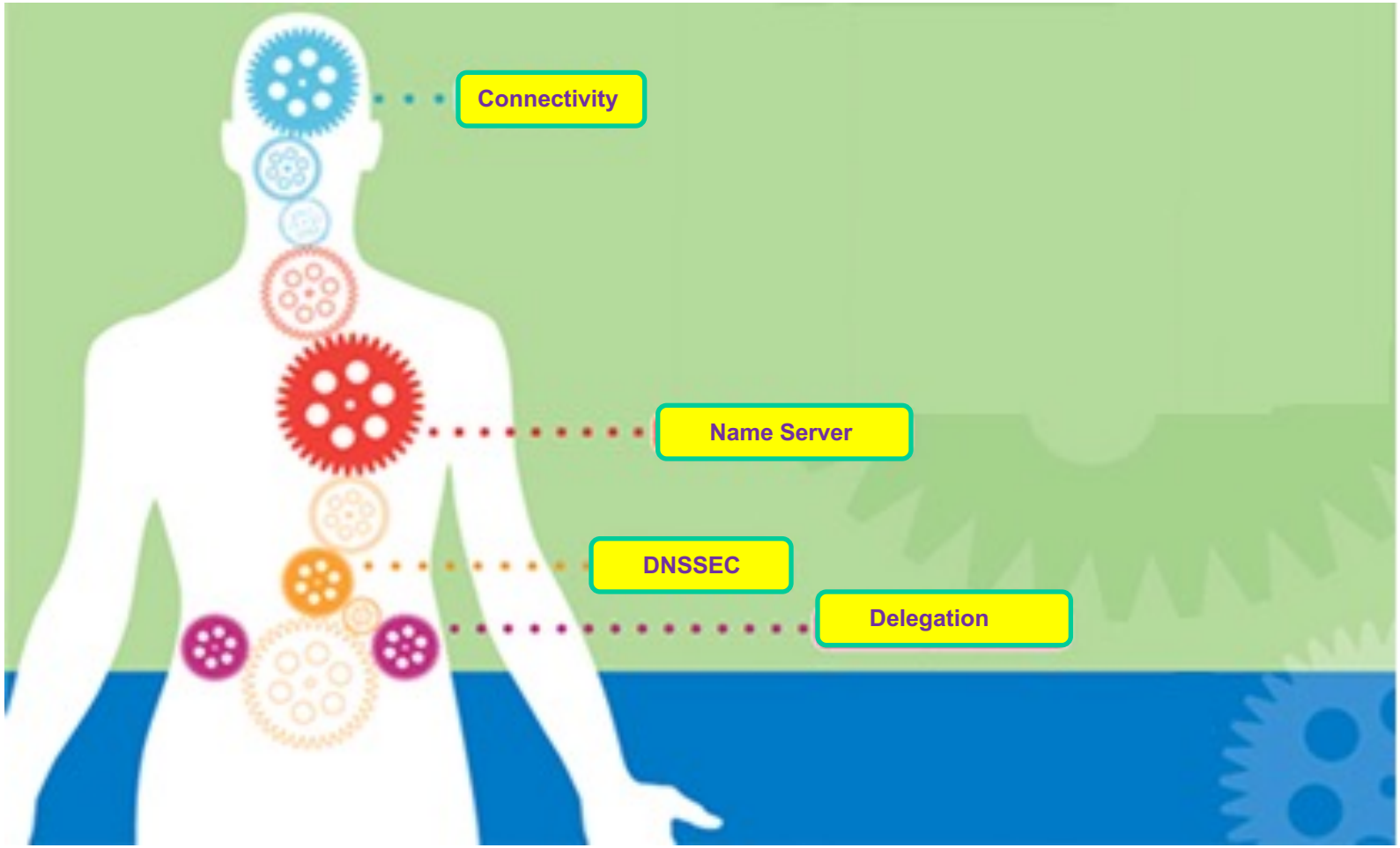
Zonemaster

Sandoche Balakrichenan (Afnic)

Health check



DNS Health check



Basic tools

✓DNS errors – dig, nslookup

```
afnic@zonemaster:~$ dig rmll.info

; <<>> DiG 9.9.5-9+deb8u8-Debian <<>> rmll.info
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 2014
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;rmll.info.                     IN      A

;; ANSWER SECTION:
rmll.info.              3600    IN      A       80.67.169.65

;; AUTHORITY SECTION:
rmll.info.              86399   IN      NS      ns0.abul.org.
rmll.info.              86399   IN      NS      rmll1.rmll.info.

;; ADDITIONAL SECTION:
ns0.abul.org.           86400   IN      A       195.214.228.104
rmll1.rmll.info.        86399   IN      A       80.67.169.65

;; Query time: 214 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Thu Jun 22 09:26:10 CEST 2017
;; MSG SIZE  rcvd: 132
```

