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Using RDAP as a Domain Suggestion Service

M. Loffredo, M. Martinelli

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Loffredo M., Martinelli M. – IIT CNR

Summary

Abstract

The availability of a domain suggestion service can be considered one of the key factors for the promotion of domains. Most domain suggestion services available on the web cannot be queried through REST APIs and, if they can, they require different request/response formats, leverage different authorization policies and provide results for a limited set of TLDs. This document describes an RDAP query extension that allows servers to provide users with a domain suggestion service that would be standardized, bootstrappable and accessible via federated authentication.

1. Introduction

A domain suggestion service is provided by many organizations involved in domain management (i.e. registries, registrars and resellers) in order to return a list of domain names that suit user requirements and agree with some factors influencing domain popularity ([SUGGESTION1],[SUGGESTION2]) such as easy memorization, brevity and clarity.

Usually, such services enable you to select a set of options that can affect the result of the suggestion algorithm:

- the keywords the domain name should contain;
- the combinations of nouns allowed (only one noun, more than one noun);
- the TLDs to be considered;
- any prefixes and/or suffixes to be applied to the domain name;
- the domain name language;
- the possibility of including numbers, UTF-8 characters and hyphens;
- the possibility of excluding registered domain names;
- the possibility of excluding objectionable domain names;
- the maximum length domain names should have;
- the maximum number of results.

Most domain suggestion services are available through a web interface and, therefore, cannot be queried by a client application via a REST call. Those implemented as REST services can be accessed using different features. In fact:

- they require different request formats;
- they return different JSON responses;
- they rely on different authentication policies.

Moreover, most popular services enable you to select the TLDs among a limited set, corresponding generally to the most well-known gTLDs (.com, .net, .org). Otherwise, the user has to search the web for a service suggesting the domains for a specific TLD.

The specification in this document extends RDAP query capabilities to enable domain suggestion in order to overcome the limits of the current implementations. In fact, by managing the RDAP features, the domain suggestion service is queried through a REST API so ensuring:

- standardized request and response;
- easy finding of the TLDs authoritative domain suggestion service through RDAP bootstrapping;

- same authentication/authorization policy through federated authentication ([I-D.HOLLENBECK-REGEXT-RDAP-OPENID]).

The extension introduces new query parameters but does not extend the standard response. Finally, it can have an interesting application in the implementation of domain availability services.

2. RDAP Path Segment Specification

The new path segments are OPTIONAL extensions of those defined in [RFC7482]. This document defines the new value "**suggestion**" for the query parameter "**searchtype**". The new search is allowed only for the "domains?name" search path (Fig.1). The search pattern must be a domain name in LDH or U-label formats. Partial matching is not allowed.

https://example.com/rdap/domains?name=suggestion.com&searchtype=suggestion

Figure 1. Example of a basic RDAP query for domain suggestion

In addition to the new value "suggestion" for the "searchtype" parameter, other OPTIONAL specific parameters of the domain suggestion capability are defined (Fig.2):

- **language**: one of the values described in RFC 5646 [RFC5646]. Each RDAP provider can define a default value.
- **maxLength**: the maximum length of the domain without considering TLD suffix. Range [1-63]
- **useHypens**: if this value is "false", then hyphens will not appear in resulting domain suggestions. Accepted values are true or false. Default value is false.
- **useNumbers**: if this value is "false", then numbers (0-9) will not appear in resulting domain suggestions. Accepted values are true or false. Default value is false.
- **useIdns**: if this value is "false", then Internationalized Domain Names (IDNs) will not appear in resulting domain suggestions. Accepted values are true or false. Default value is false.
- **showRegistered**: if this value is "false", then registered domains will not appear in resulting domain suggestions. Accepted values are true or false. Default value is false.
- **showCensurable**: if the value is "false" then all objectionable domain will be removed from the response. Accepted values are true or false. Default value is false.

https://example.com/rdap/domains?name=carwash.com&searchtype=suggestion&language=en

Figure 2. Example of RDAP query for domain suggestion specifying the language of the domain names

The keywords set up can be simulated by using hyphens in the input domain (Fig.3). For example, to simulate "car" and "wash" as keywords, the input domain can be "car-wash.com" or "wash-car.com".

https://example.com/rdap/domains?name=car-wash.com&searchtype=suggestion&language=en

Figure 3. Example of RDAP query for domain suggestion specifying two keywords

Finally, other OPTIONAL parameters described in [I-D.loffredo-regext-rdap-sorting-and-paging] can be applied (Fig.4):

