

## NAME

askmara - do simple dns queries

## DESCRIPTION

**askmara** queries the user-specified dns server for records, and outputs the reply in a csv2-compatible format (csv2 is the format of zone files that **maradns** uses).

## USAGE

**askmara** [-n] [ -v | -t timeout] query [ server ]

## OPTIONS

- t If this is present, the following argument is the askmara timeout, in seconds. Note that **askmara** can not both have a user-defined timeout and verbose output.
- v If this is set, **askmara** will verbosely output the complete reply that the server sent. Note that this verbose output is not csv2-compatible.
- n If this is set, **askmara**, when sending out a query, will not request DNS recursion; in other words, askmara will request that the remote DNS server not contact other DNS server to answer the query in question.

query

dns record to be queried. The query has two sections: The type of record we desire, and the hostname we want this record for.

The type of query can have two forms: A one-letter mnemonic, or a numeric rtype followed by a colon. This is immediately concatenated by the full name of the host name we wish to look up.

For example, to ask for the IP of 'example.com.', we can use the one-letter mnemonic, in the form 'Aexample.com.', or we can use the numeric RR followed by a colon, giving the query '1:example.com.' (since A has the record type of one). Note that the query name needs the trailing dot at the end.

Askmara supports a handful one-letter mnemonics, as follows:

**A** signifies a request for an A (ipv4 address) RR

**N** signifies a NS RR

**C** signifies that we are asking for a CNAME RR

**S** signifies that we want a SOA RR

**P** signifies that we want a PTR RR

**@** signifies that we want a MX RR

**T** signifies that we want a TXT RR

**Z** signifies that we want to ask for all RRs.

server

IP address of the dns server to be queried. If no server is given, askmara will query 127.0.0.1.

## EXAMPLES

Asking the server with the ip 127.0.0.1 for the IP address of example.com:

```
askmara Aexample.com.
```

Asking the server with the ip 198.41.0.4 for the IP address of example.com:

```
askmara Aexample.com. 198.41.0.4
```

Asking the server with the ip address 127.0.0.1 for the IP address of example.com, using the rr\_number:query format:

```
askmara 1:example.com.
```

Asking the server with the ip address 127.0.0.1 for a SRV record. In particular, we ask for the "http over tcp" service for example.net. Since askmara doesn't have a mnemonic for SRV record types, we use the numeric code (33 for SRV):

```
askmara 33:_http._tcp.example.net.
```

Asking the server with the ip address 127.0.0.1 for the AAAA (ipv6 ip) record for example.net:

```
askmara 28:example.net.
```

Note that the output will be a raw DNS packet in both the SRV and AAAA examples.

## BUGS

When askmara is asked for an SOA record, the output of **askmara** closely resembles the format of a csv2 file, but can not be parsed as a csv2 file without modification.

askmara outputs multi-chunk ("character-string") TXT records incorrectly (it only outputs the first chunk).

## SEE ALSO

**maradns(8)**

<http://www.maradns.org>

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## **AUTHOR**

MaraDNS is written by Sam Trenholme. Jaakko Niemi used 5 minutes to roll this manpage together, which Sam has subsequently revised.

## NAME

csv2 - Description of the csv2 zone file that MaraDNS uses

## DESCRIPTION

The csv2 zone file format is the new zone file format for MaraDNS 1.2. This zone file format uses any kind of whitespace (space, tab, and carriage return), or the '|' character, to delimitate fields. The zone file parser is smart enough to know how many fields the record data for a given record type needs; once all the fields for a given record type is processed, the parser parses the next entry it sees as the name for the next record to process.

This zone file format has records in the following form:

```
name [+ttl] [rtype] rdata
```

The name is the name of the record we will add, such as "www.example.net.". This must be placed at the beginning of a line. The rtype is the record type for the record, such as "A" (ipv4 IP address), "MX" (mail exchanger), or "AAAA" (ipv6 IP address). The ttl is how long other DNS servers should store this data in their memory (in seconds); this field needs a '+' as its initial character. The rdata is the actual data for this record; the format for the rdata is type-specific.

Anything in square brackets is an optional field. If the ttl is not specified, the ttl is set to be 86400 seconds long (one day). If the rtype is not specified, it is set to be an "A" (ipv4 address) record.

The zone file supports comments; comments are specified by having a '#' anywhere between fields or records; when a '#' is seen, the csv2 parser ignores any character it sees (with the exception of the '{' character, which is not currently allowed in csv2 zone files) until a newline. A '#' can usually be placed inside a field, and indicates the end of a field when placed there.

The following record types are supported; a description of the record data format accommodates the record type:

### A

An A record stores an ipv4 address. This is the default record type should the record type not be specified. The record type has one field in it: the IP for the record. Examples:

```
a.example.net.      10.11.12.13
b.example.net.      A   10.11.12.14
c.example.net. +64000 A   10.11.12.15
```

### PTR

A PTR record stores the name for a given ipv4 or ipv6 address, and is used for reverse DNS lookups. This record type has one field in it: The name for the record in question. Examples:

```
13.12.11.10.in-addr.arpa. PTR a.example.net.  
14.12.11.10.in-addr.arpa. PTR b.example.net.  
15.12.11.10.in-addr.arpa. +64000 PTR c.example.net.
```

## MX

A MX record stores a mail exchange record, and is used for mail delivery. This record type has two fields in it: The priority (or "preference" in traditional DNS parlance) of the MX record (lower numbers get higher priority), and the name of the mail exchanger. Example of mail for example.net being mailed to mail.example.net, which has the IP "10.11.12.16":

```
example.net. MX 10 mail.example.net.  
mail.example.net. 10.11.12.16
```

## AAAA

An AAAA record stores the ipv6 address for a given name. The IP is in standard ipv6 "colon delimited" format: eight 16-bit hexadecimal numbers are separated by colons. Two colons together indicate multiple streams of all-zero hex numbers. This record has only one field, the v6 IP. Example:

```
a.example.net. AAAA 3ffe:ffff:ffe:501:ffff::b:c:d
```

## SRV

An SRV record stores a "service" definition. This record has four fields: Priority, weight, port, and target. For more information, please refer to RFC 2782. Example:

```
_http._tcp.% srv 0 0 80 a.%
```

## NS

An NS record specifies the name servers for a given zone. If the name servers are not delegation name servers (in other words, if the the name servers are the authoritative name servers for the zone), they need to be at the beginning of the zone, either as the first records in the zone, or right after the SOA record. The NS records are optional; if not present, MaraDNS will make an educated guess of that NS records should be there, based on the IPs the MaraDNS process is bound to. This record has one field: The name of the name server machine. Example:

```
example.net. NS ns1.example.net.  
example.net. NS ns2.example.net.
```

## SOA

An SOA record stores the start of authority for a given zone file. This record is optional in a CSV2 zone file; should the record not be in the zone file, MaraDNS will synthesize an appropriate SOA record. This record can only exist once in a zone file: As the first record of the zone file. This record has seven fields: The name of the zone, the email address of the person responsible for the zone, and five numeric fields (serial, refresh, retry, expire, and minimum). Note that the SOA minimum does *not* affect other TTLs in MaraDNS. Example:

```
x.org. SOA x.org. email@x.org. 1 7200 3600 604800 1800
```

## TXT

A TXT record stores arbitrary text and/or binary data for a given host name. This record has one field: The text data for the record.

A basic text record can be stored by placing ASCII data between two single quotes, as follows:

```
example.com. TXT 'This is an example text field'
```

Any binary data can be specified; see the **csv2\_txt(5)** manual page for full details.

## RAW

The RAW record is a special meta-record that allows any otherwise unsupported record type to be stored in a csv2 zone file. The syntax is:

```
RAW [numeric rtype] [data]
```

The numeric rtype is a decimal number.

The data field can, among other thing, have backslashed hex sequences outside of quotes, concatenated by ASCII data inside quotes, such as the following example:

```
example.com. RAW 40 \x10\x01\x02'Kitchen sink'\x40' data'
```

The above example is a "Kitchen Sink" RR with a "meaning" of 16, a "coding" of 1, a "subcoding" of 2, and a data string of "Kitchen sink@ data" (since hex code 40 corresponds to a @ in ASCII). Note that unquoted hex sequences are concatenated with quoted ASCII data, and that spaces are *only* inside quoted data.

