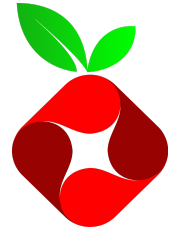# Project 3: DNS Sinkhole (Pi-Hole)

CS488 Spring 2021

Overview

In this project I created a Linux network-level advertisement and Internet tracker blocking application built and deployed on a Raspberry Pi. Which acts as a DNS sinkhole and optionally a DHCP server, intended for use on a private network.

GitHub Link: https://github.com/C-Lizzo14/CS488S21/tree/main/projects/proj3

Background Information

- **Problem-** Too Many Pointless Advertisements, Mobile games do not accept device bound ad blocking software. I wanted the kids my mom watches to be able to play more than 2 levels of a videogame without asking to download another because they saw a flashy ad about whatever zombie candy matcher crush app…
  (Literally as real world as it gets lol)
- **Solution -** A network layer DNS dump / DHCP server which I can monitor and constantly update to ward off annoying pop-ups on all of my devices. Also allows me to monitor traffic and blacklist sites I do not like.

Steps Taken / Process

- I Had a Raspberry-Pi3 device with 4GB of ram
- Consulted the internet to find the best way of creating a DNS sinkhole
- Settled on the Pi-Hole project which comes equipped with a repository of ad server ip addresses and blocks them if a request is sent by a device on a network. https://pi-hole.net/
- Used Balenca Etcher because it is easier than Rufus.
- Then flashed an image of the lite version of pi-OS on to the Pi's micro Sd card. https://www.raspberrypi.org/software/operating-systems/
- SSH'd into the pi after locating the ip off of my routers gateway
- Installed the pihole software
- … failure
- 1 Week later after.. More failure
- A week later I had the thing up and running experimenting on just my phone to see if it made any difference… Which it did

- The server filters out ads before they get to your phone or computer so on a website or application the page will display no ad or a blank rectangle where the add should be
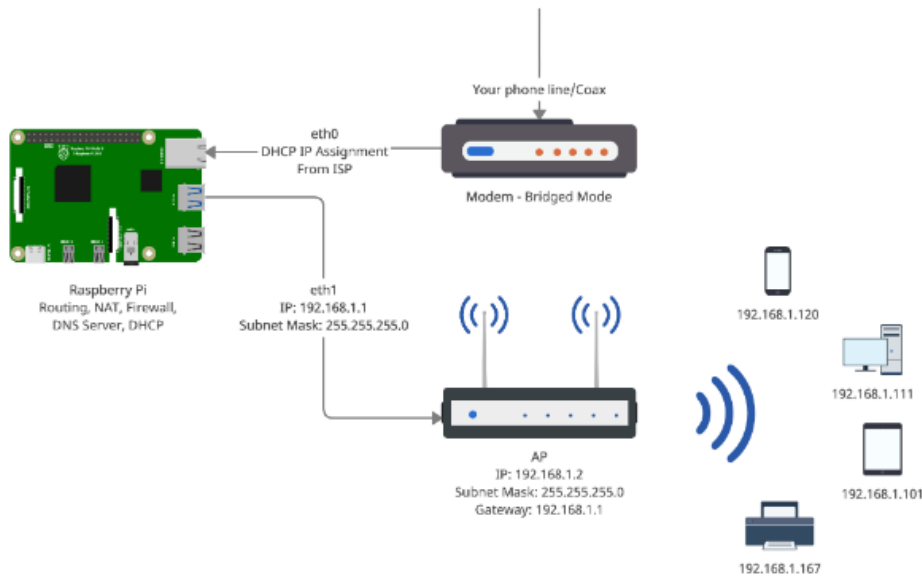- **SEE FIGURES DOWN BELOW FOR MORE INFORMATION**

