

# WHOIS Accuracy Reporting System (ARS) Project Information

Between December 2015 and June 2018, the Internet Corporation for Assigned Names and Numbers (ICANN) organization (org) published an Accuracy Reporting System (ARS) report every six months. Since then, ICANN org has not conducted further data collection or analysis; the last report published by ICANN org was the [June 2018 Cycle 6 Report](#).

ICANN org made the decision to pause further reports based on the adoption of the [Temporary Specification](#) following the adoption and subsequent enforcement of the GDPR.

In 2021, ICANN org published a [briefing on generic top-level domain \(gTLD\) registration data accuracy requirements](#) and programs including how the General Data Protection Regulation (GDPR) has affected ICANN's enforcement of accuracy requirements.

## ***Background and Goals***

The WHOIS ARS project was created both in response to recommendations compiled and delivered by the [2012 WHOIS Review Team](#) under the [Affirmation of Commitments](#) (AoC), and to address the concerns of the Governmental Advisory Committee (GAC) regarding the accuracy of registration data published in Registration Data Directory Services (commonly referred to as WHOIS). ICANN org committed to proactively identifying potentially inaccurate WHOIS data and forward this information to gTLD registrars for investigation and follow up.

On 8 November 2012, the ICANN Board approved a series of improvements to the manner in which ICANN carries out its oversight of the WHOIS program in response to recommendations compiled and delivered by the 2012 WHOIS Review Team under the AoC. To accomplish these tasks and to address the GAC's concerns about WHOIS accuracy, ICANN org initiated the development of the WHOIS ARS—a framework for conducting repeatable assessments of WHOIS accuracy, publicly reporting the findings, and providing data to the ICANN Contractual Compliance team to follow up on potentially inaccurate records with registrars. With input from the community, ICANN org designed the ARS to be organized into three phases based on the types of validations described in the [SAC058 Report](#) (syntax, operability, and identity, see WHOIS ARS Phases below for more information).

## ***WHOIS ARS Phases***

The ARS was divided into three phases based on the types of validation identified in [SAC058](#):

- [Phase 1](#): Syntax Accuracy
- [Phase 2](#): Syntax and Operability Accuracy

- Phase 3: Syntax and Operability and Identity (TBD; requires further consultation with the community as to if and how this phase would be implemented.)

### ***Accuracy Testing Methods***

Syntax and operability accuracy testing were designed to assess the contact information of a WHOIS record by comparing it to the applicable contractual requirements of the Registrar Accreditation Agreement (RAA).

- Syntax testing assessed the format of a record (e.g., does the email address contain an “@” symbol?)
- Operability testing assessed the functionality of the information in a record (e.g., did the email not get bounced back?)
- The resulting data was analyzed to produce statistics of syntax and operability accuracy for WHOIS contact information across subgroups such as new gTLDs or prior gTLDs, region, and RAA type (i.e., 2009 RAA or [2013 RAA](#))

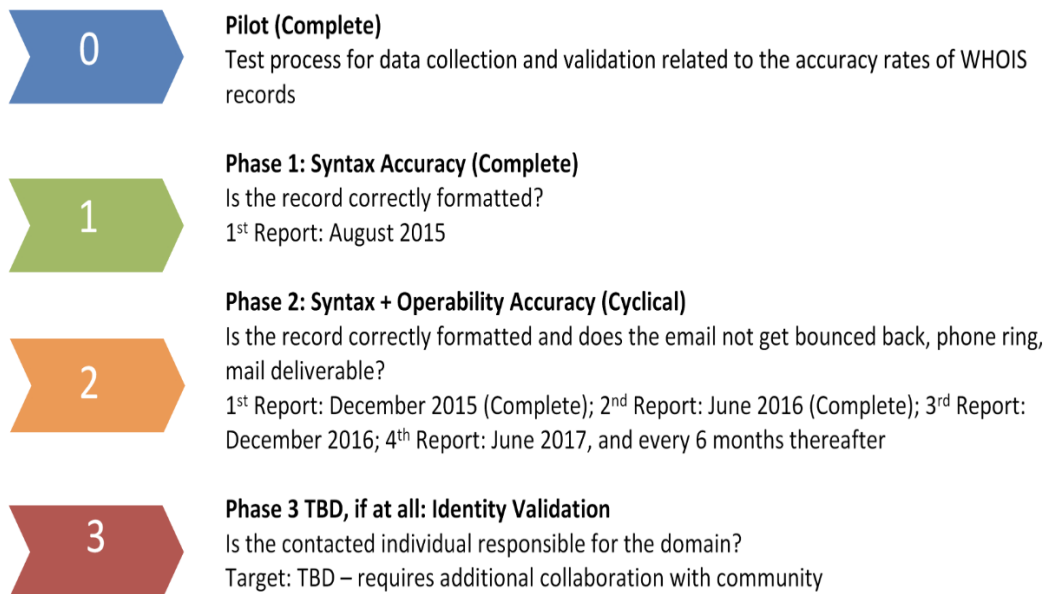
### ***Sample Design***

A two-stage sampling method was used on the WHOIS ARS project to provide a large enough sample to reliably estimate subgroups of interest, such as ICANN region, new gTLD or prior gTLD, and RAA type. Two samples were prepared at the beginning of each report cycle:

- An initial sample of 100,000–200,000 WHOIS records.
- A sub-sample of the initial sample of 10,000-12,000 WHOIS records, which was used for accuracy testing.

