

MyDNS Reference Manual

A guide to the MyDNS Internet domain name server.
for version 0.7.1, Jul 2002

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This is the manual for MyDNS (version 0.7.1, Jul 2002), a MySQL-based DNS server package.

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Table of Contents

1	Introduction to MyDNS.....	1
2	Installation.....	2
2.1	Building the source.....	2
2.2	Preparing the database.....	2
2.3	Creating <code>mydns.conf</code>	3
3	Configuration.....	4
4	The mydns database.....	5
4.1	The <code>soa</code> table.....	5
4.2	The <code>ptr</code> table.....	6
4.3	The <code>rr</code> table.....	7
5	Caching.....	8
6	Signals.....	9
7	Migration.....	10
Appendix A	References.....	11
Appendix B	GNU Free Documentation License	
	12
B.0.1	ADDENDUM: How to use this License for your documents.....	18
Index	19

1 Introduction to MyDNS

MyDNS is an Internet domain name server. It is unique among DNS servers in that it was designed explicitly to work with the MySQL (<http://www.mysql.com/>) database.

The primary goals of the MyDNS package are stability, security, interoperability, and speed. But not necessarily in that order.

This manual assumes that the reader has a working understanding of DNS concepts.

2 Installation

2.1 Building the source

First, uncompress and unpack the distribution to a location of your choosing. The distribution will be extracted into a directory named `'mydns-X.XX'`, where `'X.XX'` is the version number.

Change directory into the distribution directory, then run the `configure` script to configure the package for your system. The `'INSTALL'` file has full details on how the `configure` script works. Most installers will simply run `configure` with no additional arguments.

```
$ ./configure
```

MyDNS has a few MyDNS-specific configuration options. Run `configure --help` to output a summary of all options. After the configuration process is complete, build the package.

```
$ make
```

Then, if the build completed successfully, install the package.

```
# make install
```

The `mydns` binary should now be installed in the `'sbin'` dir beneath the `prefix` provided to the `configure` script, if any. By default it is installed as `'/usr/local/sbin/mydns'`.

2.2 Preparing the database

Now that you have installed MyDNS, you'll need to set up a database and access permissions. First, create a database called `"mydns"` on your MySQL server:

```
$ mysqladmin -h host -u username -p create mydns
```

Next, create a user that the `mydns` server can use to access the `mydns` database:

```
$ mysql -h host -u username -p mydns
mysql> GRANT SELECT ON mydns.* TO user@localhost IDENTIFIED BY 'password';
```

Finally, create the tables in your database that will hold the DNS data. The `mydns` program has an option that will dump an appropriate set of `CREATE TABLE` statements to the standard output, which you may then examine and use to create the MyDNS tables.

```
$ mydns --create-tables | mysql -h host -u username -p mydns
```

When you have created the tables, you should have three tables in your `mydns` database, called `soa` (see [Section 4.1 \[soa table\]](#), [page 5](#)), `rr` (see [Section 4.3 \[rr table\]](#), [page 7](#)), and `ptr` (see [Section 4.2 \[ptr table\]](#), [page 6](#)).

(You can use the `'--import'` option to import zones from non-MyDNS servers. See [Chapter 7 \[Migration\]](#), [page 10](#).)

2.3 Creating `mydns.conf`

`mydns` won't start properly if it cannot find a configuration file. In a default installation, the configuration file is called `/etc/mydns.conf`.

The `mydns` program has a `--dump-config` option that is useful for creating a `'mydns.conf'` file. This command will output a set of configuration options suitable for using in your `'mydns.conf'`. If a `'mydns.conf'` file already exists, any options within it will be used in the output, otherwise the built-in defaults will be used. So, for a fresh installation, you might issue the command to create your initial `'mydns.conf'` file: See [Chapter 3 \[Configuration\]](#), [page 4](#).

```
# mydns --dump-config > /etc/mydns.conf
```

3 Configuration

The `mydns.conf` file has a simple, familiar format. It consists of lines that may contain variables and values, in the format

variable = value

Blank lines are allowed. The `#` character begins comments, which are ignored.

The following variables are allowed in `mydns.conf`:

`mysql-host`

The hostname where your MySQL server is located. May be overridden by the `-h` (`--host`) option.

`mysql-user`

The username to provide to the MySQL server during authentication. May be overridden by the `-u` (`--user`) option.

`mysql-pass`

The password to provide to the MySQL server during authentication. May be overridden by the `-p` (`--password`) option.

`database`

The name of the database containing DNS data.