The format for a data field in a RAW record is almost identical to the format for a TXT data field. Both formats are described in full in the **csv2\_txt(5)** manual page.

## EXAMPLE ZONE FILE

```
# This is an example csv2 zone file
```

```
# First of all, csv2 zone files do not need an SOA record; however, if
# one is provided, we will make it the SOA record for our zone
```

```

# The SOA record needs to be the first record in the zone if provided

#%      SOA      % email@% 1 7200 3600 604800 1800

# Second of all, csv2 zone files do not need authoritative NS records.
# If they aren't there, MaraDNS will synthesize them, based on the IP
# addresses MaraDNS is bound to. (She's pretty smart about this; if
# Mara is bound to both public and private IPs, only the public IPs will
# be synthesized as NS records)

#%      NS      a.%
#%      NS      b.%

# Here are some A (ipv4 address) records; since this is the most
# common field, the zone file format allows a compact representation
# of it.
a.example.net.      10.10.10.10
b.example.net. 10.10.10.11
b.example.net. 10.10.10.12

# We can have the label in either case; it makes no difference
Z.EXAMPLE.NET. 10.2.3.4
Y.EXAMPLE.net. 10.3.4.5

# We can use the percent shortcut. When the percent shortcut is present,
# it indicates that the name in question should terminate with the name
# of the zone we are processing.
percent.%      a      10.9.8.7

# And we can have star records
#*.example.net. A      10.11.12.13

# We can have a ttl in a record; however the ttl needs a '+' before it:
# Note that the ttl has to be in seconds, and is before the RTYPE
d.example.net. +86400 A 10.11.12.13

f.example.net. # As you can see, records can span multiple lines
A      10.2.19.83

# This allows well-commented records, like this:
c.example.net.      # Our C class machine
+86400 # This record is stored for one day
A      # A record
10.1.1.1 # Where we are

```

```
# We can even have something similiar to csv1 if we want...
e.example.net.|+86400|a|10.2.3.4
h.example.net.|a|10.9.8.7
# Here, we see we can specify the ttl but not the rtype if desired
g.example.net.|+86400|10.11.9.8

# Here is a MX record
% mx 10 mail.%
mail.% +86400 IN A 10.22.23.24

# We even have a bit of ipv6 support
a.example.net.          aaaa    3ffe:ffff:1:2:3::4:f

# Not to mention support for SRV records
_http._tcp.% srv 0 0 80 a.%

# And, of course, TXT records
example.net.  txt 'This is some text'
```

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## AUTHOR

Sam Trenholme <http://www.samiam.org/>



## NAME

csv2\_txt - Description of txt and raw resource records in the csv2 zone file

## DESCRIPTION

Due to the complexity of TXT and RAW records, this man page is dedicated to describing the csv2 format of this RR.

TXT and RAW rrs in MaraDNS' csv2 zone files can store any arbitrary binary data. Additionally, it is possible to arbitrarily divide up TXT records in to chunks (chunks, which RFC1035 call "character-string"s, are described below).

## ASCII AND UTF-8 DATA

If a given TXT field or RAW record contains only ASCII data, creating a record is easy: Place the full data between single quotes, like this:

```
a.example.com. TXT 'This is some text'
```

It is also possible, with two notable exceptions, to place any byte with a value less than 0x80 (128) between quotes. If there are any bytes with a value of 0x80 or more, the data must be UTF-8 encoded Unicode.

The two ASCII characters not allowed in quotes are the ' character, and the '{' character. See BACKSLASH ESCAPE SEQUENCES below for information on adding these characters to TXT or RAW fields.

## UNQUOTED DATA

Note that the record does not have to be quoted. As long as the record only contains ASCII alphanumeric data, and/or the characters '-', '\_', '+', '%', '!', '^', and '=', the data can be unquoted as follows:

```
c.example.com. TXT This_is_100%_unquoted_text_+symbols!
```

It is also possible to mix quoted and unquoted text, such as this:

```
d.example.com. TXT This' is a mix 'of_unquoted' and quoted 'text!'
```

Which will have its data look like this:

```
This is a mix of_unquoted and quoted text!
```

When mixing quoted and unquoted data, it is important to have all whitespace *inside* quotes.

## BACKSLASH ESCAPE SEQUENCES

In order to accommodate storing non-UTF-8 high bit characters, the single quote character, the '{' character, and to permit multi-line TXT/RAW records (with comments allowed mid-record), the TXT/RAW RR allows backslashes. These backslashes only have significance *outside* of quoted text; if they are placed inside single quotes, they are

not interpreted and result in a literal backslash being added to the resource record data.

The following characters can be backslashed:

' When backslashed, the adds a literal quote to the resource record.

whitespace

When any whitespace is backslashed (space, newline, cr, and tab), this indicates that the record has not ended, and that more data for this resource will follow. This also allows comments to be placed in TXT and RAW resource records. What happens is that the backslash indicates that any whitespace characters (space, tab, carriage return, and line feed) are to be ignored until the next non-whitespace character that is not a # (hash). If a # is seen, this indicates that we ignore any and all characters until the next carriage return or line feed, and continue to ignore everything until the next non-whitespace character. See the section on multi-line and commented records for examples.

0123

When a number between 0 and 3 is backslashed, this indicates the beginning of a three-digit octal number.

x When an x is backslashed, this indicates the beginning of a two-digit hexadecimal number.

Note that, with the exception of the single quote, the backslash character is *not* used to remove the meta-significance of a given character. In particular, unlike other environments, it is not possible to backslash spaces. Spaces can be represented either as ' ' in quotes, \x20, or as \040.

Here are some examples of backslashed data. In this example, we see backslash sequences being used to store non-UTF-8 hi-bit data:

e.example.com. TXT \x80\x81\x82\x83

This same data can also be created as follows:

f.example.com. TXT \200\201\202\203

Octal and hex information can be mixed:

g.example.com. TXT \200\x81\202\x83

Literal single quotes can be placed in resource records:

h.example.com. TXT 'perl -e \"print \"A Perl of a TXT record!\n\"'

The above example produces this record:

```
perl -e 'print "A Perl of a TXT record!\n"'
```

To render the '{' character, use the escape sequence `\x7b` (outside of quotes). For example:

```
h1.example.com. TXT 'for(a=0;a<10;a++)\x7b'printf("%d\n",a);sleep(1)}'
```

Produces this record:

```
for(a=0;a<10;a++){printf("%d\n",a);sleep(1)}
```

## MULTI-LINE AND COMMENTED RECORDS

By utilizing backslashes followed by comments, it is possible to have multi-line and commented TXT and RAW records. The following resource record will span more than one line on an 80-column display:

```
i.example.com. TXT 'Not only did the quick brown fox jump over the lazy dog, but the lazy dog jumped
```

Without affecting this resource record, the same data can be split over multiple lines:

```
j.example.com. TXT 'Not only did the quick brown fox jump \  
    'over the lazy dog, but the lazy dog\  
    'jumped over the cat.'
```

Some points:

- \* The backslash must be outside of the quotes (or a literal backslash will be added to the record)
- \* The backslash must be present *before* any unquoted white space. Usually, the backslash is placed immediately after the quote character.
- \* Unlike other environments, it does not matter whether or not there is invisible whitespace after the backslash.

It is also possible to add comments after such a backslash as follows:

```
k.example.com. TXT 'Not only did the quick brown fox jump \' # The fox  
    'over the lazy dog, but the lazy dog\' # The dog  
    'jumped over the cat.' # The cat
```

Note that, since the third comment is not preceded by a backslash, this indicates the end of the resource record.

There can also be multiple lines dedicated to comments (and, optionally, even blank lines) in the middle of TXT and RAW record data:

```
k2.example.com. TXT 'This is some data \  
# Here we have some comments followed by a blank line
```

```
# Now we have some more comments,  
# followed by the rest of the data  
    'and this is the rest of the data'
```

## MULTIPLE TXT CHUNKS

TXT RRs may be divided up in to multiple "chunks" (RFC1035 calls these "character-string"s). A single chunk can be anywhere from zero to 255 bytes long. The default is to have one chunk, as follows:

```
o.example.com. TXT 'TXT record with only one chunk'
```

It is also possible to have a record with multiple chunks. Chunks are delimited by an unquoted ';' character:

```
p.example.com. TXT 'This is chunk one';'This is chunk two'
```

Or:

```
q.example.com. TXT 'This is chunk one';\ # Our first chunk  
                This_is_chunk_two;\ # Our second chunk  
                'This is chunk three' # Our final chunk
```

Quoted ; characters simply add a ; to the record data.