### ***WHOIS ARS Phases***

Phase 1 analyzed the syntax accuracy of WHOIS contact information. Phase 2 was ongoing and cyclical and assessed the operability of the contact data in the record by combining the syntax tests from Phase 1 with operability tests. Phase 3 was intended to look at identity validations.



## ***Accuracy Testing Methods***

Syntax (the format of a record) and Operability (functionality of the information in a record) accuracy tests were performed on all nine individual contact information fields in a record (i.e., email address, telephone number, and postal address for the registrant, and administrative and technical contacts) and compiled as a complete record. The accuracy tests were designed in such a way that all records in the analyzed subsample were evaluated against a set of baseline requirements derived from the requirements of the 2009 RAA. While there is little difference between the operability requirements in the 2009 and the 2013 versions of the RAA (only that the registrant email address and telephone number were not required for 2009), the 2013 RAA requires the contact data in a WHOIS record to be more syntactically complete and formatted per more specific requirements than that of the 2009 RAA. For example, the 2009 RAA requires postal addresses with a valid country, whereas the 2013 RAA requires the country in the address to be formatted per the 2-letter code from [ISO-3166-1](#).

## ***Sample Design***

Our analysis included three mutually exclusive RAA subgroups: 2009 RAA, 2013 RAA GF, and 2013 RAA non-grandfathered (referred to as 2013 RAA NGF). Though an estimated 97 percent of domain names were registered through registrars accredited under the 2013 RAA, a majority of domains were allowed to operate under the WHOIS standards of the 2009 RAA. This could be for one of two reasons: 1) the registrar had not yet signed a 2013 RAA with ICANN and was only subjected to 2009 RAA standards; or 2) the registrar had entered into the 2013 RAA with ICANN but the domain was registered before the effective date of the registrar’s 2013 RAA. We

refer to the latter group of domains as 2013 RAA Grandfathered (2013 RAA GF) domains. For this reason, the 2009 RAA criteria was used as the baseline to assess WHOIS accuracy. More detailed information can be found in the individual Sample Design sections of each report.

### ***WHOIS ARS Testing Criteria***

ARS reported syntactic accuracy of the contact data in a WHOIS record based on the contractual requirements of the applicable [RAA](#). For example:

- Syntactic Validation: Is the record correctly formatted? Is there an @ symbol in the email? Is there a country code in the telephone number?
- Operability Validation: Does the email go through? Does the phone ring? Is the mail delivered?

The criteria used to validate a WHOIS record can be found using the links below.

- [Email](#)
- [Telephone](#)
- [Postal](#)

# WHOIS ARS Reporting Materials

This page provides links to reports, reporting summaries, and other ARS materials, such as announcements and webinars. For detailed information regarding each WHOIS ARS report, please see the [Phase 1](#) or [Phase 2](#) sections below. All published materials can be accessed [here](#).

## **WHOIS ARS Phase 1 Reporting**

This page provides results from the Phase 1 Syntax Accuracy report. For result summaries for Phase 1, see below.

### **Phase 1 Findings**

Phase 1 findings showed the rates of syntax accuracy (Phase 2 looked at both syntax and operability accuracy) of WHOIS contact information over several dimensions, focusing on rates of conformance by contact mode (email, telephone or post) to the requirements of RAAs (2009 RAA or 2013 RAA). Our analysis found that approximately 99 percent of email addresses, 85 percent of telephone numbers, and 79 percent of postal addresses met all of the baseline syntax requirements of the 2009 RAA, as shown in the table below.

	<b>E-mail</b>	<b>Telephone</b>	<b>Postal Address</b>	<b>All Three Accurate</b>
<b>All Three Accurate</b>	99.2% ± 0.2%	85.8% ± 0.7%	79.1% ± 0.8%	70.3% ± 0.9%

Regarding the individual contact modes, the Phase 1 Syntax Accuracy Report made the following general observations:

- If an email was provided, it always passed all syntax accuracy tests.
- Two-thirds of the telephone numbers that failed at least one syntax accuracy check (13 percent of all telephone numbers) failed the length criteria for the applicable country.
- Postal addresses that failed at least one syntax accuracy check (23 percent of all postal addresses) were typically missing at least one required field such as postal code, state, city, or street.

