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Mesh Wi-Fi Lab

Setup guide with all the steps to configure the raspberry pi with BATMAN-ADV and configure a mesh network between several nodes.

Preparing the Testbed

1- Prerequisites

```
sudo apt install libnl-3-dev libnl-genl-3-dev
git clone https://git.open-mesh.org/batctl.git
cd batctl
sudo make install
sudo apt install alfred batmand batctl
sudo service wpa_supplicant stop
sudo systemctl mask wpa_supplicant.service
sudo update-rc.d dhcpcd disable
```

Manually compile source code:

Download the latest release of the source code: https://www.open-mesh.org/projects/open-mesh/wiki/Download

tar xvf batman-adv-2021.3.tar.gz

cd batman-adv-2021.3

make

make install

2- Configure the network

2.1 - Static Config

Run with sudo and change the (IP)

```
ip link set wlan0 down
iw wlan0 set type ibss
ifconfig wlan0 mtu 1500
iwconfig wlan0 channel 3
ip link set wlan0 up
iw wlan0 ibss join my-mesh-network 2432

modprobe batman-adv
batctl if add wlan0
ip link set up dev wlan0
ip link set up dev bat0
ifconfig bat0 (IP)/16
```

Check the network with iwconfig, ifconfig and ping

```
iwconfig
```

2.2 - Autostart

Disable the dhcpd service

```
sudo systemctl disable dhcpcd.service
```

Add the modprobe to start

```
sudo nano /etc/modules
```

```
# /etc/modules: kernel modules to load at boot time.
## This file contains the names of kernel modules that should be loaded
# at boot time, one per line. Lines begining with '#' are ignored.

batman-adv
```

Create eth0, wlan0 and bat0 files in /etc/network/interfaces.d/

```
auto eth0
iface eth0 inet static
        address 192.168.115.235
        netmask 255.255.255.0
        broadcast 192.168.115.255
        gateway 192.168.115.1
        dns-nameserver 193.136.92.73
        dns-nameserver 193.136.92.74



auto wlan0
iface wlan0 inet manual
    mtu 1500
    wireless-channel 3
    wireless-essid my-mesh-network
    wireless-mode ad-hoc
    wireless-ap b8:27:eb:6a:c8:15



auto bat0
iface bat0 inet static
   address 172.27.0.1
   netmask 255.255.0.0
   pre-up /usr/local/sbin/batctl if add wlan0
```

Utilities

- Check neighbours:

```
sudo batctl meshif bat0 n
```

References

[1] Setting Up an Ad-Hoc Mesh Network using RPI3B+
[2] OpenMesh Batman-adv
[3] Batman Autostart