NAT+

tropf

ABSTRACT

quick introduction into forwarding your connection from one interface to another

This guide explains how you can share your internet connection with other devices using NAT and setup a DHCP server so connected devices are automatically configured.

1. Preface

1.1. Goal

Afterwards you can connect to the device via e.g. ethernet and you automatically get an IP address via DHCP and all traffic will be tunneled and forwarded through the device.

1.2. Limitations

This guide will not cover:

- connecting to an existing network (see: `wpa_supplicant`)
- creating a wifi hotspot

1.3. Conventions & Preconditions

The following names will be used throughout the guide and can be changed according to your setup.

1.4. Indexing

This section contains alternative titles and topics of this article that can be used to build a search index.

search tags:

```
raspberry pi raspberrypi dnsmasq dhcp static
share sharing bridge bridging reverse router
nat wifi wlan
```

alternative titles:

- how to set up a router
- how to turn wifi into ethernet
- sharing a network connection

2. Setting a Static IP Address

`eth0` needs a static IP Address, because there is no DHCP server to get an address from. (If there is, skip this step.)

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2.1. Setting the Actual Address

Create a file named `/etc/network/interfaces.d/eth0_static` with this content:

```
auto eth0
allow-hotplug eth0
iface eth0 inet static
        address 10.0.0.1
        netmask 255.255.255.0
        network 10.0.0.0
        broadcast 10.0.0.255
```

2.2. Preventing DHCP From Interfering

By default the DHCP client will overwrite these settings. Tell them to not care about `eth0`. Insert this line into `/etc/dhcpcd.conf`:

```
denyinterfaces eth0
```

3. DHCP Server

There is no DHCP server behind `eth0`. We have to create one. (If there is, skip this step.)

Install `dnsmasq`. Create a file named `/etc/dnsmasq.d/dhcp_server.conf` with this content:

```
interface=eth0              # use interface eth0
listen-address=10.0.0.1     # explicitly specify the address to listen on
bind-interfaces             # Bind to the interface to make sure we aren't sending
server=46.182.19.48         # the DNS server to be used. this one is run by digital
domain-needed               # Don't forward short names
bogus-priv                  # Never forward addresses in the non-routed address spa

# Assign IP addresses between 10.0.0.50 and 10.0.0.150 with a 12 hour lease time
dhcp-range=10.0.0.50,10.0.0.150,12

dhcp-option=3,10.0.0.1      # gateway which is connected to the internet -- this co
```

4. Forwarding

All incoming traffic on `eth0` should be forwarded and NATed to the uplink `wlan0`.

4.1. Enable Forwarding

Forwarding has to be enabled in the kernel.

Uncomment or insert this line into `/etc/sysctl.conf`:

```
net.ipv4.ip_forward=1
```

This will only be loaded on boot. Reload the file now using:

```
sysctl -p
```

4.2. Setup iptables

Execute the following commands:

```
sudo iptables -t filter -A FORWARD -i eth0 -j ACCEPT
sudo iptables -t nat -A POSTROUTING -o wlan0 -j MASQUERADE
```

These rules are not persistent by default, so install `iptables-persistent` and then execute:

```
iptables-save > /etc/iptables/rules.v4
```

5. Troubleshooting

Things i do when things go wrong.

- reboot
- `sudo systemctl restart networking`
- check config files
- `ip a`
- rewrite config files, srsly
- `ip r` (especially check the default route)
- `apropos [problem]`, `man [program]`
- get upset
- `dmesg` (look for `link is not ready` without `link becomes ready` afterwards)
- `sudo ss -tulpn`

4 December 2020