# Pi-hole - DNS server

Purpose: Trusted and Filtering Feature Domain Name Resolution Solution: Pi-hole (https://pi-hole.net/) OS: Debian GNU/Linux 12 (bookworm)

preparations:

setup

```
# Pi-hole Automated Installer
This installer will transform your device into a network-wide ad blocker!
[OK]

# Open Source Software
The Pi-hole is free, but powered by your donations:
https://pi-hole.net/donate/
[OK]
```

Decide and assign static IP address

```
# Static IP Needed
The Pi-hole is a SERVER so it needs a STATIC IP ADDRESS to function properly.

IMPORTANT: If you have not already done so, you must ensure that this device has a static IP.

Depending on your operating system, there are many ways to achieve this, through DHCP reservation, or by manually assigning one.
Please continue when the static addressing has been configured.
[Continue]



# Select Upstream DNS Provider. To use your own, select Custom.
(*)  Cloudflare (DNSSEC)



# Blocklists
Pi-hole relies on third party lists in order to block ads.
You can use the suggestion below, and/or add your own after installation.
```

```
Select 'Yes' to include:
StevenBlack's Unified Hosts List
[Yes]



# Enable Logging
Would you like to enable query logging?
[Yes]



# Select a privacy mode for FTL.                    https://docs.pi-hole.net/ftldns/privacylevels/
(*) 0  Show everything
[Continue]
```

```
# Installation Complete!


Configure your devices to use the Pi-hole as their DNS server using:


IPv4: 10.166.0.2
IPv6: Not Configured
If you have not done so already, the above IP should be set to static.
View the web interface at http://pi.hole/admin:80 or
http://10.166.0.2:80/admin


Your Admin Webpage login password is (superpass)
```

### Configure admin dashboard listening port

```
vi /etc/pihole/pihole.toml
```

### Let's disable IPv6, disable HTTP and swap HTTPS port

```
#  port = "80o,443os,[::]:80o,[::]:443os"
  port = "445os"
```

### Restart service and check port has been changed

```
systemctl restart pihole-FTL
ss -ntap | grep hole
```

# Advanced usage

Install database cient

```
apt install sqlite
```

Set pattern

```
# export pattern="dox.installanduse.com"
# export pattern="dox.2dz.fi"
export pattern="ntp"
```

List domains from gravity database (blocking list)

```
sqlite3 /etc/pihole/gravity.db \
    "SELECT domain FROM gravity \
    WHERE domain LIKE '%${pattern}%' \
    COLLATE NOCASE ORDER BY domain;"
```

List schema

```
sqlite3 -noheader /etc/pihole/pihole-FTL.db .schema
```

List queries from pihole-FTL database (log)

```
sqlite3 -noheader /etc/pihole/pihole-FTL.db \
    "SELECT DISTINCT domain
    FROM queries
    WHERE domain LIKE '%${pattern}%'
    ORDER BY domain;"
```

Detail

```
sqlite3 -noheader /etc/pihole/pihole-FTL.db \
    "SELECT DISTINCT d.domain
    FROM query_storage q
    JOIN domain_by_id d ON d.id = q.domain
    WHERE d.domain LIKE '%${pattern}%'
    ORDER BY d.domain;"
```

Query and client

```
sqlite3 -noheader /etc/pihole/pihole-FTL.db \
    "SELECT c.ip || ' ' || d.domain
    FROM query_storage q
    JOIN domain_by_id d ON d.id = q.domain
    JOIN client_by_id c ON c.id = q.client
    WHERE d.domain LIKE '%${pattern}%'
    ORDER BY c.ip, d.domain;"

# can be used by adding suffix " | uniq"
```

Queries by specific client

```
export pattern="dox.2dz.fi"
export src="192.168.0.0"

sqlite3 -noheader /etc/pihole/pihole-FTL.db \
    "SELECT DISTINCT d.domain
    FROM query_storage q
    JOIN domain_by_id d ON d.id = q.domain
    JOIN client_by_id c ON c.id = q.client
    WHERE c.ip = '${src}'
      AND d.domain LIKE '%${pattern}%'
    ORDER BY d.domain;"
```

With count, most frequent

```
sqlite3 -noheader /etc/pihole/pihole-FTL.db \
    "SELECT d.domain, COUNT(*)
    FROM query_storage q
    JOIN domain_by_id d ON d.id = q.domain
    WHERE d.domain LIKE '%${pattern}%'
    GROUP BY d.domain
    ORDER BY COUNT(*) DESC, d.domain;"
```

Only last 24 hours

```
sqlite3 -noheader /etc/pihole/pihole-FTL.db \
    "SELECT DISTINCT d.domain
    FROM query_storage q
    JOIN domain_by_id d ON d.id = q.domain
    WHERE d.domain LIKE '%${pattern}%'
```

```
  AND q.timestamp > unixepoch('now','-1 day')
ORDER BY d.domain;"
```

Detail: timestamp + source IP + domain

```
sqlite3 -noheader /etc/pihole/pihole-FTL.db \
  "SELECT datetime(q.timestamp,'unixepoch','localtime') || ' ' || c.ip || ' ' || d.domain
  FROM query_storage q
  JOIN domain_by_id d ON d.id = q.domain
  JOIN client_by_id c ON c.id = q.client
  WHERE d.domain LIKE '%${pattern}%'
  ORDER BY q.timestamp;"
```

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