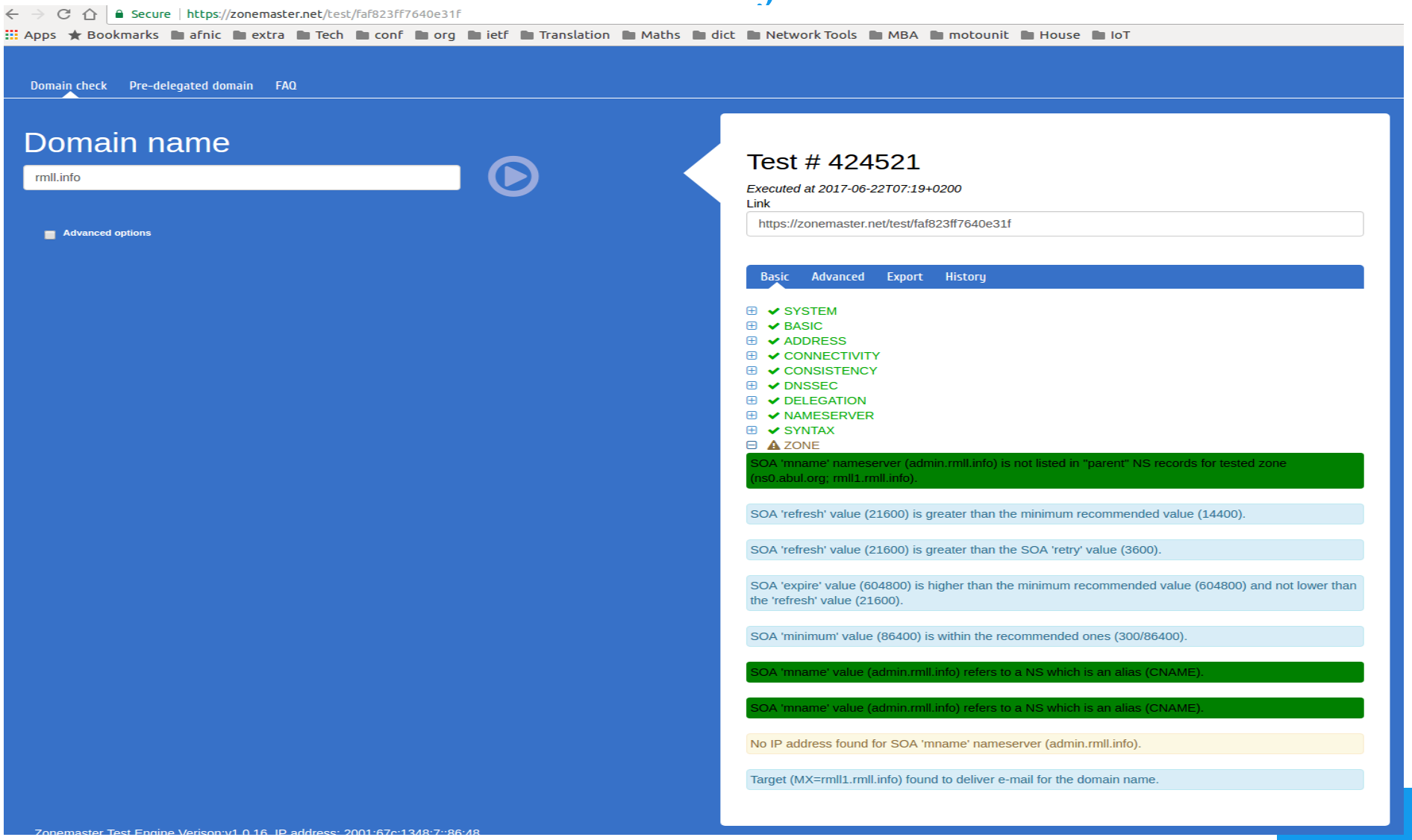
Comprehensive verification of a DNS zone using Zonemaster (1/2)

```
afnic@zonemaster:~$ zonemaster-cli --level DEBUG rmll.info
Seconds Level     Message
======= ========= =======
   0.00 DEBUG     SYSTEM:START_TIME string=2017-06-22 09:16:17 +0200; time_t=1498115777
   0.00 DEBUG     SYSTEM:TEST_TARGET module=all; zone=rmll.info
   0.00 DEBUG     Using module Zonemaster::Test::Basic version v1.0.2.
   0.00 INFO      Using version v1.0.15 of the Zonemaster engine.
   0.01 DEBUG     Using prerequisite module Net::LDNS version 0.75.
   0.01 DEBUG     Using prerequisite module IO::Socket::INET6 version 2.72.
   0.01 DEBUG     Using prerequisite module Moose version 2.1213.
   0.01 DEBUG     Using prerequisite module Module::Find version 0.12.
   0.01 DEBUG     Using prerequisite module JSON version 2.61.
   0.01 DEBUG     Using prerequisite module File::ShareDir version 1.102.
   0.01 DEBUG     Using prerequisite module File::Slurp version 9999.19.
   0.02 DEBUG     Using prerequisite module Net::IP version 1.26.
   0.02 DEBUG     Using prerequisite module List::MoreUtils version 0.33.
   0.02 DEBUG     Using prerequisite module Mail::RFC822::Address version 0.3.
   0.02 DEBUG     Using prerequisite module Scalar::Util version 1.38.
   0.02 DEBUG     Using prerequisite module Hash::Merge version 0.200.
   0.02 DEBUG     Using prerequisite module Readonly version 2.
   0.03 INFO      Configuration was read from /usr/local/share/perl/5.20.2/auto/share/dist/Zonemaster/config.json.
   0.03 INFO      Policy was read from /usr/local/share/perl/5.20.2/auto/share/dist/Zonemaster/policy.json.
   2.28 INFO      Nameserver for zone info replies when trying to fetch glue.
   2.28 INFO      Nameserver for zone info listed these nameservers as glue: ns0.abul.org.,rmll1.rmll.info..
   3.67 INFO      IPv4 is enabled, can send "NS" query to ns0.abul.org/195.214.228.104.
   3.70 INFO      Nameserver ns0.abul.org listed these servers as glue: ns0.abul.org.,rmll1.rmll.info..
   3.70 INFO      IPv4 is enabled, can send "NS" query to rmll1.rmll.info/80.67.169.65.
   3.72 INFO      Nameserver rmll1.rmll.info listed these servers as glue: ns0.abul.org.,rmll1.rmll.info..
   3.72 INFO      Functional nameserver found. "A" query for www.rmll.info test skipped.
   3.73 DEBUG     Module Zonemaster::Test::Basic finished running.
   3.73 DEBUG     Using module Zonemaster::Test::Address version v1.0.1.
   4.84 INFO      All Nameserver addresses are in the routable public addressing space.
   7.80 INFO      Reverse DNS entry exists for each Nameserver IP address.
   7.80 NOTICE    Nameserver ns0.abul.org has an IP address (195.214.228.104) with mismatched PTR result (hiero.abul.org.).
   7.81 DEBUG     Module Zonemaster::Test::Address finished running.
   7.81 DEBUG     Using module Zonemaster::Test::Connectivity version v1.0.6.
   7.81 INFO      Nameserver ns0.abul.org/195.214.228.104 accessible over UDP on port 53.
   7.83 INFO      Nameserver rmll1.rmll.info/80.67.169.65 accessible over UDP on port 53.
   7.86 INFO      Nameserver ns0.abul.org/195.214.228.104 accessible over TCP on port 53.
   7.88 INFO      Nameserver rmll1.rmll.info/80.67.169.65 accessible over TCP on port 53.
  14.57 DEBUG     [ASN:RAW] 195.214.228.104;9180 | 195.214.228.0/24 | FR | ripencc | 2003-12-09
```

