

# DNS Client and Cache

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This document applies to V3.0

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## General Information

### Summary

DNS cache is used to minimize DNS requests to an external DNS server as well as to minimize DNS resolution time. This is a simple recursive DNS server with local items.

### Specifications

Packages required: *system*

License required: *level1*

Home menu level: */ip dns*

Standards and Technologies: [DNS](#)

Hardware usage: *Not significant*

### Description

A MikroTik router with DNS feature enabled can be set as a DNS server for any DNS-compliant client. Moreover, MikroTik router can be specified as a primary DNS server under its dhcp-server settings. When the remote requests are enabled, the MikroTik router responds to TCP and UDP DNS requests on port 53.

## Additional Documents

- <http://www.freesoft.org/CIE/Course/Section2/3.htm>
- <http://www.networksorcery.com/enp/protocol/dns.htm>
- [RFC1035](#)

## DNS Cache Setup

Home menu level: */ip dns*

### Description

DNS facility is used to provide domain name resolution for router itself as well as for the clients connected to it.

### Property Description

**allow-remote-requests** (yes | no; default: **no**) - specifies whether to allow network requests

**cache-max-ttl** (*time*; default: **1w**) - specifies maximum time-to-live for cache records. In other words, cache records will expire unconditionally after cache-max-ttl time. Shorter TTL received from DNS servers are respected

**cache-size** (*integer*: 512..10240; default: **2048KiB**) - specifies the size of DNS cache in KiB

**cache-used** (*read-only: integer*) - displays the current cache size in KiB

**primary-dns** (*IP address*; default: **0.0.0.0**) - primary DNS server

**secondary-dns** (*IP address*; default: **0.0.0.0**) - secondary DNS server

### Notes

If the property **use-peer-dns** under **/ip dhcp-client** is set to **yes** then **primary-dns** under **/ip dns** will change to a DNS address given by DHCP Server.

### Example

To set 159.148.60.2 as the primary DNS server and allow the router to be used as a DNS server, do the following:

```
[admin@MikroTik] ip dns> set primary-dns=159.148.60.2 \  
\... allow-remote-requests=yes  
[admin@MikroTik] ip dns> print  
    primary-dns: 159.148.60.2  
    secondary-dns: 0.0.0.0  
allow-remote-requests: yes  
    cache-size: 2048KiB  
    cache-max-ttl: 1w
```

```
cache-used: 7KiB
[admin@MikroTik] ip dns>
```

## Cache Monitoring

Home menu level: */ip dns cache*

### Description

This menu provides a list with all address (DNS type "A") records stored on the server

### Property Description

**address** (*read-only: IP address*) - IP address of the host

**name** (*read-only: name*) - DNS name of the host

**ttl** (*read-only: time*) - remaining time-to-live for the record

## All DNS Entries

Home menu level: */ip dns cache all*

### Description

This menu provides a complete list with all DNS records stored on the server

### Property Description

**data** (*read-only: text*) - DNS data field. IP address for type "A" records. Other record types may have different contents of the data field (like hostname or arbitrary text)

**name** (*read-only: name*) - DNS name of the host

**ttl** (*read-only: time*) - remaining time-to-live for the record

**type** (*read-only: text*) - DNS record type

## Static DNS Entries

Home menu level: */ip dns static*

### Description

The MikroTik RouterOS has an embedded DNS server feature in DNS cache. It allows you to link the particular domain names with the respective IP addresses and advertize these links to the DNS clients using the router as their DNS server. This feature can also be used to provide fake DNS information to your network clients. For example, resolving any DNS request for a certain set of domains (or for the whole Internet) to your own page.

The server is capable of resolving DNS requests based on POSIX basic regular expressions, so that multiple requests can be matched with the same entry. In case an entry does not conform with DNS naming standards, it is considered a regular expression and marked with 'R' flag. The list is ordered and is checked

from top to bottom. Regular expressions are checked first, then the plain records.

## Property Description

**address** (*IP address*) - IP address to resolve domain name with

**name** (*text*) - DNS name to be resolved to a given IP address. May be a regular expression

**ttl** (*time*) - time-to-live of the DNS record

## Notes

Reverse DNS lookup (Address to Name) of the regular expression entries is not possible. You can, however, add an additional plain record with the same IP address and specify some name for it.

Remember that the meaning of a dot (.) in regular expressions is any character, so the expression should be escaped properly. For example, if you need to match anything within **example.com** domain but not all the domains that just end with *example.com*, like *www.another-example.com*, use `name=".*\\.example\\.com"`

Regular expression matching is significantly slower than of the plain entries, so it is advised to minimize the number of regular expression rules and optimize the expressions themselves.

## Example

To add a static DNS entry for **www.example.com** to be resolved to **10.0.0.1** IP address:

```
[admin@MikroTik] ip dns static> add name www.example.com address=10.0.0.1
[admin@MikroTik] ip dns static> print
Flags: D - dynamic, X - disabled, R - regexp
#      NAME          ADDRESS          TTL
0      www.example.com 10.0.0.1         1d
[admin@MikroTik] ip dns static>
```

## Flushing DNS cache

Command name: */ip dns cache flush*

## Command Description

**flush** - clears internal DNS cache

## Example

```
[admin@MikroTik] ip dns> cache flush
[admin@MikroTik] ip dns> print
      primary-dns: 159.148.60.2
      secondary-dns: 0.0.0.0
allow-remote-requests: yes
      cache-size: 2048 KiB
      cache-max-ttl: 1w
      cache-used: 10 KiB
[admin@MikroTik] ip dns>
```