

RDAP Operational Profile for gTLD Registries and Registrars

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DRAFT

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2. Introduction

Lookup and search services for name resources have traditionally been offered through WHOIS (see [RFC3912](#)), with additional services such as web pages, and bulk download. Despite its wide deployment and usage, shortcomings of the WHOIS protocol became apparent with the years. These include the lack of a standard data model, the lack of support for internationalization and the inability to authenticate users and provide differentiated services to classes of users.

In 2012, The Internet Engineering Task Force (IETF) chartered the [WEIRDS](#) (Web Extensible Internet Registration Data Services) working group to determine the needs of the community. This working group concluded in early 2015 with the publication of several specifications ([RFC7480](#), [RFC7481](#), [RFC7482](#), [RFC7483](#), [RFC7484](#) and [RFC7485](#)) defining the behavior of the Registry Data Access Protocol (RDAP), a standardized replacement for WHOIS.

The goal of this document is to define an RDAP profile for gTLD Registries and Registrars. This document covers which features within the RDAP protocol are mandatory, basic parameters, and the mandatory set of objects to be implemented as well as allowed optional objects.

3. RDAP Operational Profile

The purpose of this profile is to specify the RDAP requirements that are in line with the current Whois service requirements. The profile is built from the related IETF standards, requirements from the gTLD Registry Agreement (RA), Registrar Accreditation Agreement 2013 (RAA), Whois-related advisories and consensus policies published by ICANN.

This document should be read together with the following:

- gTLD Registry Agreement (RA), <https://newgtlds.icann.org/sites/default/files/agreements/agreement-approved-09jan14-en.htm>
- Registrar Accreditation Agreement 2013 (RAA), <https://www.icann.org/resources/pages/approved-with-specs-2013-09-17-en>
- Additional Whois Information Policy (AWIP), <https://www.icann.org/resources/pages/policy-awip-2014-07-02-en>
- RDDS Clarification Advisory, <https://www.icann.org/resources/pages/registry-agreement-raa-rdds-2015-04-27-en>

Contracted parties operating according to an agreement, which includes a clause to implement a successor protocol to WHOIS, are required to deploy RDAP. As of the time of writing of this document, the set of contracted parties subject to this are: RAA 2013 Registrars, gTLDs of the 2012 round (a.k.a. new gTLDs) and other gTLDs (e.g. .biz, .com, .info, .jobs, .name, .org, .xxx).

Section 1 contains requirements applicable to both gTLD Registries and Registrars. Section 2 only applies to gTLD Registries while Section 3 only applies to gTLD Registrars.

The term "RDDS fields" in this document refers to the key/value pairs listed in the RDDS Specification of the Registry Agreement (RA), the Registration Data Directory Service (WHOIS) Specification of the Registrar Accreditation Agreement (RAA) 2013 or the RDDS Clarification Advisory.

The term "MUST", "MUST NOT", "REQUIRED", "SHOULD" and "MAY" in this document are to be interpreted as described in [RFC2119](#).

1. The following requirements apply to both gTLD Registries and Registrars (i.e. contracted parties)

- 1.1. Within the present profile and through the RAA and RA, all references to Registration Data Directory Services (RDDS) apply to the following services: WHOIS (port 43), web-based WHOIS and RDAP.

1.2. RDDS fields defined as Optional in this document are REQUIRED to be included in a response, using the appropriate mapping as defined in Appendix B, when germane to the query and data exists in the SRS database.

1.3. RDAP protocol:

1.3.1. The RDAP service MUST implement the following Internet Engineering Task Force (IETF) documents:

- [RFC7480](#) - HTTP Usage in the Registration Data Access Protocol (RDAP)
- [RFC7481](#) - Security Services for the Registration Data Access Protocol (RDAP)
- [RFC7482](#) - Registration Data Access Protocol (RDAP) Query Format
- [RFC7483](#) - JSON Responses for the Registration Data Access Protocol (RDAP)
- [RFC7484](#) - Finding the Authoritative Registration Data (RDAP) Service

1.3.2. The RDAP service MUST be provided only over HTTPS. The TLS certificate used for the RDAP service must be issued by a Certificate Authority (CA) trusted by major browsers and mobile OS such as the ones listed in the Mozilla Included CA Certificate List (<https://wiki.mozilla.org/CA:IncludedCAs>). The CA, the certificate and its usage MUST follow the CAB Forum Baseline Requirements (<https://cabforum.org/baseline-requirements-documents>). The RDAP service MUST use the best practices for secure use of TLS as described in [RFC7525](#) or its successors.

1.3.3. The RDAP service MUST support both GET and HEAD types of HTTP methods. HEAD requests are used to verify the existence of an object in the database, as specified in [RFC7480](#).