If a single TXT chunk is longer than 255 bytes long, the csv2 parser will report an error in the zone file: Single TXT chunk too long

In order to resolve this, place unquoted ; characters in the record data so that each chunk is under 255 octets (bytes or characters) in length.

It is possible to have zero length chunks:

```
r.example.com. TXT 'chunk one';;'chunk three' # Chunk two zero-length
```

In particular, it is possible to have zero length chunks at the beginning and end of a TXT record:

```
s.example.com. TXT ';'chunk two'; # Chunks one and three zero-length
```

Do not place semicolons at the beginning nor end of TXT records unless you wish to have these zero-length chunks.

Chunk support only exists for TXT records. An unquoted ; character will cause a syntax error in a RAW record.

## RAW RECORDS

With the exception of no support for chunk delimiters, and the addition of a numeric record type before the record data, the format for RAW records is identical to text

records. For example, if we wish to have a "Kitchen Sink" RR record, which has the 8-bit binary numbers "16", "1", and "2", followed by the ASCII string "Kitchen sink+ data", we can specify this in any of the following manners:

t1.example.com. RAW 40 \x10\x01\x02'Kitchen sink'\x2b' data'

t.example.com. RAW 40 \020\001\002Kitchen' sink+ data'

u.example.com. RAW 40 \x10\x01\x02Kitchen\x20sink+\x20data

v.example.com. RAW 40 \x10\001\x02\  
'Kitchen sink+ data'

w.example.com. RAW 40 \x10\ # Meaning: 16  
                  \x01\ # Coding: 1  
                  \x02\ # Sub-coding: 2  
                  'Kitchen sink+ data' # Data: 'Kitchen sink+ data'

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## AUTHOR

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## NAME

duende - run a child process as a daemon

## DESCRIPTION

**duende** makes a given child process a daemon. The standard output and standard error of the child process is logged via syslog() with a priority of LOG\_INFO.

## USAGE

**duende** child\_process [ all subsequent arguments passed on to child ]

## DETAILS

When **duende** is invoked, it spawns two processes. In addition to spawning the daemonized child process, **duende** also spawns a process which reads and logs the standard output of the daemonized process. The parent process stays alive so as to monitor the daemonized process.

**duende** requires a blank directory named /etc/maradns/logger to run.

Should the parent duende process HUP signal, **duende** will restart the child process. Should the daemonized or logging process received an untrapped HUP signal or exit with an exit code of 8, **duende** will restart the process. Should the daemonized or logging process exit for any other reason, **duende** will send the logger process a TERM signal and exit. Should the duende parent process receive a TERM or INT signal, **duende** sends all of its children TERM signals, then exits.

The duende process must be started as the superuser; this is because Duende's intended child processes (maradns and zoneserver) need to bind to privileged ports, and because duende uses a setuid() call to change the user ID of the logging process to the user with ID 66.

## EXAMPLES

Using duende to start maradns, where the mararc file is /etc/mararc.2

```
duende maradns -f /etc/mararc.3
```

Using duende to start zoneserver, where the mararc file is /etc/mararc.4

```
duende zoneserver -f /etc/mararc.4
```

## BUGS

**Duende** assumes that all of its children are well-behaved, eating their vegetables, going to bed when told, and terminating when receiving a TERM signal.

## SEE ALSO

**maradns(8)**

<http://www.maradns.org>

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## AUTHOR

Duende and this man page are written by Sam Trenholme. D Richard Felker III provided some invaluable assistance with the piping code which **duende** uses.

## NAME

fetchzone - get dns zone from server

## DESCRIPTION

**fetchzone** transfers a user-specified dns zone from a zone server and displays it in csv2 format on the standard output.

## USAGE

**fetchzone** zone\_name zone\_server\_IP [query\_class]

## OPTIONS

### **zone\_name**

Name of the dns zone to be transferred.

### **zone\_server\_IP**

IP address of dns server

### **query\_class**

Optional argument which can change the query class from 1 (the default) to 255. This may be needed for some versions of Bind.

## EXAMPLES

To obtain the zone example.com from the server 192.168.9.8:

```
fetchzone example.com 192.168.9.8
```

To obtain the zone example.org from the server 10.9.8.78 using a query class of 255:

```
fetchzone example.com 10.9.8.78 255
```

## BUGS

Fetchzone will not correctly output host names with utf-8 characters in them.

## SEE ALSO

The man pages **maradns(8)** and **csv2(5)**

<http://www.maradns.org>

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**AUTHOR**

Sam Trenholme

Erre con erre cigarro  
Erre con erre barril  
Rápido ruedan los carros  
En el ferrocarril

## NAME

maradns - DNS server

## SYNOPSIS

**maradns** [ **-v** | **-f mararc\_file\_location** ]

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## DESCRIPTION

**maradns** is a DNS server written with security, simplicity, and performance in mind.

**maradns** has two forms of arguments, both of which are optional.

The first is the location of a **mararc** file which MaraDNS obtains all configuration information from. The default location of this file is **/etc/mararc**. This is specified in the form **maradns -f mararc\_file\_location**; *mararc\_file\_location* is the location of the mararc file.

It is also possible to have MaraDNS display the version number and exit. This is specified by invoking maradns in the form **maradns -v** or **maradns --version**

## USAGE

If MaraDNS is functioning only as a recursive nameserver, just one file needs to be set up: The mararc file.

In order for MaraDNS to function as an authoritative nameserver, two or more files need to be set up: the mararc file and one or more "csv1" zone files.

The configuration formation of a csv1 zone file can be obtained from the **csv1(5)** manual page. The configuration format of the mararc file can be obtained from the

**mararc(5)** manual page.

In order to have MaraDNS run as a daemon, the **duende** program is used to daemonize MaraDNS. See the **duende(8)** manual page for details.

## FIREWALL CONFIGURATION

If MaraDNS is being used as an authoritative nameserver, allow UDP connections from all hosts on the internet to UDP port 53 for the IP that the authoritative nameserver uses.

If MaraDNS is being used as a recursive nameserver, the firewall needs to allow the following packets to go to and from the IP the recursive nameserver uses:

- \* Allow UDP connections from the MaraDNS-running server to any machine on the internet where the UDP destination port is 53
- \* Allow UDP connections from any machine on the internet to the IP of the recursive server, where the source port from the remote server is 53, and the destination port is between 15000 and 19095 (inclusive)
- \* Allow UDP connections from IPs that use MaraDNS as a recursive DNS server to port 53 of the MaraDNS server

MaraDNS uses a strong secure RNG for both the query (16 bits of entropy) and the source port of the query (12 bits of entropy). This makes spoofing replies to a MaraDNS server more difficult, since the attacker has only a one in 250 million chance that a given spoofed reply will be considered valid.

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## ANSWERS

### 1. I'm still using version 1.0 of MaraDNS

MaraDNS 1.0 will continue to be fully supported until December 21, 2007; this means that MaraDNS 1.0 questions will still be answered and bug fixes will still be applied. After 2007/12/21, MaraDNS 1.0 will no longer be fully supported; the only updates, at that point, would be bugtraq-worthy critical security fixes. Not even these security updates will be applied after December 21, 2010.

People who wish to run MaraDNS 1.0 unsupported after 2010/12/21 need to keep in mind that MaraDNS 1.0 is *not* Y2038 compliant, and will have problems starting in 2036 or so. MaraDNS 1.2, on the other hand, is fully Y2038 compliant.

There is still a FAQ for version 1.0 of MaraDNS available [here](#).

Updating from 1.0 to 1.2 requires a minimum number of changes; with most configurations, MaraDNS 1.2 is fully compatible with MaraDNS 1.0 data files. Details are in the updating document in the tutorial.

While csv1 zone files are fully supported in MaraDNS 1.2, there is a Perl script for updating from CSV1 to CSV2 zone files in the tools/ directory of MaraDNS 1.2.

### 2. How do I try out MaraDNS?

Read the quick start guide, which is the file named 0QuickStart in the MaraDNS distribution.