`user`

Run with the permissions of this user.

`group`

Run with the permissions of this group.

`port`

Listen and accept requests on this port.

`pidfile`

The `mydns` program will write its PID to this file on startup.

`timeout`

Number of seconds after which queries should time out.

`cache-size`

The number of items stored in the DNS server's internal cache. Set this to `0` to disable the cache entirely.

`cache-expire`

Number of seconds after which cached items expire. If this is `0`, the cache is not used.

4 The mydns database

The default database name is ‘mydns’, although a different name may be specified by using the ‘database’ variable in ‘mydns.conf’.

All the SQL inside the MyDNS source code *always* specifies each column name explicitly, so you may feel free to add as many custom columns to these tables as you wish, in any position. This would come in handy for an ISP that wanted to associate an account ID with a particular zone, for example.

4.1 The soa table

The `soa` table contains one row for each zone for which the server is authoritative.

The default values for the various timer fields are from RFC 1537 (<http://www.ietf.org/rfc/rfc1537.txt>)

‘id INT UNSIGNED NOT NULL’

A unique number identifying this zone. (*Auto increment / Primary key*)

‘origin CHAR(78) NOT NULL’

The name of this zone. (*Unique key*)

ex: example.com.

‘ns CHAR(255) NOT NULL’

The name of the name server that was the original or primary source of data for this zone. (*meaningless to MyDNS*)

ex: primary.example.com.

‘mbox CHAR(255) NOT NULL’

A name which specifies the mailbox of the person responsible for this zone. This should be specified in the wacky mailbox-as-domain-name format where the ‘@’ character is replaced with a dot. (*meaningless to MyDNS*)

ex: postmaster.example.com.

‘serial INT UNSIGNED NOT NULL default ‘1’’

A "version number" for this zone. DNS servers that rely on AXFR for zone transfers use this to determine when updates have occurred. Popular values to use are the Unix timestamp or a date in the form YYYYMMDD. (*meaningless to MyDNS*)

ex: 20020529

‘refresh INT UNSIGNED NOT NULL default ‘28800’’

The SOA record of the primary server is checked every *refresh* seconds by the secondary servers; if it has changed, a zone transfer is done. (*meaningless to MyDNS*)

ex: 10800

`'retry INT UNSIGNED NOT NULL default '7200''`

If a secondary server cannot reach the primary server, it tries it again every *retry* seconds. (*meaningless to MyDNS*)
ex: 3600

`'expire INT UNSIGNED NOT NULL default '604800''`

If for *expire* seconds the primary server cannot be reached, all information about the zone is invalidated on the secondary servers (i.e., they are no longer authoritative for that zone). (*meaningless to MyDNS*)
ex: 60400

`'minimum INT UNSIGNED NOT NULL default '86400''`

The minimum TTL field that should be exported with any RR from this zone.
ex: 86400

`'ttl INT UNSIGNED NOT NULL default '86400''`

The time interval that this resource record may be cached before the source of the information should again be consulted. Zero values are interpreted to mean that the RR can only be used for the transaction in progress, and should not be cached.
ex: 86400

4.2 The ptr table

Unlike some DNS servers, MyDNS does not have the concept of zones that are authoritative for PTR records. Instead, this table is basically a straight IP-to-FQDN mapping.

`'id INT UNSIGNED NOT NULL'`

A unique number identifying this record. (*Auto increment / Primary key*)

`'minimum INT UNSIGNED NOT NULL default '86400''`

The minimum TTL field that should be exported with any RR from this zone.
ex: 86400

`'ip INT UNSIGNED NOT NULL'`

The integer IP address as returned by the MySQL `'INET_ATON(expr)'` function. For example, the IP address `'6.7.8.9'` would be calculated as $6*256^3 + 7*256^2 + 8*256 + 9$. (*Unique key*)
ex: 2130706433

`'name CHAR(255) NOT NULL'`

The FQDN associated with this IP address.
ex: `foo.example.com.`

`'ttl INT UNSIGNED NOT NULL default '86400''`

The time interval that this resource record may be cached before the source of the information should again be consulted. Zero values are interpreted to mean that the RR can only be used for the transaction in progress, and should not be cached.
ex: 86400

4.3 The rr table

This table contains *all* resource record types that are not SOA or PTR. It has a unique key on the combination of *zone*, *name*, *type*, and *data*.

‘id INT UNSIGNED NOT NULL’

A unique number identifying this record. (*Auto increment / Primary key*)

‘zone INT UNSIGNED NOT NULL’

The ID of the zone (from the ‘soa’ table) to which this resource record belongs.