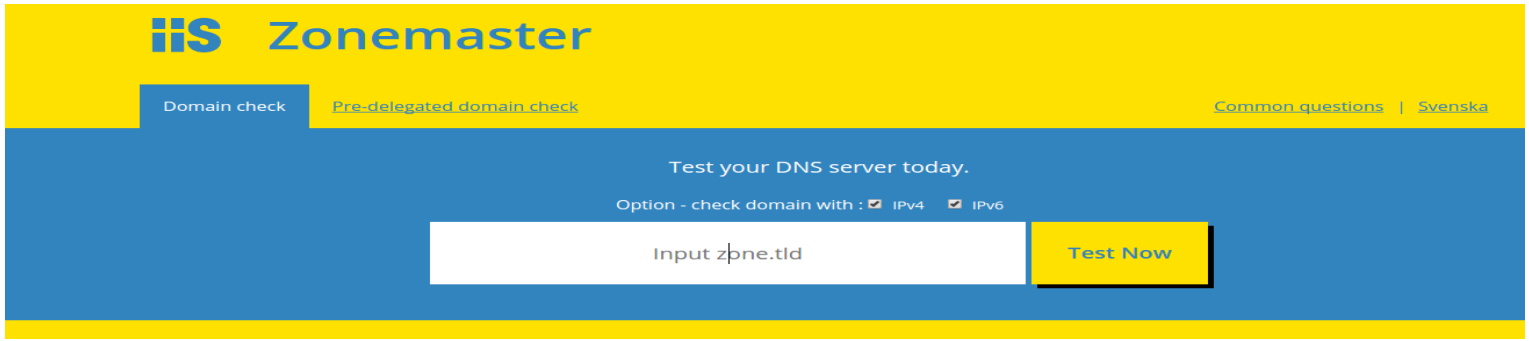
Comprehensive verification of a DNS zone using Zonemaster (1/2)