### 3. What license is MaraDNS released under?

MaraDNS 1.2 is released with the following two-clause BSD license: BSD-type license:

Copyright (c) 2002-2005 Sam Trenholme  
TERMS

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

This software is provided 'as is' with no guarantees of correctness or fitness for purpose.

#### **4. How do I report bugs in MaraDNS?**

Please contact me.

#### **5. Some of the postings to the mailing list do not talk about MaraDNS!**

In cases where I post something to the mailing list which does not directly talk about MaraDNS, the subject line will not have [MARA] in it, but will have some form of the word CHATTER in it.

This way, people who do not like this can set up mail filters to filter out anything that comes from this list and doesn't have [MARA] in the subject line, or simply unsubscribe from the list and read the list from the archives; if one needs to report a bug, they can subscribe to the list again, post their bug, then unsubscribe after a week.

Another option is to set up one's Freshmeat preferences to be notified in email every time I update MaraDNS at Freshmeat. This will give one email notice of any critical bug fixes without needing to be subscribed to the mailing list.

The web page <http://www.maradns.org/> has a link to the mailing list archives.

#### **6. How do I get off the mailing list?**

Send an email to [list-request@maradns.org](mailto:list-request@maradns.org) with "unsubscribe" as the subject line.

#### **7. How do I set up reverse DNS on MaraDNS?**

By using PTR (pointer) records. For example, the PTR record which performs the reverse DNS lookup for the ip 1.2.3.4 looks like this in a CSV2 zone file:

4.3.2.1.in-addr.arpa. PTR www.example.com.

If you wish to have a PTR (reverse DNS lookup; getting a DNS name from a numeric IP) record work on the internet at large, it is not a simple matter of just adding a record like this to a MaraDNS zonefile. One also needs control of the appropriate in-addr.arpa. domain.

While it can make logical sense to contact the IP 10.11.12.13 when trying to get the reverse DNS lookup (fully qualified domain name) for a given IP, DNS servers don't do this. DNS server, instead, contact the root DNS servers for a given in-addr.arpa name to get the reverse DNS lookup, just like they do with any other record type.

When an internet service provider is given a block of IPs, they are also given control of

the DNS zones which allow them to control reverse DNS lookups for those IPs. While it is possible to obtain a domain and run a DNS server without the knowledge or intervention of an ISP, being able to control reverse DNS lookups for those IPs requires ISP intervention.

#### **8. I am on a slow network, and MaraDNS can not process recursive queries**

MaraDNS, by default, only waits two seconds for a reply from a remote DNS server. This default can be increased by adding a line like this in the mararc file:

```
timeout_seconds = 5
```

Note that making this too high will slow MaraDNS down when DNS servers are down, which is, alas, all too common on today's internet.

#### **9. When I try to run MaraDNS, I get a cryptic error message.**

There is usually some context of where there is a syntax error in a data file before the cryptic error message. For example, when there is a syntax error in a csv2 zone file, MaraDNS will tell you exactly at what point it had to terminate parsing of the zone file.

If MaraDNS does return a cryptic error message without letting you know what is wrong, let me know so that I can fix the bug. MaraDNS is designed to be easy to use; cryptic error messages go against this spirit.

#### **10. After I start MaraDNS, I can not see the process when I run netstat -na**

Udp services do not have a prominent "LISTEN" when netstat is run.

When MaraDNS is up, the relevant line in the netstat output looks like this: udp 0 0 127.0.0.4:53 0.0.0.0:\*

While on the topic of netstat, if you run netstat -nap as root, you can see the names of the processes which are providing internet services.

#### **11. What string library does MaraDNS use?**

MaraDNS uses its own string library, which is called the "js\_string" library. Man pages for most of the functions in the js\_string library are in the folder doc/man of the MaraDNS distribution

#### **12. Why does MaraDNS use a multi-threaded model?**

The multi-threaded model is, plain and simple, the simplest way to write a functioning recursive DNS server. There is a reason why MaraDNS, pdnsd, and BIND 9 all use the multi-threaded model.

#### **13. I feel that XXX feature should be added to MaraDNS**

There are currently no plans to implement new features in MaraDNS. The reason for this is because, bottom line, MaraDNS has failed to make my resume impressive enough for me to easily get a job in today's job market.

Both the BIND and NSD name servers were developed by having the programmers paid to work on the programs. PowerDNS was originally commercial software with the author only reluctantly made GPL after seeing that the market for a commercial DNS server is very small. All of the other DNS servers which have been developed as hobbyist projects (Posadis, Pdnsd, and djbdns) are no longer being actively worked on by the primary developer.

If I were to work on MaraDNS again, it will be a complete rewrite in C++; if I can get C++ on my resume, I may be able to get a job more easily.

Like anything else, this is not absolute. For example, if I see a large MaraDNS community and a strong demand for new features from that community, I will change my mind. Should ipv6 start to become dominant, I will update MaraDNS to have full ipv6 support. Should some other technology come along that will require an update to MaraDNS for MaraDNS to continue to function as a DNS server, I may update MaraDNS to use that technology.

#### **14. I feel that MaraDNS should use another documentation format**

The reason that MaraDNS uses its own documentation format is to satisfy both the needs of translators to have a unified document format and my own need to use a documentation format that is simple enough to be readily understood and which I can add features on an as needed basis.

The documentation format is essentially simplified HTML with some special tags added to meet MaraDNS' special needs.

This gives me more flexibility to adapt the documentation format to changing needs. For example, when someone pointed out that it's not a good idea to have man pages with hi-bit characters, it was a simple matter to add a new HIBIT tag which allows man pages to be without hi-bit characters, and other document formats to retain hi-bit characters.

Having a given program have its own documentation format is not without precedent; Perl uses its own "pod" documentation format.

#### **15. Is there any process I need to follow to add a patch to MaraDNS?**

Yes.

Here is the procedure for making a proper patch:

- \* Enter the directory that the file is in, for example maradns-1.2.00/server
- \* Copy over the file that you wish to modify to another file name. For example: cp MaraDNS.c MaraDNS.c.orig
- \* Edit the file in question, e.g: vi MaraDNS.c
- \* After editing, do something like this:  
diff -u MaraDNS.c.orig MaraDNS.c > maradns.patch
- \* Make sure the modified version compiles cleanly

Send a patch to me in email, along with a statement that you place the contents of the

patch under MaraDNS' BSD license. If I find that the patch works well, I will integrate it in to MaraDNS.

#### **16. Can MaraDNS act as a primary nameserver?**

Yes.

The zoneserver program serves zones so that other DNS servers can be secondaries for zones which MaraDNS serves. This is a separate program from the maradns server, which processes both authoritative and recursive UDP DNS queries.

See the DNS master document in the MaraDNS tutorial for details.

#### **17. Can MaraDNS act as a secondary nameserver?**

Yes.

Please read the DNS slave document, which is part of the MaraDNS tutorial.

#### **18. What is the difference between an authoritative and a recursive DNS server?**

A recursive DNS server is a DNS server that is able to contact other DNS servers in order to resolve a given domain name label. This is the kind of DNS server one points to in `/etc/resolve.conf`

An authoritative DNS server is a DNS server that a recursive server contacts in order to find out the answer to a given DNS query.

#### **19. The fetchzone client isn't allowing me to add certain hostnames to my zone**

For security reasons, MaraDNS' fetchzone client does not add records which are not part of the zone in question. For example, if someone has a zone for `example.com`, and this record in the zone:

`1.1.1.10.in-addr.arpa. PTR dns.example.com.`

MaraDNS will not add the record, since the record is out-of-bailiwick. In other words, it is a host name that does not end in `.example.com`.

There are two workarounds for this issue:

- \* Create a zone file for `1.1.10.in-addr.arpa.`, and put the PTR records there.
- \* Use `rcp`, `rsync`, or another method to copy over the zone files in question.

#### **20. Is MaraDNS portable?**

MaraDNS will only compile on FreeBSD, Mac OS X, Cygwin, Linux, and partially on MinGW32 systems. If you are interested in porting MaraDNS to another system, please let me know.

#### **21. Can I use MaraDNS in Windows?**

Yes. There is both a partial mingw32 (native win32 binary) port and a full Cygwin port of MaraDNS; both of these ports are part of the native build of MaraDNS.