‘name CHAR(64) NOT NULL’

The name (beneath the origin) that this RR describes.

ex: foo

‘type ENUM(‘A’, ‘AAAA’, ‘CNAME’, ‘MX’, ‘NS’, ‘TXT’)’

The type of resource record.

‘data CHAR(255) NOT NULL’

The data associated with this resource record. For ‘A’ and ‘AAAA’ records, this is an IP address in dotted-decimal format. For ‘CNAME’, ‘MX’, and ‘NS’ records, this is a name (can be just a machine name if the name is within the origin zone, or a FQDN). For ‘TXT’ records, any text.

ex: 127.0.0.1 (A or AAAA)

ex: foo (CNAME, MX, or NS within this zone)

ex: foo.example.com. (CNAME, MX, or NS outside this zone)

‘aux INT UNSIGNED NOT NULL’

An auxillary numeric value in addition to *data*. Currently this field is meaningful only for MX records, where it specifies the preference.

ex: 10

‘ttl INT UNSIGNED NOT NULL default ‘86400’’

The time interval that this resource record may be cached before the source of the information should again be consulted. Zero values are interpreted to mean that the RR can only be used for the transaction in progress, and should not be cached.

ex: 86400

5 Caching

MyDNS uses a lightweight internal cache to speed up question resolution. When the DNS server receives a question, per RFC 1034, it must descend through each label in the name, looking for the first label that has any associated resource records. This means that for a request with lots of labels may require a number of database queries, most of which are likely to return no rows.

Because of this, MyDNS stores both positive and negative results in its cache. The size of this cache is determined by the `'cache-size'` variable in `'mydns.conf'`. The cache-size specifies the *number of entries* the cache will attempt to store at any given time. If the cache-size is set to zero, the cache will be completely disabled.

The `'cache-expire'` variable in `'mydns.conf'` specifies the number of seconds after which cache entries expire. Most installations will want to set this value fairly low, perhaps 60 seconds or so. This way, the DNS data being served by MyDNS will never be more than 60 seconds behind what is actually stored in the database.

6 Signals

MyDNS responds to ‘SIGHUP’ by flushing the cache.

MyDNS responds to ‘SIGUSR1’ by outputting server statistics via syslog.

7 Migration

The ‘mydns’ program has an option (‘-i’, ‘--import’) that makes it relatively painless to import zone data from other DNS server software that support zone transfers using AXFR. Let’s say you have a BIND server at `bind.example.com` and you are setting up a new MyDNS server at `mydns.example.com`. You have created a new `mydns` database on `mydns.example.com`, now you want to import your zones from `bind.example.com` to `mydns.example.com`.

Run `mydns --import` (or ‘-i’) for each zone you want to import. The syntax of the option’s arguments is ‘HOST/ZONE’.

For example, to import the zones ‘example.com’ and ‘1.168.192.in-addr.arpa’, you would execute the following commands:

```
# mydns -v -i bind.example.com/example.com
# mydns -v -i bind.example.com/1.168.192.in-addr.arpa
```

Of course, for this example to work, `mydns.example.com` must have access to perform zone transfers from `bind.example.com`.

Appendix A References

- RFC 1034 (<http://www.ietf.org/rfc/rfc1034.txt>)
Mockapetris, P., "Domain Names - Concepts and Facilities", STD 13, RFC 1034, November 1987.
- RFC 1035 (<http://www.ietf.org/rfc/rfc1035.txt>)
Mockapetris, P., "Domain Names - Implementation and Specification", STD 13, RFC 1035, November 1987.
- RFC 1537 (<http://www.ietf.org/rfc/rfc1537.txt>)
Beertema, P., "Common DNS Data File Configuration Errors", RFC 1537, October 1993.

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Index

A

aux	7
AXFR	10

C

cache	8
configuration	4
configure script	2

D

data	7
database	5
database, creating	2

E

expire	5
--------------	---

F

FDL, GNU Free Documentation License	12
---	----

I

importing data	10
installation	2
Introduction	1
ip address	6

M

migrating	10
minimum	5
mydns (database)	5

mydns.conf	4
mydns.conf, creating	3
mydns.ptr	6
mydns.rr	7
mydns.soa	5

O

origin	5
--------------	---

P

ptr	6
-----------	---

R

refresh	5
retry	5
rr	7

S

serial	5
SIGHUP	9
signals	9
SIGUSR1	9
soa	5

T

table layouts	5
tables	5
TTL	5