Pi-hole: Understanding and Setting Up Network-Wide Ad Blocking

INTRODUCTION

Pi-hole is a network-wide ad blocker that uses DNS (Domain Name System) to filter unwanted content. DNS is like the internet's address book. It translates domain names, like www.Google.com, into readable IP addresses that devices use.

When a device requests to access a website, it asks a DNS server for its IP address. Pi-hole intercepts these requests and checks them against a list of known ad servers. If a match is found, it blocks the request, preventing ads, malware, and trackers from reaching your network.

KEY FEATURES OF PI-HOLE

- Network-Wide Coverage: Blocks ads on all connected devices.
- Lightweight and Efficient: Suitable for low-powered devices like the Raspberry Pi.
- Highly Customizable: Add custom blocklists and fine-tune settings.
- Enhanced Privacy: Blocks tracking scripts and domains.
- Detailed Analytics: Web-based interface to view DNS traffic and manage requests.

Installation and Setup Guide for Pi-hole

PREREQUISITES

- A Raspberry Pi 4 with 4gb of RAM .
- Power supply for the Raspberry Pi.
- 32gb MicroSD card (needs at least 4gb) .

(This is a list of what I used, check the official Pi-hole website to see if you pi will work)

INSTALLATION STEPS

1. Download Raspberry Pi OS
    - I downloaded the latest version of Raspberry Pi Imager from their official website.
    - I then used Raspberry Pi Imager to flash the latest version of Raspberry Pi OS onto the microSD card.
    - I then inserted the microSD card into the Raspberry Pi and booted it up.
2. Install Pi-hole
    - I opened the terminal on the Raspberry Pi and updated the system using this command **sudo apt update && sudo apt upgrade** (it may have you enter "Y" during this process).
    - Then I installed Pi-hole with this command **curl -sSL https://install.pi-hole.net | bash**
    - I followed the prompts to configure my preferred DNS provider and network settings. (its easier if you to your router and set up a static ip for your pi)
3. Access the Web Interface
    - I accessed the Pi-hole dashboard at "http://<pi-hole-ip-address>/admin". (When setting it up it will show you a link as well you can copy"
    - Once logging in it will display the interface. This where you can view network traffic and view you adlist

Enhancing Pi-hole with Additional Ad Lists

WHAT IS AN AD LIST?

An ad list is a collection of domain names associated with advertising networks, trackers, and malware sources. By blocking these domains, Pi-hole prevents your devices from accessing them, which will enhance privacy and reduce exposure to unwanted content.

WHERE TO FIND AD LISTS?

Here is a list of websites I used:

- https://easylist.to/
- https://firebog.net/
- https://github.com/lightswitch05/hosts
- https://github.com/blocklistproject/Lists
- https://sefinek.net/pihole-blocklist-customization

Make sure to read the descriptions on the website to make sure you are adding the right list!

After adding the list to Pi-hole make sure you click the “Update Gravity” button to make sure the list you added goes into effect. Here is how to get to the “Update Gravity” button.

- From the Dashboard click the “Tools” button
- Then under “Pi-hole diagnosis” you should see the “Update Gravity” button click on then click “Update” and wait for it to load.
- Once it has finished loading check the “Pi-hole diagnosis” button to make sure that none of your list had an issue loading.
- After that you can head back to your Dashboard and in the top right of the page it should show all the domains that you are blocking.

CONCLUSION

Setting up Pi-hole was a fun experience, as it offered a simple solution for blocking unwanted content across my network. Its user-friendly setup, advanced features, and ability to enhance privacy made it a cool project for me. Within 30 minutes, I had the entire system up and running, successfully blocking ads and improving my internet experience across all my devices.