

Pi-hole DNS Server on Raspberry Pi 5

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Goodbye Ads, Hello Privacy: Setting Up a Pi-hole on Raspberry Pi 5.

Pi-hole is a lightweight DNS sinkhole that blocks advertisements and trackers across your entire network. It works by acting as a local DNS server that intercepts DNS requests and blocks any known ad-serving domains. The result? Clean, ad-free browsing and better security.

Unlike browser-based ad blockers, Pi-hole works at the network level, protecting all devices—including smartphones, smart TVs, and IoT systems—without requiring software installation on each device.

Project Overview

Hardware: Raspberry Pi 5

Objective: Create a reliable DNS server to block ads and improve network performance

Software: Raspbian (Debian-based OS), Pi-hole

Purpose: Create a DNS sinkhole to block ads, reduce unwanted traffic, and enhance network security.

Network Role: Pi-hole IP set as the DNS server for my personal PC and optionally for other home devices.

Step-by-Step Implementation

1. Preparing the Raspberry Pi 5

Flash the latest Raspberry Pi OS using Raspberry Pi Imager.

Connect PI to wifi for internet access.

Set a static IP on Network Adapter.

2. Installing Pi-hole

Use the command to install Pi-Hole

```
``curl -sSL https://install.pi-hole.net | bash``
```

Alternative Way: Clone GitHub repository and run

```
``git clone --depth 1 https://github.com/pi-hole/pi-hole.git Pi-hole
cd "Pi-hole/automated install/"
sudo bash basic-install.sh``
```

Chose the interface with static ip for the DNS server.

Opted for default blocklists (which can later be customized).

Configured upstream DNS (Cloudflare in my case for privacy-focused resolution).

Enabled logging and query analysis.

Now, you can change the password from the Pi-Hole configuration file or stick with the random password it generated (you can see it in Terminal).

3. Network Configuration

Configured my PC's DNS settings to point to the Pi-hole IP.

Optionally updated my router to use the Pi-hole DNS for all connected devices

4. Exploring the Admin Interface

Accessible at <http://<pi-ip-address>/admin>

Use your password to login

Real-time dashboard for monitoring:

- Total DNS queries
- Blocked requests
- Top clients and domains
- Forward destinations (upstream DNS)