TEST RESULTS

AND EVALUATION

REPORT

For

RESTful WHOIS

CNNIC

April, 2015

## Revision Sheet

|  |  |  |
| --- | --- | --- |
| **Release No.** | **Date** | **Revision Description** |
| 1.0 | 2015.04.22 | initial |

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# 1 GENERAL INFORMATION

## 1.1 Purpose

This document describes the test results and evaluation report for the RESTful WHOIS. RESTful WHOIS is an implementation of RDAP (Registration Data Access Protocol) which is used to retrieve registration information from registries using RESTful (HTTP+JSON) web access patterns.

## 1.2 Scope

The installation process, configuration, system function, performance of the system, compatibility of the system, quality of the code of the software are discussed in the document.

## 1.3 Project References

The list of the references that were used in preparation of this document:

1. *[RFC4780]HTTP Usage in the Registration Data Access Protocol (RDAP)*
2. *[RFC4781]Security Services for the Registration Data Access Protocol (RDAP)*
3. *[RFC4782]Registration Data Access Protocol (RDAP) Query Format*
4. *[RFC4783]JSON Responses for the Registration Data Access Protocol (RDAP)*
5. *[RFC4784]Finding the Authoritative Registration Data (RDAP) Service*
6. *[RFC4785]Inventory and Analysis of WHOIS Registration Objects*
7. *Requirements Specification for RESTful WHOIS*

## 1.4 Acronyms and Abbreviations

The list of the acronyms and abbreviations used in this document:

NFKC: Unicode Normalization Form KC

RDAP: Registration Data Access Protocol

REST: Representational State Transfer

# 2 TEST ANALYSIS

A thorough project test has been carried out which includes unit test, black box test, manual test, automated test, normative code inspection, document test, performance test and compatibility test.

According to the references, we analyzed the test requirements, designed and executed test cases. On each iteration, the existing as well as the new added system functions have been tested.

An overview of the test process is described as follows.

## 2.1 Installation Process

***Test Process Description*:** install the software on the testing environment according to the installation instruction.

Install the server following the installation instructions. With the test-data provided by the instruction, user can test whether the server works normally or not. However, the user needs to meet the following requirement:

1. Familiar with the installation and use of JDK, MYSQL and TOMCAT.

## 2.2 Configuration

### 2.2.1 Server Configuration

***Test Process Description*:** set each configuration item with normal or abnormal values, and then check the system availability.

All of the items in the configuration files are valid by default. User can adjust configurations accordingly.

### 2.2.2 Database Configuration

***Test Process Description*:** update the table data and then check the system availability.

The database update will influence the response information for query.

## 2.3 System Function

***Test Process Description*:** send requests to the server, and then check the corresponding responses.

### 2.3.1 Query API

Query of IP, AS, domain, nameserver, entity, domain search, nameserver search and entity search can have the reasonable responses. The following detail should be noticed:

1. The max length of request URL depends on the configuration in Web container.

### 2.3.2 Proxy43 Interface

The basic function of proxy43 interface can work normally. The following details should be noticed:

1. The language encoding settings of the JWHOIS client and server must be UTF-8.

### 2.3.3 Update API

IP, AS, domain, nameserver and entity data can be updated by update API. The following details should be noticed:

1. Update API does not strictly check the input data. Data validity should be guaranteed by the data provider.
2. Following data cannot be updated to the database: the leap second data.

### 2.3.4 Others

The system provides bootstrap update, case-folded & NFKC support and IRIs support. All of these functions are working properly.

## 2.4 Performance of the System

***Test Process Description*:** in the specified environment, detect the processing ability of the system.

|  |  |  |
| --- | --- | --- |
| concurrency | | 80 |
| QPS | | 1253.22 |
| 95% Average Request Response Time | | 0.131 Second |
| WEB Server CPU Utilization | | 46% |
| Data Server CPU Utilization | | 75% |
| Web server info | tomcat-7.0.53 | |
| Operating system :Linux | |
| CPU: intel（R）xeon（R）, 8 cores | |
| Memory: 16G | |
| Database server info | Mysql- 5.1  set global query\_cache\_size=1\*1024\*1024\*1024;  set global query\_cache\_limit=1\*1024\*1024\*1024; | |
| Operating system :Linux | |
| CPU: intel（R）xeon（R）, 8 cores | |
| Memory: 16G | |
| Data info | auntum(320,000 records) | |
| domain(1,000,000 records) | |
| entity(1,400,000 records) | |
| nameserver(1,900,000 records) | |
| IP(28,000 records) | |

