

Roomba's WiFi Access

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Abstract

This will show you how to setup direct wifi access to the Roomba without having to worry about getting out of range of the D-Link access point.

1 Roomba

Use mote for the initial setup. Then follow the instructions here for more.

2 Wifi and Access Point Setup

Setting up the RPi as an access point so you can log directly into it without needing an access point. We always had issues of the robots getting out of range of the base station, this will solve that problem, because you can simply follow the robot around with a laptop, iPad, or whatever logged in.

Although the RPi 3 has built in wifi, we are going to add another wifi to serve up a local dhcp server on.

- wlan0: built in wifi
- wlan1: usb dongle added

1. Install packages:

```
sudo apt-get install dnsmasq hostapd
sudo systemctl stop dnsmasq
sudo systemctl stop hostapd
```

2. Now add `denyinterfaces wlan1` to `/etc/dhcpd.conf` so we don't self assign ip addresses to ourself on wlan1. However, it is okay if another dhcp server gives wlan0 an ip address.
3. Edit `/etc/network/interfaces` so our wlan1 interface has a static ip address:

```
allow-hotplug wlan1
iface wlan1 inet static
    address 10.10.10.1
    netmask 255.255.255.0
    network 10.10.10.0
```

4. Setup dnsmasq

```
sudo mv /etc/dnsmasq.conf /etc/dnsmasq.conf.orig
sudo nano /etc/dnsmasq.conf
```

Then add the following lines which say which interface to use and min ip address, max ip address, mask, and how long it is valid for:

```
interface=wlan1      # Use the usb wifi dongle
dhcp-range=10.10.10.5,10.10.10.100,255.255.255.0,24h
```

1. Setup hostapd config file: `/etc/hostapd/hostapd.conf`:

```
interface=wlan1
driver=nl80211
ssid=<NameOfNetwork>
hw_mode=g
channel=7
wmm_enabled=0
macaddr_acl=0
auth_algs=1
ignore_broadcast_ssid=0
wpa=2
wpa_passphrase=<password_atleast_8_characters>
wpa_key_mgmt=WPA-PSK
wpa_pairwise=TKIP
rsn_pairwise=CCMP
```

2. In `/etc/default/hostapd`, add `DAEMON_CONF="/etc/hostapd/hostapd.conf"`

3. Now reboot with: `sudo reboot now`. Everything should come up working automatically.

There should be a script `setup-access-point.sh` that will automate this for you.

3 Login

```
ssh pi@<robot_name>.local
```

4 See Sensors

The create has been augmented with an inertial measurement unit.

```
pi@create rambler $ sudo i2cdetect -y 1
    0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:                -- -- -- -- -- -- -- -- -- -- -- -- -- --
10: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- 1f
20: -- 21 -- -- -- -- -- -- -- -- -- -- -- -- -- --
30: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
40: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
50: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
60: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
70: -- -- -- -- -- -- -- -- --
```

5 Test

TBD