## **WHOIS ARS Phase 2 Reporting**

This page provides the results from the Phase 2 Accuracy reports. Phase 2 examined both syntax and operability accuracy of WHOIS contact information over several dimensions, focusing on rates of conformance by contact mode (email, telephone or post) to the requirements of RAAs (2009 RAA or 2013 RAA).

### ***Cycle 1 Summary - Dec. 2015 (records as of July 2015)***

- For syntax accuracy, there was a drop in telephone number accuracy from Phase 1. The drop in telephone number accuracy appeared to be due to an increase in missing country codes among the telephone numbers sampled for Cycle 1.
- 87 percent of email addresses, 74 percent of telephone numbers, and 98 percent of postal addresses met all operability requirements of the 2009 RAA.
- 65 percent of domains passed all operability tests for all contact types (registrant, administrative, technical) and contact modes (email address, telephone number, postal address).

### ***Cycle 2 Summary - June 2016 (records as of Jan. 2016)***

- 99 percent of records had at least one contact mode (email, phone, or postal address) that could be used to establish contact.
- 98 percent of postal addresses, 76 percent of telephone numbers, and 91 percent of email addresses met all operability requirements of the 2009 RAA.
- 70 percent of domains passed all operability tests for all contact types (registrant, administrative, and technical) and contact modes (email, telephone, and postal address).

### ***Cycle 3 Summary - Dec. 2016 (records as of July 2016)***

- 97 percent of records had at least one email or telephone number that met all operability requirements of the 2009 RAA, which implies that nearly all records contained information that could be used to establish immediate contact.
- 97 percent of postal addresses, 72 percent of telephone numbers, and 90 percent of email addresses met all operability requirements of the 2009 RAA.
- 65 percent of domains passed all operability tests, which was about five percent less than Cycle 2. Besides natural sample variation, one possible reason for this could be market dynamics and the growth of domains in certain regions.

### ***Cycle 4 Summary - June 2017 (records as of Jan. 2017)***

- 98 percent of records had at least one email or telephone number that met all operability requirements of the 2009 RAA, which implies that nearly all records contained information that could be used to establish immediate contact.
- 97 percent of postal addresses, 69 percent of telephone numbers, and 94 percent of email addresses met all operability requirements of the 2009 RAA.
- 65 percent of domains passed all operability tests, which was on par with Cycle 3. Across all four cycles of Phase 2, full operability remained steady – between 65 and 70 percent.

### ***Cycle 5 Summary - Dec. 2017 (records as of July 2017)***

- 98 percent of records had at least one email or telephone number that met all operability requirements of the 2009 RAA, which implies that nearly all records contain information that could be used to establish immediate contact.
- 98 percent of postal addresses, 67 percent of telephone numbers, and 94 percent of email addresses met all operability requirements of the 2009 RAA.
- 63 percent of domains passed all operability tests, a slight decrease from Cycle 4. Across all five cycles of Phase 2, full operability was between 63 and 70 percent.

### ***Cycle 6 Summary - June 2018 (records as of Jan. 2018)***

- 98 percent of records had at least one email or telephone number that met all operability requirements of the 2009 RAA, which implies that nearly all records contain information that could be used to establish immediate contact.
- 99 percent of postal addresses, 60 percent of telephone numbers, and 92 percent of email addresses met all operability requirements of the 2009 RAA.
- 56 percent of domains passed all operability tests, a decrease from Cycle 5. Across all five cycles of Phase 2, full operability was between 56 and 70 percent.

### ***Other Data Accuracy Initiatives***

The topic of registration data accuracy continues to be the subject of many community discussions and work streams. In February 2021, ICANN org published a [briefing](#) on Registration Data Accuracy requirements and programs, which led to the formation of the [Registration Data Accuracy Scoping Team](#) in July 2021.

# WHOIS ARS Contractual Compliance Metrics

ICANN's Contractual Compliance team supported the WHOIS ARS effort by receiving reports of identified syntax and operational failures and following up with contracted parties to resolve areas of noncompliance. The team relied on several methods to accomplish this, including WHOIS inaccuracy complaints, WHOIS format complaints, and targeted outreach to contracted parties. These complaints were processed along with community-submitted WHOIS complaints. Below were ICANN Contractual Compliance metrics for each phase and cycle of WHOIS ARS complaint processing.

ICANN org reviewed data gathered from the complaints it processed during each WHOIS ARS cycle to ensure the accuracy of WHOIS ARS data sampling and to improve the processing of WHOIS ARS complaints. Additionally, ICANN org was engaged in continuous improvement efforts for processing WHOIS records. These efforts included implementing new WHOIS ARS testing methods and gathering feedback from contracted parties and ICANN's Contractual Compliance team.