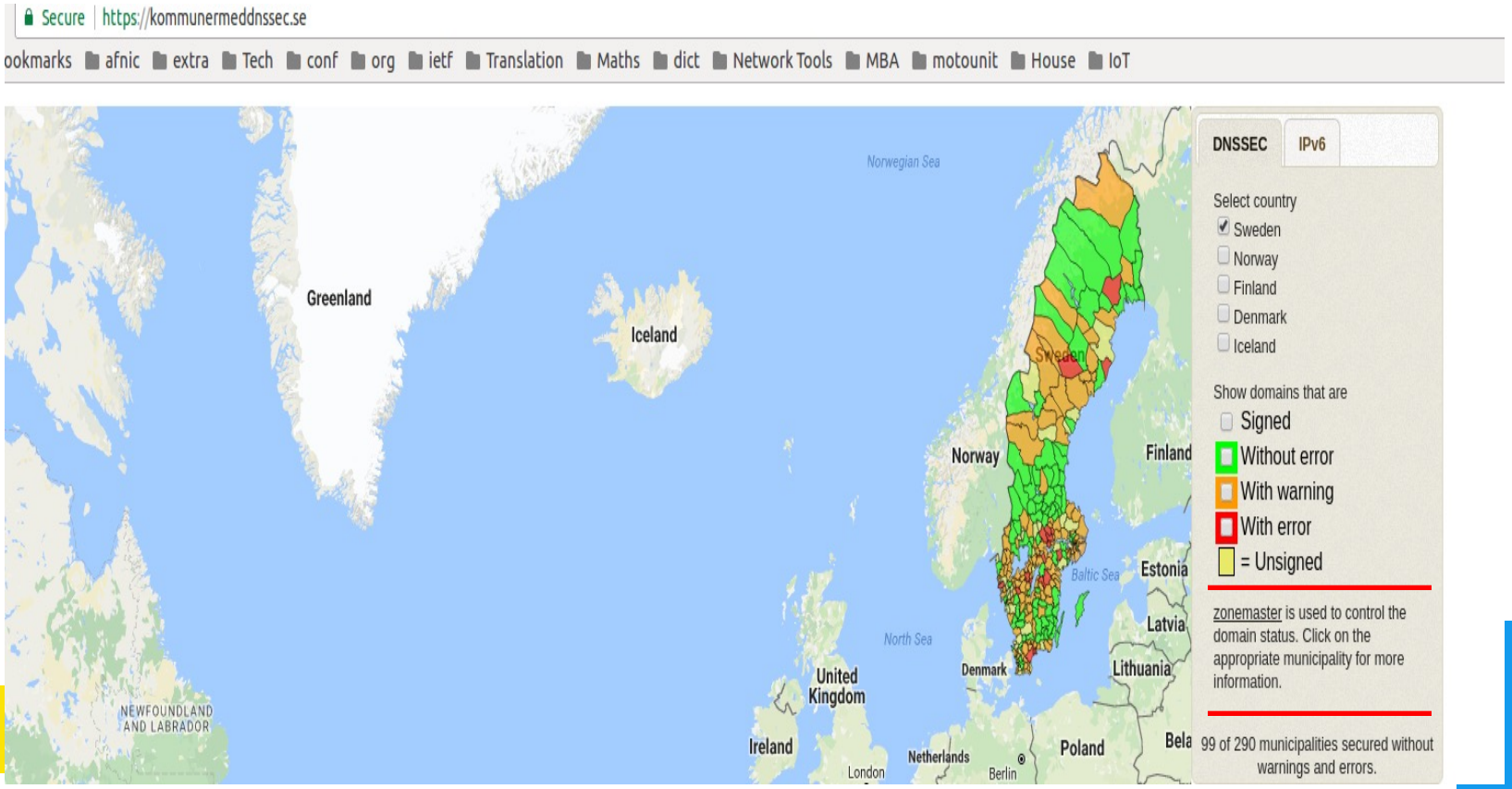
```
14.94 INFO      All the nameservers have SOA record.
14.95 INFO      All of the nameserver names are listed both at parent and child.
14.95 DEBUG     Module Zonemaster::Test::Delegation finished running.
14.95 INFO      The module Example was disabled by the policy.
14.96 DEBUG     Using module Zonemaster::Test::Nameserver version v1.0.5.
14.99 INFO      None of the following nameservers is a recursor : ns0.abul.org,rmll1.rmll.info.
15.03 INFO      The following nameservers support EDNS0 : ns0.abul.org/195.214.228.104,rmll1.rmll.info/80.67.169.65.
15.07 INFO      AXFR not available on nameserver ns0.abul.org/195.214.228.104.
15.09 INFO      AXFR not available on nameserver rmll1.rmll.info/80.67.169.65.
15.10 INFO      All nameservers reply with same IP used to query them.
15.14 INFO      The following nameservers answer AAAA queries without problems : rmll1.rmll.info/80.67.169.65,ns0.abul.org/195.214.228.104.
15.15 INFO      All nameservers succeeded to resolve to an IP address.
15.18 INFO      None of the following nameservers returns an upward referral : ns0.abul.org,rmll1.rmll.info.
15.21 INFO      Nameserver ns0.abul.org/195.214.228.104 preserves original case of queried names (www.RmlL.InfO).
15.22 INFO      Nameserver rmll1.rmll.info/80.67.169.65 preserves original case of queried names (www.RmlL.InfO).
15.27 DEBUG     When asked for SOA records on "wWw.rMLL.INfO" and "wWW.rmll.iNFo", nameserver ns0.abul.org/195.214.228.104 returns same RCODE "NOERROR".
15.30 DEBUG     When asked for SOA records on "wWw.rMLL.INfO" and "wWW.rmll.iNFo", nameserver rmll1.rmll.info/80.67.169.65 returns same RCODE "NOERROR".
15.30 INFO      When asked for SOA records on "www.rmll.info" with different cases, all servers reply consistently.
15.31 DEBUG     Module Zonemaster::Test::Nameserver finished running.
15.31 DEBUG     Using module Zonemaster::Test::Syntax version v1.0.1.
15.31 INFO      No illegal characters in the domain name (rmll.info).
15.31 INFO      Neither end of any label in the domain name (rmll.info) has a hyphen.
15.31 INFO      Domain name (rmll.info) has no label with a double hyphen ('--') in position 3 and 4 (with a prefix which is not 'xn--').
15.32 INFO      Nameserver (ns0.abul.org) syntax is valid.
15.32 INFO      Nameserver (rmll1.rmll.info) syntax is valid.
15.33 INFO      There is no misused '@' character in the SOA RNAME field (root.admin.rmll.info.).
15.34 INFO      The SOA RNAME field (root@admin.rmll.info) is compliant with RFC2822.
15.34 INFO      SOA MNAME (admin.rmll.info) syntax is valid.
15.36 INFO      Domain name MX (rmll1.rmll.info) syntax is valid.
15.37 DEBUG     Module Zonemaster::Test::Syntax finished running.
15.37 DEBUG     Using module Zonemaster::Test::Zone version v1.0.1.
16.46 NOTICE    SOA 'mname' nameserver (admin.rmll.info) is not listed in "parent" NS records for tested zone (ns0.abul.org;rmll1.rmll.info).
16.47 INFO      SOA 'refresh' value (21600) is greater than the minimum recommended value (14400).
16.47 INFO      SOA 'refresh' value (21600) is greater than the SOA 'retry' value (3600).
16.48 DEBUG     SOA 'retry' value (3600) is greater than the minimum recommended value (3600).
16.48 INFO      SOA 'expire' value (604800) is higher than the minimum recommended value (604800) and not lower than the 'refresh' value (21600).
16.48 INFO      SOA 'minimum' value (86400) is within the recommended ones (300/86400).
16.87 NOTICE    SOA 'mname' value (admin.rmll.info) refers to a NS which is an alias (CNAME).
17.24 NOTICE    SOA 'mname' value (admin.rmll.info) refers to a NS which is an alias (CNAME).
17.25 WARNING   No IP address found for SOA 'mname' nameserver (admin.rmll.info).
17.25 DEBUG     MX record for the domain is not pointing to a CNAME.
17.26 INFO      Target (MX=rmll1.rmll.info) found to deliver e-mail for the domain name.
17.26 DEBUG     Module Zonemaster::Test::Zone finished running.
```