1.3.4. RDAP extensions, if used, MUST be registered in the IANA's RDAP Extensions registry (<https://www.iana.org/assignments/rdap-extensions/rdap-extensions.xhtml>), as defined in [RFC7480](#). Deployment of RDAP extensions in gTLD Registries operated under agreement with ICANN, are subject to approval by ICANN via the RSEP process.

1.3.5. An rdapConformance object [[RFC7483](#)] MUST be present in the topmost object of every response, and it MUST contain the conformance level of the RDAP protocol and of any extension, as specified in [RFC7483](#).

1.3.6. RDAP services MUST be available over both IPv4 and IPv6 transport. The resource records related to the RDAP service MUST be signed with DNSSEC, and the DNSSEC chain of trust from the root trust anchor to

the name of the RDAP server MUST be valid at all times. The DNSSEC security algorithm used for zone signing at each level MUST be listed as standardized for Zone Signing in the IANA's Domain Name System Security (DNSSEC) Algorithm Numbers registry.

- 1.3.7. RDAP servers MUST NOT insert JSON members or objects that are not part of an ICANN-approved (e.g., per exhibit A of the RA) registered extension.
- 1.3.8. Contracted parties MUST use fully qualified domain names in RDAP responses.

1.4. Responses to RDAP queries:

- 1.4.1. Internationalized Domain Name (IDN) RDAP lookup queries of domain names using A-label or U-label format [[RFC5890](#)] MUST be supported.
- 1.4.2. The source data used to generate the RDAP responses MUST be the same across all RDDS services (i.e. port-43 WHOIS, web-based WHOIS and RDAP).
- 1.4.3. The case (i.e. uppercase and lowercase) of the data returned in RDAP responses MUST be preserved.
- 1.4.4. Leading and trailing space or spaces MUST NOT appear in the RDAP response.
- 1.4.5. RDAP responses MUST NOT contain carriage return and line feed characters. As described in [RFC7483](#) section 4.3, large fields such as notices [[RFC7483](#)] and remarks [[RFC7483](#)] may be divided in separate strings to improve readability.
- 1.4.6. The terms of service of the RDAP service MUST be specified in the notices object in the topmost JSON object of the response. The notices object MUST contain a links object [[RFC7483](#)]. The links object MUST contain an URL of the contracted party providing the RDAP service.
- 1.4.7. In contact entities [[RFC7483](#)], phone numbers MUST be inserted as tel properties with a voice type parameter, as specified in [RFC6350](#), the vCard Format Specification and its corresponding JSON mapping [RFC7095](#).
- 1.4.8. In contact entities, fax numbers are Optional RDDS fields, and MUST be inserted as tel properties with a fax type parameter, as specified in [RFC6350](#), the vCard Format Specification and its corresponding JSON mapping [RFC7095](#).

- 1.4.9. RDAP Help queries [[RFC7482](#)] MUST be answered and include a links member with a URL to a document that provides usage information, policy and other explanatory material.
 - 1.4.10. Truncated RDAP responses MUST contain a notices member describing the reason of the truncation. The notices object type MUST be of the form “Response truncated due to {authorization|load|unexplainable reason}”.
 - 1.4.11. Truncated RDAP objects MUST contain a remarks member describing the reason of the truncation. The remarks object type MUST be of the form “Result set truncated due to {authorization|load|unexplainable reason}”.
 - 1.4.12. RDAP responses MUST contain the last update date and time of the database used to generate the RDAP responses (RDAP database in this document) when an RFC defining this capability has been published. The RDAP database MUST include the registration data in the SRS database. The RDAP database must be updated within the allowed Service Level Requirement (SLR) (e.g. RDDS update time, ≤60 minutes). In a case where the contracted party is querying its SRS database directly, and therefore, using real-time data, this date and time will show the timestamp of the response to the query.
- 1.5. Responses to domain name RDAP queries:
 - 1.5.1. The top-level domain object [[RFC7483](#)] in the RDAP response MUST contain the A-label format of the domain in the ldhName member [[RFC7483](#)].
 - 1.5.2. The top-level domain object in the RDAP response MUST contain the U-label format of the domain in the unicodeName member [[RFC7483](#)], only if the domain name is an IDN.
 - 1.5.3. The top-level domain object in the RDAP response MUST contain a status member [[RFC7483](#)] with the domain statuses in the SRS. The status MUST be a valid status type per the IANA’s RDAP JSON Values registry.
 - 1.5.4. The status member value of the RDAP domain, nameserver [[RFC7483](#)] and entity objects MUST conform to the values defined in IANA’s RDAP JSON Values (<https://www.iana.org/assignments/rdap-json-values/rdap-json-values.xhtml>) of status type.

