

We Have Pi at Home

Objective: The goal of this project was to set up a Raspberry Pi 4 to run Pi-hole and act as a network-wide DNS filter. I installed and configured Pi-hole on the Raspberry Pi so it could block ads and tracking domains by handling DNS requests. After getting Pi-hole up and running, I updated the DHCP settings on my router to point all connected devices to the Raspberry Pi as their primary DNS server. This way, any device that joins the network automatically uses Pi-hole for DNS, giving me better control over traffic and cutting down on unwanted content across the whole network.

Equipment: Raspberry Pi 4, CAT 6 Ethernet Cable and AT&T Modem

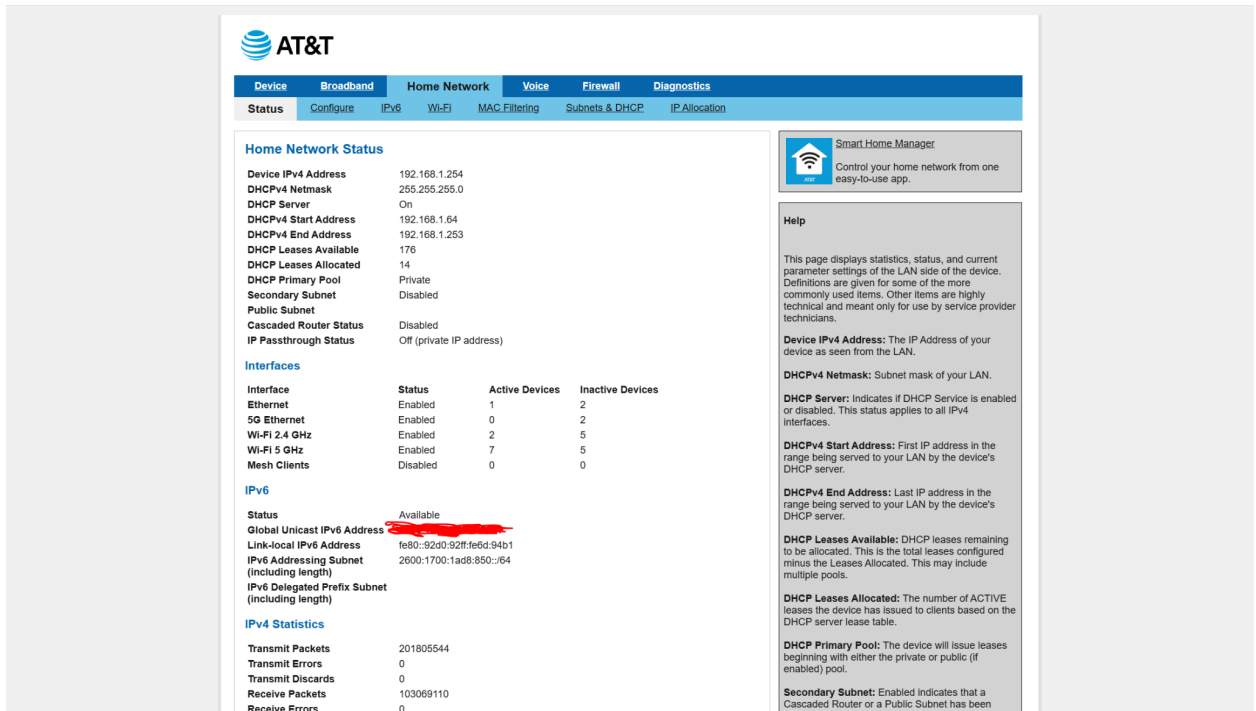
Steps:

1. First step of this project was to get my **Raspberry Pi 4** running on **Ubuntu version 22.04** for full compatibility with Pi-Hole



2. After installation and setting up the raspberry pi I ran the command **sudo apt update && sudo apt upgrade -y** to verify everything was up-to date
3. Upon verifying everything was up to date I made a **custom internet profile with a static IP address** since I want the **Raspberry Pi 4 to be the primary DNS Server**

4. I went to my AT&T modem settings and **excluded addresses 192.168.1.1-192.168.1.63**



The screenshot shows the AT&T Home Network Status page. The 'Home Network' tab is selected, showing various network settings. The 'Device IPv4 Address' is 192.168.1.254. The 'DHCPv4 Netmask' is 255.255.255.0. The 'DHCP Server' is On. The 'DHCPv4 Start Address' is 192.168.1.64. The 'DHCPv4 End Address' is 192.168.1.253. The 'DHCP Leases Available' is 176. The 'DHCP Leases Allocated' is 14. The 'DHCP Primary Pool' is Private. The 'Secondary Subnet' is Disabled. The 'Public Subnet' is Disabled. The 'Cascaded Router Status' is Disabled. The 'IP Passthrough Status' is Off (private IP address).