Web interface



You can implement Zonemaster tool for your internal use





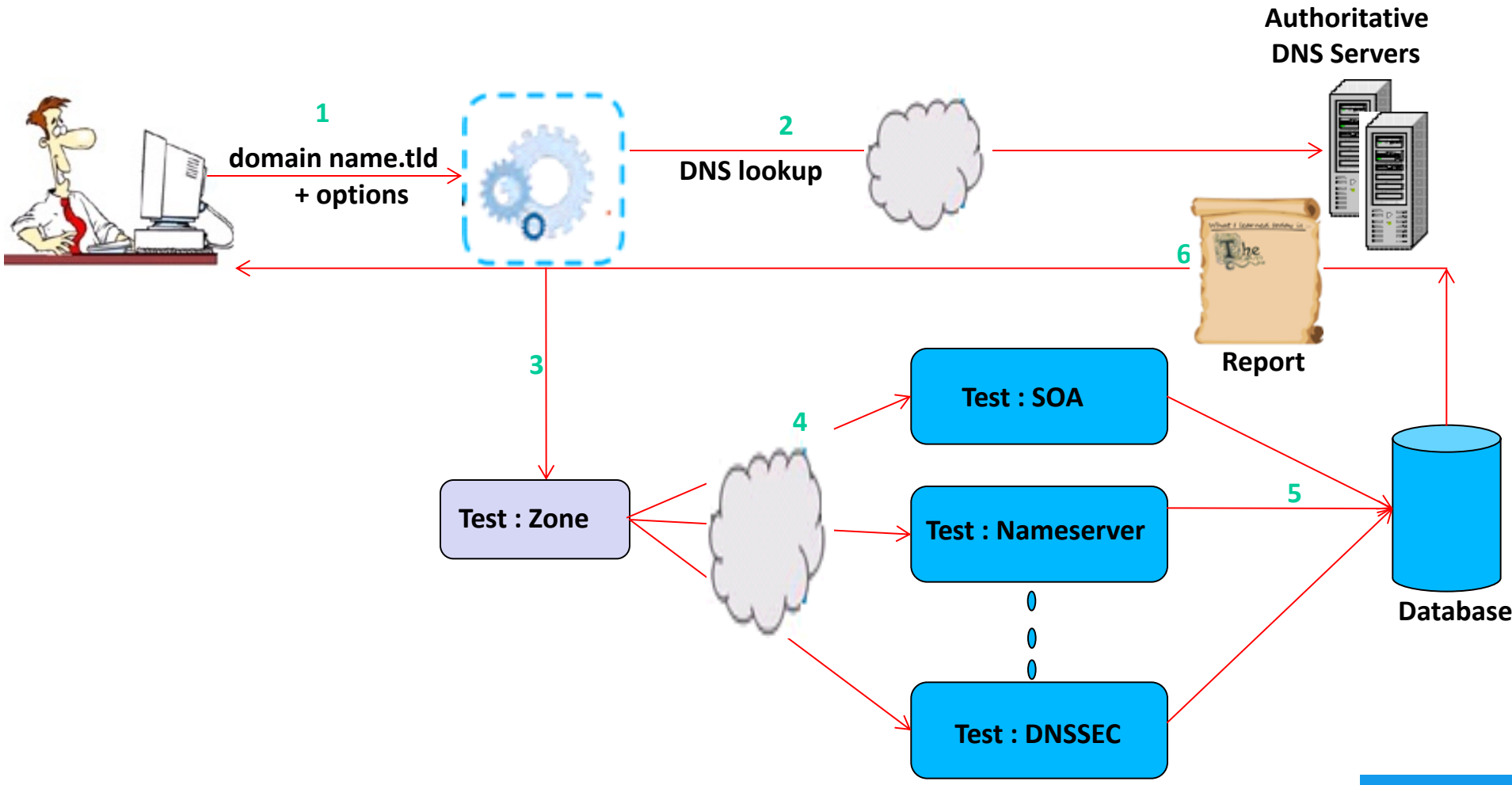
Target Users

- ✓ End-user
- ✓ Domain administrators
- ✓ Registries
- ✓ Registrars
- ✓ Geeks

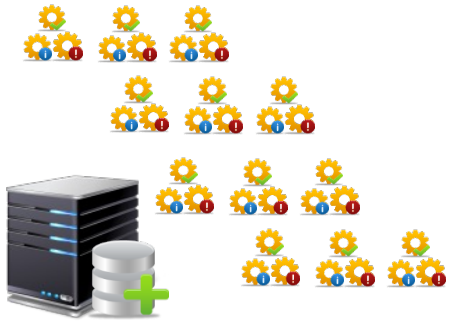
Zonemaster in brief

- ✓ Open Source Project
  - ✓ Source code written in Perl & Java Script (BSD-2 License)
  - ✓ Documentation (CC BY 4.0 License)
- ✓ Aim – to be the state-of-art checking tool for Internet domain names
- ✓ Can check delegated and non-delegated zones
- ✓ Provides CLI/Web/API interfaces
- ✓ Provides high/medium/low levels of output
- ✓ Provides different output formats – Web/Text/JSON
- ✓ Currently supports outputs in English, French and Swedish
- ✓ Can be tailored for your needs

Architecture



Functional breakdown

Usage method	Test engine	Output type
CLI method		CLI output
		Machine parsable output
Web GUI method		Web output
Batch method		Reports Statistics
		JSON Data

Requirements

R08!?

Req	Requirement description	Level and Test Case
R01	UDP connectivity	CONNECTIVITY
R02	TCP connectivity	CONNECTIVITY
R03	Address in a private network	ADDRESS
R04	Address should not be part of a bogon prefix	ADDRESS
R05	Illegal symbols in domain name	SYNTAX
R06	Dash ('-') at start or beginning of domain name	SYNTAX
R07	Double dash in domain name	SYNTAX
R09	At least two nameservers for the domain	DELEGATION
R10	Identical addresses	DELEGATION
R11	Nameserver addresses on same subnet	CONNECTIVITY
R12	Nameserver addresses are all on the same subnet	CONNECTIVITY
R13	Delegation response fit in a 512 byte UDP packet	DELEGATION
R14	Delegation response with additional fit in a 512 byte UDP packet	DELEGATION
R15	NS record present	BASIC
R16	NS authoritative answer	DELEGATION
R17	NS name has a valid domain/hostname syntax	SYNTAX

Requirements to test case mapping

Req	Requirement desription	Level	Test Case ID	Test Description
R01	UDP connectivity	Connectivity-TP	CONNECTIVITY01	UDP connectivity
R02	TCP connectivity	Connectivity-TP	CONNECTIVITY02	TCP connectivity
R03	address in a private network	Address-TP	ADDRESS01	Name server address must be globally routable
R04	address should not be part of a bogon prefix	Address-TP	ADDRESS04	IPv6 address not part of bogon prefix
R05	illegal symbols in domain name	Syntax-TP	SYNTAX01	No illegal characters in the domain name
R06	dash ('-') at start or beginning of domain name	Syntax-TP	SYNTAX02	No hyphen ('-') at the start or end of the domain name
R07	double dash in domain name	Syntax-TP	SYNTAX03	There must be no double hyphen ('--') in position 3 and 4 of the domain name

Documentation (1/2)

- ✓ All test specifications are documented
- ✓ Classified into 8 categories
  - ✓ Basic
  - ✓ Address
  - ✓ Connectivity
  - ✓ Consistency
  - ✓ Delegation
  - ✓ DNSSEC
  - ✓ Name Server
  - ✓ Syntax

Documentation (2/2)

- **BASIC00: Domain name must be valid**

Test case identifier

BASIC00 Domain name must be valid

Objective

In order to begin testing the domain name from the input must be a valid domain name. The domain name must follow the rules defined in section 2.3.1 of RFC 1123. The objective of this test is to see if it is possible to have the domain name mapped into a DNS packet in order to proceed with further testing.