- 1.5.5. The status member of a domain object in the RDAP response MUST match the EPP Status codes in the SRS within the allowed timeframe (e.g. ≤60 minutes) to update the RDAP database from the SRS.
- 1.5.6. The status member of a domain object in the RDAP response MUST be a valid status type per the mapping table in Appendix C.
- 1.5.7. The domain object in the RDAP response MUST contain the name servers of the domain in the nameservers member. Each nameserver object MUST contain the following member: ldhName. The following members are Optional: ipAddresses [[RFC7483](#)], unicodeName, events [[RFC7483](#)], handle [[RFC7483](#)] (ROID of the host object, <host:roid> as defined in [RFC5732](#)), status, remarks, and links. In the case of a Registry in which name servers are specified as domain attributes, the nameserver object MUST NOT contain the following members: events, handle and status.
- 1.5.8. The domain object in the RDAP response MUST contain entities with the following roles, exactly one entity per role MUST be present in the response, each of them with a handle (ROID of the contact object, <contact:roid>, as defined in [RFC5733](#)) and valid members fn, adr, tel, email (as specified in [RFC6350](#), the vCard Format Specification and its corresponding JSON mapping [RFC7095](#)):
 - registrant
 - administrative
 - technical
- 1.5.9. The domain object in the RDAP response MAY contain an entity of the billing role with a handle (ROID of the contact object, <contact:roid>, as defined in [RFC5733](#)) and valid members fn, adr, tel, email.
- 1.5.10. The following RDDS fields used to generate the adr member of the entities with the registrant, administrative and technical roles are REQUIRED to be included in the RDAP response:
 - Registrant/Admin/Tech Street
 - Registrant/Admin/Tech City
 - Registrant/Admin/Tech Country
- 1.5.11. The following RDDS fields are Optional:
 - Registrant/Admin/Tech Organization
 - Registrant/Admin/Tech State/Province
 - Registrant/Admin/Tech Postal Code
 - Registrant/Admin/Tech Phone Ext
 - Registrant/Admin/Tech Fax
 - Registrant/Admin/Tech Fax Ext

- 1.5.12. The domain object in the RDAP response MUST contain an entity with the registrar role (called registrar entity in this section). The handle of the entity MUST be equal to the IANA Registrar ID. A valid fn member MUST be present in the registrar entity. Other members MAY be present in the entity (as specified in [RFC6350](#), the vCard Format Specification and its corresponding JSON mapping [RFC7095](#)). Contracted parties MUST include an entity with the abuse role (called abuse entity in this section) within the registrar entity. The abuse entity MUST include tel and email members, and MAY include other members.
- 1.5.13. The entity with the registrar role in the RDAP response MUST contain a publicIDs member [[RFC7483](#)] to identify the IANA Registrar ID from the IANA's Registrar ID registry (<https://www.iana.org/assignments/registrar-ids/registrar-ids.xhtml>). The type value of the publicID object MUST be equal to IANA Registrar ID.
- 1.5.14. The domain object in the RDAP response MUST contain the following events:
- An event of eventAction type registration.
 - An event of eventAction type expiration.
 - An event of eventAction type last changed. The event of eventAction type last changed MUST be omitted if the domain name has not been updated since it was created.
 - An event with the expiration date of the Registrar, when a RFC defining this capability has been published.
- 1.5.15. The domain object in the RDAP response MAY contain the following events:
- An event of eventAction type last transferred, with the last date and time that the domain was transferred. The event of eventAction type last transferred MUST be omitted if the domain name has not been transferred since it was created.
- 1.5.16. Entities MUST use jCard [[RFC7095](#)] structured addresses.
- 1.5.17. If allocated variant domain names exist for the queried domain name or if the domain name is an allocated variant domain name, the domain object in the RDAP response MUST contain a variants member [[RFC7483](#)]. The variants relation member MUST contain valid variant relation types as defined in the IANA's RDAP JSON Values registry. If the queried domain name is an allocated variant name, the original name MUST be included in the variants member.

- 1.5.18. A domain name RDAP response MUST contain a remarks member with a title "EPP Status Codes", a description containing the string "For more information on domain status codes, please visit <https://icann.org/epp>" and a links member with the <https://icann.org/epp> URL.
- 1.5.19. The domain object in the RDAP response MUST contain a securedNS member [[RFC7483](#)] including at least a delegationSigned element. Other elements (e.g. dsData, maxSigLife) of the securedNS member MUST be included, if the domain name is signed and the elements are known by the server.
- 1.5.20. A domain name RDAP response MUST contain a remarks member with a title "Whois Inaccuracy Complaint Form", a description containing the string "URL of the ICANN Whois Inaccuracy Complaint Form: <https://www.icann.org/wicf>" and a links member with the <https://www.icann.org/wicf> URL.
- 1.5.21. The returned domain name object in the RDAP response MAY contain exactly one entity with the reseller role, if the domain name was registered through a reseller.
- 1.5.22. The domain name object handle in the RDAP response MUST contain the Repository Object Identifier (ROID of the domain object, <domain:roid> as defined in [RFC5731](#)) for the Domain Name object.