The process of reviewing and reporting WHOIS ARS test results was time consuming: it took anywhere from four to five months before ICANN Contractual Compliance could begin processing the WHOIS ARS. This lag could have resulted in outdated WHOIS ARS test results, but with each new WHOIS ARS test cycle, the WHOIS ARS and ICANN Contractual Compliance teams worked to reduce this lag time.

## ***ICANN Contractual Compliance Follow-Up Statistics***

### ***Phase 1***

#### ***ICANN Contractual Compliance Metrics for WHOIS ARS Phase 1***

(Data as of 1 October 2017)

This Phase tested syntax (the format of a record) only.

NOTE: Ticket count may not add up to total tickets created because a ticket may reach multiple notice stages. Due to rounding and tickets being closed for multiple reasons, percentages may not always appear to add up to 100%.

To learn more about the ICANN Contractual Compliance Approach and Process, please see the [Contractual Compliance webpage](#).

<b>Ticket Processing Summary and Breakdown by Process Step</b>	
Total tickets created	3,703



Total tickets closed	3,703
Tickets closed before first notice	2,309
Tickets closed after at least one notice	1,394
Tickets in process as of 1 October 2017	0

<b>Reason for Tickets Closed Before First Notice</b>	
WHOIS data when ticket processed different from sampled WHOIS data.	53.6%
Domain not registered when ticket processed.	24.2%
Domain suspended when ticket processed.	10.4%
Duplicate pending complaint when ticket processed.	8.7%
Ticket lacked sufficient information to process.	2.4%
Other (each closure reason representing less than 0.5% of cases)	0.8%

<b>Reasons for Tickets Closed After at Least One Notice</b>	
Domain suspended.	58.7%
Registrar changed or updated WHOIS data.	27.2%
Registrar corrected WHOIS format.	5.8%
Registrar verified that sampled WHOIS data is correct.	4.6%
Registrar remediated issue.	1.5%
WHOIS data when ticket processed different from sampled WHOIS data.	1.4%
Other (each closure reason representing less than 0.5% of cases)	0.7%

## **Phase 2**

### **ICANN Contractual Compliance Metrics for WHOIS ARS Phase 2 Cycle 1**

(Data as of 1 October 2017)

This Phase tested syntax (the format of a record) and operability (functionality of the information in a record). NOTE: Ticket count may not add up to total tickets created as a

ticket may reach multiple notice stages. Due to rounding and tickets being closed with multiple closure reasons, percentages may not always appear to add up to 100%. Four registrars received a Notice of Breach for tickets created during Phase 2, Cycle 1. Of the four, one registrar was suspended then terminated.

To learn more about the ICANN Contractual Compliance approach and process, please see the [Contractual Compliance webpage](#).

<b>Ticket Processing Summary and Breakdown by Process Step</b>	
Total tickets created	2,688
Total tickets closed	2,688
Tickets closed before 1st notice	1,324
Tickets closed after at least one notice	1,364
Tickets in process as of 1 October 2017	0

<b>Reason for Tickets Closed Before First Notice</b>	
WHOIS data when ticket processed different from sampled WHOIS data.	40.9%
Domain not registered when ticket processed.	30.4%
Domain suspended when ticket processed.	16.4%
WHOIS format issue identified for 2013 Grandfathered Domain.	5.6%
Registrar verified that sampled WHOIS data is correct.	5.1%
Registrar changed or updated WHOIS data.	1.0%
Known Privacy/Proxy service	0.5%
Other (each closure reason representing less than 0.5% of cases)	0.1%

<b>Reasons for Tickets Closed After at Least One Notice</b>	
Domain suspended.	60.1%
Registrar changed or updated WHOIS data.	28.2%
Registrar verified that sampled WHOIS data is correct.	6.6%

WHOIS data when ticket processed different from sampled WHOIS data.	2.1%
Registrar corrected WHOIS format.	1.7%
Domain not registered when ticket processed.	0.7%
Other (each closure reason representing less than 0.5% of cases)	0.6%

### **ICANN Contractual Compliance Metrics for WHOIS ARS Phase 2 Cycle 2**

(Data as of 1 October 2017)

This Phase tested syntax and operability. NOTE: Ticket count may not add up to total tickets created as a ticket may reach multiple notice stages. Due to rounding and tickets being closed for multiple closure reasons, percentages may not always appear to add up to 100 percent.

To learn more about the ICANN Contractual Compliance approach and process, please see the [Contractual Compliance webpage](#).

