known name server. Verify format of the response.	R11, AGB2, REG1, REG3.3, REG4-7, RFC1, RFC2
Whois Web 01	Make an IPv4 HTTP(S) connection to Whois. Verify that there is a successful connection.	R11, ABG3, REG2
Whois Web 02	Make an IPv6 HTTP(S) connection to Whois. Verify that there is a successful connection.	R11, ABG4, REG2
Whois Web 03	Visit the web-based Whois over IPv4. Query for a known domain name. Verify format of the response.	R11, AGB3, REG2, REG3.1, REG4-7
Whois Web 04	Visit the web-based Whois over IPv4. Query for a known registrar. Verify format of the response.	R11, AGB3, REG2, REG3.2, REG4-7
Whois Web 05	Visit the web-based Whois over IPv4. Query for a known name server. Verify format of the response.	R11, AGB3, REG2, REG3.3, REG4-7
Whois Web 06	Visit the web-based Whois over IPv6. Query for a known domain name. Verify format of the response.	R11, AGB4, REG2, REG3.1, REG4-7
Whois Web 07	Visit the web-based Whois over IPv6. Query for a known registrar. Verify format of the response.	R11, AGB4, REG2, REG3.2, REG4-7
Whois Web 08	Visit the web-based Whois over IPv6. Query for a known name server. Verify format of the response.	R11, AGB4, REG2, REG3.3, REG4-7
Whois Search 01	Visit the web-based Whois over IPv4. Verify abuse protection.	R11, AGB3, REG2, REG8.6
Whois Search 02	Visit the web-based Whois over IPv4. Perform partial match queries. Verify format of the response.	R11, AGB3, REG2, REG8.1, REG8.2, REG8.5
Whois Search 03	Visit the web-based Whois over IPv4.	R11, AGB3, REG2,

Test ID	Description	Requirement Point
	Perform exact-match queries. Verify format of the response.	REG8.1, REG8.3, REG8.5
Whois Search 04	Visit the web-based Whois over IPv4. Perform boolean queries. Verify format of the response.	R11, AGB3, REG2, REG8.1, REG8.4, REG8.5
Whois Search 05	Visit the web-based Whois over IPv6. Verify abuse protection.	R11, AGB4, REG2, REG8.6
Whois Search 06	Visit the web-based Whois over IPv6. Perform partial match queries. Verify format of the response.	R11, AGB4, REG2, REG8.1, REG8.2, REG8.5
Whois Search 07	Visit the web-based Whois over IPv6. Perform exact-match queries. Verify format of the response.	R11, AGB4, REG2, REG8.1, REG8.3, REG8.5
Whois Search 08	Visit the web-based Whois over IPv6. Perform boolean queries. Verify format of the response.	R11, AGB4, REG2, REG8.1, REG8.4, REG8.5

## 2.3 Features to be tested

The following features of the Whois service will be tested:

- Service on TCP port 43 and HTTP(S) using host <whois.nic.TLD>
- Availability over IPv4 and IPv6
- Queries for known domain names, registrars, and name servers
- Semi-free response format as stated in Specification 4
- Searchability is tested if the feature is claimed to be supported
- Search queries based on the requirements in Specification 4

## 2.4 Features not to be tested

- Values not originating from an EPP type
- IDN (tested domains must use the ASCII-compatible form (A-Label))
- Weirds
- Data mining protection, it is part of the Documentation Test Plan.

## 2.5 Approach

Only the connectivity tests can be verified automatically because of the semi-free response format. This is implemented with a simple test script. Validation of the actual Whois responses must be performed manually by the Test Officer.

One or more IPv4 and IPv6 addresses for the host <whois.nic.TLD> will be resolved using the delegation data from the DNS tests.

## 2.6 Item pass/fail criteria

The test will pass if an expected response was received from the Whois service. It will however fail if it is not following the requirements.

The Service Level Requirement in Specification 10 of the registry agreement states that “If the RTT is 5-times or more the corresponding SLR, the RTT will be considered undefined”. The requirement for Whois is set to two seconds. A test can thus be failed if it takes longer than 10 seconds to get an answer from the service.

## 2.7 Suspension criteria and resumption requirements

The only suspension criteria for the test would be if there are external network problems outside the control of the applicant or the PDT tester.

## 2.8 Test deliverables

The Whois test level will produce:

- Level Test Logs (LTL)
- Anomaly Report (AR) in case of error
- Level Test Report (LTR)

### 3. Test management

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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 and defining test management is not part of this subproject. However, some information can be found in the Master Test Plan.

## 4. General

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### 4.1 Glossary

The glossary is available in the Master Test Plan.

### 4.2 Document change procedures

Document change procedures are documented in the Master Test Plan.