Note: a mapping of RDAP elements/objects is available in Appendix B.

2. The following requirements apply to Registries only:

- 2.1. Registries offering searchable Whois service (e.g., per exhibit A of their RA) MUST support RDAP search requests for domains and entities. Entities MUST be searchable by name search pattern as defined in [RFC7482](#) section 3.2.3 in order to allow for searches by contact name or address. Boolean search capabilities (AND, OR) MUST be supported, when a RFC defining this capability has been published.
- 2.2. Registries MUST support RDAP search requests for name servers by IP address as defined in [RFC7482](#) section 3.2.2.
- 2.3. If a Registry supports multiple host objects with the same name, the Registry MUST support the capability to respond with a set of host objects in response to a name server lookup, when an RFC defining this capability has been published.
- 2.4. The RDAP domain lookup response MUST contain a links object as defined in [RFC7483](#) section 4.2. The links object MUST contain the elements rel:related and href pointing to the Registrar's RDAP URL of the queried domain object.

- 2.5. Registries offering Whois contact lookup (e.g., per exhibit A of their RA) MUST support RDAP lookup request for entities with any role within other objects using the handle (as described in 3.1.5 of [RFC7482](#)).
- 2.6. An RDAP response may contain redacted registrant, administrative, technical and/or other contact information in accordance with the appropriate Registry Agreement. If any information is redacted, the response MUST include a remarks member with title "Data Policy", type "object truncated due to authorization", a description containing the string "Some of the data in this object has been removed" and a links member with the elements rel:alternate and href indicating where the data policy can be found. An entity with redacted information MUST include the "removed" value in the status element.
- 2.7. Reporting requirements:
- 2.7.1. Specification 3 of the RA specifies the format and content of the monthly reporting for Registry operators. The following rows are added to the Registry Functions Activity Report under section 2:

| Field # | Field Name | Description |
|---------|------------------------------|--|
| 40 | rdap-queries | Number of RDAP queries during the period. |
| 41 | rdap-rate-limit | Number of RDAP queries refused due to rate limiting for the period. |
| 42 | rdap-redirects | Number of HTTP redirects for the period. |
| 42 | rdap-authenticated | Number of authenticated RDAP queries for the period. |
| 43 | rdap-search-domain | Number of RDAP domain search queries for the period. |
| 44 | rdap-search-entity | Number of RDAP entity search queries for the period. |
| 45 | rdap-truncated-authorization | Number of RDAP responses truncated due to authorization. Includes both results and object truncation events. |
| 46 | rdap-truncated-load | Number of RDAP responses truncated due to server load. Includes both results and object truncation events. |
| 47 | rdap-truncated-unexplainable | Number of RDAP responses truncated due to unexplainable reasons. Includes both results and object truncation events. |

- 2.8. RDAP Bootstrapping requirements:
- 2.8.1. The base URL of RDAP services MUST be registered in the IANA's Bootstrap Service registry for Domain Name Space (<https://www.iana.org/assignments/rdap-dns/rdap-dns.xhtml>), as described in [RFC7484](#). A separate entry is required for each TLD.
- 2.8.2. When the RDAP service base URL needs to be changed, the previous URL and the new one MUST remain in operation until: 1) the IANA's Bootstrap Service registry for Domain Name Space is updated, and 2) the date and time in the Expires HTTP header of a HTTP/GET request

performed on the IANA's Bootstrap registry for Domain Name Space (after the new URL has been published) has elapsed.

2.8.3. A IANA's Bootstrap registry for Domain Name Space entry MUST be populated after the RDAP service is available over both IPv4 and IPv6 (A and AAAA records are present in the DNS for the domain name used to provide the RDAP service).

2.9. Entity RDAP queries (registrar queries):

2.9.1. The returned RDAP response MUST be an entity with registrar role, with a handle (IANA Registrar ID) and valid elements fn, adr, tel, email.

2.9.2. Registrar object lookup using an entity search on the fn element MUST be supported.

2.9.3. Registries MUST support lookup for entities with the registrar role within other objects using the handle (as described in 3.1.5 of [RFC7482](#)). The handle of the entity with the registrar role MUST be equal to IANA Registrar ID. The entity with the registrar role in the RDAP response MUST contain a publicIDs member to identify the IANA Registrar ID from the IANA's Registrar ID registry. The type value of the publicID object MUST be equal to IANA Registrar ID.