<b>Ticket Processing Summary and Breakdown by Process Step</b>	
Total tickets created	4,001
Total tickets closed	4,001
Tickets closed before 1st notice	2,481
Tickets closed after at least one notice	1,520
Tickets in process as of 1 October 2017	0

<b>Reason for Tickets Closed Before First Notice</b>	
WHOIS data when ticket processed different from sampled WHOIS data.	59.7%
Domain suspended when ticket processed.	13.6%
Domain not registered when ticket processed.	12.5%
WHOIS format issue identified for 2013 Grandfathered Domain.	9.9%
Known Privacy/Proxy service	3.1%
Registrar previously verified/corrected WHOIS inaccuracy.	0.9%

Ticket lacked sufficient information to process.	0.6%
Other (each closure reason representing less than 0.5% of cases)	0.6%

<b>Reasons for Tickets Closed After at Least One Notice</b>	
Domain suspended.	60.6%
WHOIS data changed or updated.	25.4%
Registrar corrected WHOIS format.	6.1%
Registrar verified that sampled WHOIS data is correct.	4.9%
WHOIS data when ticket processed different from sampled WHOIS data.	1.2%
Other (each closure reason representing less than 0.5% of cases)	1.8%

### ***ICANN Contractual Compliance Metrics for WHOIS ARS Phase 2 Cycle 3***

(Data as of 1 October 2017)

This Phase tested syntax and operability. NOTE: Ticket count may not add up to total tickets created as a ticket may reach multiple notice stages. Due to rounding and tickets being closed with multiple closure reasons, percentages may not appear to add up to 100%.

To learn more about the ICANN Contractual Compliance approach and process, please see the [Contractual Compliance webpage](#).

<b>Ticket Processing Summary and Breakdown by Process Step</b>	
Total tickets created	4,552
Total tickets closed	4,552
Tickets closed before first notice	2,662
Tickets closed after at least one notice	1,890
Tickets in process as of 1 October 2017	0

<b>Reason for Tickets Closed Before First Notice</b>
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WHOIS data when ticket processed different from sampled WHOIS data.	60.1%
WHOIS format issue identified for 2013 Grandfathered Domain.	14.3%
Domain suspended when ticket processed.	7.9%
Domain not registered when ticket processed.	7.7%
Known Privacy/Proxy service	6.3%
Duplicate WHOIS compliant already pending.	3.8%
Other (each closure reason representing less than 0.5% of cases)	0.4%

<b>Reasons for Tickets Closed After at Least One Notice</b>	
Domain suspended.	65.0%
WHOIS data changed or updated	21.5%
Registrar corrected WHOIS format.	7.2%
Registrar verified that sampled WHOIS data is correct.	3.9%
WHOIS data when ticket processed different from sampled WHOIS data.	0.9%
Registrar demonstrated compliance with RAA.	0.7%
Registry or Registrar remediated issue.	0.5%
Other (each closure reason representing less than 0.5% of cases)	0.6%

***ICANN Contractual Compliance Metrics for WHOIS ARS Phase 2 Cycle 4***

(Data as of 1 April 2018)

This Phase tested syntax and operability. NOTE: Ticket count may not add up to total tickets created because a ticket may reach multiple notice stages. Due to rounding and tickets being closed for multiple closure reasons, percentages may not appear to add up to 100 percent.

To learn more about the ICANN Contractual Compliance approach and process, please see the Contractual Compliance [webpage](#).

<b>Ticket Processing Summary and Breakdown by Process Step</b>
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Total tickets created	4,681
Total tickets closed	4681
Tickets closed before 1st notice	2,669
Tickets closed after at least one notice	2,012
Tickets in process as of 1 April 2018	0

<b>Reason for Tickets Closed Before First Notice</b>	
WHOIS data when ticket processed different from sampled WHOIS data.	49.7%
Domain not registered when ticket processed.	18.2%
WHOIS format issue identified for 2013 Grandfathered Domain.	13.3%
Domain suspended when ticket processed.	11.8%
Known Privacy/Proxy service	7.0%
Other (each closure reason representing less than 0.5% of cases)	0.3%

<b>Reasons for Tickets Closed After at Least One Notice</b>	
Domain suspended	69.5%
WHOIS data changed or updated.	16.3%
Registrar corrected WHOIS format.	6.0%
Registrar verified that sampled WHOIS data is correct.	5.9%
Registrar demonstrated compliance with RAA.	0.9%
Other (each closure reason representing less than 0.5% of cases)	1.3%

***ICANN Contractual Compliance Metrics for WHOIS ARS Phase 2 Cycle 5***

(Data as of 1 October 2018)

This Phase tested syntax and operability. NOTE: Ticket count may not add up to total tickets created because a ticket may reach multiple notice stages. Due to rounding and tickets being closed for multiple closure reasons, percentages may not always appear to add up to 100 percent.

To learn more about the ICANN Contractual Compliance approach and process, please see the [Contractual Compliance webpage](#).

