Registration Data Access Protocol RESTful Searching
draft-zhou-weirds-rdap-restful-search-00

Abstract

   This document describes the searchability details of the Registration
   Data Access Protocol (RDAP). It specifies basic and extended
   searching parameters, defines the JSON (JavaScript Object Notation)
   formats of searching and responding data structure and also proposes
   the specification of boolean search functionality.

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1. Introduction

   A searchable RDAP service is a HTTP (Hypertext Transfer Protocol)
   based function which supports multiple searching parameters and
   boolean search capabilities. This document describes the
   specifications for searching parameters, searching response formats,
   boolean search function and some security consideration about RDAP
   searchability.

   First the RESTful query URI formats for searching specific
   information are defined. There are 5 basic searching types and some
   extended searching parameters that may be used according to the New
   gTLD Applicant Guide Book. The basic searching types, including
   search of IP, AS (Autonomous System) number, domain, name server and
   entity, that are consistent with the query types defined in
   draft-ietf-weirds-rdap-query [I-D.ietf-weirds-rdap-query].

   The second section of this document describes the boolean search
   function that supports a set of search criteria like AND, OR, NOT.

   The third part of this document gives some response data format
   specified in JSON and proposes some consideration on ordering and
   paging.

   Finally, this document talks about some security issues that should
   be considered to avoid abuses of this searchability feature.

2. Searching Parameters

   In this section, basic and extended searching parameters are mainly
   presented. The combination of following parameters can also be used
   as searching parameters.

2.1. Basic Search

   Basic search means 5 types of searching parameters which includes IP,
   AS number, domain, name server and entity.

2.1.1. IP Search

   Syntax: /search/?ip=<IP address> or ip/?address=<CIDR format>

   IP search parameter is either an IPv4 RFC 1166 [RFC1166] or IPv6 RFC
   5952 [RFC5952] address (i.e. XXX) or an IPv4 or IPv6 CIDR RFC 4632
   [RFC4632] notation address block (i.e. XXX/YY).

   This is an example URL for the most specific network containing

192.0.2.0:

/search/?ip=192.0.2.0

This is an example URL for the most specific network containing
192.0.2.0/24:

/search/?ip=192.0.2.0%2f24

2.1.2. AS Number Search

Syntax: /search/?as=<autonomous system number>

Searches for information regarding autonomous system number
registrations are of the form /autnum/?as=XXX where XXX is an
autonomous system number RFC 5396 [RFC5396].

The following is an example URL for the AS number search.

/search/?as=65551

2.1.3. Domain Search

Syntax: /search/?domain=<domain names>

Searches for domain information are of the form /?domain=XXXX, where
XXXX is a fully-qualified domain name RFC 4343 [RFC4343] in either
the in-addr.arpa or ip6.arpa zones (for Regional Internet Registries
(RIRs)) or a fully-qualified domain name in a zone administered by
the server operator (for Domain Name Registries (DNRs)).

The example URL for searching domain name like example.com is defined
below.

/search/?domain=example.com

2.1.4. Name Server Search

Syntax: /search/?ns=<name server names>

This parameter represents a fully qualified name as specified in RFC
952 [RFC0952] and RFC 1123 [RFC1123]. Internationalized names
represented in A-label format RFC 5890 [RFC5890] are also valid name
server names.

This is an example URL for the specific name server searching
cotaining ns.example.com.

/search/?ns=ns.example.com

2.1.5. Entity Search

   Syntax: /search/?entityID=<Entity Handle>

   This parameter represents an entity (such as a contact, registrant,
   or registrar) identifier.

   The example URL for searching entity handle such as CID0193 is
   defined below.

   /search/?entityID=CID0193

2.2. Extended Search

   This seachable function defined in New gTLD Applicant Guide Book
   should offer partial or exact match capabilities on some fields, such
   as contact name, city, street, postal code etc.. So besides the
   basic search parameters, other extended search parameters are also
   specified.

   Syntax: /search/?keyword=<value>

   Followings are some search examples that this functionality that
   would support.

   1. The "entityname" field represents the names of a specified
       contact, registrant or registrar. This an example URL for the
       entity names search: /search/?entityname=James%20Blunt

   2. The "street" parameter contains the entity's street address
       defined in RFC 5733 [RFC5733]. A street search example: /search/
       ?street=123%20Example%20Dr

   3. The "city" parameter contains the entity's city defined in RFC
       5733 [RFC5733]. A city search example: /search/?city=Beijing

   4. The "sp" parameter contains the entity's state or province
       defined in RFC 5733 [RFC5733]. A state or province search
       example: /search/?sp=VA

   5. The "pc" parameter contains the entity's postal code defined in
       RFC 5733 [RFC5733]. A postal code search example: /search/
       ?pc=100190

   6. The "cc" parameter contains the entity's country code defined in
       RFC 5733 [RFC5733]. A country code search example: /search/

        ?cc=CN

3. Boolean Search

    RIRs and DNRs shall offer Boolean search capabilities supporting, at
    least, the following logical operators to join a set of search
    criteria: AND, OR, NOT.

