Table of Contents

1 Introduction 3

2 How to use RDAP 4
2.1 HTTP Error Codes 4
2.2 RDAP Clients 4
2.3 Additional Services 5
2.4 References 5
2.5 Future of Port 43 Whois 5
2.6 Feedback and questions 5

3 Roles 6

4 Statuses 6

5 Data output 7
5.1 Domain name 7
5.2 Registrar 9
5.3 Name server 9
5.4 DNSSEC 9
5.5 Auteursrechtvoorbehoud/Copyright notice 10
1 Introduction

This document describes SIDN’s support for the RDAP protocol. RDAP was designed by the *weirds* working group of the Internet Engineering Task Force (*IETF*), in response to ICANN’s request for the IETF to develop a replacement for Whois. RDAP returns data similar to that provided by the Whois service, but in a JSON-structured format.

With RDAP, you can look up the following object classes:

1. Domains
2. Name servers
3. Entities

RDAP is intended to address deficiencies in the Whois protocol [RFC3912] that have been identified over time, including:

- Lack of standardised command structures
- Lack of standardised output and error structures
- Lack of support for internationalisation and localisation
- Lack of support for user identification, authentication and access control

RDAP builds upon HTTP and the *"REST" (REpresentational State Transfer)* architectural style. RDAP servers are web servers, and RDAP clients are web clients (including web browsers). RDAP responses are encoded in *JSON (JavaScript Object Notation)* and are machine-readable rather than human-readable.
2 How to use RDAP

If you are developing an RDAP client, configure it to send HTTP requests.

<table>
<thead>
<tr>
<th>HTTP Method</th>
<th>Domain name</th>
<th>Name Server</th>
<th>Entity (registrar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>GET HEAD</td>
<td>GET HEAD</td>
<td>GET HEAD</td>
</tr>
<tr>
<td>HTTP Response:</td>
<td>See data output</td>
<td>See data output</td>
<td>See data output</td>
</tr>
</tbody>
</table>

- Responses are in JSON format

**HTTP:**
- https://rdap.nic.eu/amsterdam/domain/<domain name>
- https://rdap.nic.eu/politie/domain/<domain name>
- https://rdap.nic.eu/nameserver/<name server name>
- https://rdap.nic.eu/entity/<handle>

2.1 HTTP Error Codes

- 400: Occurs when we receive an invalid request (malformed path, unsupported object type, TLD, etc).
- 401: Occurs when we cannot authorise the interface for the TLD <TLD>
- 404: #domainname# is free
- 404: #domainname# is excluded from registration (in case of NNDN)
- 404: Name server <nameservername> does not exist
- 404: Entity <IANA id> does not exist

2.2 RDAP Clients

As RDAP is a new protocol, client support is limited. However, a number of clients exist:

- CentralNic maintains the Net::RDAP library for the Perl programming language. This library is a full implementation of the complete RDAP specification. It can be installed from CPAN, and more information may be found at:
  https://gitlab.centralnic.com/centralnic/perl-net-rdap

- rdapper is a command-line program which uses Net::RDAP to implement an interface similar to traditional Whois clients. It can also be downloaded from CPAN, but more information may be found here:
  https://github.com/gbxyz/rdapper
2.3 Additional Services

- **ICANN-accredited registrars** – you can obtain RDAP records for all ICANN-accredited registrars at https://registrars.rdap.org/entity/{NNNN}-iana where {NNNN} is the IANA ID. These records are synthesised from data published by IANA and ICANN (Git repository).
- **Top-level domains** – each TLD has its own RDAP record at https://root.rdap.org/domain/{TLD}. This data is generated from the IANA Whois (Git repository).

2.4 References

- 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
- RFC8056: Extensible Provisioning Protocol (EPP) and Registration Data Access Protocol (RDAP) Status Mapping

2.5 Future of Port 43 Whois

Once RDAP has been deployed, ICANN no longer requires gTLD registries to provide a port-43 Whois service. However, in order to reduce disruption to users, SIDN will carry out a phased sunset plan to give users time to upgrade their systems to use RDAP. We will provide more information about our plans to phase out the port-43 service in due course.

2.6 Feedback and questions

If you have any feedback or questions, please e-mail support@sidn.nl.
3   Roles

RDAP role  Details
registrant  The entity object instance is the registrant.
technical  The entity object instance is a technical contact for the registration.
administrative  The entity object instance is an administrative contact for the registration.
abuse  The entity object instance handles network abuse issues on behalf of the registrant.
billing  The entity object instance handles payment and billing issues on behalf of the registrant.
registrar  The entity object instance represents the authority responsible for the registration.
reseller  The entity object instance represents a third party through which the registration was conducted (i.e. neither the registry nor the registrar).
sponsor  The entity object instance represents a domain policy sponsor, such as an ICANN-approved sponsor.
proxy  The entity object instance represents a proxy for another entity object, such as a registrant.
notifications  An entity object instance designated to receive notifications about associated object instances.
noc  The entity object instance handles communications related to a network operations centre (NOC).

4   Statuses

Status  Details
validated  Signifies that the data regarding the object instance has been found to be accurate. This type of status is usually assigned to entity object instances to note the validity of identifying contact information.
renew prohibited  Renewal or reregistration of the object instance is forbidden.
update prohibited  Updates to the object instance are forbidden.
transfer prohibited  Transfers of the registration from one registrar to another are forbidden. This type of status normally applies to DNR domain names.
delete prohibited  Deletion of the registration of the object instance is forbidden. This type of status normally applies to DNR domain names.
proxy  The registration of the object instance has been performed by a third party. This is most commonly applied to entities.
private  The information regarding the object instance is not designated for public consumption. This is most commonly applied to entities.
removed  Some of the information regarding the object instance has not been made available and has been removed. This is most commonly applied to entities.
obscured  Some of the information regarding the object instance has been altered to prevent immediate disclosure. This is most commonly applied to entities.
The object instance is associated with other object instances in the registry. This is most commonly used to signify that a name server is associated with a domain or that an entity is associated with a network resource or domain.