<b>Ticket Processing Summary and Breakdown by Process Step</b>	
Total tickets created	4,639
Total tickets closed	3,088
Tickets closed before first notice	2,150
Tickets closed after at least one notice	938
Tickets in process as of 1 October 2018	1,550

<b>Closure Reason for Tickets Closed Before 1st Notice</b>	
WHOIS data when ticket processed different from sampled WHOIS data.	56.9%
Domain not registered when ticket processed.	24.4%
Domain suspended when ticket processed.	10.2%
Known Privacy/Proxy service	7.2%
WHOIS format issue identified for 2013 Grandfathered Domain.	1.2%
Other (each closure reason representing less than 0.5% of cases)	0.2%

<b>Closure Reasons for Tickets Closed After at Least One Notice</b>	
Domain suspended.	79.7%
WHOIS data changed / updated.	12.2%
Registrar verified that sampled WHOIS data is correct.	5.5%
Registrar corrected WHOIS format.	1.5%
Other (each closure reason representing less than 0.5% of cases)	1.1%

**ICANN Contractual Compliance Metrics for WHOIS ARS Phase 2 Cycle 6**

(Data as of 1 October 2018)

This Phase tested syntax and operability. NOTE: Ticket count may not add up to total tickets created as a ticket may reach multiple notice stages. Due to rounding and tickets being closed with multiple closure reasons, percentages may not appear to add up to 100 percent.

For more about the ICANN Contractual Compliance approach and process, please see the [Contractual Compliance webpage](#).

<b>Ticket Processing Summary and Breakdown by Process Step</b>	
Total tickets created	5,600
Total tickets closed	1,169
Tickets closed before first notice	1,151
Tickets closed after at least one notice	18
Tickets in process as of 1 October 2018	4,431

<b>Reason for Tickets Closed Before First Notice</b>	
Domain not registered when ticket processed.	72.1%
WHOIS data when ticket processed different from sampled WHOIS data.	14.8%
Domain suspended when ticket processed.	12.9%
Other (each closure reason representing less than 0.5% of cases)	0.3%

<b>Reasons for Tickets Closed After at Least One Notice</b>	
Domain suspended.	83.3%
WHOIS data changed / updated.	11.1%
Registrar verified that sampled WHOIS data is correct.	5.6%



# WHOIS ARS Testing Criteria

## ***Email Address***

In the 2009 RAA, an Admin and a Tech email address was required. The presence of a Registrant email address was optional. In the 2013 RAA, the Admin, Tech, and Registrant email addresses were each required.

## ***Syntax Testing Criteria***

1. Is there the presence of an email address?  
(i.e., field is not blank)
  - a. Registrant email address  
Yes – Pass  
No – Fail: 2013 RAA || Pass: 2009 RAA
  - b. Tech email address  
Yes – Pass  
No – Fail
  - c. Admin email address  
Yes – Pass  
No – Fail
2. Does the email address only contain permissible characters?  
(i.e., as provided by the RFC 5322)
  - a. Registrant, b. Tech, and c. Admin email addresses  
Yes – Pass  
No – Fail
3. Is there the presence of an “@” symbol in the email address?
  - a. Registrant, b. Tech, and c. Admin email addresses  
Yes – Pass  
No – Fail
4. Is there the presence of a domain component?  
(i.e., the characters following the “@” symbol)
  - a. Registrant, b. Tech, and c. Admin email addresses  
Yes – Pass  
No – Fail
5. Is the domain component in a TLD, which is resolvable on the Internet?  
(see IANA’s Root Zone Database: <http://www.iana.org/domains/root/db>)
  - a. Registrant, b. Tech, and c. Admin email addresses  
Yes – Pass  
No – Fail
6. Is the domain component syntactically valid?  
(i.e., the component following the “@” symbol meets requirements)

- a. Registrant, b. Tech, and c. Admin email addresses
    - Yes – Pass
    - No – Fail
- 7. Is there the presence of local component?  
(i.e., the characters preceding the “@” symbol)
  - a. Registrant, b. Tech, and c. Admin email addresses
    - Yes – Pass
    - No – Fail
- 8. Is the local component syntactically valid?  
(i.e., the component preceding the “@” symbol meets requirement)
  - a. Registrant, b. Tech, and c. Admin email addresses
    - Yes – Pass
    - No – Fail

### **Operability Testing Criteria**

The operability criteria for email address were a combination of direct (i.e., sending an email) and indirect (i.e., server communication) methods to validate an email address.