## 22. MaraDNS freezes up after being used for a while

If using your ISP's name servers or some other name servers which are not, in fact, root name servers, please make sure that you are using the `upstream_servers` dictionary variable instead of the `root_servers` dictionary variable.

If you still see MaraDNS freeze up after making this correction, please send a bug report to the mailing list.

## 23. What kind of Python integration does MaraDNS have

The `mararc` file uses the same syntax that Python uses; in fact, Python can parse a properly formatted `mararc` file.

There is currently no other integration with Python.

## 24. Doesn't "kvar" mean "four" in Esperanto?

Indeed, it does. However the use of "kvar" in the MaraDNS source code only coincidentally is an Esperanto word. "kvar" is short for "Kiwi variable"; a lot of the parsing code comes from the code used in the Kiwi spam filter project.

## 25. How scalable is MaraDNS?

MaraDNS is optimized for serving a small number of domains as quickly as possible. That said, MaraDNS is remarkably efficient for serving a large number of domains, as long as the server MaraDNS is on has the memory to fit all of the domains, and as long as the startup time for loading a large number of domains can be worked around.

The "big-O" or "theta" growth rates for various MaraDNS functions are as follows, where N is the number of authoritative host names being served:

Startup time	N
Memory usage	N
Processing incoming DNS requests	1

As can be seen, MaraDNS will process 1 or 100000 domains in the same amount of time, once the domain names are loaded in to memory.

## BUGS

In the unusual case of having a `csv2` zone file with Macintosh-style newlines (as opposed to DOS or UNIX newlines), while the file will parse, any errors in the file will be reported as being on line 1.

The maximum allowed number of threads is 125; this is a hard limit because there may be problems with some pthreads implementations causing MaraDNS to hang if this number is higher.

The system startup script included with MaraDNS assumes that the only MaraDNS processes running are started by the script; it stops *all* MaraDNS processes running on the server when asked to stop MaraDNS.

When a resolver asks for an A record, and the A record is a CNAME which points to a

list of IPs, MaraDNS' recursive resolver only returns the first IP listed along with the CNAME. This is somewhat worked around by having a CNAME record only stay in the recursive cache for 15 minutes.

When a resolver asks for an A record, and the A record is a CNAME that points to another CNAME (and possibly a longer CNAME chain), while MaraDNS returns the correct IP (as long as the glueless level is not exceeded), MaraDNS will incorrectly state that the first CNAME in the chain directly points to the IP.

If a NS record points to a list of IPs, and the NS record in question is a "glueless" record (MaraDNS had to go back to the root servers to find out the IP of the machine in question), MaraDNS' recursive resolver only uses the first listed IP as a name server.

When MaraDNS' recursive resolver receives a "host not there" reply, instead of using the SOA minimum of the "host not there" reply as the TTL (Look at RFC1034 section 4.3.4), MaraDNS uses the TTL of the SOA reply.

MaraDNS keeps referral NS records in the cache for one day instead of the TTL specified by the remote server.

MaraDNS needs to use the **zoneserver** program to serve DNS records over TCP. See **zoneserver(8)** for usage information.

MaraDNS does not use the zone file ("master file") format specified in chapter 5 of RFC1035.

If a wildcard MX record exists in the form "\*.example.com", and there is an A record for "www.example.com", but no MX record for "www.example.com", the correct behavior (based on RFC1034 section 4.3.3) is to return "no host" (nothing in the answer section, SOA in the authority section, 0 result code) for a MX request to "www.example.com". Instead, MaraDNS returns the MX record attached to "\*.example.com".

Star records (what RFC1034 calls "wildcards") can not be attached to NS records.

MaraDNS recursive resolver treats any TTL shorter than min\_ttl seconds (min\_ttl\_cname seconds when the record is a CNAME record) as if the TTL in question was min\_ttl (or min\_ttl\_cname) seconds long when determining when to expire a record from MaraDNS' cache.

TTLs which are shorter than 20 seconds long are given a TTL of 20 seconds; TTLs which are more than 63072000 (2 years) long are given a TTL of 2 years.

MaraDNS' recursive resolver's method of deleting not recently accessed records from the cache when the cache starts to fill up can delete records from the cache before they expire. Some people consider this undesirable behavior; I feel it is necessary behavior if one wishes to place a limit on the memory resources a DNS server may use.

MaraDNS' recursive resolver stops resolving when it finds an answer in the AR section. This is a problem in the case where a given host name and IP is registered with the root name servers, and the registered IP is out of date. When this happens, a server "closer" to the root server will give an out-of-date IP, even though the authoritative DNS servers

for the host in question have the correct IP. Note that resolving this will result in increased DNS traffic.

MaraDNS, like every other known DNS implementation, only supports a QDCOUNT of 0 or 1.

MaraDNS does not send more than one DNS packet to a given DNS server when processing a DNS request; this is not a serious problem because most client implementations send multiple DNS packets to a recursive DNS server when processing a DNS request.

MaraDNS spawns a new thread for every single recursive DNS request when the data in question is not in MaraDNS' cache; this makes MaraDNS an excellent stress tester for pthread implementations. Many pthread implementations can not handle this kind of load; symptoms include high memory usage and termination of the MaraDNS process.

MaraDNS does not handle the case of a glueless in-bailiwick NS referral very gracefully; this usually causes the zone pointed to by the offending NS record to be unreachable by MaraDNS, even if other DNS servers for the domain have correct NS referrals.

## UNIMPLEMENTED FEATURES

*These are features which will not be implemented in the 1.2 release of MaraDNS:*

MaraDNS does not have a "fully qualified host name" record, which would automagically create a PTR record from an A record.

MaraDNS does not have a disk-based caching scheme for authoritative zones.

MaraDNS' UDP server only loads zone files while MaraDNS is first started. UDP Zone information can only be updated by stopping MaraDNS, and restarting MaraDNS again. Note that TCP zone files are loaded from the filesystem at the time the client requests a zone.

MaraDNS does not have support for allowing given host names to only resolve for a limited range of IPs querying the DNS server, or for host names to resolve differently, depending on the IP querying the host name.

MaraDNS only has limited authoritative-only support for IPv6.

MaraDNS generally does not support any DNS features which are not present in RFC1034 and RFC1035. The exceptions are the ability to decompress some RRs not in RFC1035, and zone file support for AAAA records (RFC 1886) and SRV records (RFC 2052).

MaraDNS only allows wildcards at the beginning or end of a host name. E.g. names with wildcards like "foo.\*.example.com". "www.\*" will work, however, if a default zonefile is set up.

MaraDNS does not have support for MRTG or any other SNMP-based logging mechanism.

## LEGAL DISCLAIMER

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## AUTHORS

Sam Trenholme (<http://www.samiam.org>) is responsible for this man page.

MaraDNS is written by me, Sam Trenholme, with a little help from my friends. Naturally, all errors in MaraDNS are my own (but read the disclaimer above).

Here is a partial list of people who have provided assistance:

Floh has generously set up a FreeBSD 4, FreeBSD 6, and Mac OS X system so that I can port MaraDNS to more platforms.

Albert Lee has provided countless bug reports, and, nicely enough, patches to fix said bugs. He has also made improvements to the code in the tcp "zoneserver".

Franky Van Liedekerke has provided much invaluable assistance. As just one example, he provided invaluable assistance in getting MaraDNS to compile on Solaris. In addition, he has provided much valuable SQA help.

Thomas Seyrat has provided French translations of the MaraDNS documentation.

Christian Kurz, who has provided invaluable bug reports, especially when I had to re-implement the core hashing algorithm.

Remmy, who is providing both the web space and a mailing list for [maradns.org](http://maradns.org).

Phil Homewood, who provided invaluable assistance with finding and fixing bugs in the authoritative portion of the MaraDNS server. He helped me plug memory leaks, find uninitialized variables being used, and found a number of bugs I was unable to find.

Albert Prats kindly provided Spanish translations for various text files.

Shin Zukeran provided a patch to recursive.c which properly makes a normal null-terminated string from a js\_string object, to send as an argument to open() so we can get the rijndael key for the PRNG.

D Richard Felker III has provided invaluable bug reports. By looking at his bug reports, I have been able to hunt down and fix many problems that the recursive nameserver had, in addition to at least one problem with the authoritative nameserver.

Ole Tange has also given me many valuable MaraDNS bug reports.