- **count**: if this value is "true", then total number of domains found will be reported in the "totalCount" field of "paging_metadata" section. Accepted values: true or false. Default value is false.
- **sort**: usually domain services provide domains sorted according to their score so, apparently, there is no need to specify different sort criteria. Anyway, an RDAP provider could show the results according to a different order.
- **limit**: the maximum number of results to be returned.
- **offset**: the number of results to skip if the number of domains returned is limited.

https://example.com/rdap/domains?name=car-wash.com&searchtype=suggestion&language=en&count=1

Figure 4. Example of RDAP query for domain suggestion specifying the "count" parameter

3. Response to a domain suggestion query

The response to a domain suggestion query is the same as a response to a query with the "fieldSet" parameter set to "id" as described in [I-D.loffredo-regext-rdap-partial-response]. For each domain object in the result set only "objectClassName" and "ldhName" are displayed. If the domain is an IDN, both "ldhName" and "unicodeName" are reported (Fig.5).

```
{
     "rdapConformance": [
         "rdap_level_0"
     ],
     "domainSearchResults": [
         {
             "objectClassName": "domain",
             "ldhName": " xn--caffbianco-26a.it",
             "unicodeName": "caffèbianco.it"
         },
         {
             "objectClassName": "domain",
             "ldhName": " xn--caffitaliano-0db.it",
             "unicodeName": "caffèitaliano.it"
         },
         {
             "objectClassName": "domain",
             "ldhName": "zucchero.it"
         },
         …
     ]
}
```

Figure 5. Example of RDAP response for a domain suggestion query

4. Domain suggestion in connection with domain availability

An interesting application of a domain suggestion service in RDAP is connected with the implementation of a domain availability capability. In fact, it is quite natural to expect that a user finding that a checked domain is unavailable wishes to know if other similar domains are available.

Currently, RDAP does not provide any capability to discover whether a domain is available or not. It has recently been made a proposal ([I-D.HOLLENBECK-REGEXT-RDAP-DOMAIN-AVAILABILITY]) that IETF RegExt WG has not considered suitable for the adoption. However, since this is the only proposal made so far we refer to it in order to show how the provisioning of a domain suggestion service could improve the efficiency of a possible domain availability capability.

The proposal does not suggest alternative available domains if the checked domain is unavailable. If it did, the JSON response should be consequently extended with an appropriate data structure and the number of returned results would be fixed. The response should be extended even if the user was not really interested in the suggested domains.

A more efficient and flexible implementation could report the suggested domains as a link to a domain suggestion query (Fig.6). The user could follow the link only if he was really interested and no extension to the standard response would be introduced.

```
{
      "rdapConformance": [
          "rdap_level_0",
          "domain_check_0"
      ],
      "objectClassName": "domain",
      "links": [
      {
          "value":"https://example.com/rdap/domain/suggestion.com?availability
          Check=1",
          "rel": "related",
          "href": "https://example.com/rdap/domains?name=suggestion.com
          &searchtype=suggestion",
          "title": "Domain Suggestion Link",
          "type": "application/rdap+json"
      }
      ],
      ''notices'': [
      {
      "title": "Domain unavailable",
      "description": [
          "Domain is registered"
          ]
      }
      ],
      "ldhName": "suggestion.com"
}
```

Figure 6. Example of the link to domain suggestion query in the domain availability response

5. References

5.1 Normative References

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[RFC7483]   A. NEWTON AND S. HOLLENBECK, "JSON RESPONSES FOR THE REGISTRATION DATA ACCESS PROTOCOL (RDAP)", RFC 7483, DOI 10.17487/RFC7483, MARCH 2015, <HTTP://WWW.RFC-EDITOR.ORG/INFO/RFC7483>.

5.2 Informative References

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[SUGGESTION1]   D. SMITH, "THE BENEFIT OF DOMAIN NAME SUGGESTION TOOLS", <HTTP://QREZLINFORMATION.BLOGSPOT.IT/2011/12/BENEFIT-OF-DOMAIN-NAME-SUGGESTION-TOOLS.HTML>

[SUGGESTION2]   C. R. SMITH, "THE 2017 ULTIMATE GUIDE TO CHOOSING A WINNING DOMAIN NAME", <HTTPS://WWW.FLAGSTONESEARCHMARKETING.COM/SEO/ULTIMATE-GUIDE-CHOOSING-WINNING-DOMAIN-NAME>