Table 1. Performance Data

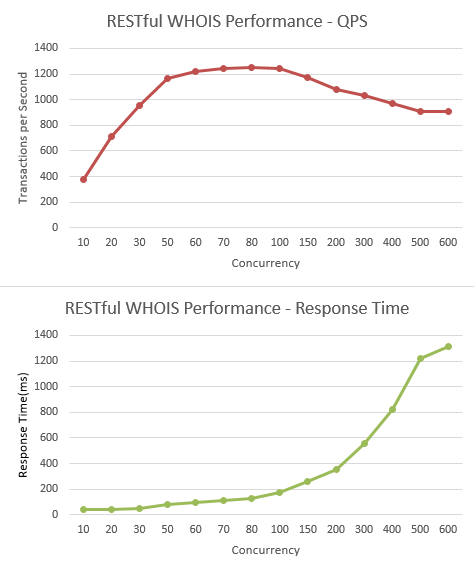


Figure 1. RESTful WHOIS Performance – QPS and Response Time

## 2.5 Compatibility of the System

***Test Process Description*:** check if the system can work normally in different environments.

System can work normally in the following system.

|  |  |  |  |
| --- | --- | --- | --- |
| Red Hat Enterprise Linux Server release 5.3 | Tomcat7 | Mysql5.1 | Jdk7 |
| Tomcat7 | Mysql5.6 | Jdk7 |
| CentOS release 5.7 | Tomcat7 | Mysql5.6 | Jdk6 |
| Win7 | Tomcat7 | Mysql5.6 | Jdk7 |
| Win8 | Tomcat7 | Mysql5.6 | Jdk7 |
| OS X 10.8.4 | Tomcat7 | Mysql5.6 | Jdk7 |

Table 2. Test Platform Environment

## 2.6 Quality of the Code

***Test Process Description*:** get the code quality measure data by SonarQube.

|  |  |
| --- | --- |
| Lines of code | About 46000 lines |
| Classes | 397 classes  1443 functions |
| Documentation | 91.9% |
| Duplications | 5.3%  2,776 lines、45 files |
| Complexity | 2.3 /function  8.3 /class  6.8 /file |
| Unit Tests Coverage | 62.3% |

Table 3. Code Quality Statistical Results

## 2.7 Security Consideration

***Test Process Description*:** simulate different scenarios and check the working condition of the server.

Based on the RFCs and the using habit of the user, the system realizes the basic security functions and provides security extension reference. The server supports Basic authentication and HTTP over TLS to protect the client’s credentials from disclosure while in transit. In addition, the server also supports connection number limit, access rate limit, defense SQL injection and access control policy to ensure safety accessibility and data integrity.

## 2.8 Document Inspection

***Test Process Description*:** documents verification.

All project documents are available here: https://github.com/cnnic/rdap/tree/master/doc.

# 3 SUMMARY AND CONCLUSIONS

## 3.1 Demonstrated Capability

The functions of the system cover all MUST requirements in the RFCs.