Florin Iucha provided a tip in the FAQ for how to compile MaraDNS on OpenBSD.

Roy Arends (one of the BIND developers, as it turns out) found a serious security problem with MaraDNS, where MaraDNS would answer answers, and pointed it out to me.

Code used as the basis for the pseudo-random-number generator was written by Vincent Rijmen, Antoon Bosselaers, and Paulo Barreto. I appreciate these programmers making the code public domain, which is the only license under which I can add code to MaraDNS under.

I also appreciate the work of Dr. Brian Gladman and Fritz Schneider, who have both written independent implementations of AES from which I obtained test vectors. With the help of their hard work, I was able to discover a subtle security problem that previous releases of MaraDNS had.

## NAME

mararc - Format of the mararc zone file that MaraDNS uses

## MARARC FILE FORMAT

Mararc files use a syntax that is a subset of Python 2.3.3 syntax. In particular, Python 2.3.3 (and possibly other versions of Python) can read a properly formatted mararc file without error.

Unlike Python, however, a mararc file can only use certain variable names, and the variables can only be declared as described below.

## COMMENTS

Comments (lines ignored by the MaraDNS parser) start with the '#' character, like this:

```
# This is a comment
```

The MaraDNS parser also ignores lines which contain only white space.

## OPERATORS

The MaraRC file supports two operators: = and +=

The = operator can be used to assign both numeric and string values

The += operator can only be used on string values, and concatenates the value to the right of the += operator to the string specified to the left of the += operator.

Examples:

```
ipv4_bind_addresses = "10.2.19.83"  
ipv4_bind_addresses += ",10.2.66.74"  
ipv4_bind_addresses += ",10.3.87.13"
```

ipv4\_bind\_addresses now has the value "10.2.19.83,10.2.66.74,10.3.87.13"

```
ipv4_alias["icann"] = "198.41.0.4"  
ipv4_alias["icann"] += ",192.228.79.201"  
ipv4_alias["icann"] += ",192.33.4.12,128.8.10.90"
```

## MARARC VARIABLES

Follows is a listing of variables that can be declared in the mararc file.

## DICTIONARY VARIABLE FORMAT

A **dictionary variable** is an array that can have multiple elements. Unlike a traditional array, these arrays are indexed by strings instead of numbers. These are analogous to associative arrays, or what Perl somewhat inaccurately calls hashes.

The syntax of a dictionary variable is in the following form:

```
name["index"] = "value"
```

Where **name** is the name of the dictionary variable, **index** is the index of the array, and **value** is the value stored at that index.

Every time we have a dictionary-type variable (such as csv2), we must first initialize it using a line in the following form:

```
csv2 = { }
```

Here, csv2 is the name of the "dictionary" variable that we are initializing.

## DICTIONARY VARIABLES

Here is a listing of all "dictionary"-style variables that MaraDNS uses:

### csv2

The csv2 dictionary variable stores all of the zone names and file names for the zone files that MaraDNS uses. Note that csv2 files are read after MaraDNS is chrooted. Hence the filename is relative to the chroot\_dir. Example:

```
csv2["example.net."] = "db.example.net"
```

See **csv2(5)** for a description of this file's format.

### csv1

csv1: Used to indicate the filename to use for a given zone stored in the legacy csv1 zone file format. This is primarily for compatibility with people who have maradns-1.0 zone files.

```
csv1["zone"] = "filename"
```

**csv1**: A pipe-separated-file. See **csv1(5)**.

**zone**: the zone that file in question is authoritative for

**filename**: the file with the CSV1 zone data

Note that csv1 files are read after MaraDNS is chrooted, and, hence the filename is relative to the chroot\_dir.

See the **csv1(5)** man page for more information on this file format.

### ipv4\_alias

ipv4\_alias: Used to give nicknames or aliases for ip/netmask pairs for ipv4 (standard 32-bit) IP addresses.

```
ipv4_alias["name"] = "ip1/netmask,ip2/netmask,etc"
```

**name**: The name of the alias in question

**ip**: The ip portion of an ip/netmask pair

**netmask**: the mask portion of an ip/netmask pair

,: Used to separate ip/netmask pairs. Spaces may be placed before or after this comma.

An ip is in dotted-decimal format, e.g. "10.1.2.3".

The netmask can be in one of two formats: A single number between 1 and 32, which indicates the number of leading "1" bits in the netmask, or a 4-digit dotted-decimal netmask.

The netmask is used to specify a range of IPs.

### **ipv4\_alias examples**

**10.1.1.1/24** indicates that any ip from 10.1.1.0 to 10.1.1.255 will match.

**10.1.1.1/255.255.255.0** is identical to 10.1.1.1/24

**10.2.3.4/16** indicates that any ip from 10.2.0.0 to 10.2.255.255 will match.

**10.2.3.4/255.255.0.0** is identical to 10.2.3.4/16

**127.0.0.0/8** indicates that any ip with "127" as the first octet (number) will match.

**127.0.0.0/255.0.0.0** is identical to 127.0.0.0/8

The netmask is optional, and, if not present, indicates that only a single IP will "match".  
e.g:

**10.9.9.9/32**, **10.9.9.9/255.255.255.255**, and **10.9.9.9** are all functionally identical, and indicate that only the ip 10.9.9.9 will match.

The significance of "match" depends on what we use the ipv4 alias for.

ipv4 aliases can nest. E.g:

```
ipv4_alias["susan"] = "10.6.7.8/24"  
ipv4_alias["office"] = "susan,10.9.9.9"
```

Where "susan" in the "office" alias matches the value of the ipv4\_alias susan.

Multiple levels of nesting are allowed. Self-referring nests will result in an error.

### **root\_servers**

root\_servers: This is a special "dictionary" element that can (currently) only have one element: ".", which points to either an ip, or a pointer to an ipv4 alias which is a listing of root name servers.

```
root_servers["."] = "list_of_servers"
```

Where "." is the only allowed array reference for the root servers (this format is used to allow potential future expansion), and list\_of\_servers is a list of root name servers in the exact same format as ipv4\_aliases.

Note that, while ips in the list of root name servers can have netmasks, the netmask portion is ignored.



The `root_servers` should only point to root servers. If one wishes to use MaraDNS as a forwarding name server, which forwards DNS requests on to another server, use the `upstream_servers` variable instead.

### **upstream\_servers**

This is identical to the `root_servers` variable (can have only one element, the element is a list of `ipv4_addresses`, etc.), but is used when one wishes to use MaraDNS to query other recursive servers, instead of querying the actual root name servers for an answer.

Note that one can not have both `root_servers` and `upstream_servers` set in a given `mararc` file; MaraDNS will return with a fatal error if one attempts to do this.

### **Final note on dictionary variables**

`csv1`, `csv2`, `ipv4_alias`, and `root_servers` are currently the only existing dictionary variables.

## **NORMAL VARIABLE FORMAT**

Normal variables. These are variables that can only take a single value.

The syntax of a normal variable is in the form

```
name = "value"
```

Where **name** is the name of the normal variable, and **value** is the value of the variable in question.

## **NORMAL VARIABLES**

Here is a listing of normal variables that MaraDNS uses:

### **ipv4\_bind\_addresses**

`ipv4_bind_addresses`: The IP addresses to give the MaraDNS server.

This accepts one or more `ipv4` IPs in dotted-decimal (e.g. "127.0.0.1") notation, and specifies what IP addresses the MaraDNS server will listen on. Multiple bind addresses are separated with a comma, like this: "10.1.2.3, 10.1.2.4, 127.0.0.1"

### **bind\_address**

`bind_address`: The IP address to give the MaraDNS server.

This accepts a single IP in dotted-decimal (e.g. "127.0.0.1") notation, and specifies what IP address the MaraDNS server will listen on. Note that `ipv4_bind_addresses` has the same functionality. This name is included so that MaraDNS 1.0 configuration files will continue to work with MaraDNS 1.2.

### **bind\_star\_handling**

In the case where there is both a star record for a given name and recordtype, a non-star record with the same name but a different recordtype, and no record for the given name and recordtype, MaraDNS will usually return the star record. BIND, on the other hand, will return a "not there" reply. In other words:

- \* If a non-A record for foo.example.com exists
- \* An A record for \*.example.com exists
- \* No A record for foo.example.com exists
- \* And the user asks for the A record for foo.example.com
- \* MaraDNS will usually return the A record attached to \*.example.com
- \* BIND, on the other hand, returns a "not there" for foo.example.com

If the BIND behavior is desired, set `bind_star_handling` to 1. Otherwise, set this to 0 (the default value if this is not set at all in the `mararc` file).