Inputs

The label of the domain name to be tested.

Implementation

- ✓ Perl
  - ✓ Engine
    - ✓ Perl library (Zonemaster::*), which implements all functionality for testing
    - ✓ Functionality for logging results
  - ✓ CLI
  - ✓ Backend
    - ✓ JSON RPC interface to the engine. Can be used by other apps
- ✓ Javascript + Perl
  - ✓ GUI
- ✓ C
  - ✓ LDNS
    - ✓ Resolver functionality built on ldns (Net::LDNS)

How to run a test from the CLI?

```
afnic@zonemaster:~$ zonemaster-cli rmll.info
Seconds Level     Message
======= ========= =======
  17.83 NOTICE    Nameserver ns0.abul.org has an IP address (195.214.228.104) with mismatched PTR result (hiero.abul.org.).
  29.90 NOTICE    There are neither DS nor DNSKEY records for the zone.
  29.90 NOTICE    The zone is not signed with DNSSEC.
  31.56 NOTICE    SOA 'mname' nameserver (admin.rmll.info) is not listed in "parent" NS records for tested zone (ns0.abul.org;rmll1.rmll.info).
  31.96 NOTICE    SOA 'mname' value (admin.rmll.info) refers to a NS which is an alias (CNAME).
  32.35 NOTICE    SOA 'mname' value (admin.rmll.info) refers to a NS which is an alias (CNAME).
  32.35 WARNING   No IP address found for SOA 'mname' nameserver (admin.rmll.info).
```

Options from the CLI

```
afnic@zonemaster:~$ zonemaster-cli --usage
usage: zonemaster-cli [-?h] [long options...]
        -h -? --usage --help  Prints this usage information.
        --version             Print version information and exit.
        --level               The minimum severity level to display. Must be
                              one of CRITICAL, ERROR, WARNING, NOTICE, INFO or
                              DEBUG.
        --locale              The locale to use for messages translation.
        --json                Flag indicating if output should be in JSON or
                              not.
        --json_stream         Flag indicating if output should be streaming
                              JSON or not.
        --json_translate      Flag indicating if streaming JSON output should
                              include the translated message of the tag or not.
        --raw                 Flag indicating if output should be translated
                              to human language or dumped raw.
        --time                Print timestamp on entries.
        --show_level          Print level on entries.
        --show_module         Print the name of the module on entries.
        --ns                  A name/ip string giving a nameserver for
                              undelegated tests, or just a name which will be
                              looked up for IP addresses. Can be given
                              multiple times.
        --save                Name of a file to save DNS data to after running
                              tests.
        --restore             Name of a file to restore DNS data from before
                              running test.
        --ipv4                Flag to permit or deny queries being sent via
                              IPv4. --ipv4 permits IPv4 traffic, --no-ipv4
                              forbids it.
        --ipv6                Flag to permit or deny queries being sent via
                              IPv6. --ipv6 permits IPv6 traffic, --no-ipv6
                              forbids it.
        --list_tests          Instead of running a test, list all available
                              tests.
        --test                Specify test to run. Should be either the name
                              of a module, or the name of a module and the
                              name of a method in that module separated by a
                              "/" character (Example: "Basic/basic1"). The
                              method specified must be one that takes a zone
                              object as its single argument. This switch can
                              be repeated.
        --stop_level          As soon as a message at this level or higher is
                              logged, execution will stop. Must be one of
                              CRITICAL, ERROR, WARNING, NOTICE, INFO or DEBUG.
        --config              Name of configuration file to load.
        --policy              Name of policy file to load.
        --ds                  Strings with DS data on the form
                              "keytag,algorithm,type,digest"
        --count               Print a count of the number of messages at each
                              level
        --progress            Boolean flag for activity indicator. Defaults to
                              on if STDOUT is a tty, off if it is not.
        --encoding            Name of the character encoding used for command
                              line arguments
        --nstimes             At the end of a run, print a summary of the
                              times the zone's name servers took to answer.
        --dump_config         Print the effective configuration used in JSON
                              format, then exit.
        --dump_policy         Print the effective policy used in JSON format,
                              then exit.
        --sourceaddr          Local IP address that the test engine should try
                              to send its requests from.
        --elapsed             Print elapsed time at end of run.
```

Log – Human readable

```
afnic@zonemaster:~$ zonemaster-cli rmll.info
Seconds Level    Message
======= ======== =======
  17.83 NOTICE   Nameserver ns0.abul.org has an IP address (195.214.228.104) with mismatched PTR result (hiero.abul.org.).
  29.90 NOTICE   There are neither DS nor DNSKEY records for the zone.
  29.90 NOTICE   The zone is not signed with DNSSEC.
  31.56 NOTICE   SOA 'mname' nameserver (admin.rmll.info) is not listed in "parent" NS records for tested zone (ns0.abul.org;rmll1.rmll.info).
  31.96 NOTICE   SOA 'mname' value (admin.rmll.info) refers to a NS which is an alias (CNAME).
  32.35 NOTICE   SOA 'mname' value (admin.rmll.info) refers to a NS which is an alias (CNAME).
  32.35 WARNING  No IP address found for SOA 'mname' nameserver (admin.rmll.info).
```

