WiFi, Rpi and Lua, Oh My

How to program and communicate with an ESP8266 WiFi device using a Raspberry Pi

ESP8266 as web server

- ESP8266 is a microcontroller with built in WiFi
- It can be programmed and used as a stand alone device, e.g, home automation
- ESP8266 can be programmed with the Raspberry Pi
- We will make a simple web server that responds to commands to turn an LED off and on
- Go to GitHub for this presentation and code
- https://github.com/hackerspace-charlotte/RaspberryPiNight
- Navigate to ESP8266

Install tool to upload programs

```
$ sudo su -
# cd /usr/local
# mkdir luatool
# cd luatool
# git clone https://github.com/4refr0nt/luatool.git
# cd /usr/local/bin
# ln -s /usr/local/luatool/luatool/luatool.py
```

Install tool to talk to ESP8266

```
# apt-get update
# apt-get install picocom
# exit
```

- Should now have the ‘$’ prompt

Verify it all works

```
$ mkdir helloworld
$ cd helloworld
```

- Navigate to the `helloworld` directory of GitHub in browser.
- Get `init.lua`, put it into `helloworld/` directory on Pi.
- Plug USB cable into Pi and ESP8266
- Upload the program with luatool (may need to retry if error):

```
$ luatool.py --port /dev/ttyUSB0 --baud 115200 \
--src init.lua --dest init.lua --verbose
```

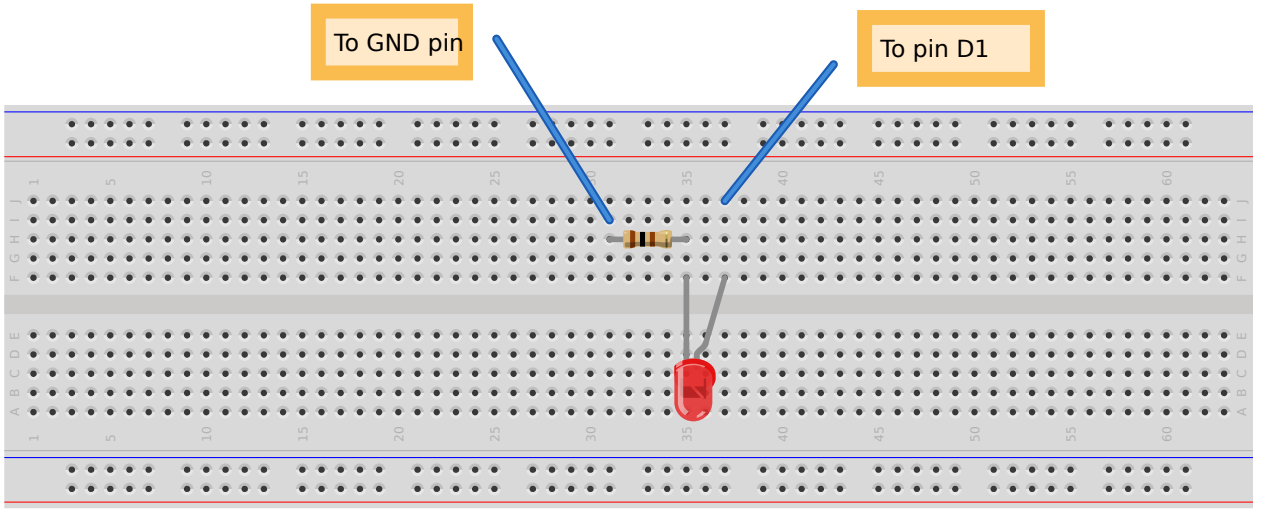
- Connect with picocom

```
$ picocom --baud 115200 /dev/ttyUSB0
```

- Reset ESP8266, output in picocom should show info, then connect to WiFi.
- Ctrl-a, Ctrl-q to quit picocom.

LED circuit

- Use breadboard
- Jumper from ESP8266 pin D1 to LED long leg
- Resistor from short leg of LED to ground
- Jumper from ground to GND on ESP8266



Upload web server code

```
$ mkdir blink
$ cd blink
```

- Navigate to the `blink` directory of GitHub, get `init.lua` and `main.lua`
- Plug USB cable into Pi and ESP8266
- Upload the programs with luatool (may need to retry if error):

```
$ luatool.py --port /dev/ttyUSB0 --baud 115200 \
--src init.lua --dest init.lua --verbose
$ luatool.py --port /dev/ttyUSB0 --baud 115200 \
--src main.lua --dest main.lua --verbose
```

Upload web server code (cont.)

- Connect with picocom

  ```
  $ picocom --baud 115200 /dev/ttyUSB0
  ```

- Reset ESP8266, get IP address from output.
- Open web browser on Pi and enter IP address as the URL.
- Should get web page with On and Off buttons.
- Press buttons, see LED go on and off.
- Disconnect ESP8266 from Pi, connect to USB charger.
- Should still work with web page on Pi.
- Try with your phone web browser.