2.9.4. The adr member in the RDAP response for a Registrar query MUST at least contain the following RDDS fields:

- Street
- City
- Country

2.9.5. The following RDDS fields in the RDAP response for a Registrar query are Optional:

- State/Province
- Postal Code
- Fax Number

2.9.6. The RDAP response SHOULD contain at least two entities, with the administrative and technical roles respectively within the entity with the registrar role. The entities with the administrative and technical roles MUST contain a handle and valid fn, tel, email members, and MAY contain a valid adr element.

2.10. Responses to nameserver RDAP queries:

2.10.1. Registries MUST support nameserver lookup queries based on the name server's name as specified in 3.1.4 of [RFC7482](#).

- 2.10.2. The name server's name MUST be specified in the IdhName in A-label format.
- 2.10.3. All known glue record IPv4 and IPv6 addresses for the name server MUST be listed in the ipAddresses member.
- 2.10.4. The unicodeName member MUST be present in the response to a nameserver lookup, if the name server has an IDN label.
- 2.10.5. The Registrar RDDS field is Optional, and it MUST be represented as an entity with the registrar role. The handle of the entity with the registrar role MUST be equal to IANA Registrar ID. The entity with the registrar role in the RDAP response MUST contain a publicIDs member to identify the IANA Registrar ID from the IANA's Registrar ID registry. The type value of the publicID object MUST be equal to IANA Registrar ID.
- 2.10.6. In the case of a Registry in which name servers are specified as domain attributes, the existence of a name server used as an attribute for an allocated domain name is equivalent to the existence of a host object.
- 2.10.7. In the case of a Registry in which name servers are specified as domain attributes, the nameserver object MUST NOT contain the following members: events, handle and status.

3. The following requirements apply to Registrars only:

- 3.1. Responses to domain name RDAP queries:
 - 3.1.1. A Registrar is REQUIRED to respond with information regarding domain names for which the Registrar is the Sponsoring Registrar.
 - 3.1.2. A Registrar MUST return a 404 response when the Registrar is not the Sponsoring Registrar for the domain name.
 - 3.1.3. The domain name object handle in the RDAP response MUST contain the Repository Object Identifier (ROID of the domain object, <domain:roid> as defined in [RFC5731](#)) for the Domain Name object. For example, a Registrar could obtain the ROID from the Registry via EPP and cache the information locally after creating or gaining a domain name via a transfer.
 - 3.1.4. The entity handle in the RDAP response MUST contain the Repository Object Identifier (ROID of the contact object, <contact:roid>, as defined in [RFC5733](#)) for the Contact object. For example, a Registrar could obtain the ROID from the Registry via EPP and cache the information locally. The RAA 2013 defines that this information MUST be shown if

available from the Registry. If this information is not available from the Registry (e.g., a "thin" Registry), the handle **MUST** contain the unique identifier within the Registrar.

- 3.1.5. The eventAction type last changed reflects the date and time of the latest successful update known to the Registrar. Registrars are not required to constantly refresh this date from the Registry.
- 3.1.6. The status element **MUST** reflect the latest known set of EPP statuses in the Registry. Registrars are not required to constantly refresh the EPP statuses from the Registry.

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Appendix A: Open Issues

The following issues have been identified in the RDAP base specification required to mirror the current RDDS requirements. The following section describes the issues found, and the possible solutions. Implementers are advised that the RFC(s) published in the future to handle this missing functionality may be different from the proposed solution in this section.

1. Status Codes for Domains

The current Whois requirements (see, Additional Whois Information Policy, <https://www.icann.org/resources/pages/policy-awip-2014-07-02-en>) require the use of the EPP domain status codes in responses.

This issue is discussed in the IETF document “Extensible Provisioning Protocol (EPP) and Registration Data Access Protocol (RDAP) Status Mapping” (<https://tools.ietf.org/html/draft-gould-epp-rdap-status-mapping>). This Internet Draft suggests new RDAP status codes to cover the EPP domain statuses that cannot be mapped to the currently defined RDAP statuses. These statuses are in italics in the table in Appendix C.

Possible Solutions

Add RDAP statuses to the IANA's RDAP JSON Values registry mapping to the missing EPP domain name statuses.

2. Last update of RDAP database

The base RDAP specification does not define an element to specify the last date and time that the RDDS database used by the RDAP service was updated from the SRS. This element is required to map the "Last update of WHOIS database" RDDS field.

Possible Solutions

A potential solution would be to add a new event action (e.g. "last RDAP database update") to specify the last date and time that the database used by the RDAP service was updated from the SRS database.

3. Boolean Search Capabilities

In specification 4 section 1.10.4 of the Registry Agreement, the Registry Operator is required to support a set of logical operators for search criteria (AND, OR, NOT operators). This requirement is not explicitly supported in the RDAP specifications.