Log – Raw format

```
afnic@zonemaster:~$ zonemaster-cli --raw rmll.info
  17.76 NOTICE    ADDRESS:NAMESERVER_IP_PTR_MISMATCH address=195.214.228.104; names=hiero.abul.org.; ns=ns0.abul.org
  24.70 NOTICE    DNSSEC:NEITHER_DNSKEY_NOR_DS child=195.214.228.104; parent=199.254.31.1
  24.70 NOTICE    DNSSEC:NOT_SIGNED zone=rmll.info
  26.33 NOTICE    ZONE:MNAME_NOT_IN_GLUE mname=admin.rmll.info; ns=ns0.abul.org;rmll1.rmll.info
  26.72 NOTICE    ZONE:MNAME_IS_CNAME mname=admin.rmll.info
  27.10 NOTICE    ZONE:MNAME_IS_CNAME mname=admin.rmll.info
  27.10 WARNING   ZONE:MNAME_HAS_NO_ADDRESS mname=admin.rmll.info
```

Log – JSON

```
afnic@zonemaster:~$ zonemaster-cli --json rmll.info
[{"args":{"address":"195.214.228.104","names":"hiero.abul.org.","ns":"ns0.abul.org"},"level":"NOTICE","modu
e":"ADDRESS","tag":"NAMESERVER_IP_PTR_MISMATCH","timestamp":17.8147161006927},{"args":{"child":"195.214.228
104","parent":"199.254.31.1"},"level":"NOTICE","module":"DNSSEC","tag":"NEITHER_DNSKEY_NOR_DS","timestamp":
4.8285620212555},{"args":{"zone":"rmll.info"},"level":"NOTICE","module":"DNSSEC","tag":"NOT_SIGNED","timest
mp":24.8302659988403},{"args":{"mname":"admin.rmll.info","ns":"ns0.abul.org;rmll1.rmll.info"},"level":"NOTI
E","module":"ZONE","tag":"MNAME_NOT_IN_GLUE","timestamp":26.4367871284485},{"args":{"mname":"admin.rmll.inf
"},"level":"NOTICE","module":"ZONE","tag":"MNAME_IS_CNAME","timestamp":26.8380980491638},{"args":{"mname":"
dmin.rmll.info"},"level":"NOTICE","module":"ZONE","tag":"MNAME_IS_CNAME","timestamp":27.2167479991913},{"ar
s":{"mname":"admin.rmll.info"},"level":"WARNING","module":"ZONE","tag":"MNAME_HAS_NO_ADDRESS","timestamp":2
.21766018867491]
```

Log Levels

DEBUG 1, 2, 3

INFO

NOTICE

WARNING

ERROR

CRITICAL



Configured by policy

Policy – to decide on the severity level of the resutls

```
afnic@zonemaster:~$ zonemaster-cli --dump_policy
{
   "ADDRESS" : {
      "NAMESERVERS_IP_WITH_REVERSE" : "INFO",
      "NAMESERVER_IP_PRIVATE_NETWORK" : "ERROR",
      "NAMESERVER_IP_PTR_MATCH" : "INFO",
      "NAMESERVER_IP_PTR_MISMATCH" : "NOTICE",
      "NAMESERVER_IP_WITHOUT_REVERSE" : "WARNING",
      "NO_IP_PRIVATE_NETWORK" : "INFO",
      "NO_RESPONSE_PTR_QUERY" : "WARNING"
   },
   "BASIC" : {
      "A_QUERY_NO_RESPONSES" : "INFO",
      "DOMAIN_NAME_LABEL_TOO_LONG" : "CRITICAL",
      "DOMAIN_NAME_TOO_LONG" : "CRITICAL",
      "DOMAIN_NAME_ZERO_LENGTH_LABEL" : "CRITICAL",
      "HAS_A_RECORDS" : "ERROR",
      "HAS_GLUE" : "INFO",
      "HAS_NAMESERVERS" : "INFO",
      "HAS_NAMESERVER_NO_WWW_A_TEST" : "INFO",
      "IPV4_DISABLED" : "INFO",
      "IPV4_ENABLED" : "INFO",
      "IPV6_DISABLED" : "INFO",
      "IPV6_ENABLED" : "INFO",
      "NOT_A_ZONE" : "CRITICAL",
      "NO_DOMAIN" : "CRITICAL",
      "NO_GLUE" : "CRITICAL",
      "NO_GLUE_PREVENTS_NAMESERVER_TESTS" : "INFO",
      "NO_PARENT_RESPONSE" : "ERROR",
      "NS_FAILED" : "ERROR",
      "NS_NO_RESPONSE" : "NOTICE",
      "PARENT_REPLIES" : "INFO"
   },
   "CONNECTIVITY" : {
      "ASN_INFOS_ANNOUNCE_BY" : "DEBUG",
      "ASN_INFOS_ANNOUNCE_IN" : "DEBUG",
```

Policy – to decide which test cases to run

```
{
    "__testcases__": {
        "syntax01": 1,
        "syntax02": 1,
        "syntax03": 1,
        "syntax04": 1,
        "syntax05": 1,
        "syntax06": 0,
        "syntax07": 1,
        "syntax08": 1
    }
}
```

