ICANN 72

VIRTUAL ANNUAL GENERAL

RDAP Conformance Tool

ICANN 72 - TechDay

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ICANN org's RDAP Conformance tool

- A stand-alone, open-source tool to verify that an RDAP server implements the specifications developed by the IETF and optionally, the gTLD RDAP profile.
  - Free.
  - Developed in Java 11.
  - Command line.
  - Flexible configuration to enable/disable specific checks as needed.

	Test groups	Tests
RDAP Standards/RFCs	**27**	**212**
gTLD RDAP Profile 2019	**11**	**74**

Conformance tests

- Tests are the atomic unit of processing of the tool
- Identified with a “code”, “value” and “message”
- Aggregated in test groups

Example:

Test group

7.2.1. RDAP Conformance validation [stdRdapConformanceValidation]

The following steps should be used to test that an *RDAP Conformance* data structure is valid:

1. The *RDAP Conformance* data structure must be a syntactically valid JSON array.

```
{
        "code": -10500,
        "value": "<rdapConformance structure>",
        "message": "The RDAP Conformance structure is not syntactically valid."
}
```

Test identifier (Error code)

2. ...

Supported RDAP query types

1	**Domain lookup** ../domain/<domain name>
2	**Entity lookup** ../entity/<handle>
3	**Nameserver lookup** ../nameserver/<nameserver name>
4	**Nameserver search** ../nameservers?ip=<nameserver search pattern>
5	**Help query** ../help

Tool workflow

User Input

- Configuration file
- Execution parameters
- RDAP URI

RDAP CONFORMANCE TOOL

- Retrieve public datasets from IANA
- Perform RDAP query(ies)
- Verify response against RDAP standards (RFC 7480-7484, 8605, 9082, 9083)
- Optionally gTLD RDAP profile

Output

- Results file

RESULT

{ ...
.....
...
}

User input

- **Configuration definition file**
  - Specify which single tests are considered to be:
    - Error (default)
    - Warning
    - Ignored (not tested)
- **Execution parameters**
  - Use gTLD RDAP profile 2019
    - As gTLD Registry
    - As gTLD Registrar
  - Verify as “thin” Registry
  - Use locally persisted datasets
  - Connection timeout
- **RDAP URI**
  - The full RDAP URI to verify

Output

Results file

- JSON formatted text file, includes:
  - Tested URI
  - Tested date
  - Received HTTP status code
  - Test groups that passed
  - Test groups that had errors or warnings
  - Results
    - Each test triggering an error or warning is listed in an array of JSON objects that contain failing test identifier:
      - **code**: a JSON number containing the test identifier.
      - **value**: a JSON string where the issue was found.
      - **message**: a JSON string explaining the issue.
      - **notes**: a JSON string containing the notes defined in the configuration definition file.

Sample output


```
{
  "testedDate": "2021-09-22T07:30:27.561327Z",
  "groupOK": [
      "stdRdapDomainLookupValidation",
      "domainNameValidation",
      ...
  ],
  "definitionIdentifier": "My custom configuration for checking RDAP",
  "groupErrorWarning": [
      "stdRdapEventsValidation"
  ],
  "results": {
      "warning": [],
      "ignore": [],
      "error": [
      {
         "code": -10901,
         "notes": "",
         "message": "The name in the name/value pair is not of: eventAction,
                     eventActor, eventDate, links.",
         "value": "#/nameservers/0/events/0/extra:I do not belong here"
       }
      ]
  },
  "testedURI": "https://rdap.example/domain/domain.example",
  "receivedHttpStatusCode": 200
}
```


"groupOK" lists check groups without issues

Each non-conformant issue is added as an "error" object

Commonly found issues

Seen on TLD servers published in the IANA bootstrap file for DNS registrations.

- Vcard array syntax issues in entity objects:
  - Use of invalid JSON names
  - Missing required elements (e.g. “fn”)
  - Invalid value syntax (e.g. invalid URI)

- Use of values not registered in the RDAP JSON values IANA registry. For example:
  - type
  - status
  - eventAction

- Incorrect capitalization used in JSON names.

Commonly found issues

- rdapConformance includes extensions not registered in the RDAP Extensions IANA registry.
- Invalid “remarks"/”notices” array (e.g. missing elements).
- Missing HTTP header (Access-Control-Allow-Origin).
- “links” type does not correspond to a registered mediaType.
- Unrecognized elements included in dsData element.

Future work

- Publish open source tool

- Additional development:
  - Support for JSContact (draft-ietf-jmap-jscontact)
  - Support future versions of the gTLD RDAP Profile
  - Evaluating incorporating other RDAP extensions and RFC updates

Thank You and Questions

Comments and questions are welcome at our public mailing list:

 gtld-tech@icann.org