The 'Interfaces' section shows a table of network interfaces:

Interface	Status	Active Devices	Inactive Devices
Ethernet	Enabled	1	2
5G Ethernet	Enabled	0	2
Wi-Fi 2.4 GHz	Enabled	2	5
Wi-Fi 5 GHz	Enabled	7	5
Mesh Clients	Disabled	0	0

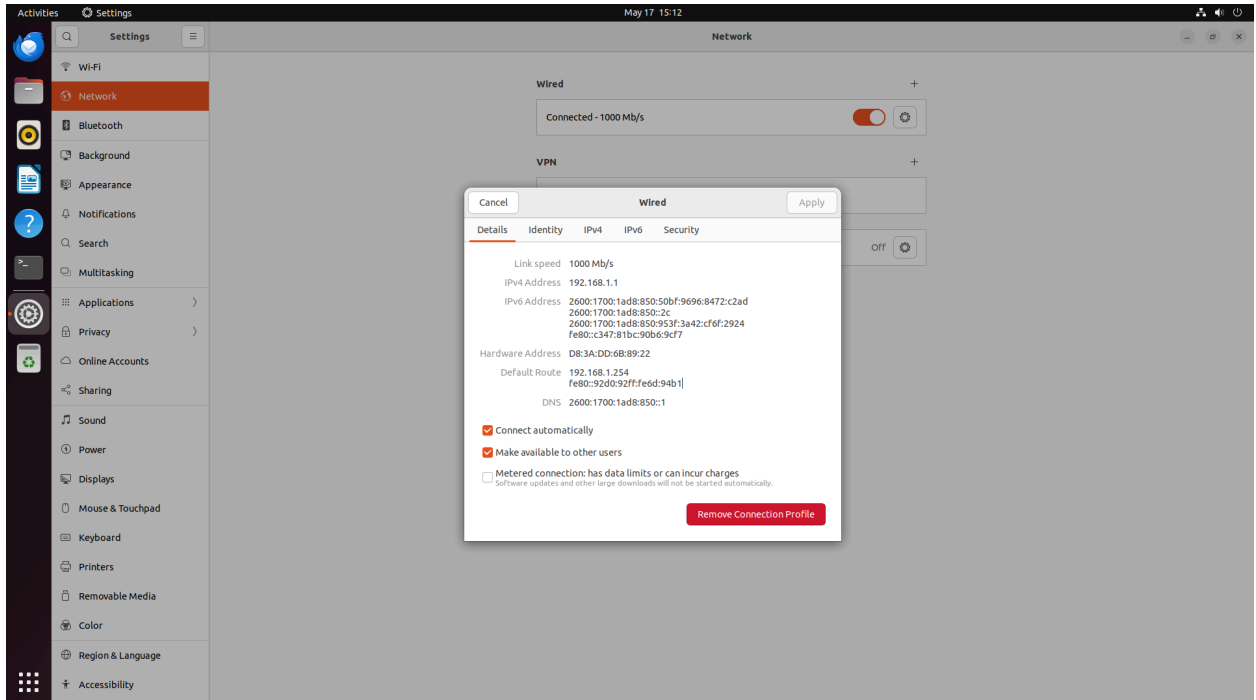
The 'IPv6' section shows the 'Status' as Available. The 'Global Unicast IPv6 Address' is fe80::92d0:92ff:fe6d:94b1. The 'Link-local IPv6 Address' is fe80::92d0:92ff:fe6d:94b1. The 'IPv6 Addressing Subnet (including length)' is 2600:1700:1ad8:850::/64. The 'IPv6 Delegated Prefix Subnet (including length)' is 2600:1700:1ad8:850::/64.

The 'IPv4 Statistics' section shows:

Statistic	Value
Transmit Packets	201905544
Transmit Errors	0
Transmit Discards	0
Receive Packets	103069110
Receive Errors	0

The 'Help' section on the right provides definitions for various terms: 'Device IPv4 Address', 'DHCPv4 Netmask', 'DHCP Server', 'DHCPv4 Start Address', 'DHCPv4 End Address', 'DHCP Leases Available', 'DHCP Leases Allocated', 'DHCP Primary Pool', and 'Secondary Subnet'.

5. I assigned **192.168.1.1/24** to my Raspberry Pi 4



The screenshot shows the Raspberry Pi 4 Network Settings window. The 'Wired' network is selected, and the 'IPv4' tab is active. The 'Link speed' is 1000 Mb/s. The 'IPv4 Address' is 192.168.1.1. The 'IPv6 Address' is 2600:1700:1ad8:850:50bf:9696:8472:c2ad. The 'Hardware Address' is D8:3A:DD:6B:89:22. The 'Default Route' is 192.168.1.254. The 'DNS' is 2600:1700:1ad8:850::1. The 'Connect automatically' checkbox is checked. The 'Make available to other users' checkbox is checked. The 'Metered connection: has data limits or can incur charges' checkbox is unchecked. The 'Remove Connection Profile' button is visible.