The object instance is in use. For domain names, it signifies that the domain name is published in the DNS. For network and autnum registrations, it signifies that they are allocated or assigned for use in operational networks. This maps to the "OK" status of the Extensible Provisioning Protocol (EPP) [RFC5730].

The object instance is not in use. See "active".

Changes to the object instance, including the association of other object instances, cannot be made.

A request has been received for the creation of the object instance, but this action is not yet complete.

A request has been received for the renewal of the object instance, but this action is not yet complete.

A request has been received for the transfer of the object instance, but this action is not yet complete.

A request has been received for the deletion or removal of the object instance, but this action is not yet complete. For domains, this might mean that the name is no longer published in the DNS, but has not yet been purged from the registry database.

5  Data output

The output is in three parts, which can be requested separately:

- Domain name
- Registrar
- Name server

5.1  Domain name

Fields and responses for 'domain name'.

<table>
<thead>
<tr>
<th>Field</th>
<th>RDAP response element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain name</td>
<td>ldhName</td>
</tr>
<tr>
<td>Registry Domain ID</td>
<td>handle</td>
</tr>
<tr>
<td>Registrar WHOIS Server (port 43)</td>
<td>events.eventAction &quot;last changed&quot;</td>
</tr>
<tr>
<td>Updated Date</td>
<td>events.eventAction &quot;Registration&quot;</td>
</tr>
<tr>
<td>Creation Date</td>
<td>events.eventAction &quot;expiration&quot;</td>
</tr>
<tr>
<td>Registry Expiry Data</td>
<td>status object</td>
</tr>
<tr>
<td>Domain status</td>
<td>nameservers.ldhname</td>
</tr>
<tr>
<td>DNSSEC</td>
<td>secureDNS object</td>
</tr>
</tbody>
</table>
1 October 2019

Internationalized Domain Name: unicodeName
IP Address: nameserver.ipAddresses
Last update of RDS Database: Events.eventAction "last update of RDAP database"
Registrant (sponsoring) Registrar: Entities.roles.registrar
(sponsoring) Registrar IANA ID: publicIDs.identifier
Registrant Registration Expiration Date: events.eventAction "registrant expiration"
Reseller: Entities.roles.reseller
Registrar Abuse Contact Email: Entities.role.abuse.email
Registrar Abuse Contact Phone: Entities.role.abuse.phone
Registry Registrant ID: Entity.handle
Registrant Name: jCard "fn"
Registrant Organization: Org
Registrant Street: Grouped into adr member
Registrant City: 
Registrant State/Province: 
Registrant Postal Code: 
Registrant Country: 
Registrant Phone: Tel type parameter voice
Registrant Phone Ext: Ext
Registrar Fax: Tel type parameter Fax
Registrar Fax Ext: Ext
Registrar Email: Email
Registry Admin ID: Entity.handle
Admin Name: jCard "fn"
Admin Organization: Org
Admin Street: Grouped into adr member
Admin State/Province: 
Admin City: 
Admin Postal Code: 
Admin Country: 
Admin Phone: Tel type parameter voice
Admin Phone Ext: Ext
Admin Fax: Tel type parameter Fax
Admin Fax Ext: Ext
Admin Email: Email
Registry Tech ID: entity.handle
Tech Name: jCard "fn"
Tech Organization: Org
Tech City: Grouped into adr member
Tech State/Province: 
Tech Street: 
Tech Postal Code: 
Tech Country: 
Tech Phone: Tel type parameter voice
Tech Phone Ext: Ext
5.2 Registrar

Field | RDAP response element
---|---
Registrar | jCard fn
Registrar IANA ID | entities.publicIDs.identifier
Street | Grouped into the adr member
City | 
State/Province | 
Country | 
Phone Number | Tel with a type parameter voice
Phone Number Ext | 
Fax Number | Tel with a type parameter fax
Fax Number Ext | 
Email | 
Registrar URL | Referral URL
Admin Contact | jCard fn
Phone Number | Tel with a type parameter voice
Phone Number Ext | 
Fax Number | Tel with a type parameter fax
Fax Number Ext | 
Email | 
Technical Contact | jCard fn
Phone Number | Tel with a type parameter voice
Phone Number Ext | 
Fax Number | Tel with a type parameter fax
Fax Number Ext | 
Email | 
Last update of RDS Database | Events.eventAction "last update of RDAP database"

5.3 Name server

Field | RDAP response element
---|---
Server name | ldhName
IP Address | ipAddresses
Registrar | jcard fn
Registrar IANA ID | entities.publicIDs.identifier
Referral URL | 
Last update of RDS Database | Events.eventAction "last update of RDAP database"

5.4 DNSSEC
DelegationSigned means that at least one DNSkey is associated with the domain name.
<table>
<thead>
<tr>
<th>DelegationSigned?</th>
<th>DNSSEC status</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>'true'</td>
<td>&quot;secureDNS&quot;: {&quot;delegationSigned&quot;: true}</td>
</tr>
<tr>
<td>No</td>
<td>'false'</td>
<td>&quot;secureDNS&quot;: {&quot;delegationSigned&quot;: false}</td>
</tr>
</tbody>
</table>

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