*A "No" response for any of these tests, except for an omitted Registrant email address subject to the 2009 RAA requirements, was considered a failure for the contact field. A missing Registrant email address subject to the 2009 RAA was noted, but not counted against the domain or registrar.*

- 1. Does the email address' domain have at least one mail exchanger (MX) record?
  - a. Registrant, b. Tech, and c. Admin email addresses
    - Yes – Pass
    - No – Fail
- 2. Is a viable connection made to the mail server?
  - a. Registrant, b. Tech, and c. Admin email addresses
    - Yes – Pass
    - No – Fail
- 3. Is there the absence of a bounce email within one (1) day after email issuance?
  - a. Registrant, b. Tech, and c. Admin email addresses
    - Yes – Pass
    - No – Fail

### **Telephone Number**

In the 2009 RAA, the presence of telephone numbers for Admin and Tech was required; presence of a Registrant telephone number was optional. In the 2013 RAA, telephone number for the Admin, Tech, and Registrant s were each required to be present.

### **Syntax Testing Criteria**

1. Is there the presence of a phone number?  
(i.e., field is not blank)
    - a. Registrant phone number  
Yes – Pass  
No – Fail: 2013 RAA || Pass: 2009 RAA
    - b. Tech phone number  
Yes – Pass  
No – Fail
    - c. Admin phone number  
Yes – Pass  
No – Fail
  2. Is there the presence of a country code?  
(i.e., contains a discernible country code based on the first three digits)
    - a. Registrant, b. Tech, and c. Admin phone number  
Yes – Pass  
No – Fail
  3. Is the country code syntactically valid?  
(i.e., meets the requirements as specified in RFC5733, +###.)
    - a. Registrant, b. Tech, and c. Admin phone number  
Yes – Pass  
No – Fail: 2013 RAA || Pass: 2009 RAA
  4. Does the phone number contain at least the minimum allowed number of digits based on the country code?
    - a. Registrant, b. Tech, and c. Admin phone number  
Yes – Pass  
No – Fail
  5. Does the phone number contain at most the maximum allowed number of digits based on the country code?
    - a. Registrant, b. Tech, and c. Admin phone number  
Yes – Pass  
No – Fail
  6. Does the phone number contain an appropriate number of digits based on the country code?  
(e.g., the number contains seven digits when only six or eight digits were acceptable based on a country code)
    - a. Registrant, b. Tech, and c. Admin phone number  
Yes – Pass  
No – Fail
  7. Does the phone number only contain permissible numbers and formatting characters?
    - a. Registrant, b. Tech, and c. Admin phone number  
Yes – Pass  
No – Fail
- IDENTIFIER – Is there the presence of an extension?

- a. Registrant, b. Tech, and c. Admin phone number
  - Yes – Proceed to additional extension validation
  - No – Move to next field
- 8. Does the extension only contain permissible numbers and formatting characters?
  - a. Registrant, b. Tech, and c. Admin phone number
    - Yes – Pass
    - No – Fail
- 9. Is the extension syntactically valid?
  - (i.e., “x” to attribute the telephone extension: RFC5733)
  - a. Registrant, b. Tech, and c. Admin phone number
    - Yes – Pass
    - No – Fail: 2013 RAA || Pass: 2009 RAA

### ***Operability Testing Criteria***

All telephone numbers were subjected to both syntax and operability testing. Telephone number operability involved a series of tests to determine if the connection existed and was working. The operability test was performed by attempting to place a call to the number listed in the WHOIS record.

*A “No” response for any of these tests, except for an omitted Registrant telephone number subject to the 2009 RAA requirements, was considered a failure for the contact field. A missing Registrant telephone number subject to the 2009 RAA was noted, but not counted against the domain or registrar. A “Yes” response initiated Stage Two testing.*

- 1. Does the phone number connect (i.e., provide a ringtone, busy signal, or an answer)
  - a. Registrant, b. Tech, and c. Admin phone number
    - Yes – Pass
    - No – Fail
- 1. Is there the absence of a disconnected message?
  - a. Registrant, b. Tech, and c. Admin phone number
    - Yes – Pass
    - No – Fail
- 2. Is there the absence of an invalid number error?
  - a. Registrant, b. Tech, and c. Admin phone number
    - Yes – Pass
    - No – Fail

### ***Postal Address***

In the 2009 RAA and 2013 RAA, presence of postal address for a Registrant, Admin, and a Tech was required.

## **Syntax Testing Criteria**

1. Is there the presence of a postal address?  
(i.e., field is not blank)
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Pass  
No – Fail
2. Is there the presence of a country?
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Pass  
No – Fail
3. Is the country identifiable?  
(i.e., full country name or an ISO 3166-1 abbreviation)
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Pass  
No – Fail
4. Is the country provided in the Country field?
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Pass  
No – Fail: 2013 RAA || Pass: 2009 RAA
5. Is the country syntactically valid?  
(i.e., meets ISO 3166-1: Alpha 2-code format)
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Pass  
No – Fail: 2013 RAA || Pass: 2009 RAA
- IDENTIFIER – Does the country use a postal code system?
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Proceed to additional postal code validation  
No – Appropriately left blank, move to next field (i.e., Test 9)
6. Is there the presence of a postal code?
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Pass  
No – Fail
7. Is the postal code in the Postal Code field?
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Pass  
No – Fail: 2013 RAA || Pass: 2009 RAA
8. Is the Postal Code syntactically valid based on the country?  
(i.e., format of postal code meets length, alpha/numeric formats of country)
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Pass  
No – Fail
- IDENTIFIER – Does the country require states/provinces in its addressing system?