6. I ran the command **sudo apt install curl -y**
7. To install Pi-Hole I ran the command **curl sSL - https://install.pi-hole.net | bash**

8. After the command finishes installing Pi-Hole a setup wizard appeared and continued with the process
9. I selected **Cloudflare (DNSSEC)** as my upstream DNS provider
10. After setting up my Pi-Hole with the wizard and logging into the dashboard, I turn to my AT&T modem to change my DNS Server

Broadband Status

Primary Broadband

Broadband Connection Source: FIBER

Broadband Connection: Up

Broadband Network Type: LightSpeed

Broadband IPv4 Address: [REDACTED]

Gateway IPv4 Address: [REDACTED]

MAC Address: [REDACTED]

Primary DNS: 192.168.1.1

Secondary DNS: 192.168.1.1

Primary DNS Name: [REDACTED]

Secondary DNS Name: [REDACTED]

MTU: 1500

Ethernet Status

Line State	Up
Current Speed (Mbps)	10000
Current Duplex	full

IPv6

Status: Available

Service Type: native IPv6

Global Unicast IPv6 Address: [REDACTED]

Link Local Address: fe80::92d0:92ff:fe6d:94b0

Default IPv6 Gateway Address: fe80::e681:84ff:fe4a:900f

Primary DNS: [REDACTED]

Secondary DNS: [REDACTED]

MTU: 1500

IPv4 Statistics

Receive Packets	200856548
Transmit Packets	96772208
Receive Bytes	2011927027
Transmit Bytes	2560746861
Receive Unicast	200856559
Transmit Unicast	96772222

Help

The Broadband Status page displays statistics, status, and current parameter settings of the WAN side of the device. Definitions are given for some of the more commonly used items. Other items are highly technical and meant only for use by service provider technicians.

Broadband Connection Source: Indicates which type of WAN connection is specified or currently in use, Fiber or Ethernet.

Broadband Connection: The status of the device's WAN connection to the Internet.

Broadband Network Type: Indicates which type of WAN Network is currently in use, IPAG or LightSpeed.

Broadband IPv4 Address: The public IP address of your device, whether dynamically or statically assigned.

Gateway IPv4 Address: Your ISP's gateway router IP address.

MAC Address: The MAC Address for the WAN side of the device.

Primary DNS: The IP Address of the Primary Domain Name Server.

Secondary DNS: The IP Address of the backup Domain Name Server.

Primary DNS Name: The hostname of the Primary Domain Name Server.

Secondary DNS Name: The hostname of the backup Domain Name Server.

MTU: Maximum Transmittable Unit before packets are broken into multiple packets

Ethernet Status: Status of the WAN ethernet port if in use.

IPv6: Status items of the IPv6 WAN. If IPv6 Status is Unavailable, some items will not be shown.

IPv4 Statistics: WAN IPv4 statistics collected since

11. I verify that my devices that request DHCP get the updated DNS Servers

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Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . : attlocal.net
Description . . . . . : Marvell AVASTAR Wireless-AC Network Controller
Physical Address. . . . . : 70-BC-10-63-CC-82
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
IPv6 Address. . . . . : 2600:1700:1ad8:850::30(Preferred)
Lease Obtained. . . . . : Saturday, May 17, 2025 7:46:13 PM
Lease Expires . . . . . : Saturday, May 17, 2025 8:46:14 PM
IPv6 Address. . . . . : 2600:1700:1ad8:850:9bd9:e0cd:5c50:c288(Preferred)
Temporary IPv6 Address. . . . . : 2600:1700:1ad8:850:98fc:9879:d488:491f(Preferred)
Link-local IPv6 Address . . . . . : fe80::49e8:b1b0:4ad4:acd5%8(Preferred)
IPv4 Address. . . . . : 192.168.1.2(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : fe80::92d0:92ff:fe6d:94b1%8
                          192.168.1.254
DHCPv6 IAID . . . . . : 108051472
DHCPv6 Client DUID. . . . . : 00-01-00-01-25-F1-F3-EE-70-BC-10-63-CC-82
DNS Servers . . . . . : 2600:1700:1ad8:850::1
                          192.168.1.1
NetBIOS over Tcpip. . . . . : Enabled
Connection-specific DNS Suffix Search List :
                          attlocal.net
```

12. Last but not least I verify that Pi-Hole is functioning properly