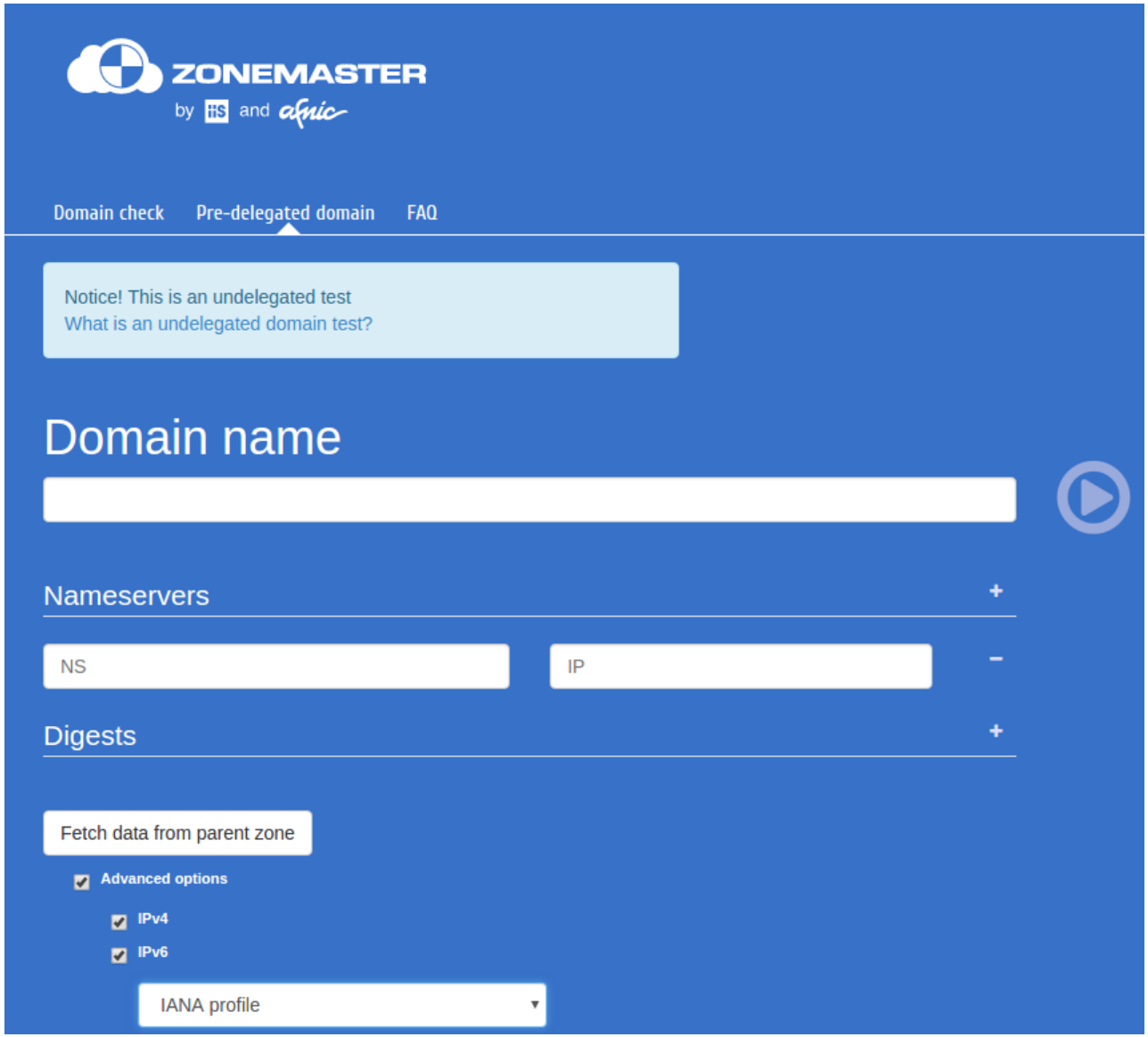
Config

```
{
   "asnroots" : [ "asnlookup.zonemaster.net", "asnlookup.iis.se",
"asn.cymru.com"],
   "net" : {
      "ipv4" : 1,
      "ipv6" : 1
   },
   "no_network" : 0,
   "resolver" : {
      "defaults" : {
         "debug" : 0,
         "dnssec" : 0,
         "edns_size" : 0,
         "igntc" : 0,
         "recurse" : 0,
         "retrans" : 3,
         "retry" : 2,
         "usevc" : 0
      }
   }
}
```

Config filter – to have fine grained control over the tests

```
"logfilter" : {
      "BASIC" : {
         "IPV6_ENABLED" : [
            {
               "when" : {
                  "rrtype" : "NS",
                  "ns" : "f.ext.nic.fr",
                  "address" : "2001:67c:1010:11::53"
               },
               "set" : "WARNING"
            },
            {
               "when" : {
                  "ns" : "h.ext.nic.fr"
               },
               "set" : "ERROR"
            }
         ]
      },
```

Configurable features from the GUI



Running a batch test from the backend using JSON-RPC (1/2)

```
{
  "jsonrpc": "2.0",
  "id": 147559211348450,
  "method": "add_batch_job",
  "params" : {
    "api_key": "fromage",
    "username": "citron",
    "test_params": {},
    "domains": [
      "zonemaster.net",
      "domain1.se",
      "domain2.fr"
    ]
  }
}
```

Example response:

```
{
    "jsonrpc": "2.0",
    "id": 147559211348450,
    "result": 8
}
```

Running a batch test from the backend using JSON-RPC (2/2)

```
{
    "jsonrpc": "2.0",
    "id": 147559211994909,
    "method": "get_batch_job_result",
    "params": "8"
}
```

Example response:

```
{
   "jsonrpc": "2.0",
   "id": 147559211994909,
   "result": {
      "nb_finished": 5,
      "finished_test_ids": [
         "43b408794155324b",
         "be9cbb44fff0b2a8",
         "62f487731116fd87",
         "692f8ffc32d647ca",
         "6441a83fcee8d28d"
      ],
      "nb_running": 195
   }
}
```

Using Zonemaster from your application

```
Use Zonemaster;


# execute a test
my @log  = Zonemaster->test_zone( ‘rmll.info’ );
my @json = Zonemaster->logger->json( ‘NOTICE’ );


# get name servers of a zone
my @zone = Zonemaster->zone( ‘rmll.info’ );
my @nameservers = join( ‘ ‘, @{ $zone->ns_names } );
```

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```

Zonemaster Usage

- ✓ CIRA has an installation for .ca
- ✓ DK Hostmaster has an installation for .dk
- ✓ Pingdom is using Zonemaster
- ✓ RIPE NCC is working on an installation
- ✓ Regsitrars like ovh and GoDaddy have recommended Zonemaster to their users
- ✓ CENTR (Council for European Top Level Domains) is planning to use Zonemaster
- ✓ IIS and Afnic are dedicated to support Zonemaster
- ✓ Users and contributors are welcome

References

- ✓ Try out Zonemaster at https://zonemaster.net
- ✓ Information regarding installation, OS support, documentation, different modules can be found here : https://github.com/dotse/zonemaster
- ✓ To contact the team
  - ✓ contact@zonemaster.net
  - ✓ zonemaster-users@lists.iis.se
  - ✓ zonemaster-devel@lists.iis.se (Development related questions)

Thank you !



www.afnic.fr
contact@afnic.fr
Twitter : @AFNIC
Facebook : afnic.fr

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