    Any fields described above can be combined together by the boolean
    criteria to be the search input parameters. Partial-match and exact-
    match capabilities would also be offered by RIRs and DNRs. "*" is the
    replace mark for partial-match function. "&" mark represents AND, "+"
    mark means OR and "-" mark means that none of the input text is
    inlcuded in the response results.

    An example is given below searching for entity name called James ***
    or Tom ***, registered domain name is xyz.com and country code is not
    CN.

    /search/?entityname=James*+Tom*&domain=xyz.com&cc=-CN

4. Search Response Format

    The search results will be returned in a JSON object, the format of
    which is discussed in the section 5 of
    draft-hollenbeck-weirds-rdap-search
    [I-D.hollenbeck-weirds-rdap-search]. Ordering and paging are taken
    into consideration in this document. Three JSON objects, which are
    "page", "total" and "orderby" are defined as below.

    The server could specifiy the number of display results per page
    according to different registries' requirements. The search response
    will include the page number and total page number information in the
    results. "orderby" is the field using for ordering all the results.

```
        {
          "results" :
          [
            {
              "handle" : "1-XXXX",
              "name" : "1.example.com",
              "objectClass" : "domain",
              ...
              "page" : "1",
              "total" : "10",
              "orderby" : "domain"
            },
            {
              "handle" : "2-XXXX",
              "name" : "2.example.com",
              "objectClass" : "domain",
              ...
              "page" : "1",
              "total" : "10",
              "orderby" : "domain"
            }
          ]
        }
```

   This response format is a preliminary design for future disscussion.
   If the idea is adopted by the working group, the search URI including
   paging and ordering information should also be specified, such as
   /search/?domain=example.com&page=1&orderby=domain.

5. IANA Considerations

   This document does not specify any IANA actions.

6. Security considerations

   The service shall include appropriate precautions to avoid abuse of
   this feature.

   A registrar or registrant may only login the searchable Whois system
   using their own ID and password, and may only search information
   related to their own domain names.

   If a registrar, registrant or a third-party user wants to search
   others' information, they need to explain the reasonable purposes,
   commit to protect privacy and security, and sign an agreement at

first.

7. Acknowledgements

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   suggestions and contributions to this document: Kevin Tse.

8. Normative References

   [I-D.hollenbeck-weirds-rdap-search]
            Hollenbeck, S. and A. Newton, "Registration Data Access
            Protocol Search Processing",
            draft-hollenbeck-weirds-rdap-search-00 (work in progress),
            January 2013.

   [I-D.ietf-weirds-rdap-query]
            Newton, A. and S. Hollenbeck, "Registration Data Access
            Protocol Query Format", draft-ietf-weirds-rdap-query-02
            (work in progress), December 2012.

   [RFC0952] Harrenstien, K., Stahl, M., and E. Feinler, "DoD Internet
            host table specification", RFC 952, October 1985.

   [RFC1123] Braden, R., "Requirements for Internet Hosts - Application
            and Support", STD 3, RFC 1123, October 1989.

   [RFC1166] Kirkpatrick, S., Stahl, M., and M. Recker, "Internet
            numbers", RFC 1166, July 1990.

   [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate
            Requirement Levels", BCP 14, RFC 2119, March 1997.

   [RFC2629] Rose, M., "Writing I-Ds and RFCs using XML", RFC 2629,
            June 1999.

   [RFC4343] Eastlake, D., "Domain Name System (DNS) Case Insensitivity
            Clarification", RFC 4343, January 2006.

   [RFC4632] Fuller, V. and T. Li, "Classless Inter-domain Routing
            (CIDR): The Internet Address Assignment and Aggregation
            Plan", BCP 122, RFC 4632, August 2006.

   [RFC5396] Huston, G. and G. Michaelson, "Textual Representation of
            Autonomous System (AS) Numbers", RFC 5396, December 2008.

   [RFC5733] Hollenbeck, S., "Extensible Provisioning Protocol (EPP)

            Contact Mapping", STD 69, RFC 5733, August 2009.

   [RFC5890] Klensin, J., "Internationalized Domain Names for
              Applications (IDNA): Definitions and Document Framework",
              RFC 5890, August 2010.

   [RFC5952] Kawamura, S. and M. Kawashima, "A Recommendation for IPv6
              Address Text Representation", RFC 5952, August 2010.

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