MaraDNS will exit with a fatal error if `bind_star_handling` has any value besides 0 or 1.

### **chroot\_dir**

`chroot_dir`: The directory MaraDNS chroots to

This accepts a single value: The full path to the directory to use as a chroot jail.

Note that `csv1` zone files are read after the chroot operation. Hence, the chroot jail needs to have any and all zone files that MaraDNS will load.

### **csv2\_default\_zonefile**

This is a special zone file that allows there to be stars at the *end* of hostnames. This file is similar to a normal `csv2` zone file, but has the following features and limitations:

- \* Stars are allowed at the end of hostnames
- \* A SOA record is mandatory
- \* NS records are mandatory
- \* CNAME records are not permitted in the zone file
- \* Delegation NS records are not permitted in the zone file
- \* Default zonefiles may not be transferred via zone transfer
- \* Both recursion and default zonefiles may not be enabled at the same time.

### **csv2\_synthip\_list**

Sometimes the IP list of nameservers will be different than the nameservers one is bound to. This allows the synthetic nameserver list to have different IPs.

Note that this may act in an unexpected manner if routable and non-routable (localhost and RFC1918) addresses are combined; in particular, a list with both routable and non-routable addresses will discard the non-routable IP addresses, and a list with `rfc1918` and localhost addresses will discard the localhost addresses.

### **debug\_msg\_level**

This is a number indicating what level of information about a running MaraDNS process should be made public. When set to 0, no information will be made public.

When set to one (the default), or higher, a `Terre-con-erre-cigarro.maradns.org.` query will return the version number of MaraDNS.

When set to two or higher, a `Tnumthreads.` query will return the number of threads that MaraDNS is currently running, and a `Tcache-elements.` query will return the number of elements in MaraDNS' cache. If MaraDNS is compiled with debugging information on, a `Tmemusage.` query will return the amount of memory MaraDNS has allocated.

When set to three or higher, a `Ttimestamp.` query will return, in seconds since the UNIX epoch, the timestamp for the system MaraDNS is running on.

### **default\_rrany\_set**

This variable used to determine what kind of resource records were returned when an ANY query was sent. In MaraDNS 1.2, the data structures have been revised to return any resource record type when an ANY query is sent; this variable does nothing, and is only here so that MaraDNS 1.0 mararc files will continue to work. The only accepted values for this variable were 3 and 15.

### **dos\_protection\_level**

If this is set to a non-zero value, certain features of MaraDNS will be disabled in order to speed up MaraDNS' response time. This is designed for situations when a MaraDNS server is receiving a large number of queries, such as during a denial of service attack.

This is a numeric variable; its default value is zero, indicating that all of MaraDNS' normal features are enabled. Higher numeric values disable more features:

- \* A `dos_protection_level` of 1 or above disables getting MaraDNS status information remotely
- \* A `dos_protection_level` of 8 or above disables CNAME lookups.
- \* A `dos_protection_level` of 12 or above disables delegation NS records.
- \* A `dos_protection_level` of 14 or above disables ANY record processing
- \* A `dos_protection_level` of 18 or above disables star record processing at the beginning of hostnames (`default_zonefiles` still work, however)

### **ipv6\_bind\_address**

If MaraDNS is compiled with as an authoritative server, then this variable will tell MaraDNS which ipv6 address for the UDP server to; for this variable to be set, MaraDNS must be bound to at least one ipv4 address.

### **hide\_disclaimer**

If this is set to "YES", MaraDNS will not display the legal disclaimer when starting up.

### **long\_packet\_ipv4**

This is a list of IPs which we will send UDP packets longer than the 512 bytes RFC1035 permits if necessary. This is designed to allow zoneserver, when used send regular DNS packets over TCP, to receive packets with more data than can fit in a

512-byte DNS packet.

This variable only functions if MaraDNS is compiled as an authoritative only server.

### **maradns\_uid**

maradns\_uid: The numeric UID that MaraDNS will run as

This accepts a single numerical value: The UID to run MaraDNS as.

MaraDNS, as soon as possible drops root privileges, minimizing the damage a potential attacker can cause should there be a security problem with MaraDNS. This is the UID maradns becomes.

The default UID is 99.

### **maradns\_gid**

maradns\_gid: The numeric GID that MaraDNS will run as.

This accepts a single numerical value: The GID to run MaraDNS as.

The default GID is 99.

### **maximum\_cache\_elements**

maximum\_cache\_elements: The maximum number of elements we can have in the cache of recursive queries.

This cache of recursive queries is used to store entries we have previously obtained from recursive queries.

If we approach this limit, the "custodian" kicks in to effect. The custodian removes elements at random from the cache (8 elements removed per query) until we are at the 99% or so level again.

The default value for this variable is 1024.

### **maxprocs**

maxprocs: The maximum number of threads or processes that MaraDNS is allowed to run at the same time.

This variable is used to minimize the impact on the server when MaraDNS is heavily loaded. When this number is reached, it is impossible for MaraDNS to spawn new threads/processes until the number of threads/processes is reduced.

The default value for this variable is 64.

The maximum value this can have is 500.

### **max\_ar\_chain**

max\_ar\_chain: The maximum number of records to display if a record in the additional section (e.g., the IP of a NS server or the ip of a MX exchange) has more than one value.

This is similar to max\_chain, but applies to records in the "additional" (or AR) section.

Due to limitations in the internal data structures that MaraDNS uses to store RRs, if this

has a value besides one, round robin rotates of records are disabled.

The default value for this variable is 1.

### **max\_chain**

max\_chain: The maximum number of records to display in a chain of records.

With DNS, it is possible to have more than one RR for a given domain label. For example, "example.com" can have, as the A record, a list of multiple ip addresses.

This sets the maximum number of records MaraDNS will show for a single RR.

MaraDNS normally round-robin rotates records. Hence, all records for a given DNS label (e.g. "example.com.") will be visible, although not at the same time if there are more records than the value allowed with max\_chain

The default value for this variable is 8.

### **max\_glueless\_level**

Maximum glueless level allowed when performing recursive lookups. The default value is 10.

This is the maximum number of times MaraDNS will "go back to the root servers" in order to find out the IP of a name server for which we do not have a glue IP for, or to find out the A value for a given CNAME record.

### **max\_queries\_total**

Maximum number of queries to perform when performing recursive lookups. The default value is 32.

This is the maximum number of times MaraDNS will send a query to nameservers in order to find out the answer to a DNS question.

### **max\_tcp\_procs**

max\_tcp\_procs: The (optional) maximum number of processes the zone server is allowed to run.

Sometimes, it is desirable to have a different number of maximum allowed tcp processes than maximum allowed threads. If this variable is not set, the maximum number of allowed tcp processes is "maxprocs".

### **max\_total**

max\_total: The maximum number of records to show total for a given DNS request.

This is the maximum total number of records that MaraDNS will make available in a DNS reply.

The default value for this variable is 20.

### **min\_ttl**

min\_ttl: The minimum amount of time a resource record will stay in MaraDNS' cache, regardless of the TTL the remote server specifies.

Setting this value changes the minimum amount of time MaraDNS' recursive server will keep a record in the cache. The value is in seconds.

The default value of this is 300 (5 minutes); the minimum value for this is 180 (2 minutes).

### **min\_ttl\_cname**

min\_ttl\_cname: The minimum amount of time a resource record will stay in MaraDNS' cache, regardless of the TTL the remote server specifies.

Setting this value changes the amount of time a CNAME record stays in the cache. The value is in seconds.

The default value for this is the value min\_ttl has; the minimum value for this is 180 (2 minutes).

### **no\_fingerprint**

no\_fingerprint: Flag that allows MaraDNS to be harder to detect.

Some people do not feel it is appropriate to have some information, such as the version number of MaraDNS being run, be publicly available.

The default value is 0.

By setting no\_fingerprint to 1, it is possible to have MaraDNS not reveal this information publicly.

### **random\_seed\_file**

random\_seed\_file: The file from which we read 16 bytes from to get the 128-bit seed for the secure pseudo random number generator.