## 3.2 System Defects

|  |  |  |  |
| --- | --- | --- | --- |
| ID | Summary | Status | Remarks |
| #44 | Object response not contains 'notices' property | Closed |  |
| #45 | Autnum look up not support NFKC | Wontfix | NFKC not used for autnum. |
| #46 | Advice to adjust the location of the 'lang' in the response | Closed |  |
| #47 | The "title" data of the second “links” lost in the response | Closed |  |
| #48 | The unicode character in 'notices' display garbled for some 400 Error Response | Closed | Reason: some request responded by filter wasn't set character Encoding Correctly. |
| #49 | Set " Accept: application / rdap+json; charset = xxx", server returns 500 error | Closed | All request for malformed HTTP header will response 415 - 'Unsupported Media Type' |
| #50 | The 405 status\_code is not appeared with the HEADERS-Allow | Closed | Conformed to rfc2616. |
| #74 | Query domain xn--123123.cn, response code is 400,the expected value is 200 or 404 | Closed |  |
| #76 | 1.in-addr.arpa exsit in the database, response of query 0.0.0.1.in-addr.arpa is 404, the expected is 200 with the info of 1.in-addr.arpa in body | Closed |  |
| #77 | Response of domain query in uppercase is 400,not match the domain in lowercase in the database | Closed |  |
| #78 | Response of domain query /domain/1.25.in-addr.arpa.. is 404,the expected response is 400 | Closed |  |
| #105 | Domain query，when enter invalid UTF-8 parameter value，the response code is 400，but the response information doesn't contain content-type and body .  /domain/%E%B8%AD%E5%9B%BD%E4%BA%92%E8%81%94%E7%BD%91%E7%BB%9C%E4%BF%A1%E6%81%AF%E4%B8%AD%E5%BF%83.cn | Wontfix | The container Tomcat intercept URI, directly back to the 400 and empty body. As a known problem in the system description |
| #106 | The response of the domain with lots of nameservers has not been truncated | Invalid | Only search and networks/autnums in entity should be truncated. |
| #107 | When the '\' in the query ,there is no response | Wontfix | The container Tomcat intercept URI, directly back to the 400 and empty body. As a known problem in the system description |
| #108 | The response of the domain search query for "中国\*" is 400,the expected value is 200 or 404 | Closed |  |
| #109 | Domain-search，the response code is 500. | Closed |  |
| #110 | The response of the search query having more than one '\*' is 200 | Closed | The response of the search query having more than one '\*' is 200, the response of the search domain by nsIp or nameserver by ip query having '\*' is 400 |
| #111 | The response of the domain search query for "xn--tiq422d\*xn--fiqa61au8b7zsevnm8ak20mc4a87e.cn." is 404, the expected value is 200,because the domain "xn--tiq422d\*xn--fiqa61au8b7zsevnm8ak20mc4a87e.cn" is exist in database. | Closed |  |
| #113 | The response of the query with Authorization info is 500 | Closed |  |
| #114 | The response of the nameserver search query for "nameservers?name=ns.c\*.cn&name=cnnic" is 404,the expected value is 200. Contents following "&" should be truncated. | Closed | Use first parameter |
| #189 | Search request with 200 response fallowing the ? and additional parameters have 404 response  218.241.106.149:8301/rdap/.well-known/rdap/entities?handle=n\*n  response:200  218.241.106.149:8301/rdap/.well-known/rdap/entities?handel=n\*n?/autnum/123  response:404 | Closed |  |
| #191 | The response of the query '/rdap/nameservers?ip=8.0.0.9&name=cnnic.cn' is 404  ip in the query have the relevant data in the database  the expect response is 200 | Closed | Use first parameter |
| #192 | The response of the '/rdap/entity/inforesultsTruncated3' is 500 | Closed |  |
| #193 | The response of the '/rdap/domain/f.f.f.ip6.arpa' is 404,200 is the expected, f.f.f.ip6.arpa have a matching data | Closed |  |
| #194 | The networks in the entity's response contain entities info | Closed |  |
| #195 | The networks info in the response of the '/rdap/entity/fullinfoe2' is inconsistent with the database | Closed |  |
| #196 | The response of the '/rdap/entities?fn=好\*' is 404,the expect is 200  entity in database have the fn info begin with 好 | Closed |  |
| #197 | Adr in the vcard is not show the pref info | Closed |  |
| #198 | The response of the ip query with format error parameters is 404,the expect is 400 | Closed |  |
| #235 | The response of the '/rdap/nameserver/ns.cnnic.cn' is 404, 200 is the expected | Closed |  |
| #236 | Info of the Location in the redirect response is error  1) Location info not add the request object and parameters  2) Location info not display the unicode character, only use space replace | Closed |  |
| #237 | Query as number not have the info in the database,but with the related redirect url is server itself, the response is 301, but 404 is the expect  ip query is similar | Closed |  |
| #238 | Enter space before search parameters or enter space after serach parameters，the response code is 200，but 400 is expected. | Closed | Only entity quert or search will trim enter space before or after the parameters |
| #243 | The response of the domain search using parameter without \* is 400, 200 or 404 is expected | Closed |  |
| #429 | IPv4/IPv6 prefix entries having large CIDR(eg. 33/129) can update to the in database | Closed |  |
| #430 | Autonomous Systems Number Ranges entries, which the start number is bigger than the end number, can update to the database. | Closed |  |
| #446 | The response of the search domains by nsLdhName or nsIp has two domains with the same info.  /domains?nsLdhName=ns\*cnnic.cn  /domains?nsIp=218.241.111.96 | Closed |  |
| #447 | Search domains by nsLdhName or nsIp, users without access authority to the qurey nameserver can also have the response info of the interrelated domains. | later |  |
| #448 | Search domains by nsLdhName using unicode name of the nameserver can have 200 response. | Closed |  |
| #475 | Response for the IP networks query is 500  /ip/218.241.111.116 | Closed |  |
| #476 | Response of the IP networks query with error parameter is 200, 400 is expected  /ip/::ffff:192.168.89.9. | Closed |  |
| #478 | The v4 info in the response of the nameserver is not correct  query:  /nameserver/ns1.host.cn  v4 info:  ipAddresses:{v4:["0.218.241.111", "8.0.0.3", "8.0.0.4" ], v6:["1000::8004" ]},  data in the database:  NAMESERVER\_ID NAMESERVER\_IP\_ID HEX(IP)  3 5 00DAF16F60  3 9 808080808080800080808080808080  3 10 8080808080805C  3 11 01E240  3 36 08000003  3 37 08000004  3 40 10000000000000000000000000008004 | Closed |  |
| #479 | The member uri should not appear in the auto generate links | Closed |  |
| #480 | Auto generate links in the response for the entity query does not treatment the Unicode characters in the value or href correctly | Closed |  |
| #488 | The notices in search-response which has been truncated is NULL  eg:  notices:[  {  }  ], | Closed |  |

Table 4. BUG Detailed Information

## 3.3 Recommended Improvements

System can do better in the following aspect:

1. One-click download and install.

## 3.4 System Acceptance

The testing results have shown that the system is ready for release.