- a. Registrant, b. Tech, and c. Admin postal address
    - Yes – Proceed to additional State/Provide validation
    - No – Appropriately left blank, move to next field (i.e., Test 13)
- 9. Is there the presence of a state/province?
  - a. Registrant, b. Tech, and c. Admin postal address
    - Yes – Pass
    - No – Fail
- 10. Is the state/province in the State/Province field?
  - a. Registrant, b. Tech, and c. Admin postal address
    - Yes – Pass
    - No – Fail: 2013 RAA || Pass: 2009 RAA
- 11. Is the State/Province syntactically valid?  
(i.e., full name or abbreviation depending on country addressing system)
  - a. Registrant, b. Tech, and c. Admin postal address
    - Yes – Pass
    - No – Fail: 2013 RAA || Pass: 2009 RAA
- 12. Is there the presence of a city?
  - a. Registrant, b. Tech, and c. Admin postal address
    - Yes – Pass
    - No – Fail
- 13. Is the city in the City field?
  - a. Registrant, b. Tech, and c. Admin postal address
    - Yes – Pass
    - No – Fail: 2013 RAA || Pass: 2009 RAA
- 14. Is there the presence of a street?
  - a. Registrant, b. Tech, and c. Admin postal address
    - Yes – Pass
    - No – Fail
- 15. Is the street in the Street field?
  - a. Registrant, b. Tech, and c. Admin postal address
    - Yes – Pass
    - No – Fail: 2013 RAA || Pass: 2009 RAA

### ***Operability Testing Criteria***

All postal addresses were subjected to both syntax and operability testing. Operability testing was mostly automated through the use of a tool employed by ICANN's postal address validation vendor. No mail was sent as part of the testing.

*Note: There is no difference between 2009 and 2013 RAA verification requirements. All records were given the same tests.*

## **Automated Stage**

The validation vendor attempted to verify the deliverability of the address automatically via the tool.

*A “Yes” for Stage One will be considered a “Pass” for Operability (i.e., deliverable). A “No” for Stage One will trigger either a “Fail” or a follow-on testing scenario.*

1. Is the tool able to automatically verify deliverability?
  - a. Registrant, b. Tech, and c. Admin postal address
    - Yes – Pass
    - No – Fail: No country present in address
    - No – Possible Fail (A): Tool has no reference data for given country; Proceed to Manual Stage (A)
    - No – Possible Fail (B): Ambiguity or incomplete data; Proceed to Manual Stage (B)

## **Manual Stage (A)**

The Operability Test in Manual Stage (A) was performed on all contact fields that attained a "Possible Fail (A)" from the Automated Stage above. Here, the validation vendor conducted manual testing of the given address using its own complementary data on the given country to determine if the address was likely to be deliverable.

*A “Yes” response for Manual Stage (A) was considered a “Pass” for Operability (i.e., deliverable). A “No” for Manual Stage (A) was considered “Indeterminate” for Operability (i.e., unable to verify automatically or manually the deliverability of the address).*

1. Based on the validation vendor’s manual check of the address, is the address likely deliverable?
  - a. Registrant, b. Tech, and c. Admin postal address
    - Yes – Pass
    - No – Indeterminate

## **Manual Stage (B)**

The Operability Test in Manual Stage (B) was performed on all contact fields that attained a "Possible Fail (B)" from the Automated Stage described above. Here, the validation vendor checked the available reference data for the given address components to determine if the address was likely to be deliverable. Two components, state/province (if applicable) and city, were essential to the validation vendor’s ability to complete this test; in the absence of these two components, an address would not be considered deliverable.

*A “Yes” response to all three criteria for Manual Stage (B) will be considered a “Pass” for Operability (i.e., deliverable). A “No” response to at least one will be considered a “Fail” for Operability (i.e., not deliverable).*

1. Is there the presence of a city in the given address?  
(i.e., field is not blank)
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Pass  
No – Fail
2. If Postal Address Syntax Identifier Test for State/Province = yes, is there presence of a state/province in the given address?  
(i.e., field is not blank)
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Pass  
No – Fail
2. Based on the validation vendor’s manual check of the given address components, is the address likely to be deliverable?
  - a. Registrant, b. Tech, and c. Admin postal address  
Yes – Pass  
No – Fail