Possible Solutions

The RDAP specifications would need to be extended to support this requirement.

4. Multiple host objects for the same name server name

Items 29, 30, 32 of the RDDS Clarification Advisory (<https://www.icann.org/resources/pages/registry-agreement-raa-rdds-2015-04-27-en>) cover the case of the existence of multiple host objects for the same name server name. This requirement is not supported by the RDAP specification.

Possible Solutions

The RDAP name server lookup specification could be extended to provide the information of multiple name servers.

5. Registrar expiration date

RDAP does not include an event to specify the registrar registration expiration date as described in the RAA 2013.

Possible Solutions

A potential solution would be to add a new event action (e.g. "registrar expiration") to specify the registrar registration expiration date.

Appendix B: Data Elements Mappings

Domain Name Query Elements (this section applies to both registries and registrars)

The table below provides data elements mappings of RDDS fields to RDAP for Domain Name queries.

| RDDS field | | Location in RDAP Response |
|--|--|-----------------------------------|
| Registry | Registrar | |
| General | | |
| WHOIS Server / Referral URL | | links object with rel:related |
| | WHOIS Server / Referral URL | [Not applicable in RDAP] |
| Last update of WHOIS database | Last update of WHOIS database | [Pending solution, see Section 4] |
| Domains | | |
| Domain Name | Domain Name | ldhName |
| Domain ID | Registry Domain ID | handle |
| Updated Date | Updated Date | events.eventAction "last changed" |
| Creation Date | Creation Date | events.eventAction "registration" |
| Registry Expiry Date | | events.eventAction "expiration" |
| Registrar Registration Expiration Date | Registrar Registration Expiration Date | [Pending solution, see Section 4] |
| Domain Status | Domain Status | status object |
| Name Server | Name Server | nameservers.ldhname |
| DNSSEC | DNSSEC | secureDNS object |
| Internationalized Domain Name | Internationalized Domain Name | unicodeName |
| Registrar | | |
| Sponsoring Registrar | Registrar | entities.roles registrar |
| Sponsoring Registrar IANA ID | Registrar IANA ID | publicIDs.identifier |
| Registrar Abuse Contact Email | Registrar Abuse Contact Email | entities.role abuse |
| Registrar Abuse Contact Phone | Registrar Abuse Contact Phone | entities role abuse |
| Reseller | | |
| Reseller | Reseller | entities.roles reseller |
| Registrant Contact | | entities role registrant |
| Registrant ID | Registry Registrant ID | entity.handle |
| Registrant Name | Registrant Name | jCard "fn" |
| Registrant Organization | Registrant Organization | org |
| Registrant Street | Registrant Street | Grouped into the adr member. |
| Registrant City | Registrant City | |
| Registrant State/Province | Registrant State/Province | |
| Registrant Postal Code | Registrant Postal Code | |
| Registrant Country | Registrant Country | |
| Registrant Phone Number | Registrant Phone Number | tel with a type parameter voice |
| Registrant Phone Number Ext | Registrant Phone Number Ext | ext |

| | | |
|-------------------------------|--------------------------|-----------------------------------|
| Registrant Fax | Registrant Fax | tel with a type parameter fax |
| Registrant Fax Ext | Registrant Fax Ext | ext |
| Registrant Email | Registrant Email | email |
| Administrative Contact | | entity role administrative |
| Admin ID | Registry Admin ID | entity.handle |
| Admin Name | Admin Name | jCard "fn" |
| Admin Organization | Admin Organization | org |
| Admin Street | Admin Street | Grouped into the adr member. |
| Admin City | Admin City | |
| Admin State/Province | Admin State/Province | |
| Admin Postal Code | Admin Postal Code | |
| Admin Country | Admin Country | |
| Admin Phone Number | Admin Phone Number | tel with a type parameter voice |
| Admin Phone Number Ext | Admin Phone Number Ext | ext |
| Admin Fax | Admin Fax | tel with a type parameter fax |
| Admin Fax Ext | Admin Fax Ext | ext |
| Admin Email | Admin Email | email |
| Technical Contact | | entitites.role technical |
| Tech ID | Registry Tech ID | entity.handle |
| Tech Name | Tech Name | jCard "fn" |
| Tech Organization | Tech Organization | org |
| Tech Street | Tech Street | Grouped into the adr member. |
| Tech City | Tech City | |
| Tech State/Province | Tech State/Province | |
| Tech Postal Code | Tech Postal Code | |
| Tech Country | Tech Country | |
| Tech Phone Number | Tech Phone Number | tel with a type parameter voice |
| Tech Phone Number Ext | Tech Phone Number Ext | ext |
| Tech Fax | Tech Fax | tel with a type parameter fax |
| Tech Fax Ext | Tech Fax Ext | ext |
| Tech Email | Tech Email | email |
| Billing Contact | | entities role billing |
| Billing ID | Registry Billing ID | entity.handle |
| Billing Name | Billing Name | jCard "fn" |
| Billing Organization | Billing Organization | org |
| Billing Street | Billing Street | Grouped into the adr member. |
| Billing City | Billing City | |
| Billing State/Province | Billing State/Province | |
| Billing Postal Code | Billing Postal Code | |
| Billing Country | Billing Country | |
| Billing Phone Number | Billing Phone Number | tel with a type parameter voice |
| Billing Phone Number Ext | Billing Phone Number Ext | ext |
| Billing Fax | Billing Fax | tel with a type parameter fax |
| Billing Fax Ext | Billing Fax Ext | ext |
| Billing Email | Billing Email | email |

