

BEMOSS and Its Enhanced Applications

Brian Lauer

Advisor: Dr. Suruz Miah

Department of Electrical and Computer Engineering
Bradley University
1501 W. Bradley Avenue
Peoria, IL, 61625, USA

Friday, July 19, 2019

Outline

- 1 Current Motor Interface
 - Problems
 - Demo
- 2 Improved Motor Interface
- 3 Plans

Current Motor Interface

- Using command `nmap -sn 192.168.1.0/24` to perform ping scan
- Command `arp -a` dumps ARP (Address Resolution Protocol) cache
- Unable to use command `sudo nmap -sn 192.168.1.0/24`
- User input not accepted in VOLTTRON log terminal

Current Motor Interface

```
ramgroup@ramgroup-Latitude-E6510: ~  
? (192.168.1.48) at <incomplete> on wlp2s0b1  
? (192.168.1.205) at <incomplete> on wlp2s0b1  
? (192.168.1.142) at <incomplete> on wlp2s0b1  
? (192.168.1.75) at <incomplete> on wlp2s0b1  
? (192.168.1.193) at <incomplete> on wlp2s0b1  
? (192.168.1.130) at <incomplete> on wlp2s0b1  
? (192.168.1.95) at <incomplete> on wlp2s0b1  
? (192.168.1.213) at <incomplete> on wlp2s0b1  
? (192.168.1.150) at <incomplete> on wlp2s0b1  
? (192.168.1.108) at <incomplete> on wlp2s0b1  
? (192.168.1.41) at b8:27:eb:bf:ba:de [ether] on wlp2s0b1  
? (192.168.1.234) at <incomplete> on wlp2s0b1  
? (192.168.1.167) at <incomplete> on wlp2s0b1  
? (192.168.1.96) at <incomplete> on wlp2s0b1  
? (192.168.1.61) at <incomplete> on wlp2s0b1  
? (136.176.88.1) at 00:6c:bc:a6:9b:c1 [ether] on eno1  
? (192.168.1.254) at <incomplete> on wlp2s0b1  
? (192.168.1.187) at <incomplete> on wlp2s0b1  
? (192.168.1.116) at <incomplete> on wlp2s0b1  
? (192.168.1.49) at <incomplete> on wlp2s0b1  
? (192.168.1.242) at <incomplete> on wlp2s0b1  
? (192.168.1.143) at <incomplete> on wlp2s0b1  
? (192.168.1.72) at <incomplete> on wlp2s0b1  
? (192.168.1.198) at <incomplete> on wlp2s0b1
```

Figure: Use of arp command

Current Motor Interface

- Parse arp output with regex
- Retrieve IP and mac address of Raspberry Pi
- Remove ' :' delimiters from MAC address
- Regex in URL mapping to `devicedata_view` only searches for a-z, A-Z, and 0-9

Current Motor Interface

Problems

- Device model, vendor name, username, and password of Pi not easily accessible
- Hardcoded in json file
- Password must be encrypted
- RPi script paths must be specified on BEMOSS host machine

Current Motor Interface

Demo

Play video

Improved Motor Interface

- Raspberry Pi remote GPIO server
- Control GPIO pins over the Internet
- gpiozero or pigpio python libraries
- Only requires IP address, no login credentials

Plans

- Find new device to implement with BEMOSS
- Implement PID control algorithm with motor to control speed

Any questions?