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.

Roomba

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

NOTE: Because of various security issues (I can't buy thumb drives ... really?), this had to be changed to username t5/t6 and I am now using only the built in wifi, no USB wifi dongle. If you see it still in this guide (or else where), then I just missed removing the old info.

NOTE: The `pi` user account has the password changed, so students cannot log into it. The student user accounts will be either `t5` or `t6` (yes, real original, but I honestly don't think they will remember those) with the password `raspberry`. There are so many moving parts with this new course, I don't want to have to track password too. You could do this in the future to ensure a group isn't looking at another group's code and cheating.

User Accounts

Usernames and passwords (including SMB access) are:

- `t5`: raspberry
- `t6`: raspberry
- `pi`: I changed it from the default so students don't know it

If you need to reset a password:

passwd

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.

We are going to use the built in wifi (wlan0) on the RPi 3 to host a local dhcp server.

1. Install packages:

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

2. Now add `denyinterfaces wlan0` to `/etc/dhcpcd.conf` so we don't self assign ip addresses to ourself on `wlan0`. However, it is okay if another dhcp server gives `eth0` (the wired network interface) an ip address

3. Edit `/etc/network/interfaces` so our `wlan1` interface has a static ip address:

```
allow-hotplug wlan0
iface wlan0 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=wlan0 # Use the usb wifi dongle dhcp-range=10.10.10.5,10.10.10.100,255.255.255.0,24h

5. Setup hostapd config file: `/etc/hostapd/hostapd.conf`, note, we are setting up the SSID name the same as the hostname:

```
interface=wlan0
ssid=<NameOfNetwork>
channel=10
auth_algs=1
wpa=2
wpa_passphrase=<password_atleast_8_characters>
wpa_key_mgmt=WPA-PSK
wpa_pairwise=CCMP
rsn_pairwise=CCMP
```

6. Remove `/etc/init.d/hostapd` since it is unnecessary

7. Create `/etc/system.d/system/hostapd.service`: "'bash [Unit] Description=Hostapd Access Point After=sys-subsystem-net-devices-wlan0.device BindsTo=sys-subsystem-net-devices-wlan0.device

```
[Service]
Type=forking
PIDFile=/var/run/hostapd.pid
ExecStart=/usr/sbin/hostapd -B /etc/hostapd/hostapd.conf -P /var/run/hostapd.pid

[Install]
WantedBy=multi-user.target
```

   "' *Note:* if you are using an interface other than wlan0, make the correct change above.

8. Now do:

```
sudo systemctl enable hostapd
sudo systemctl start hostapd
```

9. Finally, double check all is well with `service hostapd status` which should show everything is up and running.

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

Login

Now you should be able to join your robot's wifi using the SSID and WPA passphrase. Then login via `ssh`:

```
ssh <username>@<robot_name>.local
ssh <username>@10.10.10.1
```