Name Server Elements (this section only applies to registries)

The table below provides data elements mappings of RDDS fields to RDAP for Name Server queries.

| RDDS field | Location in RDAP Response |
|--|-----------------------------------|
| Registry | |
| Server Name | nameserver.lidhName |
| IP Address | nameserver.ipAddresses |
| Registrar | entities.roles registrar |
| WHOIS Server / Referral URL | [Not applicable in RDAP] |
| Last update of WHOIS database (RA and RAA) | [Pending solution, see Section 4] |

Registrar Queries Elements (this section only applies to registries)

The table below provides data elements mappings of RDDS fields to RDAP for Registrar queries.

| RDDS field | Location in RDAP Response |
|--|-----------------------------------|
| Registry | |
| General | |
| WHOIS Server / Referral URL | [Not applicable in RDAP] |
| Last update of WHOIS database (RA and RAA) | [Pending solution, see Section 4] |
| Registrar | entities.role registrar |
| Registrar Name | jCard fn |
| Registrar Street | Grouped into the adr member. |
| Registrar City | |
| Registrar State/Province | |
| Registrar Postal Code | |
| Registrar Country | |
| Registrar Phone Number | tel with a type parameter voice |
| Registrar Phone Number Ext | ext |
| Registrar Fax | tel with a type parameter fax |
| Registrar Fax Ext | ext |
| Registrar Email | email |
| Registrar Administrative Contact | entity.role administrative |
| Admin Contact | jCard fn |
| Phone Number | tel with a type parameter voice |
| Phone Number Ext | ext |
| Fax Number | tel with a type parameter fax |
| Fax Number Ext | ext |
| Email | email |
| Registrar Technical Contact | entites.role technical |
| Technical Contact | jCard fn |
| Phone Number | tel with a type parameter voice |

| | |
|------------------|-------------------------------|
| Phone Number Ext | ext |
| Fax Number | tel with a type parameter fax |
| Fax Number Ext | ext |
| Email | email |

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Appendix C: EPP status code mapping

| EPP Status Code | RDAP Status Code <i>(italics: proposed in https://draft-gould-epp-rdap-status-mapping)</i> | Comments |
|---|---|--|
| addPeriod | <i>add period</i> | |
| autoRenewPeriod | <i>auto renew period</i> | |
| clientDeleteProhibited | <i>client delete prohibited</i> | |
| clientHold | <i>client hold</i> | |
| clientRenewProhibited | <i>client renew prohibited</i> | |
| clientTransferProhibited | <i>client transfer prohibited</i> | |
| clientUpdateProhibited | <i>client update prohibited</i> | |
| clientDeleteProhibited | <i>client delete prohibited</i> | |
| inactive | inactive | |
| linked (contact status from RFC5733) | associated | Applies to nameservers and entities, when they are associated with a network resource or domain. |
| ok | ok | ICANN proposed mapping |
| pendingCreate | pending create | |
| pendingDelete | pending delete | |
| pendingRenew | pending renew | |
| pendingRestore | <i>pending restore</i> | |
| pendingTransfer | pending transfer | |
| pendingUpdate | pending update | |
| redemptionPeriod | <i>redemption period</i> | |
| renewPeriod | <i>renew period</i> | |
| serverDeleteProhibited | <i>server delete prohibited</i> | |
| serverHold | <i>server hold</i> | |
| serverRenewProhibited | <i>server renew prohibited</i> | |
| serverTransferProhibited | <i>server transfer prohibited</i> | |
| serverUpdateProhibited | <i>server update prohibited</i> | |
| transferPeriod | <i>transfer period</i> | |

Appendix D: RDAP IETF Standards

RDAP standards are a set of interworking specifications, which together, provide a complete RDAP service. Each specification is briefly described below.