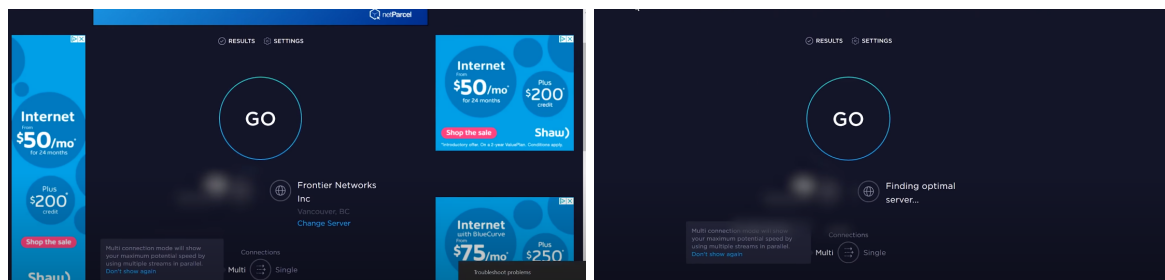**Figure A:** Network Structure Example

Figure B: Site filled with ads before and after implementation of my service
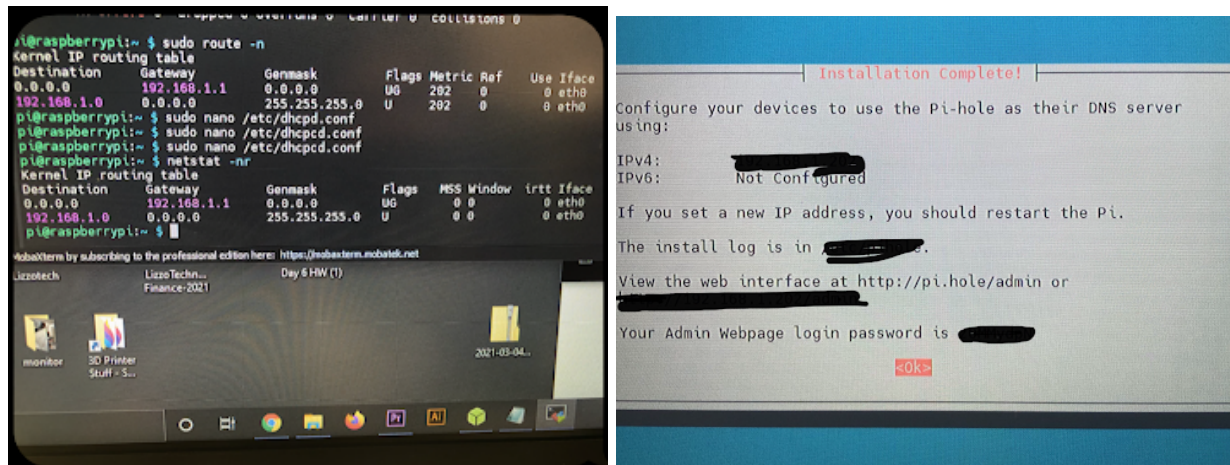
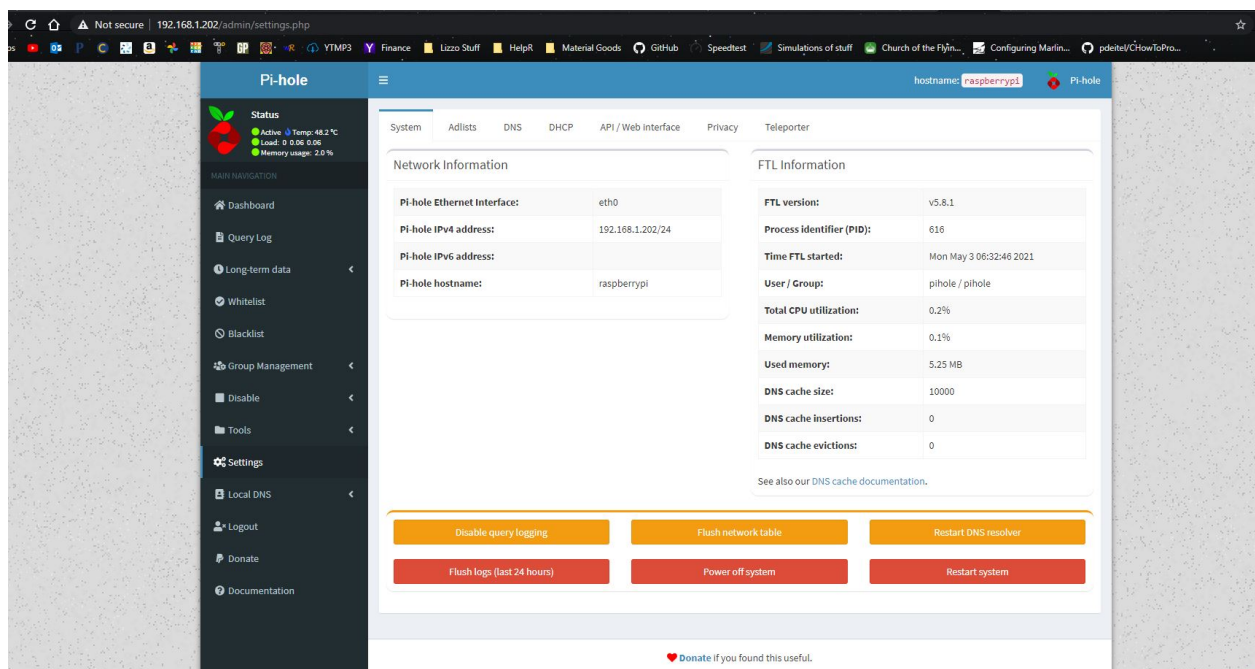**Figure C:** SSH terminal and software installed on server now operational

Figure D: Screenshot of me accessing the operational pi-hole server over the internet for live monitoring

- You must submit all source code and measurement results to github:
  - All your work done in this project must be placed in a directory project3 immediately under **CS488S21PROJS**
  - The source code must be in a folder called src immediately under project3
  - You must submit a project proposal in a folder called `documents`, immediately under project3
  - If you have any design, it must be in a folder called design immediately under project3
  - Any other files, including task3 data , should be in a folder called others immediately under project3
  - The git commit history must show all the members of the group have contributed and committed at least one procedure or measurement result, or the entire group receives a 20% penalty.
  - For all submissions, please submit the url of your github repo to Gradescope.
- Milestone Deadlines.

Deadline(end of day)	What to submit
End of 04/14/2021	Proposal
End of 05/01/2021	Everything

Please note each milestone deadline is treated as any other deadlines -- if you miss a milestone deadline, you will lose slip days and, if applicable, even receive late penalty to the task. Even if you catch up on all the work in the last week, these penalties will not be lifted.