This locallocation of this file is relative to the root of the filesystem, not MaraDNS' chroot directory.

This is ideally a file which is a good source of random numbers (e.g. /dev/urandom), but can also be a fixed file if your OS does not have a decent random number generator. In that case, make sure the contents of that file is random and with 600 perms, owned by root. We read the file **before** dropping root privileges.

### **recursive\_acl**

recursive\_acl: List of ips allowed to perform recursive queries with the recursive portion of the MaraDNS server

The format of this string is identical to the format of an ipv4\_alias entry.

### **spammers**

spammers: A list of DNS servers which the recursive resolver will not query.

This is mainly used to not allow spam-friendly domains to resolve, since spammers are starting to get in the habit of using spam-friendly DNS servers to resolve their domains, allowing them to hop from ISP to ISP.

The format of this string is identical to the format of an ipv4\_alias entry.

**synth\_soa\_origin**

When a CSV2 zone file doesn't have a SOA record in it, MaraDNS generates a SOA record on the fly. This variable determines the host name for the "SOA origin" (which is called the MNAME in RFC1035); this is the host name of the DNS server which has the "master copy" of a given DNS zone's file.

This host name is in human-readable format without a trailing dot, e.g.:

```
synth_soa_origin = "ns1.example.com"
```

If this is not set, a synthetic SOA record will use the name of the zone for the SOA origin (MNAME) field.

**synth\_soa\_serial**

This determines whether we strictly follow RFC1912 section 2.2 with SOA serial numbers. If this is set to 1 (the default value), we do not strictly follow RFC1912 section 2.2 (the serial is a number, based on the timestamp of the zone file, that is updated every six seconds), but this makes it so that a serial number is guaranteed to be automatically updated every time one edits a zone file.

If this is set to 2, the SOA serial number will be in YYYYMMDDHH format, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day, and HH is the 2-digit hour of the time the zone file was last updated (GMT; localtime doesn't work in a chroot() environment). While this format is strictly RFC1912 compliant, the disadvantage is that more than one edit to a zone file in an hour will not update the serial number.

I strongly recommend, unless it is extremely important to have a DNS zone that generates no warnings when tested at [dnsreport.com](http://dnsreport.com), to have this set to 1 (the default value). Having this set to 2 can result in updated zone files not being seen by slave DNS servers.

**tcp\_convert\_acl**

This only applies to the zoneserver (general DNS-over-TCP) program.

This is a list of IPs which are allowed to connect to the zoneserver and send normal TCP DNS requests. The zoneserver will convert TCP DNS requests in to UDP DNS requests, and send the UDP request in question to the server specified in **tcp\_convert\_server**. Once it gets a reply from the UDP DNS server, it will convert the reply in to a TCP request and send the reply back to the original TCP client.

Whether the RD (recursion desired) flag is set or not when converting a TCP DNS request in to a UDP DNS request is determined by whether the TCP client is on the **recursive\_acl** list.

**tcp\_convert\_server**

This only applies to the zoneserver (general DNS-over-TCP) program.

This is the UDP server which we send a query to when converting DNS TCP queries in

to DNS UDP servers. Note that, while this value allows multiple IPs, all values except the first one are presently ignored.

### **timeout\_seconds**

This only applies when performing recursive lookups.

The amount of time, in seconds, to wait for a reply from a remote DNS server before giving up and trying the next server on this list. The default value is 2 seconds.

This is for setups where a recursive MaraDNS server is on a slow network which takes more than two seconds to send and receive a DNS packet.

Note that, the larger this value is, the slower MaraDNS will process recursive queries when a DNS server is not responding to DNS queries.

### **timestamp\_type**

`timestamp_type`: The type of timestamp to display. The main purpose of this option is to suppress the output of timestamps. Since `duende` uses `syslog()` to output data, and since `syslog()` adds its own timestamp, this option should be set to 5 when `maradns` is invoked with the `duende` tool.

This option also allows people who do not use the `duende` tool to view human-readable timestamps. This option only allows timestamps in GMT, due to issues with showing local times in a `chroot()` environment.

This can have the following values:

- 0 The string "Timestamp" followed by a UNIX timestamp
- 1 Just the bare UNIX timestamp
- 2 A GMT timestamp in the Spanish language
- 3 A GMT timestamp in the Spanish language
- 4 A timestamp using `asctime(gmtime())`; usually in the English language
- 5 No timestamp whatsoever is shown (this is the best option when `maradns` is invoked with the `duende` tool).

The default value for this variable is 5.

### **verbose\_level**

`verbose_level`: The number of messages we log to `stdout`

This can have five values:

- 0 No messages except for the legal disclaimer and fatal parsing errors
- 1 Only startup messages logged (Default level)
- 2 Error queries logged
- 3 All queries logged



- 4 All actions adding and removing records from the cache logged

The default value for this variable is 1.

### **zone\_transfer\_acl**

zone\_transfer\_acl: List of ips allowed to perform zone transfers with the zone server

The format of this string is identical to the format of an ipv4\_alias entry.

## **EXAMPLE MARARC FILE**

```
# Example mararc file.
# This only shows a subset of MaraDNS' features needed to be an
# authoritative and recursive name server. Look at
# detailed/example_full_mararc for an example showing most of
# the features that MaraDNS has.

# Note that this example mararc file will not actually do anything
# without modification.
# Look in the doc/en/examples directory for a working example
# authoritative nameserver, and a working recursive nameserver.

# The various zones we support

# When running in authoritative mode, we must initialize the csv2 hash,
# or MaraDNS will be unable to load any csv2 zone files
csv2 = { }

# This is just to show the format of the file
# Note the this is commented out. Any line that starts with
# a '#' is not read by the parser. Remove the leading '#' to
# enable any line that is commented out

# The following line (commented out) tells MaraDNS to look at the
# file db.example.net to get the zone for example.net
csv2["example.net."] = "db.example.net"
# Naturally, we can have multiple zone files
#csv2["example.com."] = "db.example.com"

# The address this DNS server runs on. If you want to bind
# to multiple addresses, separate them with a comma like this:
# "10.1.2.3, 10.1.2.4, 127.0.0.1"
ipv4_bind_addresses = "127.0.0.1"
# The directory with all of the zone files
chroot_dir = "/etc/maradns"

# If you want to enable recursion on the loopback interface, uncomment
# the following line:
```

```
#recursive_acl = "127.0.0.1/8"
```

## BUGS

If one should declare the same the same index twice with a dictionary variable, MaraDNS will exit with a fatal error. This is because earlier versions of MaraDNS acted in a different manner than Python 2.3.3. With Python 2.3.3, the last declaration is used, while MaraDNS used to use the first declaration.

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## NAME

**zoneserver** - handle zone transfers and other TCP functions for MaraDNS

## DESCRIPTION

**zoneserver** listens on port 53/tcp and handles DNS zone transfers and any DNS query done over TCP instead of UDP. **zoneserver** uses a configuration file, `/etc/mararc` by default, to determine its parameters.

## USAGE

**zoneserver -f** pointer\_to\_mararc\_file

## OPTIONS

**-f** Specifies the location of the configuration file. MaraDNS uses the same configuration file for both the main dns server and the zoneserver.

## CONFIGURATION FILE FORMAT

The file format for the mararc file can be found in the **mararc(5)** manual page. In particular, the zoneserver uses the `zone_transfer_acl`, `tcp_convert_acl`, `tcp_convert_server`, `bind_address`, and `recursive_acl` mararc parameters.

## SEE ALSO

The man pages **maradns(8)** and **mararc(5)**

<http://www.maradns.org>

## BUGS

**zoneserver** assumes that the authoritative NS records are immediately after the SOA record, and that there is at least one non-NS between that last authority NS record for the zone and the first delegation NS record.

IXFR requests are incremental zone transfers, meaning that the DNS server should only display records changed since the last IXFR request. **zoneserver**, however, treats an IXFR as if it were an AXFR request, outputting all of the records for the zone in question.

**zoneserver** closes the TCP connection after transferring the requested zone.

If an unauthorized client attempts to connect to the zoneserver, **zoneserver** immediately disconnects the unauthorized client.

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NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

## **AUTHOR**

MaraDNS is written by Sam Trenholme. Jaakko Niemi used 5 minutes to put the original version this manpage together. Sam has subsequently revised this manual page.