RFC7480 - HTTP Usage in the Registration Data Access Protocol (RDAP)

<https://www.rfc-editor.org/rfc/rfc7480.txt>

Describes usage of HTTP transport for RDAP, error messages, RDAP extensions, rate limiting and internationalization with URIs.

RFC7481 - Security Services for the Registration Data Access Protocol (RDAP)

<https://www.rfc-editor.org/rfc/rfc7481.txt>

Covers access control, authentication, authorization, privacy, data confidentiality and RDAP services availability considerations.

RFC7482 - Registration Data Access Protocol (RDAP) Query Format

<https://www.rfc-editor.org/rfc/rfc7482.txt>

Defines the URL patterns for networks, autonomous systems, reverse DNS, name servers, registrars and entities queries. Also covers help requests, search (wildcards) and internationalization in requests.

RFC7483 - JSON Responses for the Registration Data Access Protocol (RDAP)

<https://www.rfc-editor.org/rfc/rfc7483.txt>

Defines JSON object classes for domains, name servers, entities, IP networks and autonomous system numbers. Describe answers to help queries, searches, JSON-embedded error codes and truncated answers.

RFC7484 - Finding the Authoritative Registration Data (RDAP) Service

<https://www.rfc-editor.org/rfc/rfc7484.txt>

Describes a method to find the authoritative server for RDAP data.

IANA RDAP JSON Values Registry

<https://www.iana.org/assignments/rdap-json-values/rdap-json-values.xhtml>

This registry defines valid values for RDAP JSON status, role, notices and remarks, event action, and domain variant relation, as defined in RFC7483. The current version contains only the values defined in RFC7483, but new ones may be registered in the future.

IANA Bootstrap Service Registry for Domain Name Space

<https://www.iana.org/assignments/rdap-dns/rdap-dns.xhtml>

Appendix E: Other References

RFC7485 - Inventory and Analysis of WHOIS Registration Objects

<https://www.rfc-editor.org/rfc/rfc7485.txt>

Extensible Provisioning Protocol (EPP) and Registration Data Access Protocol (RDAP) Status Mapping

<https://tools.ietf.org/html/draft-gould-epp-rdap-status-mapping>

jCard: The JSON Format for vCard

<https://tools.ietf.org/html/rfc7095>

vCard Format Specification

<https://tools.ietf.org/html/rfc6350>

gTLD Registry Agreement

<https://newgtlds.icann.org/sites/default/files/agreements/agreement-approved-09jan14-en.htm>

2013 Registrar Accreditation Agreement

<https://www.icann.org/resources/pages/approved-with-specs-2013-09-17-en>

ICANN Advisories

<https://www.icann.org/resources/pages/advisories-2012-02-25-en>

Advisory: Clarifications to the Registry Agreement, and the 2013 Registrar Accreditation Agreement (RAA) regarding applicable Registration Data Directory Service (Whois) Specifications (a.k.a. RDDS clarification Advisory)

<https://www.icann.org/resources/pages/registry-agreement-raa-rdds-2015-04-27-en>

Advisory: Registrar Implementation of the 2013 RAA's Whois Requirements

<https://www.icann.org/news/announcement-2013-07-31-en>

ICANN Consensus Policies

<https://www.icann.org/resources/pages/registrars/consensus-policies-en>

Additional Whois Information Policy

<https://www.icann.org/resources/pages/policy-awip-2014-07-02-en>

EPP Status Code (ICANN)

<https://www.icann.org/epp>

Draft Final Report from the Expert Working Group on Internationalized Registration Data

<https://gnso.icann.org/en/issues/ird/ird-draft-final-10mar15-en.pdf>

Study to Evaluate Available Solutions for the Submission and Display of Internationalized Contact Data

<https://www.icann.org/en/system/files/files/transform-dnrd-02jun14-en.pdf>

Final Report on the Thick Whois Policy Development Process

<https://gnso.icann.org/en/issues/whois/thick-final-21oct13-en.pdf>

ICANN Whois Marketing Restriction Policy

<https://www.icann.org/resources/pages/registrars/consensus-policies/wmrp-en>

gTLD Applicant Guidebook

<https://newgtlds.icann.org/en/applicants/agb/guidebook-full-04jun12-en.pdf>

RIPE RDAP Implementation (beta)

<https://github.com/RIPE-NCC/whois/wiki/RDAP>

CNNIC RDAP Project Git

<https://github.com/cnnic/rdap>

APNIC RDAP Conformance Git

<https://github.com/APNIC-net/rdap-conformance>

Viagenie RDAP Test Suite

<http://rdap.viagenie.ca>

Mozilla Included CA Certificate List

<https://wiki.mozilla.org/CA:IncludedCAs>

CAB Forum Baseline Requirements

<https://cabforum.org/baseline-requirements-documents>